National Survey on Recreation and the Environment 2000

Projected Participation in Marine Recreation: 2005 & 2010

March 2005

By

Dr. Vernon R. (Bob) Leeworthy
Dr. J. M. Bowker
Justin D. Hospital
&
Edward A. Stone

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Special Projects
Silver Spring, Maryland

This page intentionally left blank

Table of Contents

List of Tables

List of Figures

List of Tables in Appendices

FOREWORD

The 1999-2000 National Survey on Recreation and the Environment (NSRE) is the latest in a series of national surveys that was started in 1960 by the Outdoor Recreation Resources Review Commission (ORRRC). The federal government (ORRRC) initiated this National Recreation Survey (NRS) to assess outdoor recreation participation in the United States. Since that first in-the-home survey in 1960, six additional NRS's have been conducted —1965, 1970, 1972, 1977, 1982-83 and 1994-95. Over the years, the NRS surveys have changed in their methodology, composition, funding, and sponsorship.

In 1960, interviews were done in person over the four seasons of the year. In 1965, interviewing was done only in early fall. The 1970 survey instrument was a brief mailed supplement to the National Fishing and Hunting Survey. The 1982 survey was conducted in person in cooperation with the National Crime Survey, and the 1977, 1994, and 2000 surveys were conducted by telephone.

In 1994 the NRS was renamed the National Survey on Recreation and the Environment (NSRE). This new name was introduced to reflect the growing interest and emphasis of the U.S. population about their natural environment. Accordingly, the NSRE was expanded to include questions concerning peoples' wildlife and wilderness uses, environmental values, and attitudes regarding public and management issues. Additional information pertaining to the recreational needs of people with challenging and disabling conditions was also included.

NSRE 2000 is the eighth in the continuing series of U.S. National Recreation Surveys. Although similar to the previous national surveys, NRSE 2000 explores the outdoor recreational needs and environmental interests of the American people in greater depth. The growth of NRSE 2000 reflects the continuing growth of interest in our nation in outdoor recreation and our natural environment.

NSRE 2000 is an in-the-home phone survey of over 50,000 households across all ethnic groups throughout the United States. Questions from NSRE 2000 broadly address such areas as outdoor recreation participation, demographics, household structure, lifestyles, environmental attitudes, natural resource values (for example, concerning Wilderness), constraints to participation, and attitudes toward management policies.

The funding and responsibility of the NRS's have also changed quite considerably over the years. Initially the Outdoor Recreation Resources Review Commission, which did the first survey in 1960, recommended that subsequent surveys be completed at five-year intervals, but consistent funding and responsibility were not created. From 1965 through 1977, the Bureau of Outdoor Recreation and its successor, the Heritage Conservation and Recreation Service, did the research. Those agencies were abolished in 1981, and responsibility fell to the National Park Service in the U.S. Department of the Interior (USDI). The National Park Service coordinated the development of a consortium that included itself, the Forest Service in the U.S. Department of Agriculture (USDA), the Department of Health and Human Service's Administration on Aging, and the USDA's Bureau of Land Management. By the late 1980's, it was clear that the National Park Service would no longer assume the financial and organizational demands of such a large survey. Park Service Officials asked the Forest Service to assume its coordinating role for the next National Recreation Survey. The Outdoor Recreation and Wilderness Assessment Group, a part of the research branch of the Forest Service, assumed this role jointly with the National Oceanic and Atmospheric Administration (NOAA). This joint role between the Forest Service Outdoor Recreation and Wilderness Assessment Group in Athens, GA and NOAA has continued to the present day and includes responsibility for the current NSRE 2000 survey.

The present list of sponsoring agencies for the 1999-2000 NSRE efforts includes the USDA Forest Service, NOAA, the USDA's Economic Research Service, the U.S. Environmental Protection Agency, USDA Bureau of Land Management, the National Park Service, the University of Georgia, and the University of Tennessee. In addition, valuable assistance and resources were also provided by the American Horse Council, the American Motorcyclist Association, the American Recreation Coalition, B.A.S.S., Inc., the Carhart Wilderness Training Center, the Corps of Engineers, the Forest Service (specifically the Carhart Wilderness Training Center, Ecosystem Management Coordination, Recreation Staff, the Rocky Mountain Research Station, and Wildlife Staff), the Motorcycle Industry Council, the National Association of Recreation Resource Planners, the National Association of State Outdoor Recreation Liaison Officers, the National Environmental Education & Training Foundation, the Natural Resources Conservation Service, the Outdoor Recreation Coalition of America, the Rails-to-Trails Conservancy, the Recreation Vehicle Industry Association, the Snow Sports Industries of America, the U.S. Orienteering Federation, and the Wilderness Society.

In addition to versions one through six of the NSRE 2000 used in Leeworthy (2001), and versions one through nine used in Leeworthy and Wiley (2001), this report also includes data from versions ten and eleven. It is also important to note that participation estimates presented in this report are based on the estimate of U.S. population from the 2000 Census, which is for April 2000 (212 million). Estimates found in Leeworthy and Wiley (2001) were based on population estimates as of November 1999 (206.2 million). This accounts for slight differences in the number of participants reported herein.

Here we report the results of forecasting participation rates, number of participants, and number of days for years 2005 and 2010. Forecasts are done for 19 marine recreation activities/settings. Only national estimates are produced. Future efforts will attempt to estimate the number of participants and number of days, by activities/settings, for each state bordering marine waters.

All versions of the NSRE 2000 questionnaire and project results are being posted on the following web site: http://www.srs.fs.fed.us/recreation/nsre.html

Results from NSRE 2000 for Marine Recreation can be found on the following web site: http://marineeconomics.noaa.gov/NSRE/welcome.html.

NSRE 2005 will begin in January 2005 and the survey will run for 36-months with a goal of 50,000 completed interviews. For further information, contact the Project Co-leaders.

Project Co-leaders:

Dr. H. Ken Cordell
Outdoor Recreation and Wilderness Assessment Group
U.S. Forest Service
320 Green Street
Athens, GA 30602
(706) 559-4262
kcordell@fs.fed.us

Dr. Vernon R. (Bob) Leeworthy
Special Projects – N/MB7
NOAA, National Ocean Service
1305 East West Highway
SSMC4, 9th floor
Silver Spring, MD 20910
(301) 713-3000 ext. 138
Bob.Leeworthy@noaa.gov
Web site http://marineeconomics.noaa.gov

Introduction

Background and Definitions. NSRE 2000 is the first National Survey to include a broad assessment of the Nation's participation in marine recreation. Approximately every five years since 1955, the U.S. Fish and Wildlife Service has conducted a National Survey of Fishing, Hunting and Wildlife Associated Recreation. But the marine component of recreation was only broken out for saltwater fishing. In 1979, the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) initiated the Marine Recreational Fisheries Statistics Survey (MRFSS). This survey is an annual survey of catch and effort. So prior to the NSRE 2000, national surveys of marine recreation have been limited to saltwater fishing.

Marine Recreation. We originally called the marine recreation module in the NSRE 2000 the Coastal and Ocean Participation Module. We defined Coastal and Ocean participation as participation in at least one of nineteen activities/settings. Survey respondents were asked if they participated in an activity/setting "in freshwater, saltwater or both" for activities and "in freshwater or saltwater surroundings or both" for settings (e.g. beaches, watersides besides beaches, viewing activities and hunting for waterfowl). The respondent was told that for saltwater or saltwater surroundings, in addition to oceans and sounds, to please include mixed fresh-salt water in tidal portions of rivers and bays. Under the Coastal Zone Management Act (16 USC 1451, et seq.), the Great Lakes are now officially considered "coastal". Since the Great Lakes are freshwater, the NSRE 2000 did not specifically break out participation in the Great Lakes. So to be technically correct we changed the title from Coastal Recreation to Marine Recreation.

A key difference in the Marine Recreation Participation Module of the NSRE 2000 and the rest of the participation module is that the Marine Recreation Module asks in which states participation took place (up to five states for each activity/setting), and for 16 of the activity/settings, the number of days in each state.

Participation Rate. "Participation Rate" is the percent of the civilian non-institutionalized population 16 years or older in all households of the U.S. that participated in a particular activity or visited a particular setting over a 12-month period.

Participants. Number of participants is equal to the participation rate multiplied by the non-institutionalized population 16 years or older in all households of the U.S. as of April 2000 or 212,033,860 (U.S. Department of Commerce, Bureau of the Census). Estimates provided here are in millions of participants. In Leeworthy (2001) and Leeworthy and Wiley (2001), the population used to calculate total number of participants was based on an estimate as of September 1999 (206,171,709).

Days. As discussed above, we asked respondents for the number of days they participated in each activity or visited each setting over the past 12 months in each state. Respondents were instructed to include any part of a day as a whole day. Days are equal to one person doing an activity or visiting any setting for any part of a day. Generally, Days are not additive across activities, since a person can participate in multiple activities or visit multiple settings in a given day or participate in multiple activities at particular settings (e.g. swim, fish and view birds and wildlife at a beach).

Double Counting. It is also not appropriate to add the number of participants across activities/settings. Again, the reason is that people can participate in multiple activities/settings. When we report the participation rate and the number of participants across activities/settings, we eliminate double counting. For example, "Any Marine Recreation" includes the number of people that participated in at least one marine recreation activity or visited at least one marine setting, and if the person participated in more than one activity or visited more than one setting, they are only counted once. The same is true for adding across states.

Total days of water-based activities (freshwater and saltwater) were often less than the total number of days in saltwater when added across states. Some of this discrepancy was explained by double counting across states. It is possible, for example, to motorboat down a river separating two states and participate in a portion of a day of motor boating in more than one state. We eliminated this type of double counting in the totals for each activity/setting across states, so the addition of days for each activity/setting across states will be greater than the total reported across states.

Days Estimation. Besides the elimination of double counting, we estimated days of activity under three scenarios representing a range of estimates. Sample outlier values (days greater than 200) had significant influence on estimated mean number of days. This was especially true for beach visitation and the three viewing activities. We produced a low, medium and high estimate for each activity/setting in each state. For the low estimate, we deleted all sample observations with values exceeding 200 days. In the medium estimate (values reported in all tables in the report) we censored days to 200, i.e., we set all days greater than 200 days to 200 days when calculating mean number of days per person. For the high estimate, we made no adjustments to the data. For our forecasts of mean days of participation per person (see discussion below), we used the medium days estimate. See Leeworthy and Wiley (2001) for estimates of days by activity/setting and by States.

Sample. For estimating participation rates, number of participants and developing demographic profiles, Versions one through six of the NSRE 2000 were used. Versions one through six included 27,854 completed interviews conducted between July 1999 and December 2000. We found that national participation rates stabilized at around 5,000 completed interviews (the approximate amount in each version).

For estimating the participation equations used to forecast participation rates, we used Versions 1 through 11 that included over 52,000 interviews. A sample of 50,495 had complete information for all the socioeconomic variables and was used in estimating all participation equations. Versions 1 through 11 were also used for estimating the days equations used to forecast mean days of participation. A sample of 45,393 had complete information and was used in estimating all days equations.

Forecast Methodology. In this report, we provided forecasts for participation rates and for mean days of participation per person (as opposed to per participant) in 19 activities/settings for marine recreation. Estimates are provided for the Nation only. Future work will attempt to estimate the number of participants and days by activity/setting for each State. Our baseline year is 2000 and we forecast participation and days for years 2005 and 2010. Participation equations were estimated for all 19 activities/settings. Day's equations were estimated for only 16 activities/settings, as there was insufficient data for the other three (canoeing, kayaking, and rowing). For forecasts of explanatory variables, we used forecasts by Woods and Poole (2004). Forecasts of the civilian noninstitutionalized population 16 years old and older were not available. We developed estimates of this population assuming that this sub-population would grow at the same rate as the general population 16 years old and older as obtained from the U.S. Census Bureau (Census 2004).

Caveats. The level of educational attainment was an important factor in explaining participation in all marine recreation activities/settings. Education also proved an important factor in explaining mean days of participation in many of the activities/settings. However, forecasts for level of educational attainment were not available, so we held it constant in the forecast periods. Since, educational attainment is positively related to participation and mean days, and the fact is that the level of educational attainment is likely to increase in the future; there is a possible downward bias in our estimates of participation and mean days. On the other hand, our assumption that the civilian noninstitutionalized population 16 years old and older grows at the same rate as the general population 16 years old and older may lead to an upward bias in our estimates. The reasons are twofold. First, the population is projected to be aging over the forecast period. This will likely result in a higher proportion of the population being institutionalized in nursing homes and other facilities. Second, the proportion of the population classified as Non White and Hispanic is projected to increase and these groups have higher rates of incarceration than the population classified as White, Non Hispanic. We don't know to what extent the possible downward bias in the participation rates will be offset by the possible upward bias in the estimated population.

Probably the greatest shortcoming of our forecasts is the lack of supply constraints. Our forecasts are unconstrained forecasts of demand.

Participation Functions. Equations relating participation, by activity/setting, to socioeconomic factors (e.g., age, race/ethnicity, household income, sex, education, and place of residence) were estimated (See Appendix A). Initially, equations were estimated using ordinary least squares, probit and logit models. All three model specifications identified the same factors as being statistically significant (a T-value probability of 0.05 level of significance or less was used as the cut-off value for inclusion in the final estimated equations). In addition, all three specifications had the same signs on model coefficients. The logit specification was chosen as the preferred specification.

In initial model specifications, the variable for age was specified in continuous format, with age and age squared used to test for parabolic relationships between age and participation rates. However, the parabolic relationships were not found. Participation rates generally declined with increases in age. In addition, the available forecasts of the socioeconomic factors from Woods and Poole (2004) were all specified categorically. In some cases, our sample data was more precise (i.e., contained more detailed categories), but we were constrained in estimation to what was available for forecasts from Woods and Poole. So all socioeconomic factors are specified as categorical variables in our estimated models. Generally, the category with the lowest participation rate was allocated to the base (i.e., excluded from the equation and thus captured in the constant of the estimated equation). Interpretation of the coefficients on each factor category is the effect of the category on participation relative to the base. If in initial estimation a factor category was not statistically significant, the factor category was dropped from the equation, thus entering the base. The interpretation is that there is not a statistically significant difference between categories allocated to the base. Results varied by activity/setting.

For *Place of Residence*, three separate variables (factors) were included in the equations. The first variable included was Census Division. There are nine Census Divisions in the U.S. and they are aggregations of States. The nine

Census Divisions can be further aggregated into four Census Regions (Figure 1). We expect that people living in Census Divisions in the interior portions of the country would have lower participation rates for marine recreation. The second variable included was *Coastal County*. Counties that are adjacent to tidally influenced (marine) waters are classified as coastal counties. The variable is specified as a simple dummy variable with residents of coastal counties receiving a value of one (1) and residents of non-coastal counties receiving a value of zero (0). Residents of non-coastal counties are therefore the base category for the variable *Coastal County* (in the constant of the estimated equation). Census Divisions and coastal county residence capture location/distance effects on participation. Residence in urban or rural areas was the third variable included for place of residence. The variable *Urban* is a dummy variable with residents of urban areas receiving a code of one (1) and residents of rural areas receiving a code of zero (0). Thus, residents of rural areas are the base category for the variable *Urban* and are captured in the equation constant.

All participation equations were estimated using the software package LIMDEP Version 7 (Greene 1995). As mentioned above, all equations were estimated using the logit model specification. Equation 1 below shows the general logit model specification. Note that the dependent variable in the logit model is the natural logarithm of the odds ratio (P_i/ $1-P_i$), where P_i is the probability that an individual participates in an activity/setting (i). The coefficients on the estimated logit models don't give us directly the relationship between the socioeconomic factors and P_i, so we must solve Equation 2 to get our estimate of P_i.

Predicting Baseline Year Participation Rates. The 19 estimated logit equations that were used to forecast future participation rates first had to be calibrated to provide perfect predictions in the base year. Sample means for each explanatory variable for year 2000 were plugged into each equation, and Equation 2 was then used to solve for the estimated or "*Predicted Participation Rate*". However, the logit model doesn't predict exactly the sample estimates of participation rates as found in Leeworthy (2001) and Leeworthy and Wiley (2001), so the model constants were adjusted to yield the *"Adjusted Participation Rate"*, which is equivalent to the participation rates found in Leeworthy (2001) and Leeworthy and Wiley (2001).

Normalization of Forecasted Explanatory Variables. As mentioned above, we obtained forecasts of the explanatory variables from Woods and Poole (2004). The Woods and Poole forecasts were for the general population of all ages. Since our sample is of the civilian noninstitutionalized population 16 years old and older, we had to normalize the Woods and Poole estimates to our sample. The details are explained in Appendix B. The Excel Workbook with the calculations will be posted on our web site (http://marineeconomics.noaa.gov).

Predictions. Participation rates were forecasted for all 19 activities/settings using the estimated logit equations and the normalized forecasts of the explanatory variables from Woods and Poole (2004). The calculations are all included in the Excel Workbook called "*NSRE 2000 Participation.xls*" posted on our web site. We also calculate and present here the estimated "marginal effects" of each explanatory variable on the estimated participation rates.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

$$\ln[P_i / (1- P_i)] = a + b_1x_1 + b_2x_2 + \ldots + b_kx_k \qquad \textbf{(Eq. 1)}$$

P_i = probability that an individual will participate in a given coastal activity

α = model constant

x_i's = variables for socioeconomic attributes (age, race, sex, income, etc.; constant across activities)

b_j's = coefficients for the socioeconomic variables (different for each activity)

$$P_i = 1 / (1 + \exp(-a - \Sigma\, b_jx_j) \qquad \textbf{(Eq. 2)}$$

Days Functions. Equations relating mean days of participation, by activity/setting, to socioeconomic factors (e.g., age, race/ethnicity, household income, sex, education, and place of residence) were estimated (See Appendix A). Mean days of participation per person (member of the civilian noninstitutionalized population 16 years old or older) was estimated as opposed to mean days of participation per participant. Total days of participation was derived by multiplying the estimate of mean days per person by the civilian noninstitutionalized population 16 years old and older. Mean days per participant was then easily obtained by dividing the estimate of total days by the number of participants from the participation estimation.

Because survey responses for days were limited to integer values, the models were initially estimated using both Poisson and negative binomial regression models. The Poisson regression model presupposes that the mean of the dependent variable is equal to the variance. Tests for over dispersion confirmed that the negative binomial model was the appropriate model specification for days of participation.

The negative binomial equations for mean days used the same explanatory variables as the logit estimation of participation rates. See the participation functions section above for a discussion of issues with the specification of these explanatory variables.

All days equations were estimated using the software package LIMDEP Version 7 (Greene 1995). As mentioned above, all equations were estimated using the negative binomial model specification. Equation 3 below shows the general negative binomial model specification. Note that the dependent variable in the negative binomial model is the natural logarithm of the dependent variable Y_i. Here Y_i is the mean number of days of participation in an activity/setting (i). The coefficients on the estimated logit models don't give us directly the relationship between the socioeconomic factors and Y_i, so we must solve Equation 4 to get our estimate of Y_i.

Predicting Baseline Year Days of Participation. Like the estimated logit equations for participation, the estimated negative binomial equations for days had to be calibrated to provide perfect predictions in the base year (see above). The negative binomial equation coefficients were adjusted so that the days of participation per person predicted by the model is consistent with estimates from Leeworthy and Wiley (2001).

Normalization of Forecasted Explanatory Variables. As mentioned above, we obtained forecasts of the explanatory variables from Woods and Poole (2004). The Woods and Poole forecasts were for the general population of all ages. Since our sample is of the civilian noninstitutionalized population 16 years old and older, we had to normalize the Woods and Poole estimates to our sample. The details are explained in Appendix B. The Excel Workbook with the calculations will be posted on our web site (http://marineeconomics.noaa.gov).

Predictions. Mean days of participation per person were forecasted for 16 activities/settings using the estimated negative binomial equations and the normalized forecasts of the explanatory variables from Woods and Poole (2004). The calculations are all included in the Excel Workbook called "*NSRE 2000 Days.xls*" posted on our web site. We also calculate and present here the estimated "marginal effects" of each explanatory variable on the estimated participation rates.

Marginal Effects. Marginal effects are defined as the change in the mean number of days in a given activity/setting for a unit change in an explanatory variable, holding all other explanatory variables constant. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

$$\ln[Y_i] = a + b_1x_1 + b_2x_2 + \ldots + b_kx_k + \varepsilon \qquad \textbf{(Eq. 3)}$$

Y_i = per person days of participation in a given coastal activity

α = model constant

x_i's = variables for socioeconomic attributes (age, race, sex, income, etc.; constant across activities)

b_j's = coefficients for the socioeconomic variables (different for each activity)

ε = additional error term of Negative Binomial Model due to inequality of mean and variance

$$Y_i = \exp(a + \Sigma b_jx_j) \qquad \textbf{(Eq. 4)}$$

References

Greene, William H. LIMDEP Version 7.0, Econometric Software, Inc., 43 Maple Avenue, Bellport, NY.

Leeworthy, Vernon R., 2001. *Preliminary Estimates from Versions 1-6: Coastal Recreation Participation, National Survey on Recreation and the Environment (NSRE) 2000*. Silver Spring, MD: National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects Office. May 2001, 46 pp. Portable document format (PDF) located at http://marineeconomics.noaa.gov/NSRE/NSRE_V1- 6_May.pdf.

Leeworthy, Vernon R. and Wiley, Peter C., 2001. *Current Participation Patterns in Marine Recreation, National Survey on Recreation and the Environment (NSRE) 2000*. Silver Spring, MD: National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects Office. November 2001, 47pp. Portable document format (PDF) located at http://marineeconomics.noaa.gov/NSRE/NSRE_2.pdf.

General Overview

In this report, we provide forecasts of participation rates, number of participants, mean days of participation per person, and total number of days, by activity/setting, in marine recreation. The baseline year is 2000 with forecasts for 2005 and 2010.

Participation Rates. Overall, participation rates in 13 of 19 activities/settings are projected to decline over the forecast period. Four (4) of the 19 activities/settings are projected to have increasing participation rates (visiting watersides besides beaches, scuba diving, hunting waterfowl, and rowing), while two (2) of the activities/settings are projected to have constant participation rates (surfing and wind surfing).

Activities/Settings with the largest projected declines in participation rates are swimming (-0.26% for 2000-2005 and –0.65% for 2000-2010) and visiting beaches (-0.18% for 2000-2005 and –0.44% for 2000-2010). Activities/Settings with the largest projected increases in participation rates are scuba diving (+0.03% for 2000-2005 and +0.04% for 2000-2010) and visiting watersides besides beaches (+0.01% for 2000-2005 and +0.02% for 2000-2010).

Number of Participants. Even though participation rates are projected to decline for 13 of the 19 activities/settings, the number of participants is projected to increase for all activities/settings. The reason is that the increase in the projected population more than offsets the projected declines in participation rates.

The largest projected increases in number of participants were for visiting beaches (+3.9 million for 2000-2005 and +7.3 million for 2000-2010) and swimming (+3.1 million for 2000-2005 and +5.5 million for 2000-2010).

Increases in the absolute number of participants are a function of the relative size of participation rates. In terms of growth rates, hunting waterfowl (+9.76% for 2000-2005 and +19.32% for 2000-2010) and scuba diving (+8.96% for 2000-2005 and +16.63% for 2000-2010) were projected to increase the fastest. However, these two activities are relatively low participation activities.

Mean Days of Participation per Person. Overall, mean days of participation per person is projected to decline over the forecast period in 13 out of 16 activities/settings for which equations were estimated. Two (2) of the activities/settings (sailing and hunting waterfowl) are projected to have increasing mean days of participation per person, while one (1) activity/setting (visiting watersides besides beaches) is forecasted to have mean days per person fall slightly between 2005 and 2010, after increasing between 2000 and 2005. It is important to make the distinction between mean days per person (member of the civilian noninstitutionalized population 16 years old and older) and mean days per participant.

Activities/Settings with the largest projected percent declines in mean days of participation per person are viewing other wildlife (-4.1% or -0.067 days for 2000-2005 and -8.4% or -0.139 days for 2000-2010) and scuba diving (-3.7% or -0.004 days for 2000-2005

Table O1: Participation Rates and Number of Participants by Activity/Setting and Year

Activity/Setting	2000		2005		2010	
	Participation Rate (%)	Number of Participants (millions)	Participation Rate (%)	Number of Participants (millions)	Participation Rate (%)	Number of Participants (millions)
Visiting Beaches	30.03	63.67	29.85	67.59	29.59	70.94
Visiting Watersides Besides Beaches	4.50	9.54	4.51	10.22	4.52	10.84
Swimming	25.53	54.13	25.27	57.21	24.88	59.64
Snorkeling	5.07	10.75	5.02	11.38	4.96	11.88
Scuba Diving	1.35	2.86	1.38	3.12	1.39	3.34
Surfing	1.59	3.37	1.60	3.63	1.59	3.81
Wind Surfing	0.39	0.83	0.39	0.89	0.39	0.94
Fishing	10.32	21.88	10.29	23.31	10.24	24.54
Motorboating	7.11	15.08	7.04	15.95	6.97	16.70
Sailing	2.98	6.32	2.95	6.69	2.92	7.00
Personal Watercraft Use	2.57	5.45	2.55	5.77	2.50	5.99
Canoeing	1.05	2.23	1.04	2.35	1.02	2.45
Kayaking	1.33	2.82	1.33	3.01	1.31	3.15
Rowing	0.53	1.12	0.53	1.21	0.54	1.28
Water Skiing	1.15	2.44	1.14	2.57	1.12	2.69
Viewing or Photographing Scenery	9.19	19.49	9.11	20.62	9.02	21.62
Hunting Waterfowl	0.33	0.70	0.34	0.77	0.35	0.83
Bird-Watching	7.17	15.20	7.11	16.10	7.03	16.86
Viewing other Wildlife	6.45	13.68	6.37	14.41	6.26	15.01

and -7.8% or -0.009 days for 2000-2010). The activity/setting with the largest projected percent increase in mean days of participation per person is sailing (+1.1% or +0.003 days for both 2000-2005 and 2000-2010).

Total Days of Participation. Total days of participation~~,~~ by activity/setting was calculated by multiplying the forecasts of mean days per person by the population forecasts. Visiting beaches was the number one activity with an estimated 878.7 million days of activity in 2000 and projected number of days of 927.7 million days in 2005 and 969.6 million days in 2010. The projected increase of 49.0 million days for 2000-2005 represents a 5.57% increase, while the estimated increase of 90.9 million for 2000-2010 represents a 10.34% increase. Thus we project significant increases in demand for the Nation’s scarce and eroding beach resources.

Forecasts of Explanatory Variables. The above forecasts of participation rates are based on estimated logit models relating participation rates to various socioeconomic variables and forecasts of these socioeconomic variables (explanatory variables). Forecasts of the explanatory variables were produced by Woods and Poole

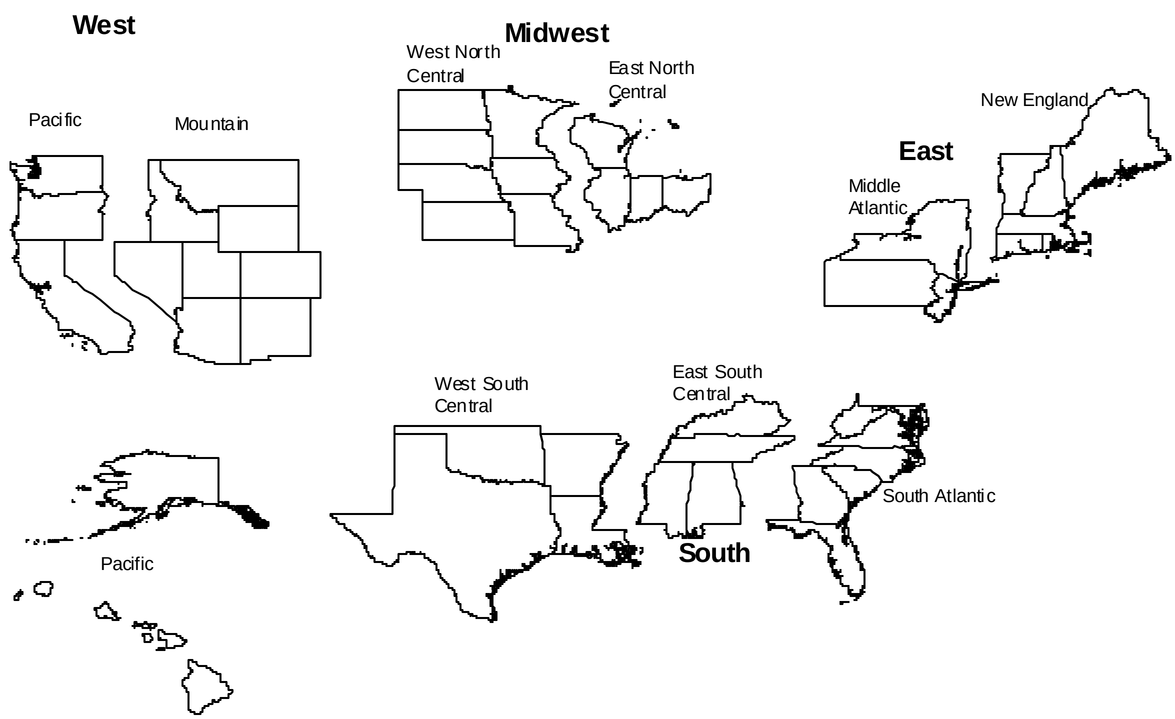
Table O2: Population Distributions for Explanatory Variables by Year

Factors	2000 (%)	2005 (%)	2010 (%)
Age			
16-24 years old	20.28	20.33	19.97
25-34 years old	16.40	15.56	15.55
35-44 years old	19.88	18.27	16.50
45-54 years old	15.98	16.85	16.93
55-64 years old	10.75	12.62	14.27
65+ years old	16.70	16.37	16.79
Census Division			
New England	6.64	6.48	6.32
Middle Atlantic	11.98	11.61	11.28
South Atlantic	17.26	17.55	17.79
East South Central	6.84	6.78	6.75
West South Central	10.95	11.11	11.25
East North Central	13.60	13.28	13.02
West North Central	8.35	8.22	8.13
Mountain	9.08	9.52	9.90
Pacific	15.28	15.45	15.56
Coastal County Resident	48.49	48.16	47.88
Urban Resident	79.72	80.02	80.24
Educational Attainment			
Less than High School	25.26	25.26	25.26
High School	29.45	29.45	29.45
Some College or College Degree	38.04	38.04	38.04
Master's, Professional Degree, or Doctorate	6.55	6.55	6.55
Other	0.70	0.70	0.70
Household Income			
$0-$25,000	14.28	13.26	12.18
$25,000-$50,000	18.68	18.34	17.77
$50,000-$100,000	17.04	18.03	19.19
$100,000+	6.20	6.57	7.05
Income Missing	43.80	43.80	43.80
Race/Ethnicity			
White, not Hispanic	67.99	65.43	63.19
Black, not Hispanic	12.92	13.00	13.13
Native American or Pacific Islander, not Hispanic	0.66	0.67	0.67
Asian, not Hispanic	3.08	3.49	3.92
Hispanic	15.35	17.41	19.09
Sex			
Male	47.87	48.00	48.07
Female	52.13	52.00	51.93

Table O3: Mean Days per Person and Total Days by Activity/Setting and Year

	Mean Number of Days per Person 2000	Mean Number of Days per Person 2005	Mean Number of Days per Person 2010	Total Days 2000	Total Days 2005	Total Days 2010
Visiting Beaches	4.14414	4.09694	4.04450	878,698,001	927,663,095	969,569,540
Visiting Watersides Besides Beaches	0.76950	0.77307	0.76855	163,160,055	175,045,921	184,241,244
Swimming	3.62526	3.53210	3.42972	768,677,871	799,766,868	822,191,278
Snorkeling	0.44616	0.43461	0.41945	94,601,027	98,408,038	100,553,153
Scuba Diving	0.11070	0.10660	0.10210	23,472,148	24,137,506	24,475,294
Surfing	0.35457	0.35089	0.34172	75,180,846	79,452,285	81,919,806
Wind Surfing	0.02808	0.02800	0.02732	5,953,911	6,340,801	6,550,432
Fishing	1.25904	1.24796	1.23688	266,959,111	282,574,704	296,510,275
Motorboating	0.98118	0.95628	0.93000	208,043,383	216,527,849	222,945,140
Sailing	0.23542	0.23801	0.23807	49,917,011	53,892,966	57,071,826
Personal Watercraft Use	0.21331	0.21108	0.20609	45,228,943	47,793,554	49,404,811
Canoeing						
Kayaking						
Rowing						
Water-Skiing	0.13685	0.13272	0.12700	29,016,834	30,050,790	30,445,011
Viewing or Photographing Scenery	4.00684	4.01869	3.98978	849,585,752	909,945,854	956,451,695
Hunting Waterfowl	0.03069	0.03078	0.03083	6,507,319	6,968,602	7,390,000
Bird-Watching	3.05442	2.99471	2.92019	647,640,463	678,087,198	700,042,977
Viewing other Wildlife	1.65120	1.58392	1.51255	350,110,310	358,643,751	362,596,586

Figure O1:
Census Regions and Divisions



(2004) and normalized to our population (See explanation in Introduction and Appendix B for details). Below we briefly discuss the projected changes in the explanatory variables.

Age. Generally, the population is expected to age between 2000 and 2010. The one exception is that there is a small projected decline in the proportion of the population 65 years old and older between 2000 and 2005. However, over the longer-term forecast period, the proportion of the population 65 years old and older is projected to increase. Since age is negatively related to participation rates for all activities/settings except bird watching, the impact of the aging population decreases projected participation rates for all activities/settings except bird watching. Age is a statistically significant factor in all of the estimated days equations with the exception of hunting waterfowl.

Census Division. Population is projected to change in distribution across the nine Census Divisions. Four Census divisions are projected to increase their share of the Nation's population (New England, Middle Atlantic, East South Central, East North Central, and West North Central), while five Census Divisions are projected to decrease their share of the Nation's population (South Atlantic, West South Central, Mountain and Pacific). The largest increase in shares of the Nation's population is projected for the Mountain Division (+0.43% for 2000-2005 and +0.82% for 2000-2010) and the South Atlantic Division (+0.29% for 2000-2005 and +0.53% for 2000-2010). The largest decrease in shares of the Nation's population is projected for the Middle Atlantic Division (-0.37% for 2000-2005 and –0.69% for 2000-2010). The relationships between Census Divisions and participation rates varied by activity/setting. However, Census Division 7 (West North Central) had the lowest participation rates for all activities/settings, except for water skiing and motor boating. For these two activities, Census Division 6 (East North Central) and lowest participation rates. The relationships between Census Divisions and mean days of participation varied as well, but again Census Division 7 (West North Central) had the lowest mean days of participation in most of the estimated equations.

Coastal County Residence. The proportion of the population residing in coastal counties is projected to decline. In 2000, 48.49% of the civilian noninstitutionalized 16 years old and older resided in coastal counties. This is projected to decrease to 48.16% in 2005 and to 47.88% in 2010. Since coastal county residence is positively related to participation rates for all activities/setting except hunting waterfowl (for which it was not a statistically significant factor), the decline in this factor had a negative impact on projected participation rates for all activities/settings except hunting waterfowl. For the estimation of mean days of participation, the forecasted decline in the proportion of the population residing in coastal counties had a negative impact on mean days per person for all activities/ settings except wind surfing and hunting waterfowl.

Urban Residence. The projected proportion of the population residing in urban areas is projected to increase from 79.72% in 2000 to 80.02% in 2005 and 80.24% in 2010. Since urban residence is positively related to participation rates in 11 of the 19 activities/settings, this factor has a positive impact on participation rates for most activities/settings. Urban residence was not a statistically significant factor in explaining participation rates for wind surfing, fishing, canoeing, kayaking, rowing, hunting waterfowl and bird watching. Urban residence was statistically significant in explaining mean days of participation only for beach visitation, swimming, scuba diving, sailing, personal watercraft use, and viewing other wildlife. It had a negative impact on mean days for viewing other wildlife and a positive influence for the other activities/settings.

Household Income. Annual household income is projected to increase. Since household income is positively related to participation rates for all activities/settings, this factor has a positive impact on projected participation rates for all activities/settings. For mean days of participation, household income was statistically insignificant for hunting waterfowl, bird watching, and viewing other wildlife. In general, income has a positive effect on mean days of participation.

Race/Ethnicity. The proportion of the population classified as *White, Not*

Figure O2: Population Distributions for Age Groups by Year

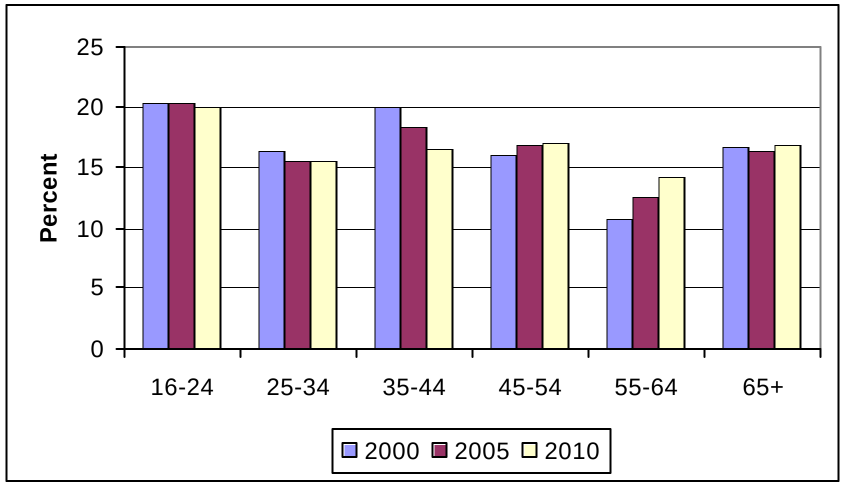


Figure O3: Population Distributions for Coastal County Residence by Year

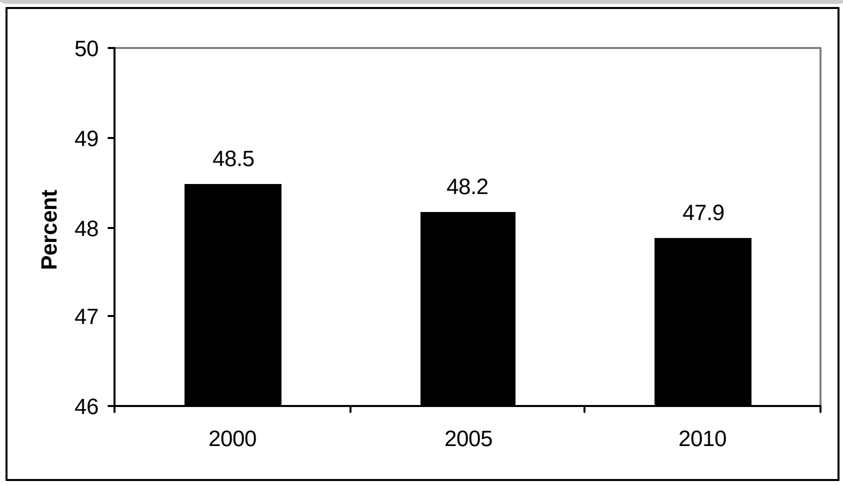
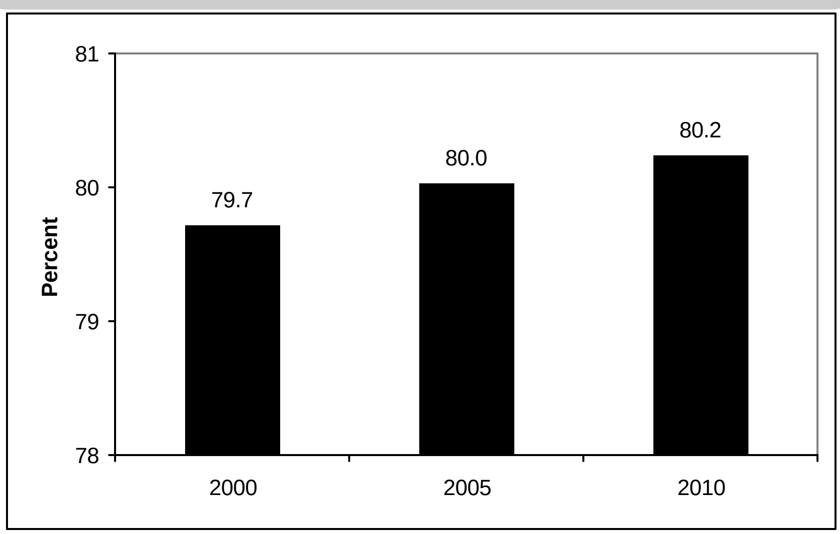


Figure O4: Population Distributions for Urban Residence by Year



Hispanic is projected to decline from 67.99% of the population in 2000 to 65.43% in 2005 and 63.19% in 2010. The largest increase in the proportion of the population is projected for those classified as *Hispanic*. The *Hispanic* population is projected to increase from 15.35% of the population in 2000 to 17.41% in 2005 and 19.09% in 2010. The next largest increase in the projected proportion of the population is for those classified as *Asian, Not Hispanic*. Those classified as *Asian, Not Hispanic* are projected to increase from 3.08% of the population in 2000 to 3.49% in 2005 and 3.92 % in 2010. Those classified as *Black, Not Hispanic* made up 12.92% of the population in 2000 and are projected to increase to 13.0% of the population in 2005 and to 13.13% of the population in 2010. Those classified as *Native American or Pacific Islander, Not Hispanic* are projected to remain relatively constant as a proportion of the population from 0.66% of the population in 2000 to 0.67% in both 2005 and 2010. Since the logit models revealed many different relationships between race/ethnicity and participation rates by activities/settings, there is no general statement that can be made here on the impacts of the projected changes in the racial/ethnic composition of the population on participation rates. The impacts are discussed by activity/setting in the following sections of the report. The negative binomial models also reveal a variety of relationships between race/ethnicity and mean days of participation. Race/ethnicity was not a statistically significant factor in explaining mean days of participation for visiting watersides besides beaches, windsurfing, sailing, personal watercraft use, water skiing, and hunting waterfowl.

Sex. Males are projected to become a slightly larger proportion of the population. Males were 47.87% of the population in 2000 and are projected to increase to 48.0% of the population in 2005 and 48.07% of the population in 2010. As with race/ethnicity, there

Figure O5: Population Distributions for Income by Year

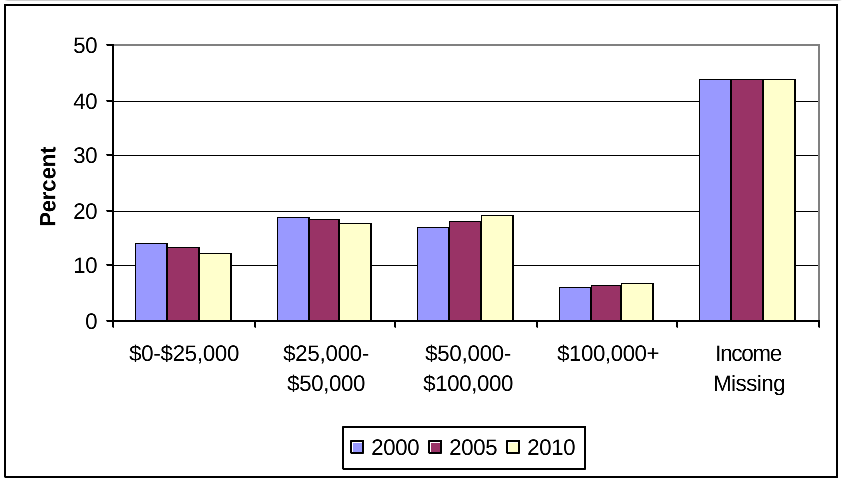


Figure O6: Population Distributions for Race by Year

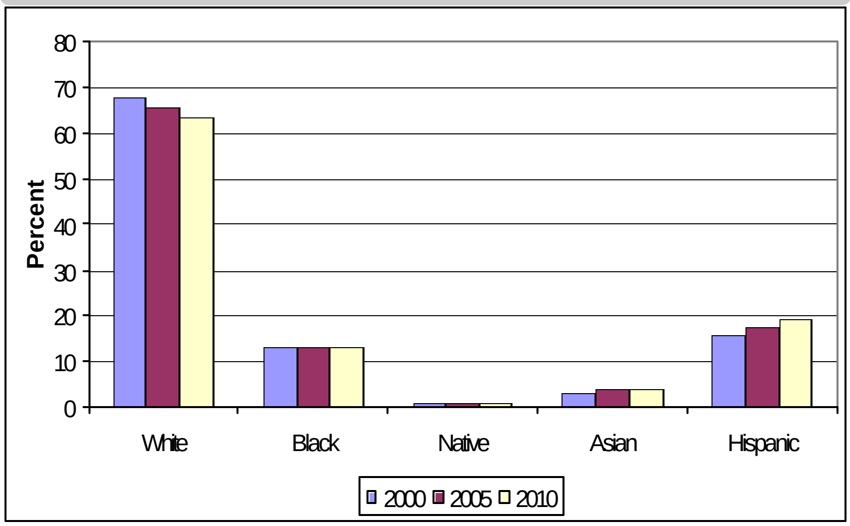
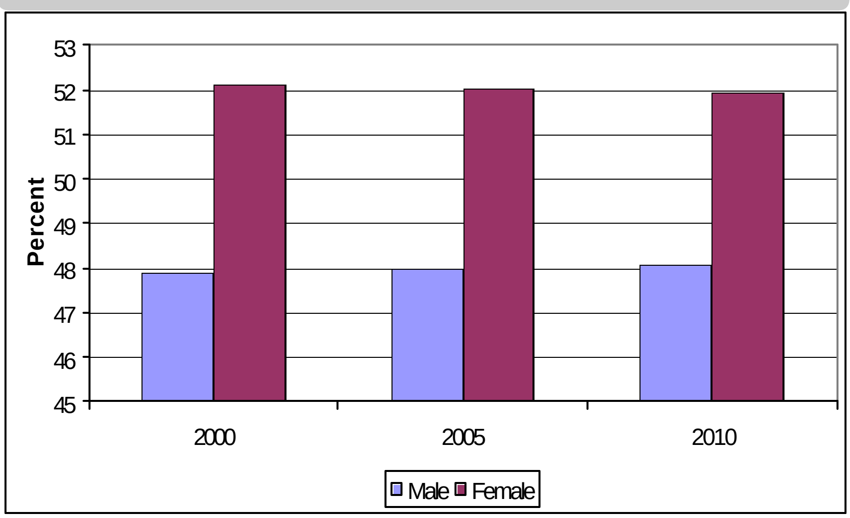


Figure O7: Population Distributions for Sex by Year



was a varying relationship between sex and participation rates by activity/setting. There was no relationship between sex and participation rates in kayaking and viewing other wildlife. There was no relationship between sex and mean days of participation in beach visitation, swimming, wind surfing, sailing, and viewing or photographing scenery.

Education. As mentioned in the Introduction, we were not able to find forecasts for the level of educational attainment and so held this factor constant over the forecast period. As with race/ethnicity and sex, the relationship between education and participation rates, by activity/setting, varied greatly. There wasn't a statistically significant relationship between education and participation rates in water skiing and hunting waterfowl. There was no relationship between education and mean days of participation in wind surfing, water skiing, and hunting waterfowl.

Table O4: Forecasted Changes in Explanatory Variables

Factors	% Change 2000-2005	% Change 2000-2010
Age		
16-24 years old	0.05	-0.31
25-34 years old	-0.84	-0.85
35-44 years old	-1.61	-3.38
45-54 years old	0.87	0.94
55-64 years old	1.88	3.52
65+ years old	-0.33	0.08
Census Division		
New England	-0.17	-0.32
Middle Atlantic	-0.37	-0.69
South Atlantic	0.29	0.53
East South Central	-0.06	-0.09
West South Central	0.16	0.29
East North Central	-0.32	-0.59
West North Central	-0.13	-0.23
Mountain	0.43	0.82
Pacific	0.17	0.28
Coastal County Resident	-0.33	-0.61
Urban Resident	0.30	0.51
Educational Attainment		
Less than High School	0	0
High School	0	0
Some College or College Degree	0	0
Master's, Professional Degree, or Doctorate	0	0
Other	0	0
Household Income		
$0-$25,000	-1.02	-1.07
$25,000-$50,000	-0.34	-0.56
$50,000-$100,000	0.99	1.16
$100,000+	0.38	0.47
Income Missing	0	0
Race/Ethnicity		
White, not Hispanic	-2.56	-4.80
Black, not Hispanic	0.08	0.21
Native American or Pacific Islander, not Hispanic	0.01	0.01
Asian, not Hispanic	0.41	0.84
Hispanic	2.06	3.74
Sex		
Male	0.12	0.07
Female	-0.12	-0.07

Beach Visitation

Participation in Beach Visitation
Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. BV1), while population is projected to increase. The net effect is an estimated increase in participants from 63.7 million in 2000 to 67.6 million in 2005 and 70.9 million in 2010 (See Fig. BV2). The 3.9 million increase in participants from 2000 to 2005 represents a 6.1% increase, while the 7.3 million increase in participants from 2000 to 2010 represents an 11.4% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure BV1: Beach Visitation Participation Rates by Year

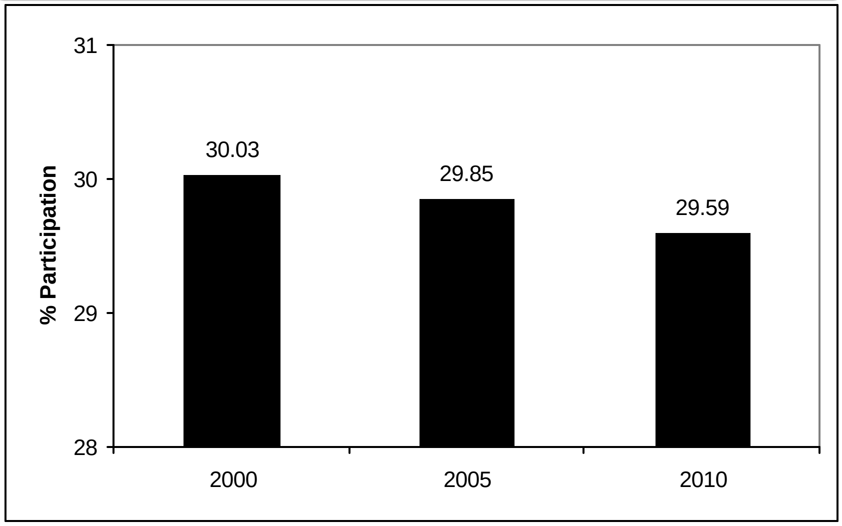
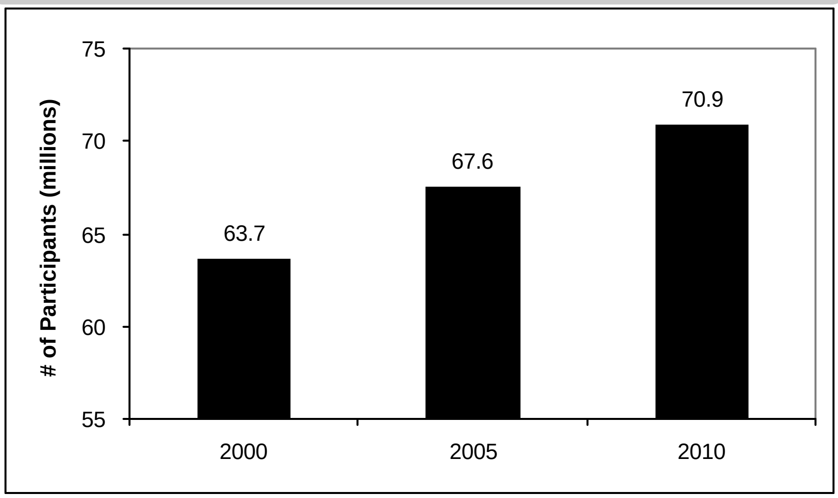


Figure BV2: Beach Visitation Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity and sex were all statistically significant factors in explaining participation in beach visitation (see Appendix A, Table A.1 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 71.5% of the sample of 50,495 participants and non-participants. About 87.9% of non-participants were predicted correctly, while 38.2% of participants were predicted correctly.

Age: As age increases participation in beach visitation declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in beach visitation. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for visiting marine beaches (Great Lakes beaches not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 9 (Pacific) have the highest participation rates followed closely by residents of Census Division 3 (South Atlantic) and Census Division 1 (New England).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine beaches than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on beach visitation. The logit equation estimation found that residents of urban areas had higher participation rates for beach visitation than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for beach visitation increase. People with less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have participation rates somewhere between those with college degrees and those with graduate/professional degrees.

Household Income: As the level of annual household income increases participation rates for beach visitation increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43 %) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000, but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: Those who were classified as *White, Not Hispanic* had the highest participation rates for beach visitation. In the initial logit equation estimation, *Native American or Pacific Islander, Not Hispanic* was included in the base. However, only those classified as *White, Not Hispanic* were statistically different from the base, and in the final equation all other race/ethnicity classification were included in the base. The estimated logit model coefficient on *White, Not Hispanic* was positive meaning that those classified in this category have higher participation rates than those classified in all other racial/ethnic classifications.

Sex. Males have lower participation rates in beach visitation than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was negative meaning males have lower participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future beach visitation participation rates for years 2005 and 2010. Overall, beach visitation rates are estimated to decline from the year 2000 rate of 30.03% to 29.85% in 2005 and to 29.59% in 2010 (See Fig. BV1). The predominant factors driving the negative changes in the forecasted participation rates are the aging population and the decline in the proportion of the population classified as *White, Not Hispanic* over the two forecast periods. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.11% or an increase of 0.11 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate declines 0.18 percentage points for the time period 2000 – 2005 and declines 0.44 percentage points for the period 2000 – 2010 (See Table BV1). On net, three factors had positive marginal effects (Census Division, urban resident, and household income), while four factors had negative marginal effects (age, coastal county resident, race/ethnicity, and sex). Age and race/ethnicity were the factors with the largest net marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a reduction in participation rates of 0.18 percentage points for the 2000 – 2005 period and a reduction of 0.47 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a reduction in participation rates of 0.22 percentage points for the 2000 – 2005 period and a reduction of 0.41 percentage points for the 2000 – 2010 period.

Table BV1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.11	-0.85	0.11
35-44 years old	-1.61	0.22	-3.38	0.45
45-54 years old	0.87	-0.16	0.94	-0.18
55-64 years old	1.88	-0.44	3.52	-0.83
65+ years old	-0.33	0.10	0.08	-0.03
Net Effects Age		-0.18		-0.47
Census Division				
New England	-0.17	-0.04	-0.32	-0.08
Middle Atlantic	-0.37	-0.07	-0.69	-0.13
South Atlantic	0.29	0.09	0.53	0.16
East South Central	-0.06	-0.01	-0.09	-0.02
West South Central	0.16	0.03	0.29	0.05
Mountain	0.43	0.05	0.82	0.10
Pacific	0.17	0.05	0.28	0.09
Net Effects Census Division		0.09		0.15
Coastal County Resident	-0.33	-0.04	-0.61	-0.07
Urban Resident	0.30	0.02	0.51	0.03
Household Income				
$25,000-$50,000	-0.34	-0.03	-0.90	-0.07
$50,000-$100,000	0.99	0.13	2.15	0.28
$100,000+	0.38	0.08	0.85	0.17
Net Effects Income		0.18		0.38
Race/Ethnicity				
White, not Hispanic	-2.56	-0.22	-4.80	-0.41
Sex				
Male	0.12	-0.02	0.20	-0.03
Total Net Effects		-0.18		-0.44

Days of Beach Visitation

The total number of days of beach visitation is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. BV3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 878.7 million in 2000 to 927.7 million in 2005 and to 969.6 million in 2010 (See Fig. BV4). The 49.0 million increase in total days from 2000 to 2005 represents a 5.6% increase, while the 90.9 million increase from 2000 to 2010 represents a 10.3% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, and race/ethnicity are all statistically significant factors in explaining mean days of participation in beach visitation (see Appendix A, Table A.20 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in beach visitation tends to decline. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative, and all but one increase in absolute value (i.e., have a larger impact on mean days of participation) as age increases. The coefficient on age category 55-64, while still negative, is slightly smaller in absolute value than that on the preceding age category 45-54; however, orders of magnitude are similar. In general, as age increases, mean days of participation declines.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in beach visitation. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base. All the coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 3 (South Atlantic).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine beaches than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had higher mean days of participation in beach visitation than rural residents, holding other factors constant.

Figure BV3: Mean Days of Beach Visitation per Person by Year

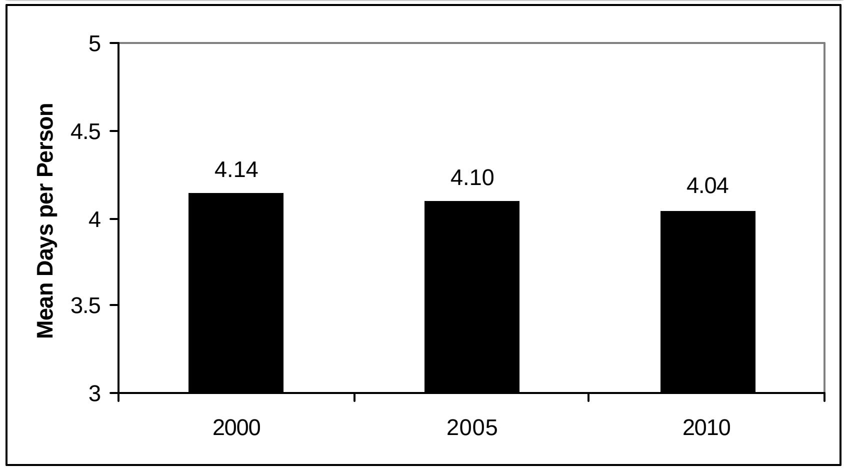
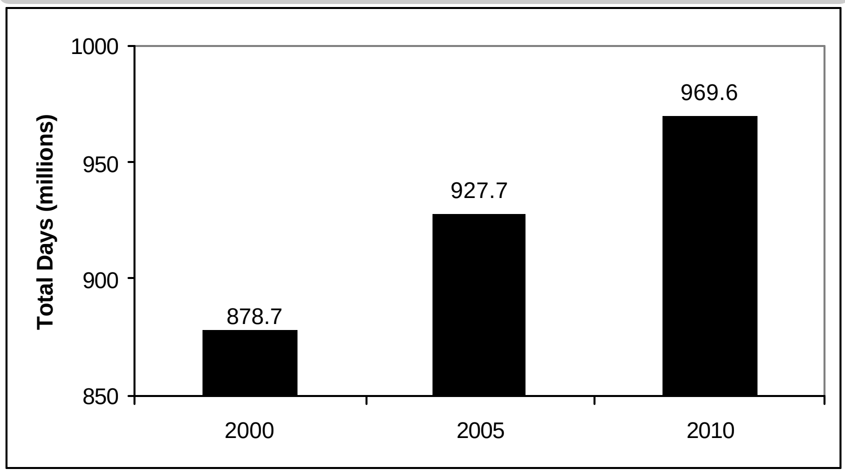


Figure BV4: Total Days of Beach Visitation by Year



Education: As the level of educational attainment increases, mean days of participation in beach visitation increases. People with less than a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an “other” category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have higher mean days of participation than those in any other category.

Household Income: As the level of household income increases, mean days of participation in beach visitation increases. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income are statistically significant, with positive signs on the coefficients, and as the level of household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people have higher mean days of participation than those with annual household incomes less than $25,000 but lower mean days of participation than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. However, only those classified as *White, Not Hispanic* and *Asian, Not Hispanic* were statistically significant, and, in the final estimation, all other race/ethnicity classifications were added to the base. The estimated negative binomial equation coefficients on *White, Not Hispanic* and *Asian, Not Hispanic* were positive, meaning that those classified in these categories have higher mean days of participation than those in all other categories. The coefficient on *White, Not Hispanic* was larger, meaning that those classified in this category had the highest mean days of participation.

Sex: Sex was not a statistically significant factor in explaining mean days of participation in beach visitation.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) of beach visitation for years 2005 and 2010. Overall, mean days of beach visitation is estimated to decline from 4.14 days per person (13.8 days per participant) in 2000 to 4.10 days per person (13.72 days per participant) in 2005 and to 4.04 days per person (13.67 days per participant) in 2010 (See Fig..BV3). The predominant factor driving the negative changes in the forecasted mean days of beach visitation is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Table BV2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.029	-0.85	0.030
35-44 years old	-1.61	0.062	-3.38	0.132
45-54 years old	0.87	-0.041	0.94	-0.045
55-64 years old	1.88	-0.082	3.52	-0.153
65+ years old	-0.33	0.018	0.08	-0.004
Net Effects Age		-0.014		-0.041
Census Division				
New England	-0.17	-0.009	-0.32	-0.018
Middle Atlantic	-0.37	-0.014	-0.69	-0.026
South Atlantic	0.29	0.018	0.53	0.033
East South Central	-0.06	-0.004	-0.09	-0.005
West South Central	0.16	0.005	0.29	0.010
East North Central	-0.32	-0.002	-0.59	-0.004
Mountain	0.43	0.007	0.82	0.013
Pacific	0.17	0.013	0.28	0.021
Net Effects Census Division		0.014		0.024
Coastal County Resident	-0.33	-0.011	-0.61	-0.021
Urban Resident	0.30	0.003	0.51	0.004
Household Income				
$25,000-$50,000	-0.34	-0.005	-0.90	-0.013
$50,000-$100,000	0.99	0.018	2.15	0.039
$100,000+	0.38	0.013	0.85	0.030
Net Effects Income		0.026		0.056
Race/Ethnicity				
White, not Hispanic	-2.56	-0.072	-4.80	-0.134
Asian, not Hispanic	0.41	0.009	0.84	0.019
Net Effects Race/Ethnicity		-0.063		-0.115
Total Net Effects		-0.047		-0.100

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.029 or an increase in the mean number of days per person of 0.029. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person declines by 0.047 for the time period 2000-2005 and declines by 0.100 for the period 2000-2010 (See Table BV2). On net, three factors had positive marginal effects (Census Division, urban resident, and household income), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Race/ethnicity was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a reduction in mean days of participation of 0.063 days for the 2000-2005 period and a reduction of 0.115 days for the 2000-2010 period.

Visiting Watersides Besides Beaches

Participation in Waterside Visitation
Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, both participation rates and population are projected to increase (See Fig. W1). The net effect is an estimated increase in participants from 9.54 million in 2000 to 10.22 million in 2005 and 10.84 million in 2010 (See Fig. W2). The 681.1 thousand increase in participants from 2000 to 2005 represents a 7.1% increase, while the 1.3 million increase in participants from 2000 to 2010 represents a 13.6% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure W1: Visiting Watersides Besides Beaches Participation Rates by Year

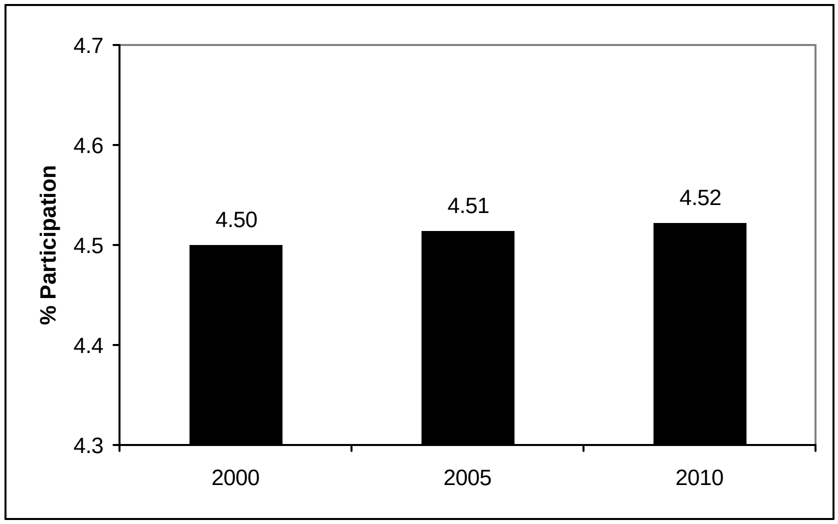
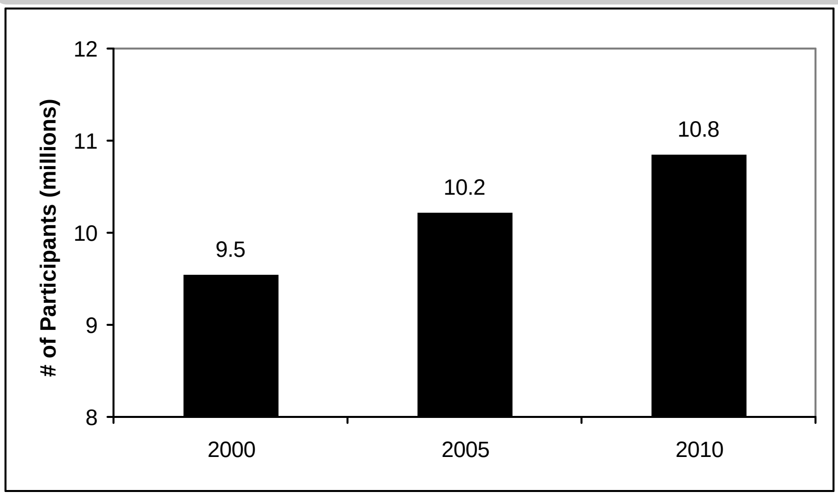


Figure W2: Visiting Watersides Besides Beaches Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining participation in visiting watersides besides beaches (see Appendix A, Table A.2 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 95.7% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in visiting watersides besides beaches declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases, except for age category 55-64. The coefficient on age category 55-64 is slightly less than that of age category 45-54 (-0.6519 versus -0.6532). However, the coefficient on age category 65 and greater has a coefficient of –0.7511. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in visiting watersides besides beaches. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for visiting marine watersides besides beaches (Great Lakes watersides not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 1 (New England Region) have the highest participation rates followed closely by residents of Census Division 3 (South Atlantic) and Census Division 9 (Pacific).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine watersides than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on visiting watersides besides beaches. The logit equation estimation found that residents of urban areas had higher participation rates for visiting watersides besides beaches than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases participation rates for visiting watersides besides beaches increase. People with a high school education and less are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. It was also included in the base meaning people in this group had participation rates that were not statistically different from those with a high school level of education or less.

Household Income: As the level of annual household income increases participation rates for visiting watersides besides beaches increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43 %) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: The logit model estimation did not yield any statistically significant differences in participation rates for visiting watersides besides beaches across racial/ethnic classifications.

Table W1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.03	-3.38	0.06
45-54 years old	0.87	-0.02	0.94	-0.03
55-64 years old	1.88	-0.05	3.52	-0.10
65+ years old	-0.33	0.01	0.08	< -0.01
Net Effects Age		-0.02		-0.05
Census Division				
New England	-0.17	-0.01	-0.32	-0.01
Middle Atlantic	-0.37	-0.01	-0.69	-0.02
South Atlantic	0.29	0.01	0.53	0.02
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	< 0.01	0.29	0.01
Mountain	0.43	0.01	0.82	0.01
Pacific	0.17	0.01	0.28	0.01
Net Effects Census Division		0.01		0.02
Coastal County Resident	-0.33	-0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.02	2.15	0.05
$100,000+	0.38	0.01	0.85	0.03
Net Effects Income		0.03		0.06
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		0.01		0.02

Sex. Males have higher participation rates in visiting watersides besides beaches than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future visitation to watersides besides beaches participation rates for years 2005 and 2010. Overall, visitation to watersides besides beaches participation rates are estimated to increase from the year 2000 rate of 4.50% to 4.51% in 2005 and to 4.52% in 2010 (See Fig. W1). The predominant factors driving the positive changes in the forecasted participation rates are the increases in annual household income, the changing distribution of population by Census Division, and the increase in the proportion of males in the population over the two forecast periods. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables. Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases 0.01 percentage points for the time period 2000 – 2005 and increases 0.02 percentage points for the period 2000 – 2010 (See Table W1). On net, four factors had positive marginal effects (Census Division, urban resident, household income, and sex), while two factors had negative marginal effects (age and coastal county resident). Annual household income was the factor with the largest net marginal effects and is therefore the main driver of the participation rate forecasts. On net (across all income categories), the marginal effect of annual household income was an increase in participation rates of 0.03 percentage points for the 2000 – 2005 period and an increase of 0.06 percentage points for the 2000 – 2010 period. And, for Census Divisions, the net effect is an increase in participation rates of 0.01 percentage points for the 2000 – 2005 period and an increase of 0.02 percentage points for the 2000 – 2010 period.

Days of Waterside Visitation

The total number of days of visiting watersides besides beaches is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated first to increase marginally then to decline (See Fig. W3), while population is projected to increase in both periods. The net effect is an estimated increase in total days of participation from 163.2 million in 2000 to 175.0 million in 2005 and to 184.2 million in 2010 (See Fig. W4). The 11.9 million increase in total days from 2000 to 2005 represents a 7.3% increase, while the 21.1 million increase from 2000 to 2010 represents a 12.9% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining mean days of participation in visiting watersides besides beaches (see Appendix A, Table A.21 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in visiting watersides besides beaches tends to decline. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative, demonstrating the negative effect of aging on mean days of participation. For the older age categories, the coefficients increase in absolute value (i.e., have a larger impact on mean days of participation) as age increases. The coefficient on age category 35-44, while still negative, is slightly smaller in absolute value than that on the preceding age category 25-34; however, orders of magnitude are similar. In general, as age increases, mean days of participation declines.

Figure W3: Mean Days of Waterside Visitation per Person by Year

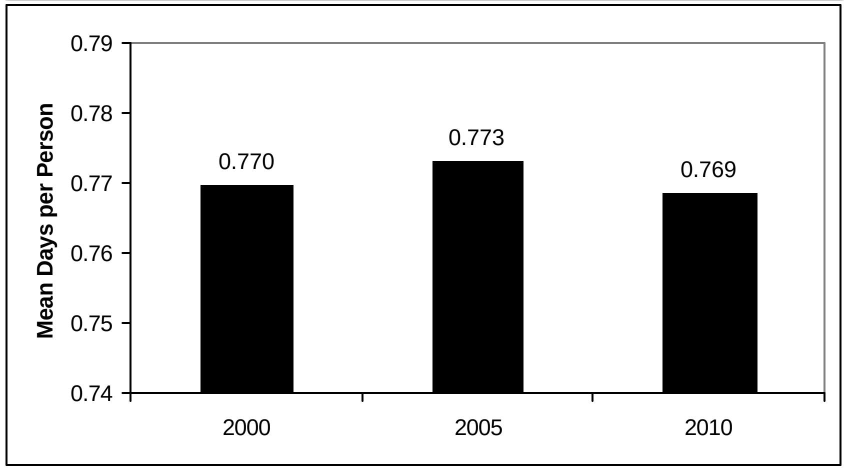
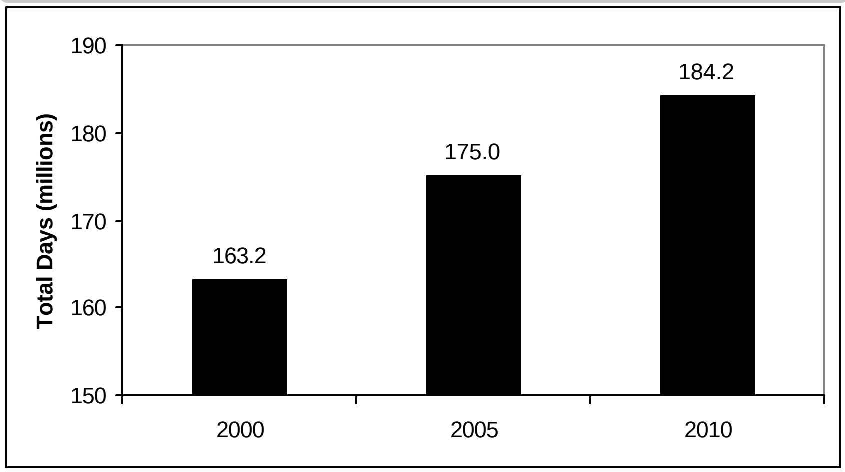


Figure W4: Total Days of Waterside Visitation by Year



Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in visiting watersides besides beaches. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different mean days of participation than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest mean days of participation for visiting watersides besides beaches (Great Lakes not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions were statistically significant and positive. Residents of Census Division 3 (South Atlantic) had the highest mean days of participation, followed closely by residents of Census Division 9 (Pacific) and Census Division 1 (New England).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine watersides than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in visiting watersides besides beaches and was therefore dropped.

Education: As the level of educational attainment increases, mean days of participation in visiting watersides besides beaches increases. People with less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an “other” category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have higher mean days of participation than those in any other category.

Household Income: In general, higher annual household incomes are associated with greater mean days of participation. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients. Those with annual household income between $50,000 and $100,000 had lower mean days of participation than those with incomes between $25,000 and $50,000. Those with annual household incomes greater than $100,000 had the highest mean days of participation of any income group. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. However, this variable proved statistically insignificant and was included in the base.

Race/Ethnicity: Race/Ethnicity was not a statistically significant factor in explaining mean days of participation in visiting watersides besides beaches.

Sex: Males have higher mean days of participation in visiting watersides besides beaches than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) of visiting watersides besides beaches for years 2005 and 2010. Overall, mean days of visiting watersides besides beaches is estimated to increase marginally from 0.770 days per person (17.1 days per participant) in 2000 to 0.773 days per person (17.12 days per participant) in 2005 and to then decline to 0.769 days per person (16.99 days per participant) in 2010 (See Fig. W3). These are very small changes in the mean days of participation per person. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000 to 2005 is +0.007 or an increase in the mean number of mean days per person of 0.007. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person increases by

Table W2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.007	-0.85	0.007
35-44 years old	-1.61	0.010	-3.38	0.021
45-54 years old	0.87	-0.007	0.94	-0.008
55-64 years old	1.88	-0.018	3.52	-0.034
65+ years old	-0.33	0.004	0.08	-0.001
Net Effects Age		-0.004		-0.014
Census Division				
New England	-0.17	-0.002	-0.32	-0.005
Middle Atlantic	-0.37	-0.004	-0.69	-0.007
South Atlantic	0.29	0.005	0.53	0.009
East South Central	-0.06	-0.001	-0.09	-0.001
West South Central	0.16	0.002	0.29	0.004
Mountain	0.43	0.002	0.82	0.004
Pacific	0.17	0.003	0.28	0.005
Net Effects Census Division		0.005		0.008
Coastal County Resident	-0.33	-0.002	-0.61	-0.004
Household Income				
$25,000-$50,000	-0.34	-0.002	-0.90	-0.004
$50,000-$100,000	0.99	0.004	2.15	0.008
$100,000+	0.38	0.003	0.85	0.006
Net Effects Income		0.005		0.010
Sex				
Male	0.12	<0.001	0.20	0.001
Total Net Effects		0.004		-0.001

0.004 for the time period 2000-2005 and declines by 0.001 for the period 2000-2010 (See Table W2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while two factors had negative marginal effects (age and coastal county resident). Age and household income were the factors with the largest net marginal effects and are therefore the main drivers of the forecasts of mean days of participation per person. On net, the marginal effect of age is a reduction in mean days of participation of 0.004 days for the 2000-2005 period and a reduction of 0.014 days for the 2000-2010 period. The net effect of household income is an increase of 0.005 days for 2000-2005 and an increase of 0.010 days for 2000-2010.

Swimming

Participation in Swimming

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. SW1), while population is projected to increase. The net effect is an estimated increase in participants from 54.13 million in 2000 to 57.21 million in 2005 and 59.64 million in 2010 (See Fig. SW2). The 3.1 million increase in participants from 2000 to 2005 represents a 5.7% increase, while the 5.5 million increase in participants from 2000 to 2010 represents a 10.2% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure SW1: Swimming Participation Rates by Year

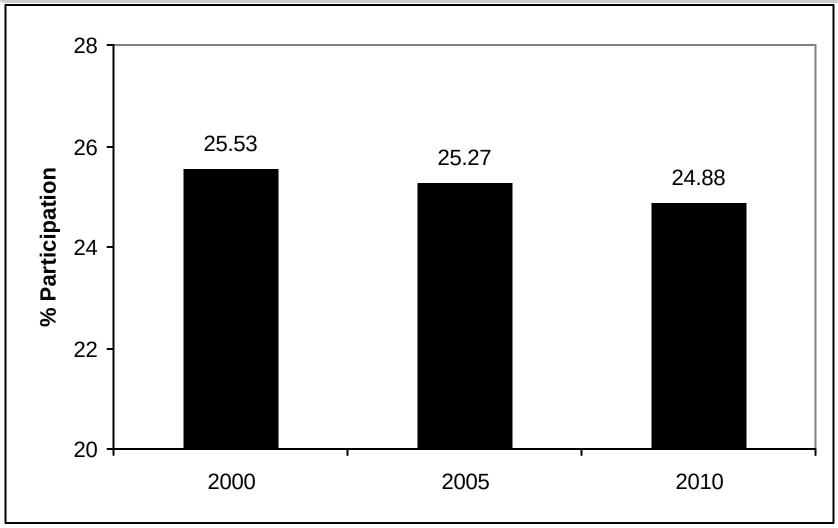
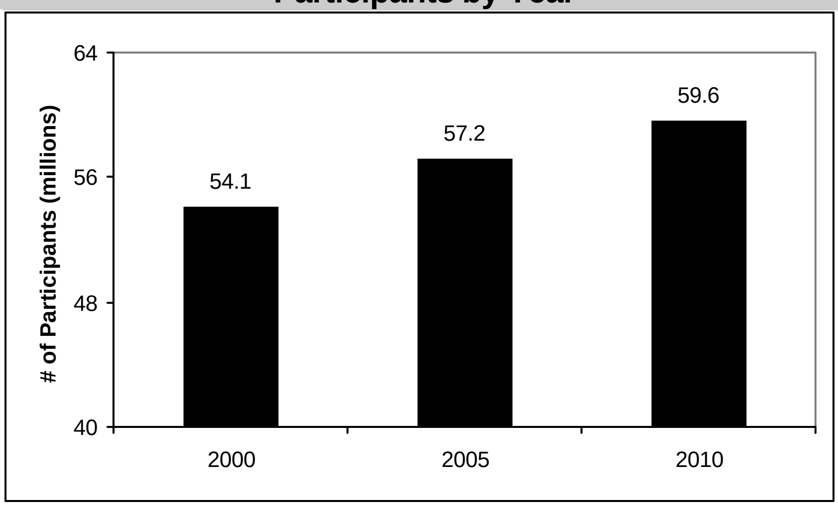


Figure SW2: Swimming Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining participation in swimming (see Appendix A, Table A.3 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 75.5% of the sample of 50,495 participants and non-participants. About 92.5% of non-participants were predicted correctly, while about 29.5% of participants were predicted correctly.

Age: As age increases participation in saltwater swimming declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in swimming. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for swimming in marine waters (Great Lakes swimming not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates followed closely by residents of Census Division 1 (New England).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on swimming. The logit equation estimation found that residents of urban areas had higher participation rates for swimming than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for swimming increase. People with a less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that people in this category have higher participation rates than those with less than a high school education, but lower participation rates than those with a high school education.

Table SW1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.12	-0.85	0.12
35-44 years old	-1.61	0.23	-3.38	0.49
45-54 years old	0.87	-0.17	0.94	-0.18
55-64 years old	1.88	-0.50	3.52	-0.93
65+ years old	-0.33	0.13	0.08	-0.03
Net Effects Age		-0.19		-0.54
Census Division				
New England	-0.17	-0.04	-0.32	-0.08
Middle Atlantic	-0.37	-0.07	-0.69	-0.13
South Atlantic	0.29	0.08	0.53	0.14
East South Central	-0.06	-0.01	-0.09	-0.02
West South Central	0.16	0.02	0.29	0.03
Mountain	0.43	0.03	0.82	0.05
Pacific	0.17	0.03	0.28	0.04
Net Effects Census Division		0.03		0.04
Coastal County Resident	-0.33	-0.03	-0.61	-0.06
Urban Resident	0.30	0.02	0.51	0.04
Household Income				
$25,000-$50,000	-0.34	-0.03	-0.90	-0.08
$50,000-$100,000	0.99	0.13	2.15	0.29
$100,000+	0.38	0.08	0.85	0.18
Net Effects Income		0.18		0.40
Race/Ethnicity				
White, not Hispanic	-2.56	-0.26	-4.80	-0.49
Black, not Hispanic	0.08	-0.01	0.21	-0.03
Net Effects Race		-0.27		-0.52
Sex				
Male	0.12	< -0.01	0.20	< -0.01
Total Net Effects		-0.26		-0.65

Household Income: As the level of annual household income increases participation rates for swimming increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: Only those classified as *White, Not Hispanic* and *Black, Not Hispanic* had statistically significant coefficients in the estimated logit model. All other categories of race/ethnicity are included in the base. Those classified as *White, Not Hispanic* have the highest participation rates in swimming and those classified as *Black, Not Hispanic* have the lowest participation rates in swimming. *White, Not*

Hispanic had a positive coefficient meaning that an increase in the proportion of the population classified as *White, Not Hispanic* increases participation rates or a decrease in the proportion of the population classified as *White, Not Hispanic* reduces participation rates. The negative coefficient on *Black, Not Hispanic* means that an increase in the proportion of the population classified as *Black, Not Hispanic* decreases participation rates.

Sex. Males have lower participation rates in swimming than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was negative meaning males have lower participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future swimming participation rates for years 2005 and 2010. Overall, swimming participation rates are estimated to decline from the year 2000 rate of 25.53% to 25.27% in 2005 and to 24.88% in 2010 (See Fig. SW1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population, the changing distribution of population by racial/ethnic classifications, and the decrease in the proportion of the population residing in coastal counties. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be an increase of +0.12 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 –34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.26 percentage points for the time period 2000 – 2005 and decreases 0.65 percentage points for the period 2000 – 2010 (See Table SW1). On net, four factors had negative marginal effects (age, coastal county resident, race/ethnicity, and sex), while three factors had positive marginal effects (Census Division, urban resident, and household income). Age and race/ethnicity had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.19 percentage points for the 2000 – 2005 period and a decrease of 0.54 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a decrease in participation rates of 0.27 percentage points for the 2000 – 2005 period and a decrease of 0.52 percentage points for the 2000 – 2010 period.

Days of Swimming

The total number of days of swimming is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. SW3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 768.7 million in 2000 to 799.8 million in 2005 and to 822.2 million in 2010 (See Fig. SW4). The 31.1 million increase in total days from 2000 to 2005 represents a 4.0% increase, while the 53.5 million increase from 2000 to 2010 represents a 7.0% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, and race/ethnicity were all statistically significant factors in explaining mean days of participation in swimming (see Appendix A, Table A.22 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in swimming declines. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases. Thus, as age increases mean days of participation declines.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in swimming. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. All the coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 3 (South Atlantic) had the highest mean days of participation, followed closely by residents of Census Division 1 (New England) and Census Division 9 (Pacific).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had higher mean days of participation in swimming than rural residents, holding other factors constant.

Figure SW3: Mean Days of Swimming per Person by Year

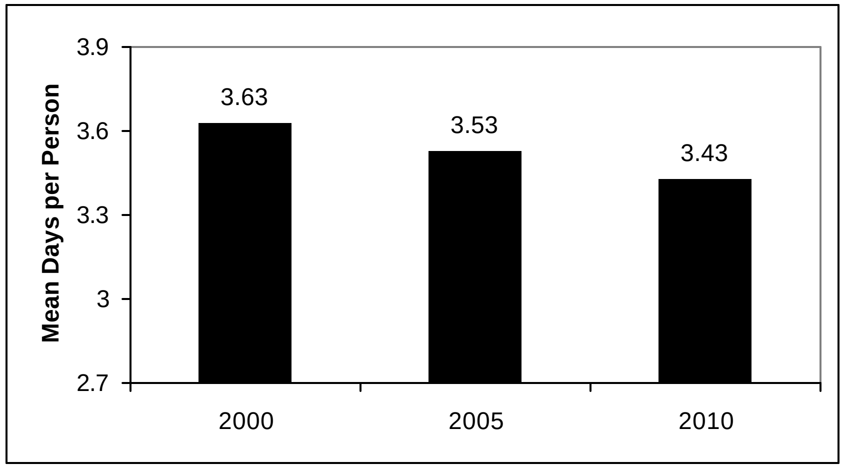
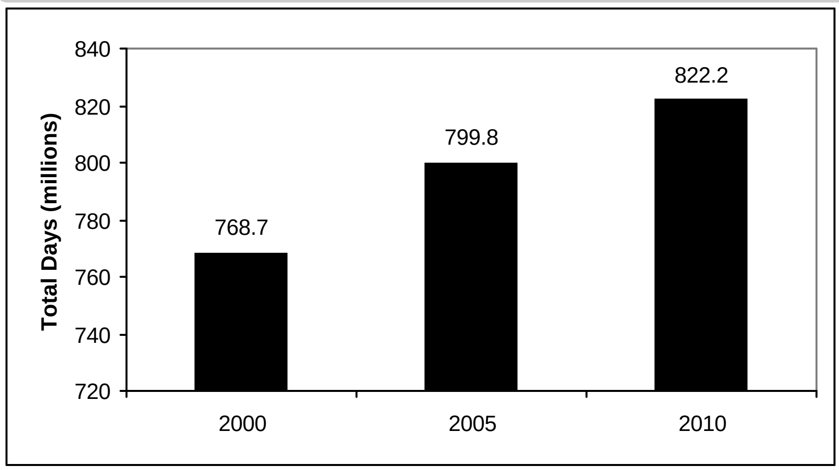


Figure SW4: Total Days of Swimming by Year



Education: As the level of educational attainment increases, mean days of participation in swimming increases. People with less than a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an “other” category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have mean days of participation between those with a high school education and those with less than a high school education.

Household Income: As the level of annual household income increases, mean days of participation increases. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people had higher mean days of participation than those with annual household incomes less than $25,000 but lower mean days of participation than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. All other race/ethnicity classifications proved statistically significant. The estimated negative binomial equation coefficients on *White, Not Hispanic* and *Asian, Not Hispanic* were positive, meaning that those classified in these categories have higher mean days of participation than those in all other categories. The coefficient on *Asian, Not Hispanic* was larger, meaning that those classified in this category had the highest mean days of participation. The estimated coefficients on *Black, Not Hispanic* and *Hispanic* were negative, meaning that those classified in these categories have lower mean days of participation than any other group. The coefficient on *Black, Not Hispanic* was larger in absolute value, meaning that those classified in this category have the lowest mean days of participation in swimming.

Sex: Sex was not a statistically significant factor in explaining mean days of participation in swimming.

Table SW2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.029	-0.85	0.029
35-44 years old	-1.61	0.061	-3.38	0.130
45-54 years old	0.87	-0.047	0.94	-0.051
55-64 years old	1.88	-0.113	3.52	-0.210
65+ years old	-0.33	0.026	0.08	-0.006
Net Effects Age		-0.044		-0.108
Census Division				
New England	-0.17	-0.009	-0.32	-0.018
Middle Atlantic	-0.37	-0.015	-0.69	-0.028
South Atlantic	0.29	0.018	0.53	0.032
East South Central	-0.06	-0.003	-0.09	-0.004
West South Central	0.16	0.005	0.29	0.009
East North Central	-0.32	-0.005	-0.59	-0.010
Mountain	0.43	0.007	0.82	0.013
Pacific	0.17	0.009	0.28	0.014
Net Effects Census Division		0.006		0.009
Coastal County Resident	-0.33	-0.009	-0.61	-0.017
Urban Resident	0.30	0.003	0.51	0.005
Household Income				
$25,000-$50,000	-0.34	-0.006	-0.90	-0.015
$50,000-$100,000	0.99	0.017	2.15	0.038
$100,000+	0.38	0.013	0.85	0.028
Net Effects Income		0.024		0.052
Race/Ethnicity				
White, not Hispanic	-2.56	-0.030	-4.80	-0.056
Black, not Hispanic	0.08	-0.003	0.21	-0.008
Asian, not Hispanic	0.41	0.008	0.84	0.017
Hispanic	2.06	-0.046	3.74	-0.084
Net Effects Race/Ethnicity		-0.071		-0.131
Total Net Effects		-0.093		-0.196

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for swimming for years 2005 and 2010. Overall, mean days of swimming is estimated to decline from 3.63 days per person (14.2 days per participant) in 2000 to 3.53 days per person (14.0 days per participant) in 2005 and to 3.43 days per person (13.8 days per participant) in 2010 (See Fig. SW3). The predominant factors driving the negative changes in mean days of participation per person in swimming are the aging population and the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000 to 2005 is +0.029 or an increase in the mean number of days per person of 0.029. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person declines by 0.093 for the time period 2000-2005 and declines by 0.196 for the period 2000-2010 (See Table SW2). On net, three factors had positive marginal effects (Census Division, urban resident, and household income), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Age and race/ethnicity were the factors with the largest net marginal effects and are therefore the main drivers of the forecasts of mean days of participation per person. On net, the marginal effect of age is a reduction in mean days of participation of 0.044 days for the 2000-2005 period and a reduction of 0.108 days for the 2000-2010 period. The net effect of race/ethnicity is a reduction of 0.071 days for 2000-2005 and a reduction of 0.131 days for 2000-2010.

Snorkeling

Participation in Snorkeling

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. SN1), while population is projected to increase. The net effect is an estimated increase in participants from 10.75 million in 2000 to 11.38 million in 2005 and 11.88 million in 2010 (See Fig. SN2). The 627.6 thousand increase in participants from 2000 to 2005 represents a 5.8% increase, while the 1.1 million increase in participants from 2000 to 2010 represents a 10.5% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure SN1: Snorkeling Participation Rates by Year

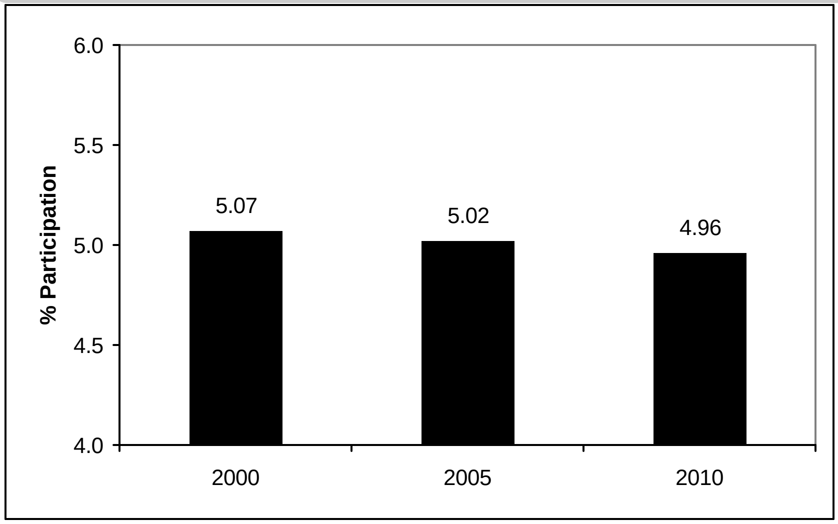
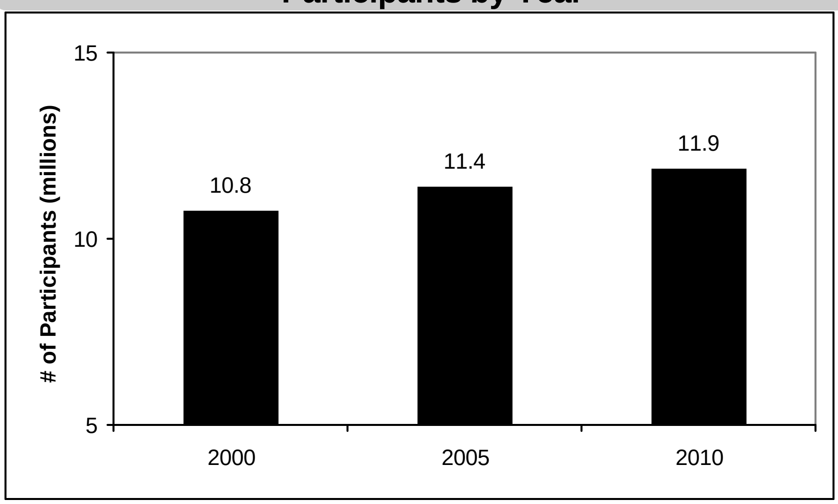


Figure SN2: Snorkeling Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining participation in snorkeling (see Appendix A, Table A.4 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 94% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in snorkeling declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in snorkeling. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 2 (Middle Atlantic), Census Division 5 (West South Central), and Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added them to the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 9 (Pacific) have the highest participation rates. Residents of Census Division 3 (South Atlantic) have the second highest participation rates. This is expected since marine waters in these areas contain most of the shallow natural reefs in the U.S., where people are likely to go snorkeling.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on snorkeling. The logit equation estimation found that residents of urban areas had higher participation rates for snorkeling than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for snorkeling increase. People with a less than a high school education and people in the "other" category are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger.

Table SN1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.02	-0.85	0.02
35-44 years old	-1.61	0.05	-3.38	0.10
45-54 years old	0.87	-0.03	0.94	-0.03
55-64 years old	1.88	-0.11	3.52	-0.21
65+ years old	-0.33	0.03	0.08	-0.01
Net Effects Age		-0.04		-0.13
Census Division				
New England	-0.17	< -0.01	-0.32	-0.01
South Atlantic	0.29	0.01	0.53	0.01
East South Central	-0.06	< -0.01	-0.09	< -0.01
Mountain	0.43	0.01	0.82	0.02
Pacific	0.17	0.01	0.28	0.01
Net Effects Census Division		0.02		0.03
Coastal County Resident	-0.33	-0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.03
$50,000-$100,000	0.99	0.05	2.15	0.11
$100,000+	0.38	0.03	0.85	0.07
Net Effects Income		0.07		0.16
Race/Ethnicity				
White, not Hispanic	-2.56	-0.09	-4.80	-0.17
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		-0.05		-0.11

Household Income: As the level of annual household income increases participation rates for snorkeling increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $50,000 but lower participation rates than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: Only those classified as *White, Not Hispanic* had a statistically significant coefficient in the estimated logit model. All other categories of race/ethnicity are included in the base. Those classified as *White, Not Hispanic* have the highest participation rates in snorkeling. *White, Not Hispanic* had a positive coefficient meaning that an increase in the proportion of the population classified as *White, Not Hispanic* increases participation rates or a decrease in the proportion of the population classified as *White, Not Hispanic* reduces participation rates.

Sex. Males have higher participation rates in snorkeling than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future snorkeling participation rates for years 2005 and 2010. Overall, snorkeling participation rates are estimated to decline from the year 2000 rate of 5.07% to 5.02% in 2005 and to 4.96% in 2010 (See Fig. SN1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population, the changing distribution of population by racial/ethnic classifications, and the decrease in the proportion of the population residing in coastal counties. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.02% or an increase of 0.02 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.05 percentage points for the time period 2000 – 2005 and decreases 0.11 percentage points for the period 2000 – 2010 (See Table SN1). On net, three factors had negative marginal effects (age, coastal county resident, and race/ethnicity), while four factors had positive marginal effects (Census Division, urban resident, household income, and sex). Race/ethnicity and age had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all racial/ethnic categories), the marginal effect of race/ ethnicity was a decrease in participation rates of 0.09 percentage points for the 2000 – 2005 period and an decrease of 0.17 percentage points for the 2000 – 2010 period. And, for age, the net effect is a decrease in participation rates of 0.04 percentage points for the 2000 – 2005 period and a decrease of 0.13 percentage points for the 2000 – 2010 period.

Days of Snorkeling

The total number of days of snorkeling is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. SN3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 94.6 million in 2000 to 98.4 million in 2005 and to 100.6 million in 2010 (See Fig. SN4). The 3.8 million increase in total days from 2000 to 2005 represents a 4.0% increase, while the 6.0 million increase from 2000 to 2010 represents a 6.3% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining mean days of participation in snorkeling (see Appendix A, Table A.23 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in snorkeling declines. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases. Thus, as age increases mean days of participation declines.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in snorkeling. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. For the most part, our expectations were confirmed in the estimated negative binomial equation, in that the areas of the country where we would expect to see snorkeling have the highest mean days of participation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In the initial estimation, we found that residents of Census Division 2 (Middle Atlantic) did not have statistically different mean days of participation than residents of Census Division 7, so we added it to the base. All the coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 3 (South Atlantic). This is expected since marine waters in these areas contain most of the shallow natural reefs in the U.S., where people are likely to go snorkeling.

Figure SN3: Mean Days of Snorkeling per Person by Year

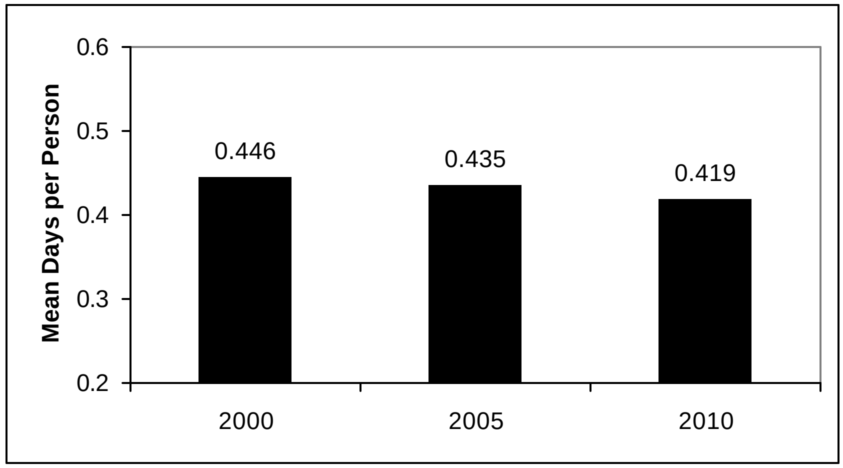
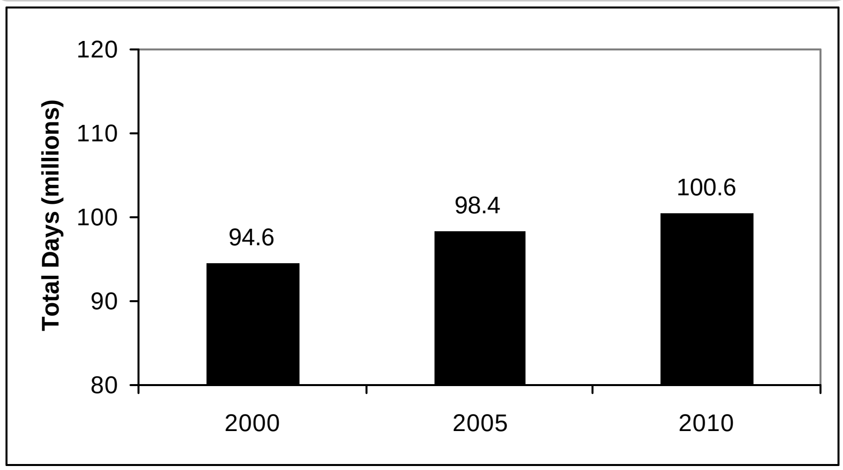


Figure SN4: Total Days of Snorkeling by Year



For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in snorkeling and was therefore dropped.

Education: As the level of educational attainment increases, mean days of participation in snorkeling increases. People with less than a high school education are in the base and have the lowest mean days of participation. People in the "other" category are also included in the base. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: As the level of annual household income increases, mean days of participation increases. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people had higher mean days of participation than those with annual household incomes less than $25,000 but lower mean days of participation than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. However, only those classified as *Black, Not Hispanic* and *Hispanic* were found to be statistically significant, and, in the final estimation, all other race/ethnicity classifications were added to the base. The estimated coefficients on *Black, Not Hispanic* and *Hispanic* were negative, meaning that those classified in these categories have lower mean days of participation than any other group. The coefficient on *Hispanic* was larger in absolute value, meaning that those classified in this category have the lowest mean days of participation in snorkeling.

Sex: Males have higher mean days of participation in snorkeling than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for snorkeling for years 2005 and 2010. Overall, mean days of snorkeling is estimated to decline from 0.446 days per person (8.8 days per participant) in 2000 to 0.435 days per person (8.6 days per participant) in 2005 and to 0.419 days per person (8.5 days per participant) in 2010 (See Fig. SN3). The predominant factors driving the negative changes in mean days of participation per person in snorkeling are the aging population and the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Table SN2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.002	-0.85	0.002
35-44 years old	-1.61	0.007	-3.38	0.014
45-54 years old	0.87	-0.005	0.94	-0.005
55-64 years old	1.88	-0.015	3.52	-0.028
65+ years old	-0.33	0.005	0.08	-0.001
Net Effects Age		-0.007		-0.019
Census Division				
New England	-0.17	0.000	-0.32	-0.001
South Atlantic	0.29	0.001	0.53	0.004
East South Central	-0.06	<-0.001	-0.09	<-0.001
West South Central	0.16	0.001	0.29	0.001
East North Central	-0.32	-0.001	-0.59	-0.002
Mountain	0.43	0.002	0.82	0.003
Pacific	0.17	0.001	0.28	0.002
Net Effects Census Division		0.003		0.007
Coastal County Resident	-0.33	-0.002	-0.61	-0.003
Household Income				
$25,000-$50,000	-0.34	-0.001	-0.90	-0.004
$50,000-$100,000	0.99	0.005	2.15	0.010
$100,000+	0.38	0.003	0.85	0.006
Net Effects Income		0.006		0.013
Race/Ethnicity				
Black, not Hispanic	0.08	<-0.001	0.21	-0.001
Hispanic	2.06	-0.012	3.74	-0.022
Net Effects Race/Ethnicity		-0.012		-0.023
Sex				
Male	0.12	<0.001	0.20	<0.001
Total Net Effects		-0.012		-0.027

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.002 or an increase in the mean number of days per person of 0.002. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for snorkeling declines by 0.012 for the time period 2000-2005 and declines by 0.027 for the period 2000-2010 (See Table SN2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Age and race/ethnicity were the factors with the largest net marginal effects and are therefore the main drivers of the forecasts of mean days of participation per person. On net, the marginal effect of age is a reduction in mean days of participation of 0.007 days for the 2000-2005 period and a reduction of 0.019 days for the 2000-2010 period. The net effect of race/ethnicity is a reduction of 0.012 days for 2000-2005 and a reduction of 0.023 days for 2000-2010.

Scuba Diving

Participation in Scuba Diving

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, both participation rates and population are projected to increase (See Fig. SD1). The net effect is an estimated increase in participants from 2.86 million in 2000 to 3.12 million in 2005 and 3.34 million in 2010 (See Fig. SD2). The 256.5 thousand increase in participants from 2000 to 2005 represents a 9% increase, while the 476.1 thousand increase in participants from 2000 to 2010 represents a 16.6% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure SD1: Scuba Diving Participation Rates by Year

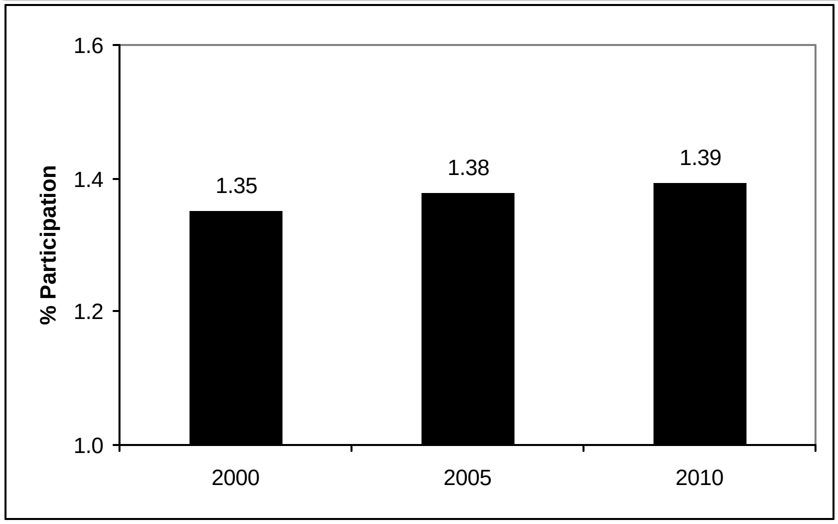
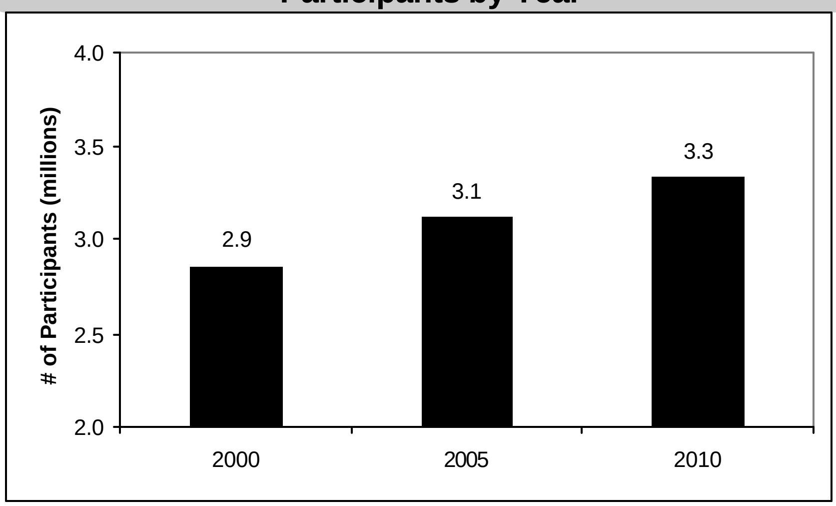


Figure SD2: Scuba Diving Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining participation in scuba diving (see Appendix A, Table A.5 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 98.5% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in scuba diving declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation) The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in scuba diving. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), Census Division 5 (West South Central), and Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added them to the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 8 (Mountain) have the highest participation rates, followed closely by residents of Census Division 9 (Pacific). Residents of Census Division 3 (South Atlantic) have the third highest participation rates. Results for Census Divisions 3 and 9 were expected since marine waters in these areas contain most of the shallow natural reefs in the U.S., where people are likely to go scuba diving. Results for Census Division 8 (Mountain) were surprising, since this Census Division is located in the interior of the country.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on scuba diving. The logit equation estimation found that residents of urban areas had higher participation rates for scuba diving than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for scuba diving increase. People with a less than a college education and people in the "other" category are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger.

Table SD1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.02	-3.38	0.04
45-54 years old	0.87	-0.01	0.94	-0.01
55-64 years old	1.88	-0.03	3.52	-0.06
65+ years old	-0.33	0.01	0.08	< 0.01
Net Effects Age		-0.01		-0.03
Census Division				
South Atlantic	0.29	< 0.01	0.53	< 0.01
East South Central	-0.06	< -0.01	-0.09	< -0.01
Mountain	0.43	< 0.01	0.82	0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		0.01		0.01
Coastal County Resident	-0.33	< -0.01	-0.61	< -0.01
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.02	2.15	0.05
$100,000+	0.38	0.01	0.85	0.03
Net Effects Income		0.03		0.06
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		0.03		0.04

Household Income: As the level of annual household income increases participation rates for scuba diving increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $50,000 but lower participation rates than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: This was not a statistically significant factor in explaining participation rates in scuba diving.

Sex. Males have higher participation rates in scuba diving than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future scuba diving participation rates for years 2005 and 2010. Overall, scuba diving participation rates are estimated to increase from the year 2000 rate of 1.35% to 1.38% in 2005 and to 1.39% in 2010 (See Fig. SD1). The predominant factors driving the positive changes in the forecasted participation rates are

Figure SD3: Mean Days of Scuba Diving per Person by Year

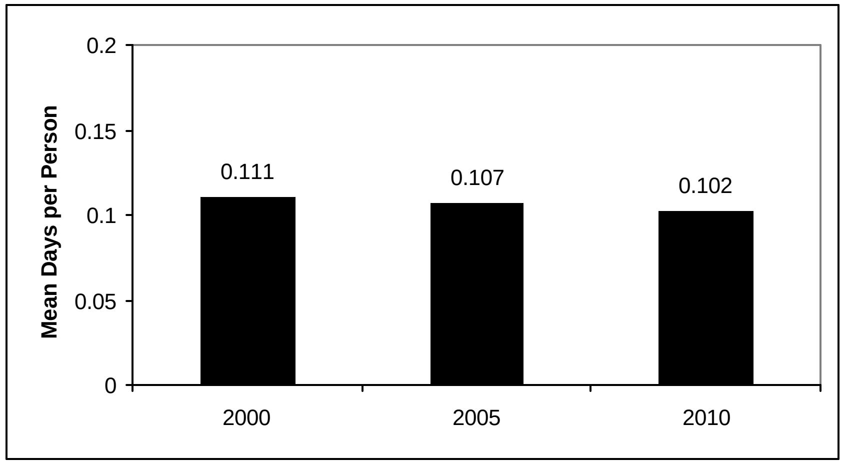
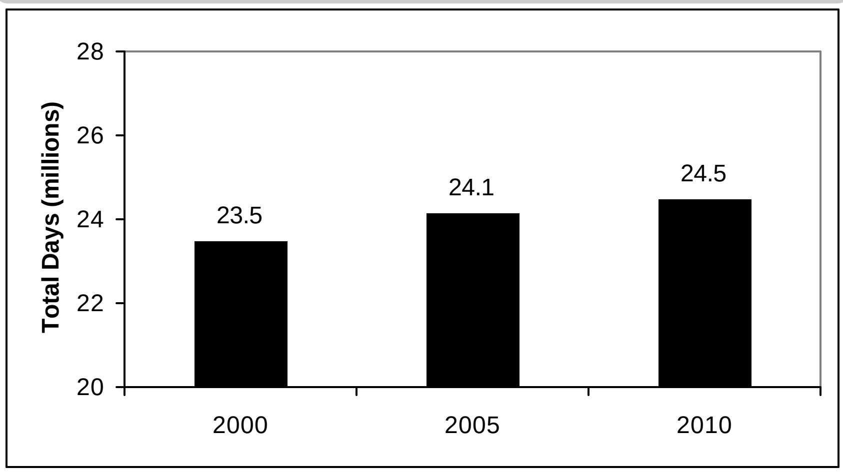


Figure SD4: Total Days of Scuba Diving by Year



household income and the changing distribution of residence by Census Divisions. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases 0.03 percentage points for the time period 2000 – 2005 and increases 0.04 percentage points for the period 2000 – 2010 (See Table SD1). On net, two factors had negative marginal effects (age and coastal county resident), while four factors had positive marginal effects (Census Division, household income, urban resident, and sex). Household income had the largest positive marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all household income categories), the marginal effect of household income was an increase in participation rates of 0.03 percentage points for the 2000 – 2005 period and an increase of 0.06 percentage points for the 2000 – 2010 period.

Days of Scuba Diving
The total number of days of scuba diving is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. SD2), while population is projected to increase. The net effect is an estimated increase in total days of participation from 23.5 million in 2000 to 24.1 million in 2005 and to 24.5 million in 2010 (See Fig. SD4). The 665.4 thousand increase in total days from 2000 to 2005 represents a 2.8% increase, while the 1.0 million increase from 2000 to 2010 represents a 4.3% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of

participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining mean days of participation in scuba diving (see Appendix A, Table A.24 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in scuba diving declines. In the initial estimation, age category 16-24 was included in the base (excluded from the equation and therefore included in the constant). Age category 25-34 was found to be statistically insignificant and was added to the base. All other age categories were statistically significant. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases. Thus, as age increases mean days of participation declines.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in scuba diving. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation, with the exception of Census Division 8 (Mountain) whose residents had high mean days of participation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In the initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), Census Division 4 (East South Central), and Census Division 6 (East North Central) did not have statistically different mean days of participation than residents of Census Division 7, so we added these Census Divisions to the base. All the coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 8 (Mountain) and Census Division 3 (South Atlantic).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had higher mean days of participation in scuba diving than rural residents, holding other factors constant.

Education: As the level of educational attainment increases, mean days of participation in scuba diving increases. People with less than a high school education or a high school education are in the base and have the lowest mean days of participation. People in the “other” category were included in the base as well. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: Those in the highest income group (annual household income greater than $100,000) proved statistically different from those in all other income groups, which were included in the base. The coefficient associated with the highest income group was positive, indicating higher mean days of participation in scuba diving.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. All other racial/ethnic classifications were statistically significant with negative coefficients, meaning that those classified as *Native American/Pacific Islander*, *Not Hispanic* have the highest mean days of participation in scuba diving.

Sex: Males have higher mean days of participation in scuba diving than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for scuba diving for years 2005 and 2010. Overall, mean days of scuba diving is estimated to decline from 0.111 days per person (8.2 days per participant) in 2000 to 0.107 days per person (7.7 days per participant) in 2005 and to 0.102 days per person (7.3 days per participant) in 2010 (See Fig. SD3). The predominant factor driving the negative changes in mean days of participation per person in scuba diving is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 35-44 years old from 2000-2005 is +0.001 or an increase in the mean number of days per person of 0.001. Even though the negative binomial model coefficient on age category 35-44 is negative, the proportion of the population aged 35-44 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for scuba diving declines by 0.004 for the time period 2000-2005 and declines by

Table SD2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
35-44 years old	-1.61	0.001	-3.38	0.003
45-54 years old	0.87	-0.001	0.94	-0.001
55-64 years old	1.88	-0.003	3.52	-0.005
65+ years old	-0.33	0.001	0.08	<-0.001
Net Effects Age		-0.002		-0.004
Census Division				
South Atlantic	0.29	<0.001	0.53	0.001
West South Central	0.16	<0.001	0.29	<0.001
Mountain	0.43	<0.001	0.82	0.001
Pacific	0.17	<0.001	0.28	0.001
Net Effects Census Division		0.001		0.003
Coastal County Resident	-0.33	<-0.001	-0.61	-0.001
Urban Resident	0.30	<0.001	0.51	<0.001
Household Income				
$100,000+	0.38	<0.001	0.85	0.001
Race/Ethnicity				
White, not Hispanic	-2.56	0.005	-4.80	0.010
Black, not Hispanic	0.08	<-0.001	0.21	-0.001
Asian, not Hispanic	0.41	-0.001	0.84	-0.002
Hispanic	2.06	-0.008	3.74	-0.014
Net Effects Race/Ethnicity		-0.004		-0.007
Sex				
Male	0.12	<0.001	0.20	<0.001
Total Net Effects		-0.004		-0.009

0.009 for the period 2000-2010 (See Table SD2). On net, four factors had positive marginal effects (Census Division, urban resident, household income, and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Race/ethnicity was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a reduction in mean days of participation of 0.004 days for the 2000-2005 period and a reduction of 0.007 days for the 2000-2010 period.

Surfing

Participation in Surfing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are first estimated to increase in 2005, and then estimated to decline in 2010 (See Fig. SU1). Population is projected to increase in both 2005 and 2010. The net effect is an estimated increase in participants from 3.37 million in 2000 to 3.63 million in 2005 and 3.81 million in 2010 (See Fig. SU2). The 256.5 thousand increase in participants from 2000 to 2005 represents a 7.6% increase, while the 442.3 thousand increase in participants from 2000 to 2010 represents a 13.1% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure SU1: Surfing Participation Rates by Year

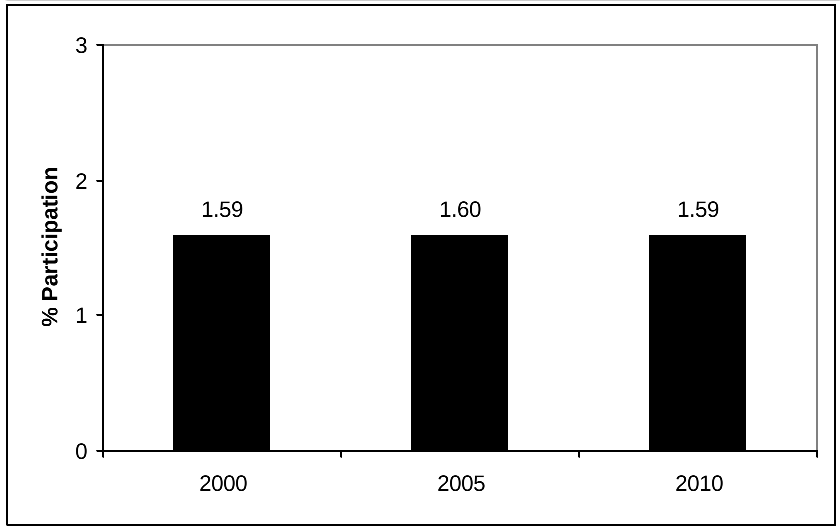
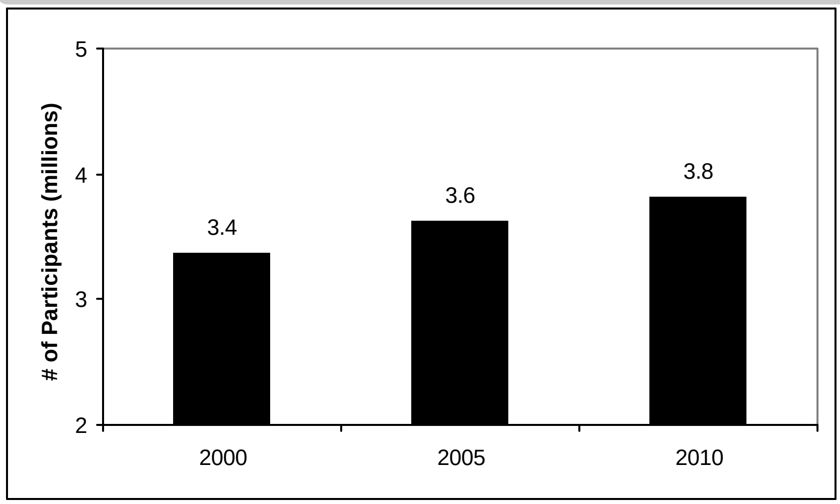


Figure SU2: Surfing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining participation in surfing (see Appendix A, Table A.6 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 98.5% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in surfing declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in surfing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), Census Division 4 (East South Central), Census Division 5 (West

South Central), and Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added them to the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 9 (Pacific) have the highest participation rates. Residents of Census Division 3 (South Atlantic) have the second highest participation rates. This is expected since marine waters in these areas contain most of the shorelines and wave conditions in the U.S. where people are likely to go surfing.

Table SU1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.05	-3.38	0.10
45-54 years old	0.87	-0.02	0.94	-0.03
55-64 years old	1.88	-0.06	3.52	-0.12
65+ years old	-0.33	0.02	0.08	< 0.01
Net Effects Age		-0.01		-0.04
Census Division				
South Atlantic	0.29	< 0.01	0.53	0.01
Mountain	0.43	< 0.01	0.82	0.01
Pacific	0.17	< 0.01	0.28	0.01
Net Effects Census Division		0.01		0.02
Coastal County Resident	-0.33	< -0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	< -0.01	-0.90	-0.01
$50,000-$100,000	0.99	0.01	2.15	0.02
$100,000+	0.38	0.01	0.85	0.02
Net Effects Income		0.02		0.03
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	-0.01
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		0.01		< 0.01

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on surfing. The logit equation estimation found that residents of urban areas had higher participation rates for surfing than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for surfing increase. People with less than a college education and people in the “other” category are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger.

Household Income: As the level of annual household income increases participation rates for surfing increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn’t provide an income response. Results indicate that those that didn’t provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: Only those classified as *Black, Not Hispanic* had a statistically significant coefficient in the estimated logit model. All other categories of race/ethnicity are included in the base. Those classified as *Black, Not Hispanic* have the lowest participation rates in surfing. *Black, Not Hispanic* had a negative coefficient meaning that an increase in the proportion of the population classified as *Black, Not Hispanic* decreases participation rates or a decrease in the proportion of the population classified as *Black, Not Hispanic* increases participation rates.

Sex. Males have higher participation rates in surfing than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future surfing participation rates for years 2005 and 2010. Overall, surfing participation rates are estimated to increase from the year 2000 rate of 1.59% to 1.60% in 2005, and to decline back to 1.59% in 2010 (See Fig. SU1). The predominant factors driving these changes in the forecasted participation rates are the aging of the population, the changing distribution of population by racial/ ethnic classifications, the changing distribution of population by Census Divisions, and the decrease in the proportion of the population residing in coastal counties. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases 0.01 percentage points for the time period 2000 – 2005 and increases 0.001 percentage points for the period 2000 – 2010 (See Table SU1). On net, four factors had positive marginal effects (Census Division, urban resident, household income and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ ethnicity). Household income had the largest positive marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all household income categories), the marginal effect of household income was an increase in participation rates of 0.02 percentage points for the 2000 – 2005 period and an increase of 0.03 percentage points for the 2000 – 2010 period. For age, the net effect is a decrease in participation rates of 0.01 percentage points for the 2000 – 2005 period and a decrease of 0.04 percentage points for the 2000 – 2010 period.

Days of Surfing

The total number of days of surfing is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. SU3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 75.2 million in 2000 to 79.5 million in 2005 and to 81.9 million in 2010 (See Fig. SU4). The 4.3 million increase in total days from 2000 to 2005 represents a 5.7% increase, while the 6.7 million increase from 2000 to 2010 represents a 9.0% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining mean days of participation in surfing (see Appendix A, Table A.25 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in surfing declines. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases. Thus, as age increases mean days of participation declines.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in surfing. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation, with the exception of Census Division 8 (Mountain) whose residents had high mean days of participation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In the initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), Census Division 4 (East South Central), and Census Division 6 (East North Central) did not have statistically different mean days of participation than residents of Census Division 7, so we added these Census Divisions to the base. All the coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 8 (Mountain).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in surfing and was therefore dropped.

Figure SU3: Mean Days of Surfing per Person by Year

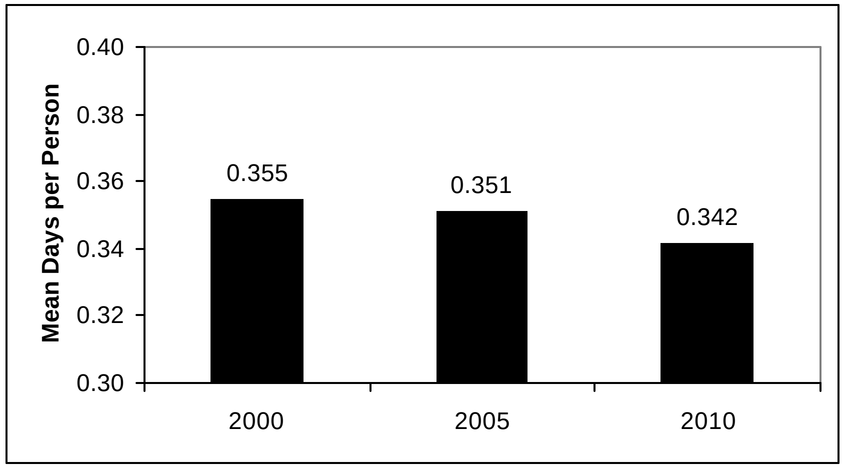
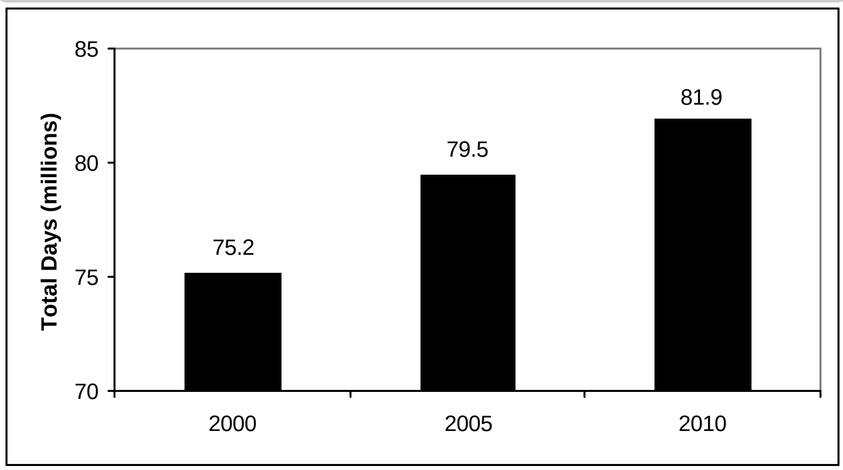


Figure SU4: Total Days of Surfing by Year



Education: As the level of educational attainment increases, mean days of participation in surfing increases. People with less than a high school education or a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have mean days of participation higher than those in any other category.

Household Income: Higher annual household incomes are associated with higher mean days of participation in surfing. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients. Though mean days of participation tends to increase with income, the coefficient for those with annual household incomes between $50,000 and $100,000 is slightly lower than that for those with incomes between $25,000 and $50,000. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people had lower mean days of participation than those with annual household income between $25,000 and $50,000 but higher mean days of participation than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. However, all other racial/ethnic classifications except *Black, Not Hispanic* were found to be statistically insignificant and were included in the base. The coefficient on the category *Black, Not Hispanic* is negative, indicating that those classified in this category have the lowest mean days of participation in surfing.

Sex: Males have higher mean days of participation in surfing than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for surfing for years 2005 and 2010. Overall, mean days of surfing is estimated to decline from 0.355 days per person (22.3 days per participant) in 2000 to 0.351 days per person (21.9 days per participant) in 2005 and to 0.342 days per person (21.5 days per participant) in 2010 (See Fig. SU3). The predominant factor driving the negative changes in mean days of participation per person in surfing is the aging of the population. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Table SU2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.003	-0.85	0.003
35-44 years old	-1.61	0.013	-3.38	0.029
45-54 years old	0.87	-0.008	0.94	-0.009
55-64 years old	1.88	-0.026	3.52	-0.047
65+ years old	-0.33	0.006	0.08	-0.002
Net Effects Age		-0.012		-0.026
Census Division				
South Atlantic	0.29	0.001	0.53	0.002
West South Central	0.16	<0.001	0.29	0.001
Mountain	0.43	0.003	0.82	0.005
Pacific	0.17	0.001	0.28	0.002
Net Effects Census Division		0.006		0.011
Coastal County Resident	-0.33	-0.002	-0.61	-0.004
Household Income				
$25,000-$50,000	-0.34	-0.002	-0.90	-0.005
$50,000-$100,000	0.99	0.004	2.15	0.009
$100,000+	0.38	0.003	0.85	0.007
Net Effects Income		0.006		0.012
Race/Ethnicity				
Black, not Hispanic	0.08	-0.001	0.21	0.001
Sex				
Male	0.12	0.001	0.20	0.001
Total Net Effects		-0.004		-0.013

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.003 or an increase in the mean number of days per person of 0.003. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for surfing declines by 0.004 for the time period 2000-2005 and declines by 0.013 for the period 2000-2010 (See Table SU2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Age was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of age is a reduction in mean days of participation of 0.012 days for the 2000-2005 period and a reduction of 0.026 days for the 2000-2010 period.

Wind Surfing

Participation in Wind Surfing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are first estimated to increase in 2005, and then estimated to decline in 2010 (See Fig. WI1). Population is projected to increase in both 2005 and 2010. The net effect is an estimated increase in participants from 826.9 thousand in 2000 to 888.8 thousand in 2005 and 937.4 thousand in 2010 (See Fig. WI2). The 61.9 thousand increase in participants from 2000 to 2005 represents a 7.5% increase, while the 110.4 thousand increase in participants from 2000 to 2010 represents a 13.36% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure WI1: Wind Surfing Participation Rates by Year

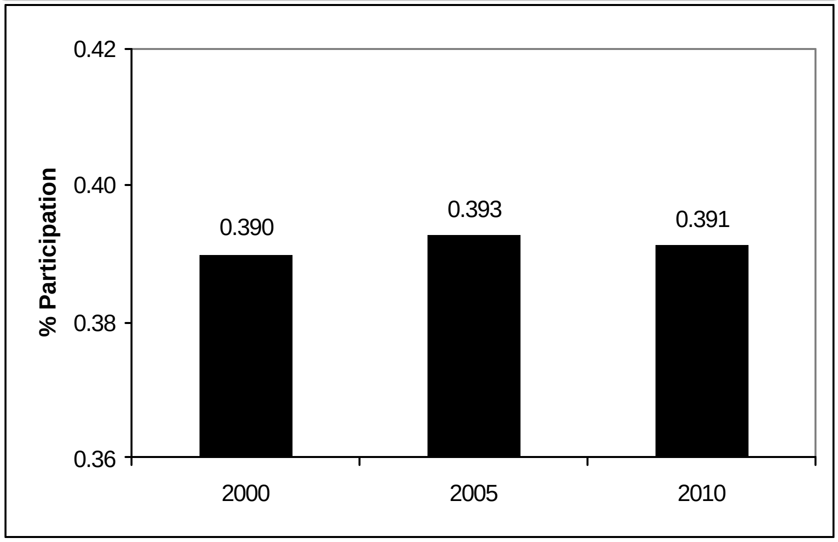
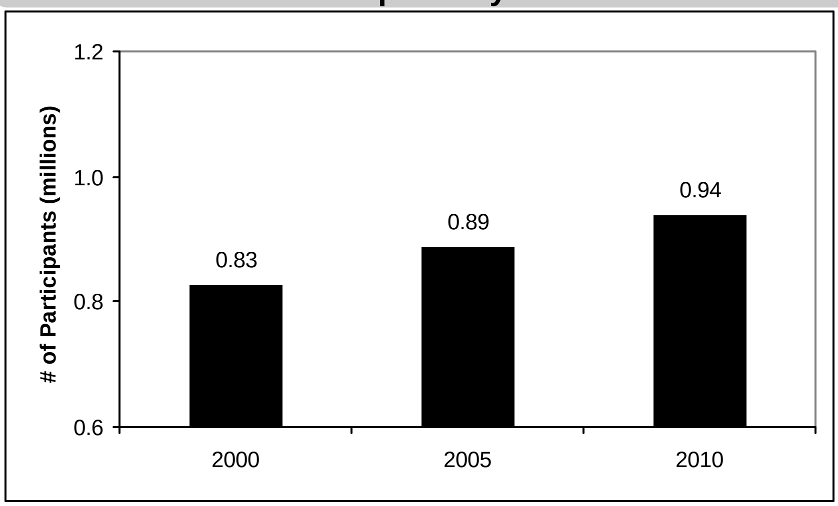


Figure WI2: Wind Surfing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining participation in wind surfing (see Appendix A, Table A.7 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 99.6% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in wind surfing declines. Age category 16-24 was included in the base (excluded from equation and therefore in the constant of the estimated equation) in initial model estimation. We found that age category 25-34 was not significantly different from age category 16-24, so age category 25-34 was added to the base. The coefficient on each age category is interpreted relative to the base. All other age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases beyond age 34, participation rates decline.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in wind surfing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. However, for wind surfing, we found that only residents of Census Division 1 (New England) had significantly different participation rates than residents of all other Census Divisions. The coefficient on Census Division 1 was positive meaning the residents of the New England Census Division have higher participation rates than residents of all other Census Divisions.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

A third place of residence variable *Urban* was included in the estimation for most of the other activity/settings but proved statistically insignificant in the initial estimation of the logit equation for wind surfing and was therefore dropped.

Education: People with a high school education were statistically different from those with all other levels of educational attainment. People with all other levels of educational attainment were included in the base. People with a high school education had lower participation rates than those with all other levels of educational attainment.

Household Income: As the level of annual household income increases participation rates for wind surfing increase, except that people with household incomes between $50,000 and $100,000 had lower participation rates than those with household incomes between $25,000 and $50,000. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger, except for the case noted above. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: This was not a statistically significant factor in explaining participation in wind surfing.

Sex. Males have higher participation rates in wind surfing than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future wind surfing participation rates for years 2005 and 2010. Overall, wind surfing participation rates are estimated to increase from the year 2000 rate of 0.39% to 0.393% in 2005, and to decline back to 0.391% in 2010 (See Fig. WI1). These are extremely small changes in participation rates (only to thousandths of a percentage point). The predominant factors driving these changes in the forecasted participation rates are the aging of the population and increases in household income. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Table WI1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
35-44 years old	-1.61	< 0.01	-3.38	0.01
45-54 years old	0.87	< 0.01	0.94	< 0.01
55-64 years old	1.88	-0.01	3.52	-0.01
65+ years old	-0.33	< 0.01	0.08	< 0.01
Net Effects Age		< -0.01		-0.01
Census Division				
New England	-0.17	< -0.01	-0.32	< -0.01
Coastal County Resident	-0.33	< -0.01	-0.61	< -0.01
Household Income				
$25,000-$50,000	-0.34	< -0.01	-0.90	< -0.01
$50,000-$100,000	0.99	< 0.01	2.15	0.01
$100,000+	0.38	< 0.01	0.85	0.01
Net Effects Income		0.01		0.01
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		< 0.01		< 0.01

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 35 – 44 years old over the 2000 – 2005 period is estimated to be less than +0.01% or an increase of less than 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 35 – 44 years old is negative, the proportion of the population 35 – 44 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases less than 0.01 percentage points for both time periods 2000 – 2005 and 2000 – 2010 (See Table WI1). On net, two factors had positive marginal effects (household income and sex), while three factors had negative marginal effects (age, Census Division, and coastal county resident). Household income had the largest positive marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all household income categories), the marginal effect of household income was an increase in participation rates of 0.01 percentage points for both the 2000 – 2005 and 2000-2010 periods. And, for age, the net effect is a decrease in participation rates of less than 0.01 percentage points for the 2000 – 2005 and a decrease of 0.01 percentage points for the 2000 – 2010 period.

Figure WI3: Mean Days of Wind Surfing per Person by Year

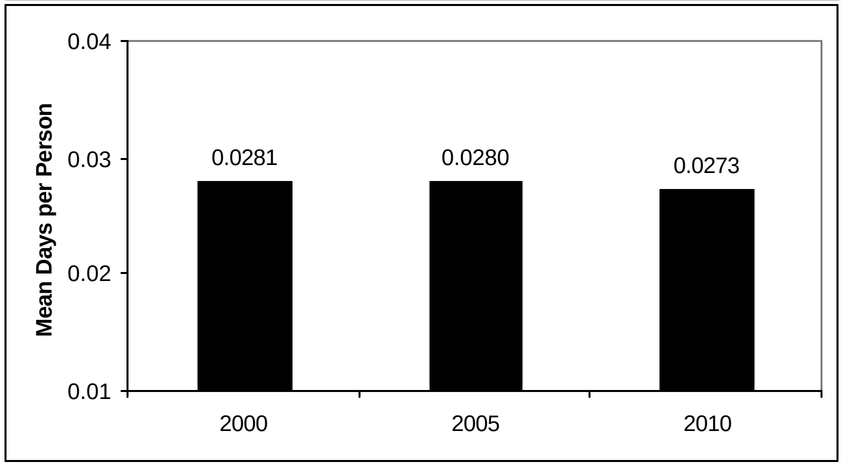
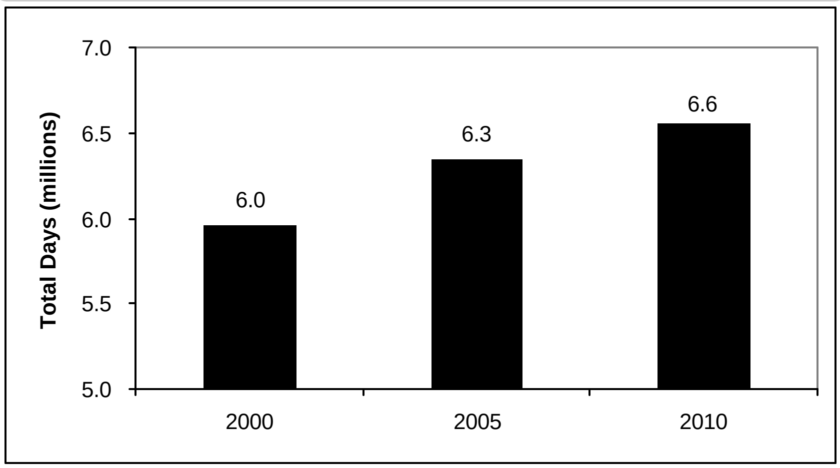


Figure WI4: Total Days of Wind Surfing by Year



Days of Wind Surfing

The total number of days of wind surfing is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline slightly (See Fig. WI3), and population is projected to increase. The net effect is an estimated increase in total days of participation from 6.0 million in 2000 to 6.3 million in 2005 and to 6.6 million in 2010 (See Fig. WI4). The 386.9 thousand increase in total days from 2000 to 2005 represents a 6.5% increase, while the 596.5 thousand increase from 2000 to 2010 represents a 10.0% increase.

Forecast Equation. Only age and annual household income were found to be statistically significant factors in explaining mean days of participation in wind surfing (see Appendix A, Table A.26 for details on the estimated negative binomial equation). The forecast equation estimates meandays of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: Only age category 55-64 and age category 65 and older were statistically significant in explaining mean days of participation in wind surfing. All other age categories were included in the base. The coefficients on both age categories were negative, and the coefficient on age category 65 and older was larger in absolute value than that on age category 55-64, indicating lower mean days of participation. Thus, as age increases past the age of 55, mean days of participation in windsurfing declines.

Place of Residence: Place of residence was not a statistically significant factor in explaining mean days of participation in wind surfing.

Education: Education was not a statistically significant factor in explaining mean days of participation in wind surfing.

Household Income: Only the coefficient on the highest income category (annual household income greater than $100,000) proved to be statistically significant. All other income categories were included in the base. The coefficient on the highest income bracket was positive, indicating that those in this income group have the highest mean days of participation in wind surfing.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining mean days of participation in wind surfing.

Sex: Sex was not a statistically significant factor in explaining mean days of participation in wind surfing.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for wind surfing for years 2005 and 2010. Overall, mean days of wind surfing is estimated to decrease slightly from 0.0281 days per person (5.48 days per participant) in 2000 to 0.0280 days per person (5.43 days per participant) in 2005 and to 0.0273 days per person (5.32 days per participant) in 2010 (See Fig. WI3). These changes are very small, but we can gain insight into them by examining the marginal effects of the few explanatory variables.

Table WI2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
55-64 years old	0.43	-0.0007	0.82	-0.0014
65+ years old	-0.33	0.0004	0.08	-0.0001
Net Effects Age		-0.0004		-0.0015
Household Income				
$100,000+	0.12	0.0003	0.20	0.0008
Total Net Effects		-0.0001		-0.0008

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables. Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable.

Across all factors, mean days of participation per person for wind surfing declines by 0.0001 for the time period 2000-2005 and declines by 0.0008 for the period 2000-2010 (See Table WI2). Age had negative marginal effects, while household income had positive marginal effects. The aging of the population was the primary driver of the negative net changes in mean days of participation. On net, the marginal effect of age is a reduction in mean days of participation of 0.0004 days for the 2000-2005 period and a reduction of 0.0015 days for the 2000-2010 period.

Fishing

Participation in Fishing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. F1), while population is projected to increase. The net effect is an estimated increase in participants from 21.88 million in 2000 to 23.31 million in 2005 and 24.54 million in 2010 (See Fig. F2). The 1.42 million increase in participants from 2000 to 2005 represents a 6.5% increase, while the 2.66 million increase in participants from 2000 to 2010 represents a 12.1% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure F1: Fishing Participation Rates by Year

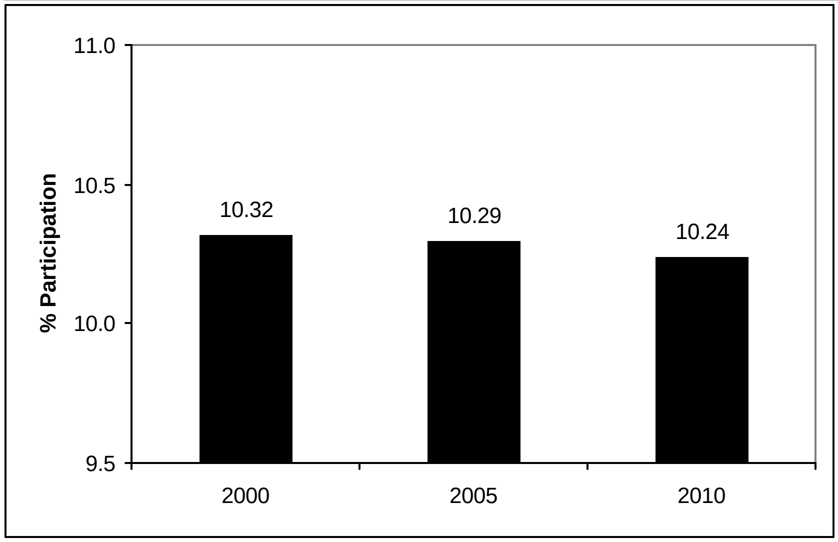
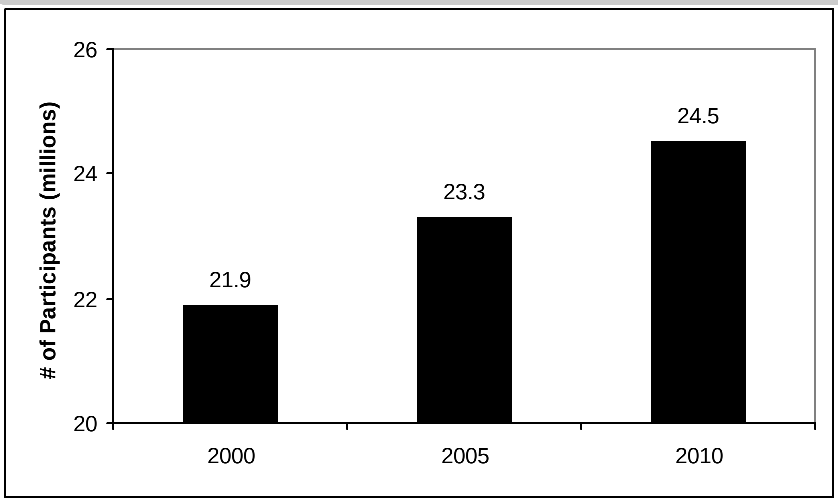


Figure F2: Fishing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining participation in fishing (see Appendix A, Table A.8 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 89.7 % of the sample of 50,495 participants and non-participants. About 99.99 % of non-participants were predicted correctly, while about 0.08% of participants were predicted correctly.

Age: All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. As age increases from age 16-24 to age 25-34, participation in fishing declines. For people in the age category 35-44, participation rates are lower than those age 16-24, but higher than those age 25-34. After people reach age 45-54, as age increases participation rates decline.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in fishing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for fishing in marine waters (Great Lakes Fishing not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates followed closely by residents of Census Division 5 (West South Central). Census Division 5 includes Texas and Louisiana.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

A third place of residence variable *Urban* was included in the estimation for most of the other activity/settings but proved statistically insignificant in the initial estimation of the logit equation for fishing and was therefore dropped.

Education: The relationship between level of educational attainment and fishing participation rates seems to follow a parabolic relationship. As the level of educational attainment increases from the less than high school level (included in the base) to the high school level, participation rates for fishing increase. Participation rates for fishing increase further for those with a college education versus those with a high school education. But for those people with a level of educational attainment beyond a college degree, participation rates are lower than those with less than a high school degree. People in the "other category were included in the base.

Table F1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.02	-0.85	0.02
35-44 years old	-1.61	0.03	-3.38	0.07
45-54 years old	0.87	-0.03	0.94	-0.03
55-64 years old	1.88	-0.08	3.52	-0.15
65+ years old	-0.33	0.03	0.08	-0.01
Net Effects Age		-0.03		-0.10
Census Division				
New England	-0.17	-0.02	-0.32	-0.03
Middle Atlantic	-0.37	-0.03	-0.69	-0.06
South Atlantic	0.29	0.05	0.53	0.08
East South Central	-0.06	-0.01	-0.09	-0.01
West South Central	0.16	0.02	0.29	0.04
Mountain	0.43	0.02	0.82	0.04
Pacific	0.17	0.02	0.28	0.03
Net Effects Census Division		0.05		0.08
Coastal County Resident	-0.33	-0.03	-0.61	-0.05
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.05	2.15	0.10
$100,000+	0.38	0.03	0.85	0.06
Net Effects Income		0.06		0.14
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	-0.01
Hispanic	2.06	-0.09	3.74	-0.16
Net Effects Race		-0.09		-0.17
Sex				
Male	0.12	0.01	0.20	0.02
Total Net Effects		-0.03		-0.08

Household Income: As the level of annual household income increases participation rates for fishing increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: Only those classified as *Black, Not Hispanic* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories of race/ethnicity are included in the base. Those classified as *Black, Not Hispanic* have the lowest participation rates in Fishing and those classified as *Hispanic* have the next lowest participation rates in fishing. Estimated coefficients on these two classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic* or *Hispanic* decrease participation rates.

Sex. Males have higher participation rates in fishing than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future fishing participation rates for years 2005 and 2010. Overall, fishing participation rates are estimated to decline from the year 2000 rate of 10.32% to 10.29% in 2005 and to 10.24% in 2010 (See Fig. F1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population, the changing distribution of population by racial/ethnic classifications, and the decrease in the proportion of the population residing in coastal counties. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.02% or an increase of 0.02 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.03 percentage points for the time period 2000 – 2005 and decreases 0.08 percentage points for the period 2000 – 2010 (See Table F1). On net, three factors had negative marginal effects (age, coastal county resident, and race/ethnicity), while three factors had positive marginal effects (Census Division, household income, and sex). Age and race/ethnicity had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.03 percentage points for the 2000 – 2005 period and a decrease of 0.10 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a decrease in participation rates of 0.09 percentage points for the 2000 – 2005 period and a decrease of 0.17 percentage points for the 2000 – 2010 period.

Days of Fishing

The total number of days of fishing is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. F3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 267.0 million in 2000 to 282.6 million in 2005 and to 296.5 million in 2010 (See Fig. F4). The 15.6 million increase in total days from 2000 to 2005 represents a 5.8% increase, while the 29.6 million increase from 2000 to 2010 represents an 11.1% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining mean days of participation in fishing (see Appendix A, Table A.27 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in fishing tends to decline. Age category 16-24 was included in the base (excluded from the equation and therefore included in the constant) in the initial estimation. Age category 25-34 was found to be statistically insignificant and was added to the base. All other age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases, with the exception of age category 55-64. The coefficient on age category 55-64 is slightly smaller in absolute value than that on preceding age category 45-54, but orders of magnitude are similar. In general, as age increases mean days of participation declines.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in fishing. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. All coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation than residents of Census Division 7. Residents of Census Division 3 (South Atlantic) had the highest mean days of participation, followed closely by residents of Census Division 5 (West South Central).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in fishing and was therefore dropped.

Education: Mean days of participation in fishing has an unusual relationship with the level of educational attainment. People with less than a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, but as educational attainment increases the coefficients get smaller. So, as we move from those with a high school education to those with a college education, mean days of participation declines. Mean days of participation declines further as we move beyond a college education. There was an “other” category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have mean days of participation higher than those in any other category.

Household Income: Higher annual household incomes are associated with higher mean days of participation in fishing. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients. Though mean days of participation tends to increase with income, the coefficient for those with annual household incomes between $50,000 and $100,000 is slightly lower than that for those with incomes between $25,000 and $50,000. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for

Figure F3: Mean Days of Fishing per Person by Year

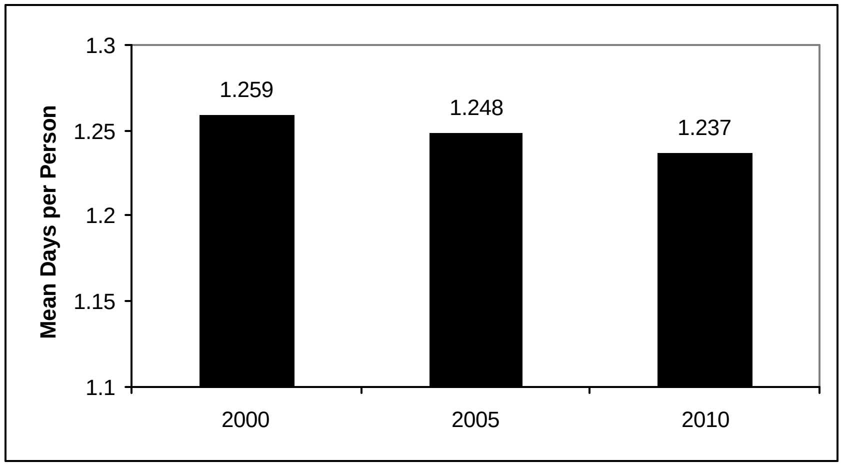
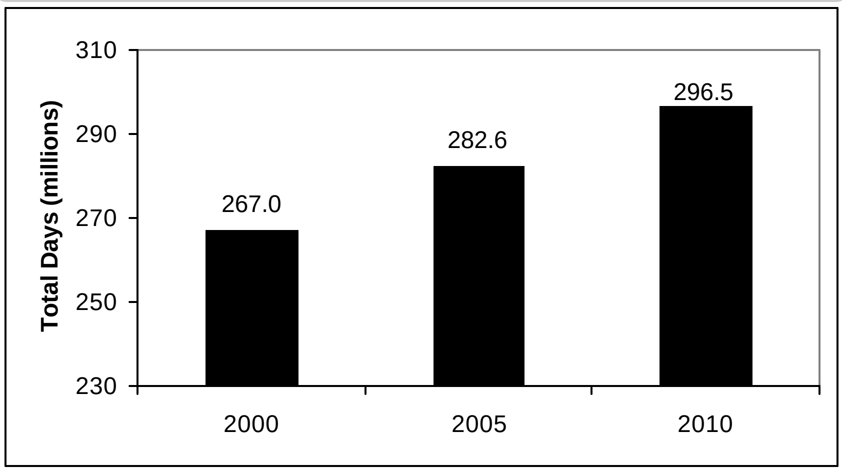


Figure F4: Total Days of Fishing by Year



those that didn't provide an income response. However, this category proved statistically insignificant and was included in the base.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. The racial/ethnic classification *Asian, Not Hispanic* was subsequently found to be statistically insignificant and was added the base. The coefficients on the remaining categories *White, Not Hispanic*, *Black, Not Hispanic*, and *Hispanic* are negative, meaning that as the proportion of the population classified in these racial/ethnic categories increases, mean days of participation decreases. The coefficient on the classification *Hispanic* is largest in absolute value, indicating that those classified in this category have the lowest mean days of participation in fishing.

Sex: Males have higher mean days of participation in fishing than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Table F2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
35-44 years old	-1.61	0.005	-3.38	0.008
45-54 years old	0.87	-0.005	0.94	-0.004
55-64 years old	1.88	-0.010	3.52	-0.015
65+ years old	-0.33	0.004	0.08	-0.001
Net Effects Age		-0.006		-0.012
Census Division				
New England	-0.17	-0.003	-0.32	-0.006
Middle Atlantic	-0.37	-0.006	-0.69	-0.012
South Atlantic	0.29	0.008	0.53	0.014
East South Central	-0.06	-0.001	-0.09	-0.002
West South Central	0.16	0.004	0.29	0.007
East North Central	-0.32	-0.001	-0.59	-0.002
Mountain	0.43	0.005	0.82	0.010
Pacific	0.17	0.004	0.28	0.006
Net Effects Census Division		0.008		0.015
Coastal County Resident	-0.33	-0.006	-0.61	-0.011
Household Income				
$25,000-$50,000	-0.34	-0.002	-0.90	-0.004
$50,000-$100,000	0.99	0.004	2.15	0.008
$100,000+	0.38	0.004	0.85	0.009
Net Effects Income		0.006		0.013
Race/Ethnicity				
White, not Hispanic	-2.56	0.022	-4.80	0.041
Black, not Hispanic	0.41	-0.001	0.84	-0.003
Hispanic	2.06	-0.036	3.74	-0.064
Net Effects Race/Ethnicity		-0.015		-0.026
Sex				
Male	0.12	0.002	0.20	0.003
Total Net Effects		-0.011		-0.022

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for fishing for years 2005 and 2010. Overall, mean days of fishing is estimated to decline from 1.26 days per person (12.2 days per participant) in 2000 to 1.25 days per person (12.12 days per participant) in 2005 and to 1.24 days per person (12.08 days per participant) in 2010 (See Fig. F1). The predominant factor driving the negative changes in mean days of participation per person in fishing is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 35-44 years old from 2000-2005 is +0.005 or an increase in the mean number of days per person of 0.005. Even though the negative binomial model coefficient on age category 35-44 is negative, the proportion of the population aged 35-44 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for fishing declines by 0.011 for the time period 2000-2005 and declines by 0.022 for the period 2000-2010 (See Table F2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Race/ethnicity was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a reduction in mean days of participation of 0.015 days for the 2000-2005 period and a reduction of 0.026 days for the 2000-2010 period.

Motorboating

Participation in Motorboating

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. MB1), while population is projected to increase. The net effect is an estimated increase in participants from 15.08 million in 2000 to 15.95 million in 2005 and 16.7 million in 2010 (See Fig. MB2). The 869.7 thousand increase in participants from 2000 to 2005 represents a 5.8% increase, while the 1.62 million increase in participants from 2000 to 2010 represents a 10.8% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure MB1: Motorboating Participation Rates by Year

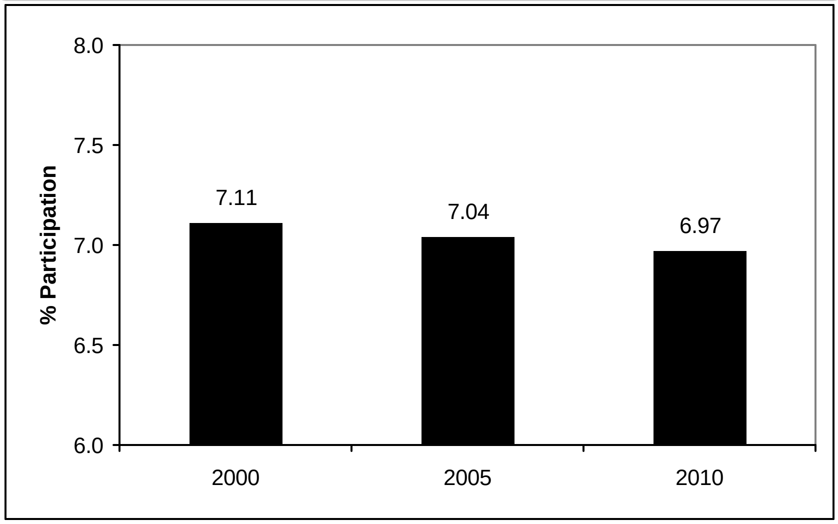
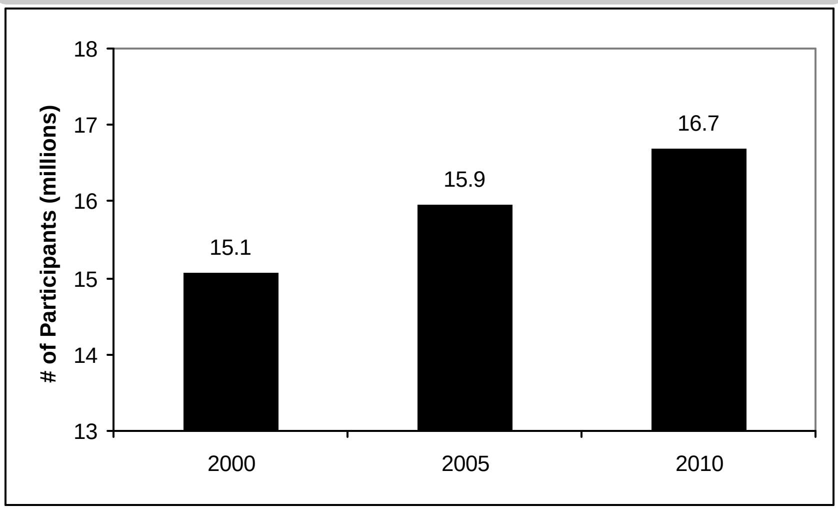


Figure MB2: Motorboating Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining participation in motorboating (see Appendix A, Table A.9 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 92.1% of the sample of 50,495 participants and non-participants. About 99.99 % of non-participants were predicted correctly, while about 0.03% of participants were predicted correctly.

Age: As age increases participation in motorboating declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in motorboating. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate for most activities. In this case, Census Division 6 (East North Central) had a negative coefficient, so its residents have slightly lower participation rates than residents from Census Division 7. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for motorboating in marine waters (Great Lakes motorboating not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates followed closely by residents of Census Division 5 (West South Central) and Census Division 1 (New England).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on motorboating. The logit equation estimation found that residents of urban areas have higher participation rates for motorboating than residents of rural areas, holding other factors constant.

Education: Higher levels of educational attainment are associated with higher participation rates for motorboating. As the level of educational attainment increases from the less than high school level (included in the base) to the high school level, participation rates for motorboating increase. Participation rates for motorboating increase further for those with a college education versus those with a high school education. For those people with a level of educational attainment beyond a college degree, participation rates are higher than those with less than a high school degree or a high school degree but lower than those with a college education. People in the "other" category were included in the base.

Table MB1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.03	-3.38	0.07
45-54 years old	0.87	-0.03	0.94	-0.03
55-64 years old	1.88	-0.06	3.52	-0.12
65+ years old	-0.33	0.02	0.08	-0.01
Net Effects Age		-0.03		-0.08
Census Division				
New England	-0.17	-0.01	-0.32	-0.02
Middle Atlantic	-0.37	-0.01	-0.69	-0.03
South Atlantic	0.29	0.02	0.53	0.04
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	0.01	0.29	0.02
East North Central	-0.32	0.01	-0.59	0.01
Mountain	0.43	0.01	0.82	0.02
Pacific	0.17	0.01	0.28	0.01
Net Effects Census Division		0.03		0.05
Coastal County Resident	-0.33	-0.02	-0.61	-0.04
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.03
$50,000-$100,000	0.99	0.04	2.15	0.10
$100,000+	0.38	0.03	0.85	0.07
Net Effects Income		0.07		0.14
Race/Ethnicity				
Black, not Hispanic	0.08	-0.01	0.21	-0.02
Asian, not Hispanic	0.41	-0.02	0.84	-0.05
Hispanic	2.06	-0.09	3.74	-0.16
Net Effects Race		-0.12		-0.22
Sex				
Male	0.12	< 0.01	0.20	0.01
Total Net Effects		-0.07		-0.14

Household Income: As the level of annual household income increases participation rates for motorboating increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: For race, those classified as *Black, Not Hispanic*, *Asian, Not Hispanic,* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Those classified as *Black, Not Hispanic* have the lowest participation rates in motorboating, followed by those classified as *Asian, Not Hispanic* and those classified as *Hispanic*. Estimated coefficients on these three classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic, Asian, Not Hispanic,* or *Hispanic* decrease participation rates.

Sex. Males have higher participation rates in motorboating than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future motorboating participation rates for years 2005 and 2010. Overall, motorboating participation rates are estimated to decline from the year 2000 rate of 7.11% to 7.04% in 2005 and to 6.97% in 2010 (See Fig. MB1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population, the changing distribution of population by racial/ethnic classifications, and the decrease in the proportion of the population residing in coastal counties. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.07 percentage points for the time period 2000 – 2005 and decreases 0.14 percentage points for the period 2000 – 2010 (See Table MB1). On net, three factors had negative marginal effects (age, coastal county resident, and race/ethnicity), while four factors had positive marginal effects (Census Division, urban resident, household income, and sex). Age and race/ethnicity had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.03 percentage points for the 2000 – 2005 period and a decrease of 0.08 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a decrease in participation rates of 0.12 percentage points for the 2000 – 2005 period and a decrease of 0.22 percentage points for the 2000 – 2010 period.

Days of Motorboating

The total number of days of motorboating is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. MB3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 208.0 million in 2000 to 216.5 million in 2005 and to 222.9 million in 2010 (See Fig. MB4). The 8.5 million increase in total days from 2000 to 2005 represents a 4.1% increase, while the 14.9 million increase from 2000 to 2010 represents a 7.2% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity, and sex were all statistically significant factors in explaining mean days of participation in motorboating (see Appendix A, Table A.28 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in motorboating tends to decline. Age category 16-24 was included in the base (excluded from the equation and therefore included in the constant) in the initial estimation. All other age category coefficients are negative and increase in absolute value (i.e., have a larger impact on days of participation) as age increases, with the exception of age category 45-54. The coefficient on age category 45-54, while still negative, is slightly smaller in absolute value than that on preceding age category 35-44, but orders of magnitude are similar. In general, as age increases mean days of participation declines.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in motorboating. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different mean days of participation than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region, and residents from that region have the lowest mean days of participation in motorboating (Great Lakes not included since the Great Lakes are freshwater). All coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 3 (South Atlantic) had the highest mean days of participation.

Figure MB3: Mean Days of Motorboating per Person by Year

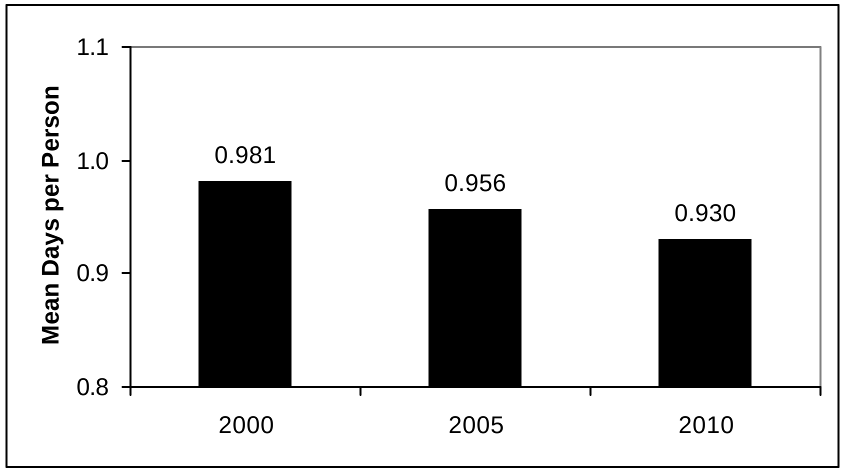
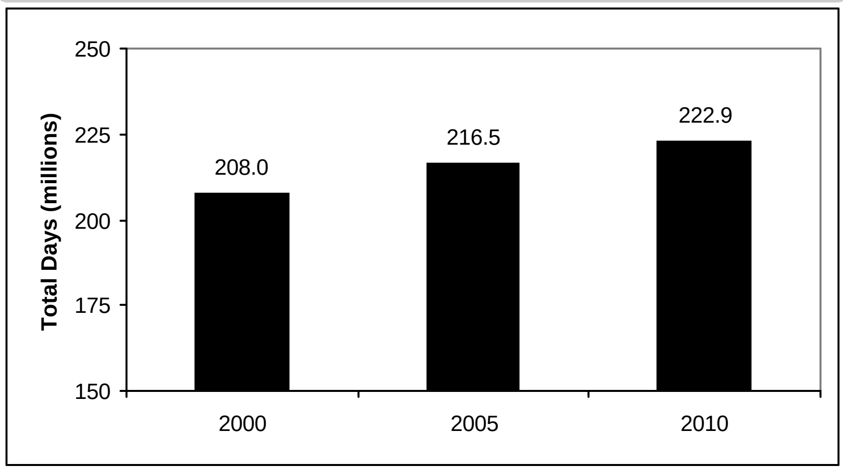


Figure MB4: Total Days of Motorboating by Year



For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in motorboating and was therefore dropped.

Education: As the level of educational attainment increases, mean days of participation in motorboating increases. People with less than a high school education are in the base and have the lowest participation rates. People in the “other” category were also included in the base. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: Higher annual household incomes are associated with higher mean days of participation in motorboating. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients. Though mean days of participation tends to increase with income, the coefficient for those with annual household incomes between $50,000 and $100,000 is slightly lower than that for those with incomes between $25,000 and $50,000. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people had higher mean days of participation than those with annual household income less than $25,000 but lower mean days of participation than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. All other racial/ethnic classifications were found to be statistically significant with negative coefficients. The coefficient on the category *Asian, Not Hispanic* was largest in absolute value, followed closely by the coefficient on the category *Black, Not Hispanic*, indicating that these two groups had the lowest mean days of participation.

Sex: Males have higher mean days of participation in motorboating than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for motorboating for years 2005 and 2010. Overall, mean days of motorboating is estimated to decline from 0.981 days per person (13.8 days per participant) in 2000 to 0.956 days per person (13.6 days per participant) in 2005 and to 0.930 days per person (13.4 days per participant) in 2010 (See Fig. MB3). The predominant factor driving the negative changes in mean days of participation per person in motorboating is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.004 or an increase in the mean number of

Table MB2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.004	-0.85	0.004
35-44 years old	-1.61	0.014	-3.38	0.029
45-54 years old	0.87	-0.007	0.94	-0.007
55-64 years old	1.88	-0.017	3.52	-0.032
65+ years old	-0.33	0.005	0.08	-0.001
Net Effects Age		-0.001		-0.008
Census Division				
New England	-0.17	-0.002	-0.32	-0.004
Middle Atlantic	-0.37	-0.003	-0.69	-0.005
South Atlantic	0.29	0.005	0.53	0.009
East South Central	-0.06	<-0.001	-0.09	-0.001
West South Central	0.16	0.002	0.29	0.004
Mountain	0.43	0.003	0.82	0.006
Pacific	0.17	0.002	0.28	0.003
Net Effects Census Division		0.007		0.012
Coastal County Resident	-0.33	-0.005	-0.61	-0.009
Household Income				
$25,000-$50,000	-0.34	-0.002	-0.90	-0.007
$50,000-$100,000	0.99	0.006	2.15	0.014
$100,000+	0.38	0.005	0.85	0.011
Net Effects Income		0.009		0.019
Race/Ethnicity				
White, not Hispanic	-2.56	0.015	-4.80	0.028
Black, not Hispanic	0.08	-0.002	0.21	-0.005
Asian, not Hispanic	0.41	-0.010	0.84	-0.020
Hispanic	2.06	-0.038	3.74	-0.068
Net Effects Race/Ethnicity		-0.035		-0.064
Sex				
Male	0.12	0.001	0.20	0.002
Total Net Effects		-0.025		-0.051

days per person of 0.004. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for motorboating declines by 0.025 for the time period 2000-2005 and declines by 0.051 for the period 2000-2010 (See Table MB2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Race/ ethnicity was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a reduction in mean days of participation of 0.035 days for the 2000-2005 period and a reduction of 0.064 days for the 2000-2010 period.

Sailing

Participation in Sailing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. S1), while population is projected to increase. The net effect is an estimated increase in participants from 6.32 million in 2000 to 6.69 million in 2005 and 7.0 million in 2010 (See Fig. S2). The 367.7 thousand increase in participants from 2000 to 2005 represents a 5.8% increase, while the 685.0 thousand increase in participants from 2000 to 2010 represents a 10.8% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure S1: Sailing Participation Rates by Year

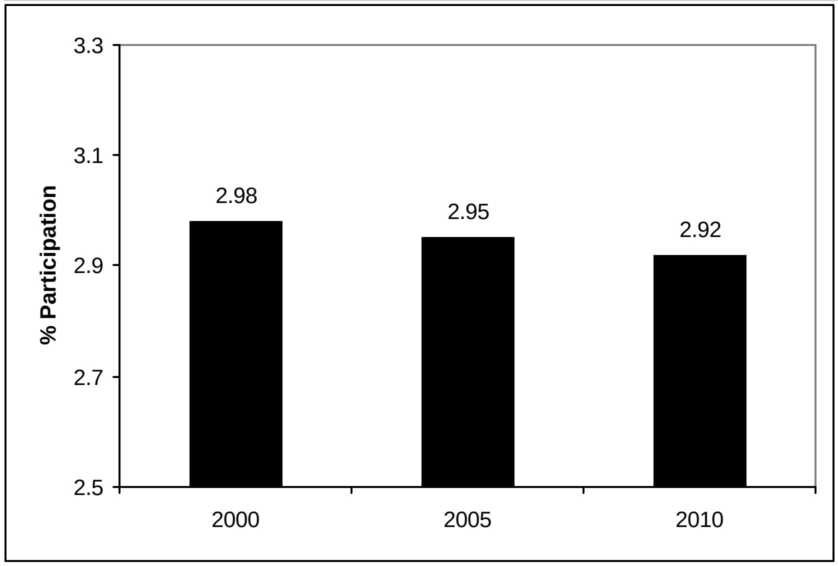
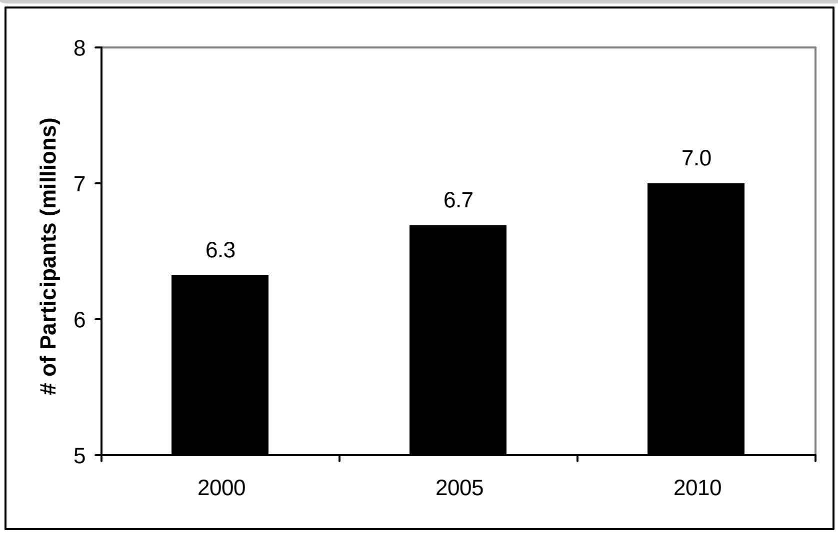


Figure S2: Sailing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining participation in sailing (see Appendix A, Table A.10 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 96.4% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in sailing declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in sailing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In the initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for sailing in marine waters (Great Lakes sailing not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 1 (New England) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on sailing. The logit equation estimation found that residents of urban areas have higher participation rates for sailing than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for sailing increase. People with a less than a high school education, people with a high school education, and people in the "other" category are in the base and have the lowest participation rates. Those with college educations and educations beyond a college degree have higher participation rates, and as the level of educational attainment increases the coefficients get larger.

Table S1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.03	-3.38	0.06
45-54 years old	0.87	-0.02	0.94	-0.02
55-64 years old	1.88	-0.04	3.52	-0.08
65+ years old	-0.33	0.01	0.08	< -0.01
Net Effects Age		-0.01		-0.02
Census Division				
New England	-0.17	-0.01	-0.32	-0.01
Middle Atlantic	-0.37	-0.01	-0.69	-0.02
South Atlantic	0.29	0.01	0.53	0.02
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	< 0.01	0.29	0.01
Mountain	0.43	0.01	0.82	0.01
Pacific	0.17	0.01	0.28	0.01
Net Effects Census Division		0.01		0.01
Coastal County Resident	-0.33	-0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.01
$50,000-$100,000	0.99	0.02	2.15	0.04
$100,000+	0.38	0.02	0.85	0.03
Net Effects Income		0.03		0.06
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	< -0.01
Asian, not Hispanic	0.41	-0.01	0.84	-0.02
Hispanic	2.06	-0.04	3.74	-0.07
Net Effects Race		-0.05		-0.10
Sex				
Male	0.12	< -0.01	0.20	< -0.01
Total Net Effects		-0.03		-0.06

Household Income: As the level of annual household income increases participation rates for sailing increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes between $25,000 and $50,000, but lower participation rates than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: For race/ethnicity, those classified as *Black, Not Hispanic, Asian, Not Hispanic,* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Those classified as *Asian, Not Hispanic* have the lowest participation rates in sailing, followed by those classified as *Black, Not Hispanic* and those classified as *Hispanic*. Estimated coefficients on these three classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic, Asian, Not Hispanic,* or *Hispanic* decrease participation rates.

Sex. Females have higher participation rates in sailing than males. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was negative meaning females have higher participation rates than males.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future sailing participation rates for years 2005 and 2010. Overall, sailing participation rates are estimated to decline from the year 2000 rate of 2.98% to 2.95% in 2005 and to 2.92% in 2010 (See Fig. S1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population and the changing distribution of population by racial/ethnic classifications. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.03 percentage points for the time period 2000 – 2005 and decreases 0.06 percentage points for the period 2000 – 2010 (See Table S1). On net, four factors had negative marginal effects (age, coastal county resident, race/ethnicity, and sex), while three factors had positive marginal effects (Census Division, urban resident, and household income). Age and race/ethnicity had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.01 percentage points for the 2000 – 2005 period and a decrease of 0.02 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a decrease in participation rates of 0.05 percentage points for the 2000 – 2005 period and a decrease of 0.10 percentage points for the 2000 – 2010 period.

Days of Sailing

The total number of days of sailing is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to increase slightly (See Fig. S3), and population is projected to increase. The net effect is an estimated increase in total days of participation from 49.9 million in 2000 to 53.9 million in 2005 and to 57.0 million in 2010 (See Fig. S4). The 4.0 million increase in total days from 2000 to 2005 represents an 8.0% increase, while the 7.2 million increase from 2000 to 2010 represents a 14.3% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, and household income were all statistically significant factors in explaining mean days of participation in sailing (see Appendix A, Table A.29 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: Mean days of participation in sailing has an unusual relationship with age. Age category 16-24 was included in the base (excluded from the equation and therefore included in the constant) in the initial estimation. All other age category coefficients are negative, that is have lower mean days of participation than age category 16-24, but they do not follow an apparent trend. As we move from one age category coefficient to the next, the absolute value first falls, then rises, then falls again, and finally rises again.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in sailing. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In initial estimation, we found that residents of Census Division 6 (East North Central) and Census Division 8 (Mountain) did not have statistically different mean days of participation than residents from Census Division 7, so we added them to the base. All coefficients on the other Census Divisions were statistically significant and positive, meaning residents from those regions had higher mean days of participation. Residents of Census Division 1 (New England) had the highest mean days of participation, followed by residents of Census Division 9 (Pacific).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had higher mean days of participation in sailing than rural residents, holding other factors constant.

Figure S3: Mean Days of Sailing per Person by Year

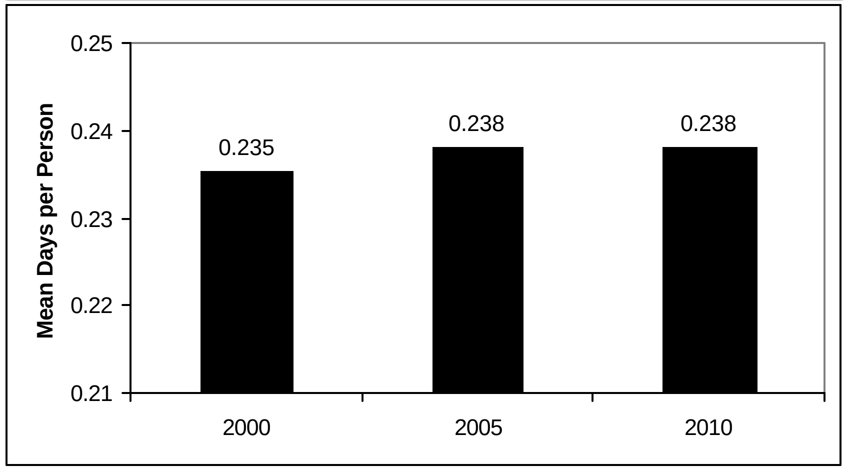
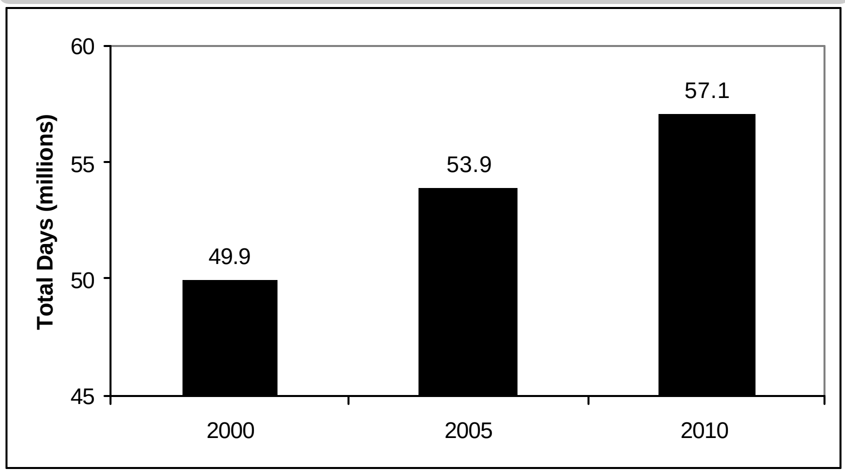


Figure S4: Total Days of Sailing by Year



Education: As the level of educational attainment increases, mean days of participation in sailing increases. People with less than a high school education are in the base and have the lowest participation rates. People in the "other" category are also included in the base. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: Higher annual household incomes are associated with higher mean days of participation in sailing. People with the lowest level of annual household income (less than $25,000) are included in the base and have the lowest mean days of participation. All other levels of annual household income were statistically significant, with positive signs on the coefficients. Though mean days of participation tends to increase with income, the coefficient for those with annual household incomes between $50,000 and $100,000 is slightly lower than that for those with incomes between $25,000 and $50,000. Those in the highest income category, with annual household incomes over $100,000, had by far the highest mean days of participation in sailing. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. Results indicate that these people had higher mean days of participation than those with annual household income less than $25,000 but lower mean days of participation than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining mean days of participation in sailing.

Sex: Sex was not a statistically significant factor in explaining mean days of participation in sailing.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for sailing for years 2005 and 2010. Overall, mean days of sailing is estimated to increase slightly from 0.235 days per person (7.9 days per participant) in 2000 to 0.238 days per person (8.1 days per participant) in 2005 and to remain virtually unchanged at 0.238 days per person (8.1 days per participant) in 2010 (See Fig. S3). The predominant factor driving the positive changes in mean days of participation per person in sailing is the changing distribution of the population by annual household income. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Table S2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.003	-0.85	0.003
35-44 years old	-1.61	0.003	-3.38	0.007
45-54 years old	0.87	-0.003	0.94	-0.003
55-64 years old	1.88	-0.004	3.52	-0.008
65+ years old	-0.33	0.001	0.08	<-0.001
Net Effects Age		0.001		-0.001
Census Division				
New England	-0.17	-0.001	-0.32	-0.002
Middle Atlantic	-0.37	-0.001	-0.69	-0.001
South Atlantic	0.29	0.001	0.53	0.001
East South Central	-0.06	<-0.001	-0.09	<-0.001
West South Central	0.16	<0.001	0.29	<0.001
Pacific	0.17	0.001	0.28	0.001
Net Effects Census Division		<-0.001		-0.001
Coastal County Resident	-0.33	-0.001	-0.61	-0.002
Urban Resident	0.30	<0.001	0.51	0.001
Household Income				
$25,000-$50,000	-0.34	-0.001	-0.90	-0.002
$50,000-$100,000	0.99	0.002	2.15	0.004
$100,000+	0.38	0.002	0.85	0.004
Net Effects Income		0.003		0.006
Total Net Effects		0.003		0.003

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.003 or an increase in the mean number of days per person of 0.003. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person for sailing increases by 0.003 for the time period 2000-2005 and increases by the same amount for the period 2000-2010 (See Table S2). On net, two factors had positive marginal effects (urban resident and household income), while two factors had negative marginal effects (Census Division and coastal county resident). Age had a positive marginal effect for the period 2000-2005 and a negative marginal effect for the period 2000-2010. Household income was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of household income is an increase in mean days of participation of 0.003 days for the 2000-2005 period and an increase of 0.006 days for the 2000-2010 period.

Personal Watercraft Use

Participation in Personal Watercraft Use
Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. PW1), while population is projected to increase. The net effect is an estimated increase in participants from 5.45 million in 2000 to 5.77 million in 2005 and 5.99 million in 2010 (See Fig. PW2). The 323.7 thousand increase in participants from 2000 to 2005 represents a 5.9% increase, while the 543.1 thousand increase in participants from 2000 to 2010 represents a 10.0% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure PW1: Personal Watercraft Use Participation Rates by Year

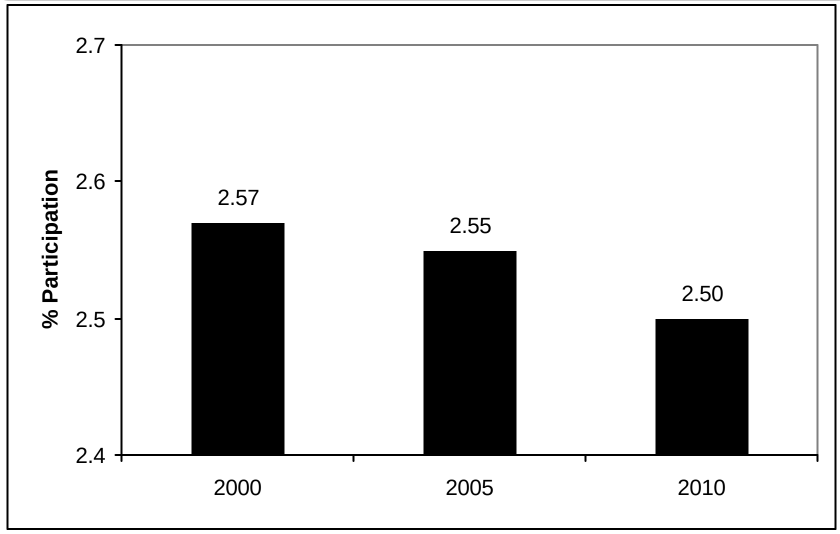
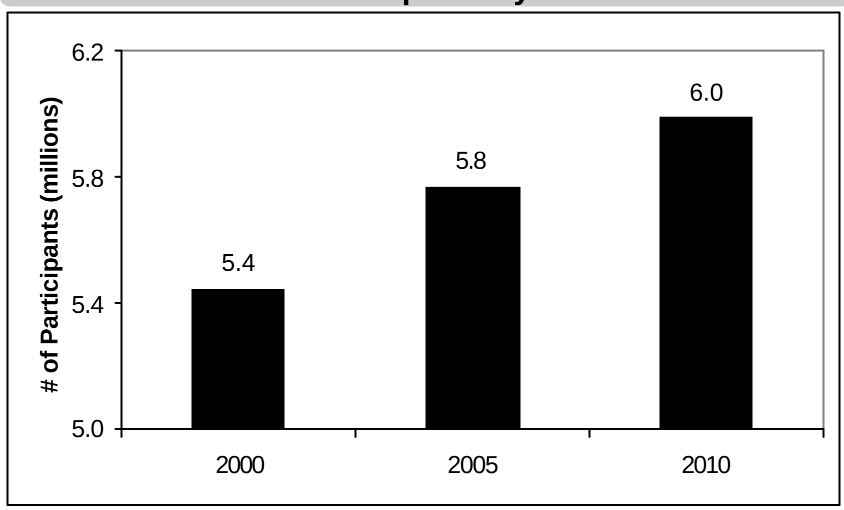


Figure PW2: Personal Watercraft Use Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining participation in personal watercraft use (see Appendix A, Table A.11 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 97.6% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in personal watercraft use declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in personal watercraft use. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents of Census

Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for personal watercraft use in marine waters (Great Lakes personal watercraft use not included since the Great Lakes are freshwater). Census Division 8 (Mountain) was also found to be statistically insignificant and was included in the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates.

Table PW1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.02	-0.85	0.02
35-44 years old	-1.61	0.05	-3.38	0.10
45-54 years old	0.87	-0.04	0.94	-0.04
55-64 years old	1.88	-0.10	3.52	-0.18
65+ years old	-0.33	0.03	0.08	-0.01
Net Effects Age		-0.04		-0.11
Census Division				
New England	-0.17	< -0.01	-0.32	< -0.01
Middle Atlantic	-0.37	-0.01	-0.69	-0.01
South Atlantic	0.29	0.01	0.53	0.02
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	< 0.01	0.29	0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		< 0.01		0.01
Coastal County Resident	-0.33	-0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.02	2.15	0.04
$100,000+	0.38	0.01	0.85	0.03
Net Effects Income		0.02		0.05
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		-0.02		-0.07

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on personal watercraft use. The logit equation estimation found that residents of urban areas have higher participation rates for personal watercraft use than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for personal watercraft use increase. People with a less than a high school education, people with a high school education, and people in the "other" category are in the base and have the lowest participation rates. Those with college educations and educations beyond a college degree have higher participation rates, but those with education beyond a college degree participate less than those with a college education.

Household Income: As the level of annual household income increases participation rates for personal watercraft use increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes between $25,000 and $50,000 but lower participation rates than those with annual household incomes between $50,000 and $100,000.

Race/Ethnicity: This was not a statistically significant factor in explaining participation in Personal Watercraft Use.

Sex. Males have higher participation rates in personal watercraft use than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future personal watercraft use participation rates for years 2005 and 2010. Overall, Personal Watercraft Use participation rates are estimated to decline from the year 2000 rate of 2.57% to 2.55% in 2005 and to 2.50% in 2010 (See Fig. PW1). The predominant factor driving the negative changes in the forecasted participation rates is the aging of the population. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.02% or an increase of 0.02 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Figure PW3: Mean Days of Personal Watercraft Use per Person by Year

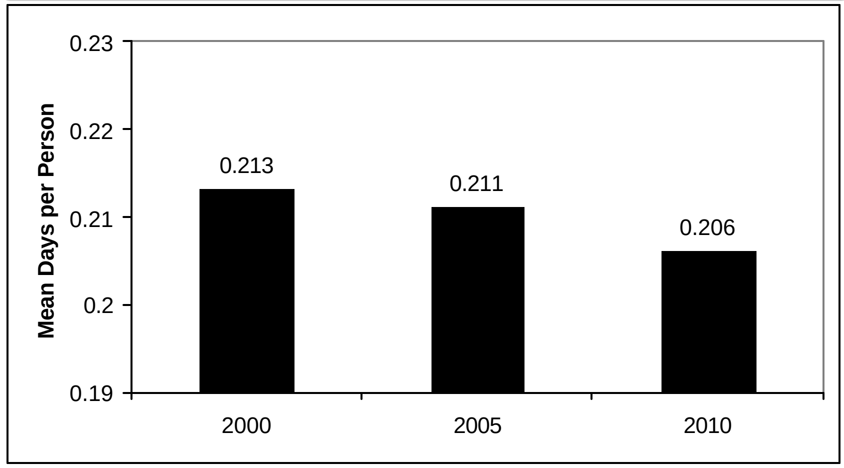
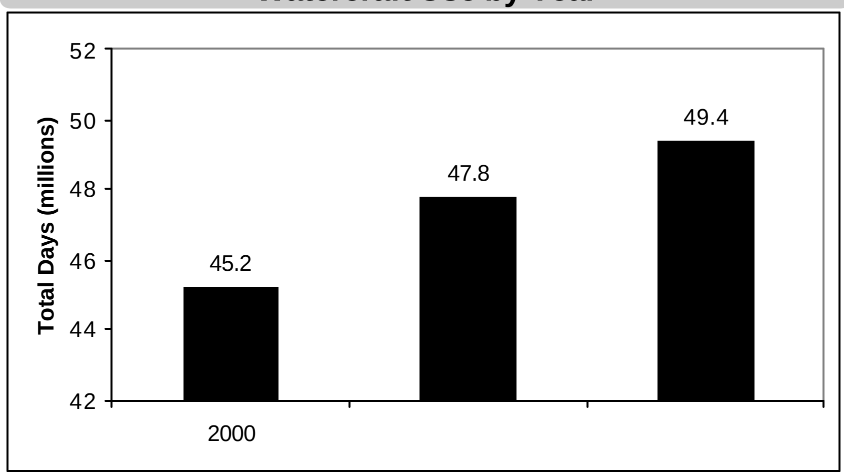


Figure PW4: Total Days of Personal Watercraft Use by Year



Across all factors, the participation rate decreases 0.02 percentage points for the time period 2000 – 2005 and decreases 0.07 percentage points for the period 2000 – 2010 (See Table PW1). On net, two factors had negative marginal effects (age and coastal county resident), while four factors had positive marginal effects (Census Division, urban resident, household income, and sex). Age had the largest negative marginal effect and was therefore the main driver of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.04 percentage points for the 2000 – 2005 period and a decrease of 0.11 percentage points for the 2000 – 2010 period.

Days of Personal Watercraft Use
The total number of days of personal watercraft use is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline slightly (See Fig. PW3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 45.2 million in 2000 to 47.8 million in 2005 and to 49.4 million in 2010 (See Fig. PW4). The 2.6 million increase in total days from 2000 to 2005 represents a 5.7% increase, while the 4.2 million increase from 2000 to 2010 represents a 9.2% increase.

Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining mean days of participation in personal watercraft use (see Appendix A, Table A.30 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in personal watercraft use tends to decline. Age category 16-24 was included in the base (excluded from the equation and therefore included in the constant) in the initial estimation. All other age category coefficients are negative and increase in absolute value (i.e., have a larger impact on mean days of participation) as age increases, with the exception of age category 55-64. The coefficient on age category 55-64 is slightly smaller in absolute value than that on preceding age category 45-54, but orders of magnitude are similar. In general, as age increases mean days of participation declines.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in personal watercraft use. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In subsequent estimations all Census Divisions other than Census Division 3 (South Atlantic) and Census Division 4 (East South Central) were found to be statistically insignificant and were added to the base. The coefficients on the remaining Census Divisions were positive, indicating higher mean days of participation. Residents of Census Division 3 (South Atlantic) had the highest mean days of participation.

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had higher mean days of participation in personal watercraft use than rural residents, holding other factors constant.

Education: As the level of educational attainment increases, mean days of participation in personal watercraft use increases. People with less than a high school education are in the base and have the lowest participation rates. People in the “other” category are also included in the base. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: In the initial estimation, people with the lowest level of annual household income (less than $25,000) were included in the base. Those with incomes between $50,000 and $100,000 and those with incomes greater than $100,000 were found to be statistically insignificant and were added to the base, leaving only those with annual household incomes between $25,000 and $50,000 and those whose chose not to provide an income response (over 43% of the sample). The coefficients on both of these groups were negative, indicating lower mean days of participation. The coefficient for those with incomes between $25,000 and $50,000 was slightly larger in absolute value than that for those who did not provide an income response.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining mean days of participation in personal watercraft use.

Sex: Males have higher mean days of participation in personal watercraft use than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for personal watercraft use for years 2005 and 2010. Overall, mean days of personal watercraft use is estimated to decrease slightly from 0.213 days per person (8.3 days per participant) in 2000 to 0.211 days per person (8.28 days per participant) in 2005 and to 0.206 days per person (8.24 days per participant) in 2010 (See Fig. PW3). The predominant factors driving the negative changes in mean days of participation per person in personal watercraft use are the aging of the population and the changing distribution of the population by coastal county residence. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Table PW2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.002	-0.85	0.002
35-44 years old	-1.61	0.006	-3.38	0.012
45-54 years old	0.87	-0.005	0.94	-0.005
55-64 years old	1.88	-0.009	3.52	-0.016
65+ years old	-0.33	0.003	0.08	-0.001
Net Effects Age		-0.002		-0.007
Census Division				
South Atlantic	0.29	0.001	0.53	0.002
East South Central	-0.06	<-0.001	-0.09	<-0.001
Net Effects Census Division		0.001		0.002
Coastal County Resident	-0.33	-0.001	-0.61	-0.002
Urban Resident	0.30	<0.001	0.51	<0.001
Household Income				
$25,000-$50,000	-0.34	<0.001	-0.90	0.001
Sex				
Male	0.12	<0.001	0.20	<0.001
Total Net Effects		-0.002		-0.007

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.002 or an increase in the mean number of days per person of 0.002. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person in personal watercraft use declines by 0.002 for the time period 2000-2005 and declines by 0.007 for the period 2000-2010 (See Table PW2). On net, four factors had positive marginal effects (Census Division, urban resident, household income, and sex), while two factors had negative marginal effects (age and coastal county resident). Age and coastal county resident were the factors with the largest net marginal effects and are therefore the main drivers of the forecasts of mean days of participation per person. On net, the marginal effect of age is a decrease in mean days of participation of 0.002 days for the 2000-2005 period and a decrease of 0.007 days for the 2000-2010 period. The net effect of coastal county residence is a decrease in mean days of participation of 0.001 days for the 2000-2005 period and a decrease of 0.002 days for the 2000-2010 period.

Canoeing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. CA1), while population is projected to increase. The net effect is an estimated increase in participants from 2.23 million in 2000 to 2.35 million in 2005 and 2.45 million in 2010 (See Fig. CA2). The 125.1 thousand increase in participants from 2000 to 2005 represents a 5.6% increase, while the 221.8 thousand increase in participants from 2000 to 2010 represents a 10.0% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure CA1: Canoeing Participation Rates by Year

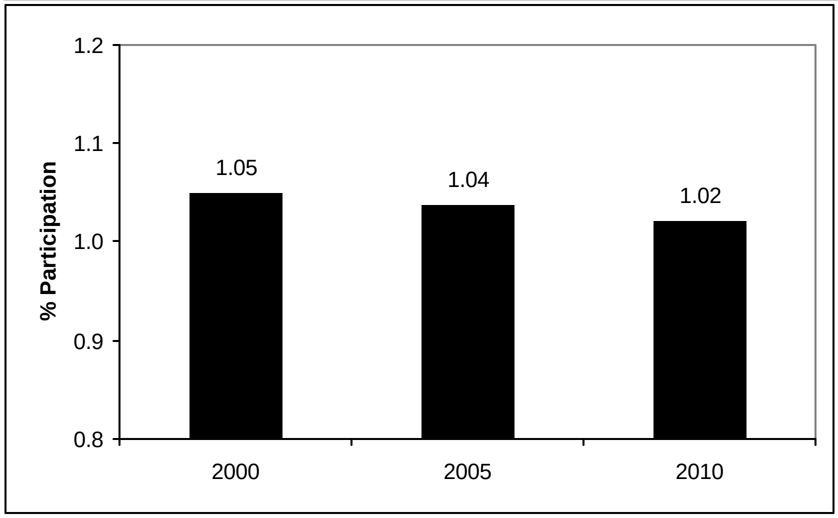
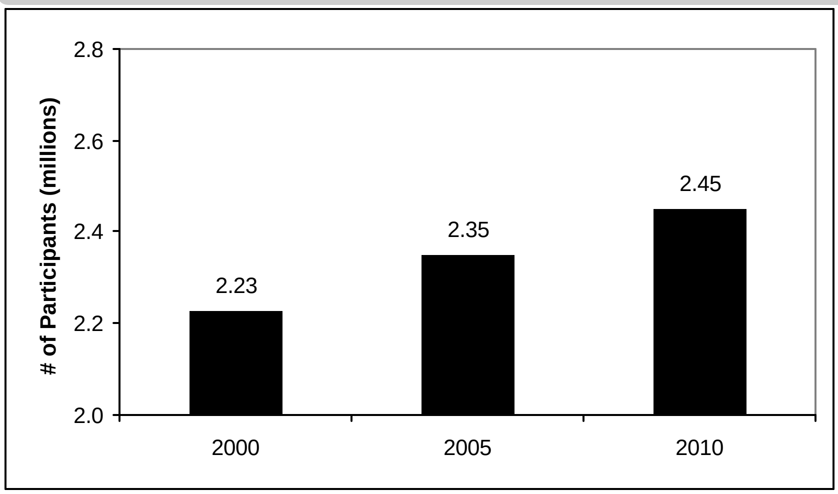


Figure CA2: Canoeing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining participation in canoeing (see Appendix A, Table A.12 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 99.1% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in canoeing declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases, with the exception of the age category 35-44. This category has a coefficient that is still negative, but slightly smaller in absolute value than the preceding age category 25-34. Aside from the category 35-44, as age increases participation rates decline.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in canoeing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6

(East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for canoeing in marine waters (Great Lakes canoeing not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates followed closely by residents of Census Division 1 (New England).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Table CA1: Marginal Effects of Driving Factors

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.01	-3.38	0.02
45-54 years old	0.87	-0.01	0.94	-0.01
55-64 years old	1.88	-0.02	3.52	-0.04
65+ years old	-0.33	0.01	0.08	< -0.01
Net Effects Age		-0.01		-0.02
Census Division				
New England	-0.17	< -0.01	-0.32	-0.01
Middle Atlantic	-0.37	< -0.01	-0.69	-0.01
South Atlantic	0.29	0.01	0.53	0.01
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	< 0.01	0.29	< 0.01
Mountain	0.43	0.01	0.82	0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		0.01		0.01
Coastal County Resident	-0.33	< -0.01	-0.61	-0.01
Household Income				
$25,000-$50,000	-0.34	< -0.01	-0.90	< -0.01
$50,000-$100,000	0.99	0.01	2.15	0.01
$100,000+	0.38	< 0.01	0.85	0.01
Net Effects Income		0.01		0.02
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	< -0.01
Hispanic	2.06	-0.02	3.74	-0.03
Net Effects Race		-0.02		-0.03
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		-0.01		-0.03

A third place of residence variable *Urban* was included in the estimation for most of the other activity/settings but proved statistically insignificant in the initial estimation of the logit equation for canoeing and was therefore dropped.

Education: The only level of educational attainment that proved statistically significant was a high school education. All other levels of educational attainment are included in the base. Respondents with only a high school education had significantly lower participation rates for canoeing.

Household Income: As the level of annual household income increases participation rates for canoeing increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: For race, only those classified as *Black, Not Hispanic* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Those classified as *Black, Not Hispanic* have the lowest participation rates in canoeing, followed by those classified as *Hispanic*. Estimated coefficients on these two classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic* or *Hispanic* decrease participation rates.

Sex. Males have higher participation rates in canoeing than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future canoeing participation rates for years 2005 and 2010. Overall, canoeing participation rates are estimated to decline from the year 2000 rate of 1.05% to 1.04% in 2005 and to 1.02% in 2010 (See Fig. CA1). The predominant factors driving the negative changes in the forecasted participation rates are the aging of the population and the changing distribution of population by racial/ethnic classifications. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.01 percentage points for the time period 2000 – 2005 and decreases 0.03 percentage points for the period 2000 – 2010 (See Table CA1). On net, three factors had negative marginal effects (age, coastal county resident, and race/ethnicity), while three factors had positive marginal effects (Census Division, household income, and sex). Age and race/ethnicity had the largest negative marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.01 percentage points for the 2000 – 2005 period and a decrease of 0.02 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a decrease in participation rates of 0.02 percentage points for the 2000 – 2005 period and a decrease of 0.03 percentage points for the 2000 – 2010 period.

Days of Canoeing

There was no estimation of days of participation for canoeing.

Kayaking

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. K1), while population is projected to increase. The net effect is an estimated increase in participants from 2.82 million in 2000 to 3.01 million in 2005 and 3.15 million in 2010 (See Fig. K2). The 187.5 thousand increase in participants from 2000 to 2005 represents a 6.7% increase, while the 329.8 thousand increase in participants from 2000 to 2010 represents an 11.7% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure K1: Kayaking Participation Rates by Year

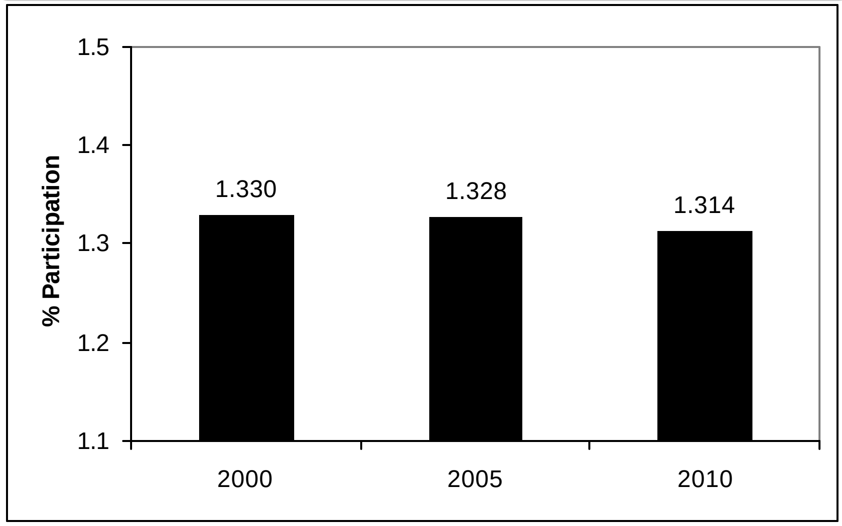
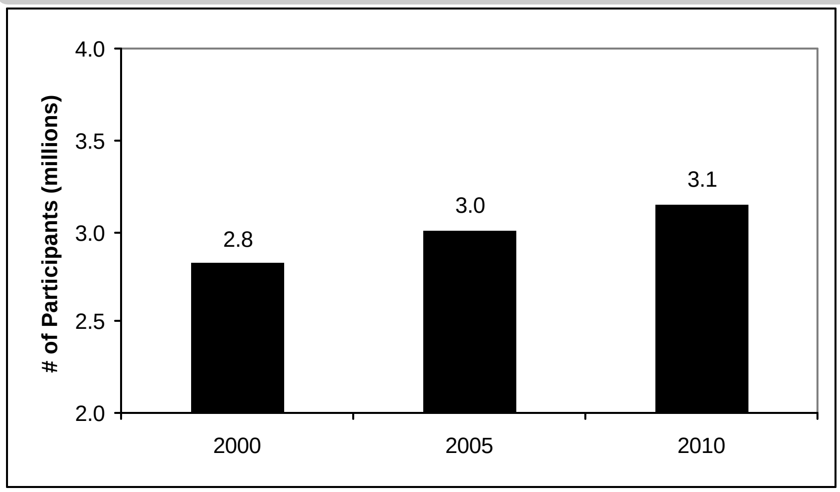


Figure K2: Kayaking Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and race/ethnicity were all statistically significant factors in explaining participation in kayaking (see Appendix A, Table A.13 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 98.3% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in kayaking declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in kayaking. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. The coefficients on Census Divisions 4 (East South Central) and 5 (West South

Central) were also found to be statistically insignificant, and these Divisions were included in the base. All the coefficients on the other Census Divisions had positive signs meaning that residents from those regions had higher participation rates. Residents of Census Division 1 (New England) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

A third place of residence variable *Urban* was included in the estimation for most of the other activity/settings but proved statistically insignificant in the initial estimation of the logit equation for kayaking and was therefore dropped.

Education: As the level of educational attainment increases, participation rates for kayaking increase. People with a less than a high school education, people with a high school education, and people in the "other" category are in the base and have the lowest participation rates. Those with college educations and educations beyond a college degree have higher participation rates, and as the level of educational attainment increases the coefficients get larger.

Household Income: As the level of annual household income increases participation rates for kayaking increase; however, only the two highest income levels were statistically significant. Households with income greater than $100,000 have higher participation rates than those with incomes between $50,000 and $100,000. Both of these groups have higher participation rates than all other groups, which are included in the base.

Table K1: Marginal Effects of Driving Factors

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.02	-3.38	0.04
45-54 years old	0.87	-0.01	0.94	-0.01
55-64 years old	1.88	-0.03	3.52	-0.05
65+ years old	-0.33	0.01	0.08	< 0.01
Net Effects Age		-0.01		-0.03
Census Division				
New England	-0.17	< -0.01	-0.32	-0.01
Middle Atlantic	-0.37	< -0.01	-0.69	-0.01
South Atlantic	0.29	< 0.01	0.53	0.01
Mountain	0.43	< 0.01	0.82	0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		< 0.01		< 0.01
Coastal County Resident	-0.33	< -0.01	-0.61	-0.01
Household Income				
$50,000-$100,000	0.99	< 0.01	2.15	0.01
$100,000+	0.38	< 0.01	0.85	0.01
Net Effects Income		0.01		0.02
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	< -0.01
Total Net Effects		< -0.01		-0.02

Race/Ethnicity: For race, only those classified as *Black, Not Hispanic* had a statistically significant coefficient in the estimated logit model. All other categories are included in the base. Those classified as *Black, Not Hispanic* have the lowest participation rates in kayaking. The estimated coefficient on this classification was negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic* decrease participation rates.

Sex. Sex was not a statistically significant factor in explaining participation in kayaking.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future kayaking participation rates for years 2005 and 2010. Overall, kayaking participation rates are estimated to decline from the year 2000 rate of 1.330% to 1.328% in 2005 and to 1.314% in 2010 (See Fig. K1). The predominant factor driving the negative changes in the forecasted participation rates is the aging of the population. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases less than 0.01 percentage points for the time period 2000 – 2005 and decreases 0.02 percentage points for the period 2000 – 2010 (See Table K1). On net, three factors had negative marginal effects (age, coastal county resident, and race/ethnicity), while two factors had positive marginal effects (Census Division and household income). Age had the largest negative marginal effect and was therefore the main driver of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a decrease in participation rates of 0.01 percentage points for the 2000 – 2005 period and a decrease of 0.03 percentage points for the 2000 – 2010 period.

Days of Kayaking

There was no estimation of days of participation for kayaking.

Rowing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to increase (See Fig. R1), as is population. The net effect is an estimated increase in participants from 1.12 million in 2000 to 1.21 million in 2005 and 1.28 million in 2010 (See Fig. R2). The 85.5 thousand increase in participants from 2000 to 2005 represents a 7.6% increase, while the 158.8 thousand increase in participants from 2000 to 2010 represents a 14.1% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure R1: Rowing Participation Rates by Year

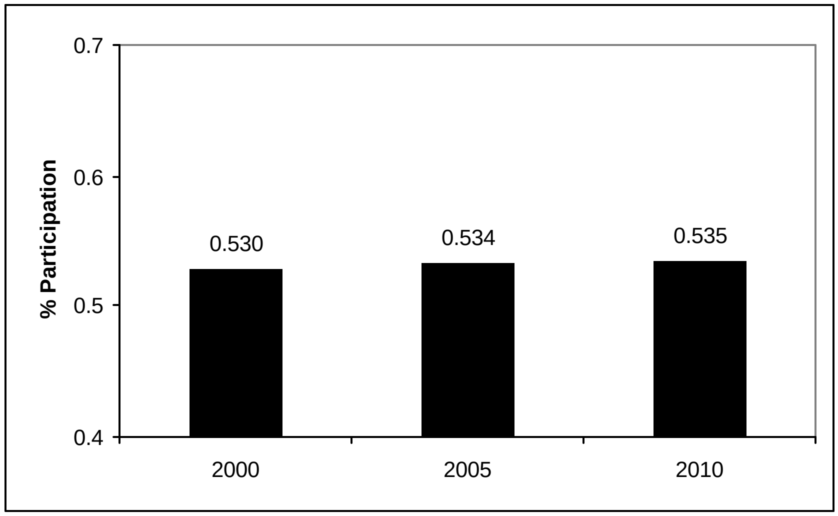
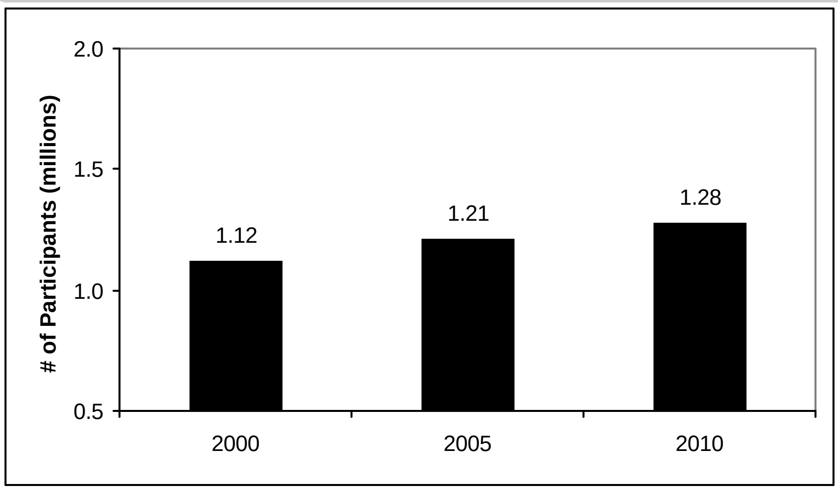


Figure R2: Rowing Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and sex were all statistically significant factors in explaining participation in rowing (see Appendix A, Table A.14 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 99.4% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: In general, as age increases participation in rowing declines; however, there are several exceptions to this trend. The age category 16-24 was initially included in the base (excluded from equation and therefore in the constant of the estimated equation). Subsequently the age category 55-64 was added to the base, as it proved statistically insignificant. All remaining age category coefficients are negative, and all coefficients increase in absolute value (i.e., have a larger impact on participation) as age increases, with one exception. The coefficient on the category 35-44 is slightly smaller in absolute value than that of the preceding category 25-34. Still, as a general trend, participation rates decline as age increases.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in rowing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. The coefficients on Census Divisions 4 (East South Central) and 5 (West South Central) were also found to be statistically insignificant, and these divisions were included in the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 1 (New England) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

A third place of residence variable *Urban* was included in the estimation for most of the other activity/settings but proved statistically insignificant in the initial estimation of the logit equation for rowing and was therefore dropped.

Education: The only level of educational attainment that proved statistically significant was a high school education. All other levels of educational attainment are included in the base. Respondents with a high school education had significantly lower participation rates for rowing.

Household Income: Only households with income greater than $100,000 were statistically significant in explaining participation rates for rowing. The coefficient for this income group was positive indicating that an increase in the proportion of the population classified in this group increases participation rates. All other household income groups were added to the base.

Race/Ethnicity: Race/Ethnicity was not a statistically significant factor in explaining participation in rowing.

Table R1: Marginal Effects of Driving Factors

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	< 0.01	-0.85	< 0.01
35-44 years old	-1.61	< 0.01	-3.38	< 0.01
45-54 years old	0.87	< -0.01	0.94	< -0.01
65+ years old	-0.33	< 0.01	0.08	< -0.01
Net Effects Age		< 0.01		< 0.01
Census Division				
New England	-0.17	< -0.01	-0.32	< -0.01
Middle Atlantic	-0.37	< -0.01	-0.69	< -0.01
South Atlantic	0.29	< 0.01	0.53	< 0.01
Mountain	0.43	< 0.01	0.82	< 0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		< 0.01		< 0.01
Coastal County Resident	-0.33	< -0.01	-0.61	< -0.01
Household Income				
$100,000+	0.38	< 0.01	0.85	< 0.01
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		< 0.01		0.01

Sex. Males have higher participation rates in rowing than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future rowing participation rates for years 2005 and 2010. Overall, rowing participation rates are estimated to increase from the year 2000 rate of 0.530% to 0.534% in 2005 and to 0.535% in 2010 (See Fig. R1). There are no readily identifiable factors driving the positive changes in the forecasted participation rates. Examining the marginal effects of each of the explanatory variables can offer limited insight into the details of these changes.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be less than +0.01% or an increase of less than 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 –34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases less than 0.01 percentage points for the time period 2000 – 2005 and increases 0.01 percentage points for the period 2000 – 2010 (See Table R1). All marginal effects of each of the explanatory variables are less than 0.01 percentage points in absolute value, which limits the information they offer. However, we can examine their signs to get an idea of their effects. On net, one factor had negative marginal effects (coastal county resident), while four factors had positive marginal effects (age, Census Division, household income, and sex).

Days of Rowing

There was no estimation of days of participation for rowing.

Water Skiing

Participation in Water Skiing

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decrease (See Fig. WS1), while population is projected to increase. The net effect is an estimated increase in participants from 2.44 million in 2000 to 2.57 million in 2005 and 2.69 million in 2010 (See Fig. WS2). The 135.6 thousand increase in participants from 2000 to 2005 represents a 5.6% increase, while the 250.6 thousand increase in participants from 2000 to 2010 represents a 10.3% increase.

Figure WS1: Water Skiing Participation Rates by Year

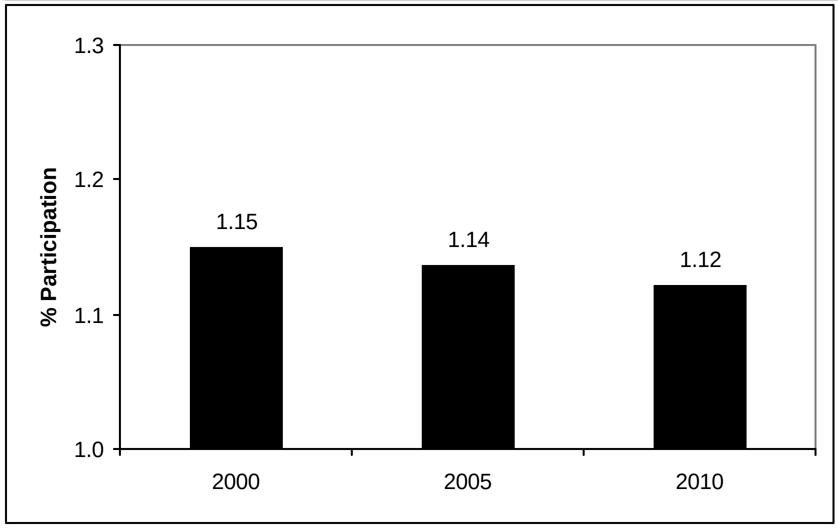
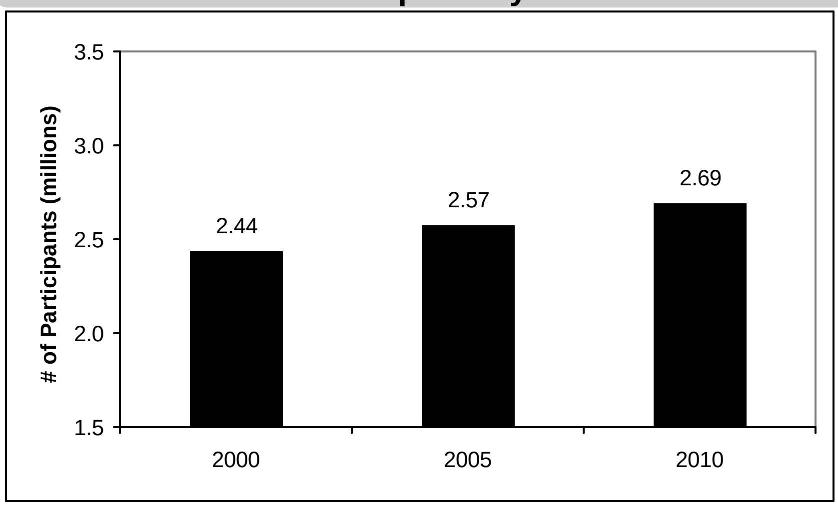


Figure WS2: Water Skiing Number of Participants by Year



Forecast Equation. Age, place of residence, household income, and sex were all statistically significant factors in explaining participation in water skiing (see Appendix A, Table A.15 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 99.0% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: As age increases participation in water skiing declines. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of the estimated equation). The coefficient on each age category is interpreted relative to the base. All age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases. Thus, as age increases participation rates decline.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in water skiing. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate for most activities/settings. In initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), Census Division 4 (East South Central), Census Division 8 (Mountain), and Census Division 9 (Pacific) did not have statistically different participation rates than residents from Census Division 7, so we added them to the base. The coefficients on Census Division 3 (South Atlantic) and Census Division 5 (West South Central) had positive signs meaning the residents from those regions had higher participation rates. The coefficient on Census Division 6 (East North Central) had a negative sign, meaning that residents from that region had lower participation rates. Residents of Census Division 3 (South Atlantic) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on water skiing. The logit equation estimation found that residents of urban areas had higher participation rates for water skiing than residents of rural areas, holding other factors constant.

Education: Education was not a statistically significant factor in explaining participation in water skiing.

Household Income: As the level of annual household income increases participation rates for water skiing increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000, but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining participation in water skiing.

Sex. Males have higher participation rates in water skiing than females. In the logit equation, a dummy variable was included for sex (*Male* with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future water skiing participation rates for years 2005 and 2010. Overall, water skiing participation rates are estimated to decline from the year 2000 rate of 1.15% to 1.14% in 2005 and to 1.12% in 2010 (See Fig. WS1). The predominant factor driving the negative changes in the forecasted participation rates is the aging of the population. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and

Table WS1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.02	-3.38	0.05
45-54 years old	0.87	-0.02	0.94	-0.02
55-64 years old	1.88	-0.05	3.52	-0.10
65+ years old	-0.33	0.01	0.08	< -0.01
Net Effects Age		-0.03		-0.06
Census Division				
South Atlantic	0.29	< 0.01	0.53	< 0.01
West South Central	0.16	< 0.01	0.29	< 0.01
East North Central	-0.32	< 0.01	-0.59	< 0.01
Net Effects Census Division		0.01		0.01
Coastal County Resident	-0.33	< -0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	< -0.01	-0.90	-0.01
$50,000-$100,000	0.99	0.01	2.15	0.02
$100,000+	0.38	0.01	0.85	0.02
Net Effects Income		0.01		0.03
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		-0.01		-0.03

forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.01 percentage points for the time period 2000 – 2005 and decreases 0.03 percentage points for the period 2000 – 2010 (See Table WS1). On net, two factors had negative marginal effects (age and coastal county resident), while four factors had positive marginal effects (Census Division, urban resident, household income, and sex). Age had the largest negative marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all Age categories), the marginal effect of age is a decrease in participation rates of 0.03 percentage points for the 2000 – 2005 period and a decrease of 0.06 percentage points for the 2000 – 2010 period.

Figure WS3: Mean Days of Water Skiing per Person by Year

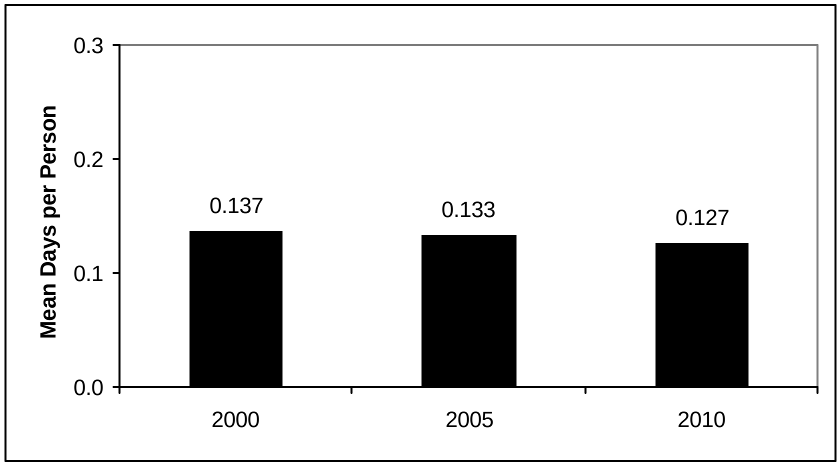
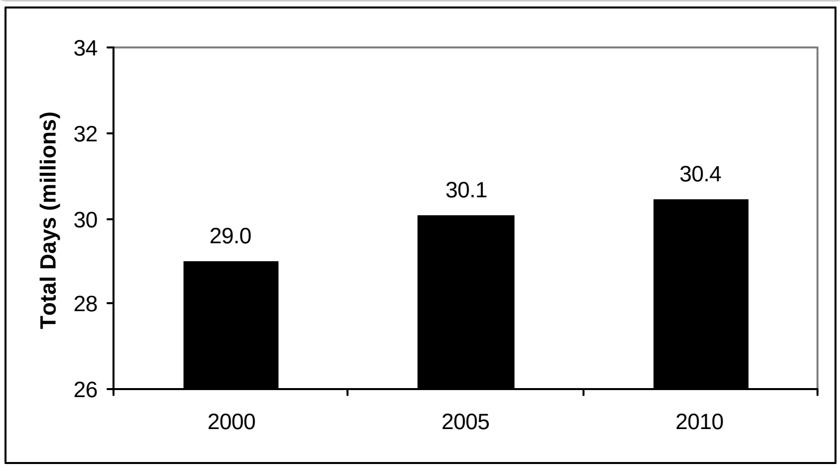


Figure WS4:Total Days of Water Skiing by Year



Days of Water Skiing
The total number of days of water skiing is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. WS3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 29.0 million in 2000 to 30.1 million in 2005 and to 30.4 million in 2010 (See Fig. WS4). The 1.0 million increase in total days from 2000 to 2005 represents a 3.6% increase, while the 1.4 million increase from 2000 to 2010 represents a 4.9% increase.

Forecast Equation. Age, place of residence, household income, and sex were all statistically significant factors in explaining mean days of participation in water skiing (see Appendix A, Table A.31 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in water skiing declines. Age category 16-24 was included in the base (excluded from the equation and therefore included in the constant) in the initial estimation. All other age category coefficients are negative and increase in absolute value (i.e., have a larger impact on mean days of participation) as age

Table WS2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.001	-0.85	0.001
35-44 years old	-1.61	0.003	-3.38	0.006
45-54 years old	0.87	-0.002	0.94	-0.002
55-64 years old	1.88	-0.010	3.52	-0.017
65+ years old	-0.33	0.002	0.08	<-0.001
Net Effects Age		-0.006		-0.013
Census Division				
East North Central	-0.32	0.001	-0.59	0.002
Coastal County Resident	-0.33	-0.001	-0.61	-0.001
Household Income				
$25,000-$50,000	-0.34	<-0.001	-0.90	-0.001
$100,000+	0.38	0.002	0.85	0.005
Net Effects Income		0.001		0.004
Sex				
Male	0.12	<0.001	0.20	<0.001
Total Net Effects		-0.004		-0.010

increases. Thus, as age increases mean days of participation decreases.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in water skiing. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In subsequent estimations all Census Divisions other than Census Division 6 (East North Central) were found to be statistically insignificant and were added to the base. The coefficient on Census Division 6 was negative, meaning that residents of this Census Division had the lowest mean days of participation.

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in water skiing and was therefore dropped.

Education: Education was not a statistically significant factor in explaining mean days of participation in water skiing.

Household Income: In the initial estimation, people with the lowest level of annual household income (less than $25,000) were included in the base. Those with incomes between $50,000 and $100,000 were found to be statistically insignificant and were added to the base, as were those who chose not to provide an income response, leaving only those with annual household incomes between $25,000 and $50,000 and those with annual household incomes greater than $100,000. The coefficients on both of these groups were positive, indicating higher mean days of participation. The coefficient for those with incomes greater than $100,000 was much larger in absolute value, meaning that those in this income group had the highest mean days of participation.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining mean days of participation in water skiing.

Sex: Males have higher mean days of participation in water skiing than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variableswas used to estimate future mean days per person (as opposed to per participant) for water skiing for years 2005 and 2010. Overall, mean days of water skiing is estimated to decrease slightly from 0.137 days per person (11.9 days per participant) in 2000 to 0.133 days per person (11.7 days per participant) in 2005 and to 0.127 days per person (11.3 days per participant) in 2010 (See Fig. WS3). The predominant factor driving the negative changes in mean days of participation per person in water skiing is the aging of the population. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.001 or an increase in the mean number of days per person of 0.001. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person in water skiing declines by 0.004 for the time period 2000-2005 and declines by 0.010 for the period 2000-2010 (See Table WS2). On net, three factors had positive marginal effects (Census Division, household income, and sex), while two factors had negative marginal effects (age and coastal county resident). Age was the factor with the largest net marginal effect and is therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of age is a decrease in mean days of participation of 0.006 days for the 2000-2005 period and a decrease of 0.013 days for the 2000-2010 period.

Viewing or Photographing Scenery

Participation in Viewing or Photographing Scenery
Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. VP1), while population is projected to increase. The net effect is an estimated increase in participants from 19.5 million in 2000 to 20.6 million in 2005 and 21.6 million in 2010 (See Fig. VP2). The 1.1 million increase in participants from 2000 to 2005 represents a 5.8% increase, while the 2.1 million increase in participants from 2000 to 2010 represents an 11.0% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure VP1: Viewing or Photographing Scenery Participation Rates by Year

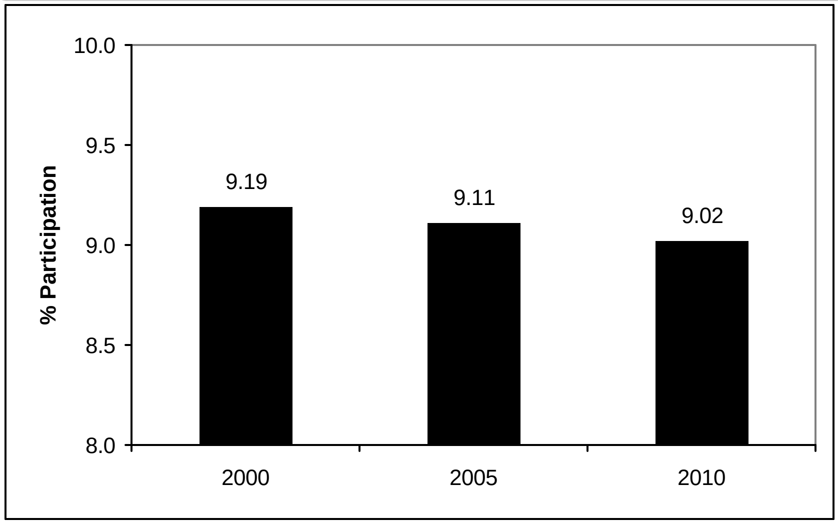
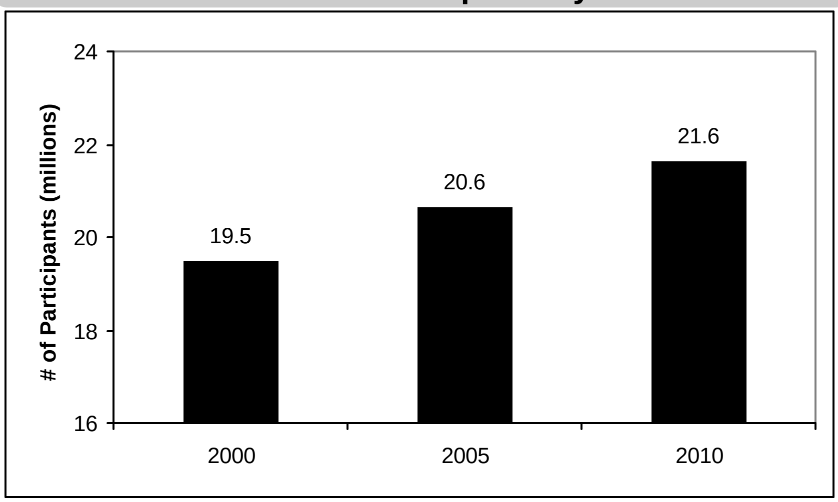


Figure VP2: Viewing or Photographing Scenery Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ethnicity and sex were all statistically significant factors in explaining participation in viewing or photographing scenery (see Appendix A, Table A.16 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 89.0 % of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: The only age group that proved statistically significant was age 65 or greater. The coefficient for this age group was negative, indicating that an increase in the proportion of the population aged 65 or greater decreases participation rates. All other age groups were included in the base.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in viewing or photographing scenery. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for viewing or photographing scenery (Great

Lakes activity not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 9 (Pacific) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine beaches than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on viewing or photographing scenery. The logit equation estimation found that residents of urban areas had higher participation rates for viewing or photographing scenery than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases, participation rates for viewing or photographing scenery increase. People with less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have participation rates somewhere between those with high school degrees and those with college degrees.

Table VP1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
65+ years old	-0.33	0.01	0.08	< -0.01
Census Division				
New England	-0.17	-0.01	-0.32	-0.02
Middle Atlantic	-0.37	-0.01	-0.69	-0.03
South Atlantic	0.29	0.02	0.53	0.04
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	0.01	0.29	0.01
Mountain	0.43	0.01	0.82	0.03
Pacific	0.17	0.02	0.28	0.03
Net Effects Census Division		0.03		0.06
Coastal County Resident	-0.33	-0.02	-0.61	-0.03
Urban Resident	0.30	< 0.01	0.51	0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.04	2.15	0.08
$100,000+	0.38	0.02	0.85	0.04
Net Effects Income		0.05		0.10
Race/Ethnicity				
Black, not Hispanic	0.08	-0.01	0.21	-0.01
Asian, not Hispanic	0.41	-0.03	0.84	-0.05
Hispanic	2.06	-0.13	3.74	-0.23
Net Effects Race		-0.16		-0.30
Sex				
Male	0.12	< -0.01	0.20	< -0.01
Total Net Effects		-0.08		-0.17

Household Income: As the level of annual household income increases participation rates for viewing or photographing scenery increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000, but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: For race, those classified as *Black, Not Hispanic*, *Asian, Not Hispanic,* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Estimated coefficients on these three classifications were similar in magnitude and were all negative, meaning that increases in the proportion of the population classified as *Black, Not Hispanic*, *Asian, Not Hispanic,* or *Hispanic* decrease participation rates.

Sex. Males have lower participation rates in viewing or photographing scenery than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was negative meaning males have lower participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future viewing or photographing scenery participation rates for years 2005 and 2010. Overall, viewing or photographing scenery participation rates are estimated to decline from the year 2000 rate of 9.19% to 9.11% in 2005 and to 9.02% in 2010 (See Fig. VP1). The predominant factor driving the negative changes in the forecasted participation rates is the changing distribution of population by racial/ethnic classifications. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 65 years old or greater over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 65 years old or greater is negative, the proportion of the population 65 years old or greater is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate declines 0.08 percentage points for the time period 2000 – 2005 and declines 0.17 percentage points for the period 2000 – 2010 (See Table VP1). On net, three factors had positive marginal effects (Census Division, urban resident, and household income), while three factors had negative marginal effects (coastal county resident, race/ethnicity, and sex). Age had a positive marginal effect for the period 2000-2005 and a slightly negative marginal effect for the period 2000-2010. Race/ethnicity was the factor with the largest net marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all categories), the marginal effect of race/ ethnicity was a reduction in participation rates of 0.16 percentage points for the 2000 – 2005 period and a reduction of 0.30 percentage points for the 2000 – 2010 period.

Days of Viewing or Photographing Scenery

The total number of days of viewing or photographing scenery is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated first to increase slightly then to decrease (See Fig. VP3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 849.6 million in 2000 to 909.9 million in 2005 and to 956.5 million in 2010 (See Fig. VP4). The 60.4 million increase in total days from 2000 to 2005 represents a 7.1% increase, while the 106.7 million increase from 2000 to 2010 represents a 12.6% increase.

Forecast Equation. Age, place of residence, level of educational attainment, household income, and race/ethnicity were all statistically significant factors in explaining mean days of participation in viewing or photographing scenery (see Appendix A, Table A.32 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: Mean days of participation in viewing or photographing scenery has an unusual relationship with age. Only age categories 25-34, 45-54, and 65 and older proved statistically significant. All other age categories were included in the base. The coefficients on age categories 25-34 and 65 and older were negative. The coefficient on age category 25-34 was larger in absolute value, meaning that those classified in this age category have the lowest mean days of participation. The coefficient on age category 45-54 was positive, meaning that those classified in this age category have the highest mean days of participation.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in viewing or photographing scenery. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. All other Census Divisions proved statistically significant with positive coefficients, indicating higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 3 (South Atlantic) and Census Division 1 (New England).

Figure VP3: Mean Days of Viewing or Photographing Scenery per Person by Year

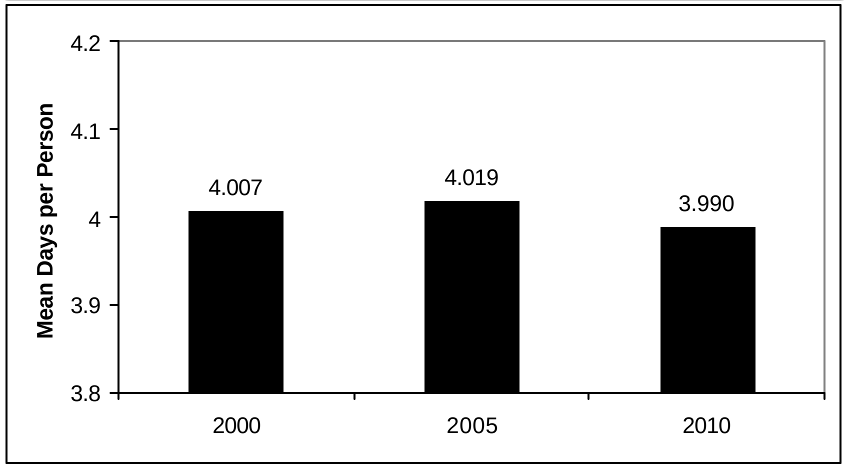
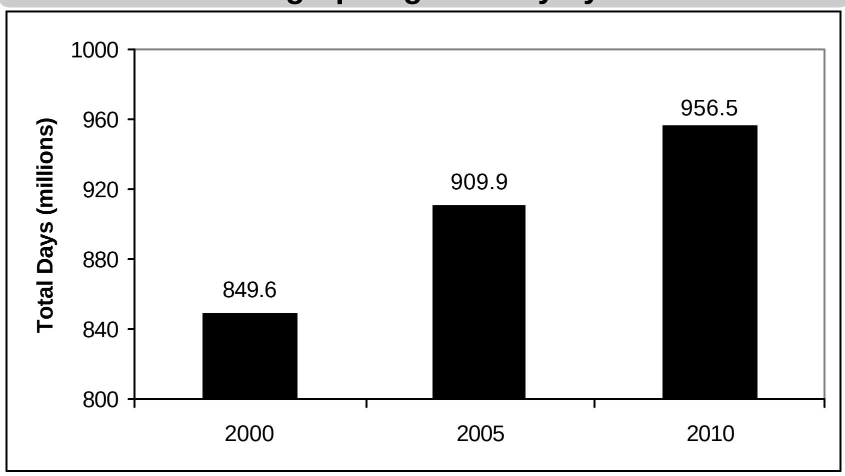


Figure VP4: Total Days of Viewing or Photographing Scenery by Year



For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in viewing or photographing scenery and was therefore dropped.

Education: As the level of educational attainment increases, mean days of participation in viewing or photographing scenery increases. People with less than a high school education are in the base and have the lowest mean days of participation. People in the "other" category are also included in the base. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger.

Household Income: In general, household income was not a significant factor in explaining the mean days of participation in viewing or photographing scenery. Only, those who chose not to provide an income response were found to be statistically different from those in all other income groups. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the negative binomial equations, we created a variable for those that didn't provide an income response. The coefficient on this income group is positive, indicating that those who chose not to provide an income response have the highest mean days of participation in viewing or photographing scenery.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. All other racial/ethnic categories were found to be statistically significant with negative signs on the coefficients, indicating that those classified as *Native American/Pacific Islander, Not Hispanic* have the highest mean days of participation. The coefficient on the racial/ethnic category *Asian, Not Hispanic* was the largest in absolute value, followed closely by that on the category *Black, Not Hispanic*. Those classified in these two racial/ethnic categories have the lowest mean days of participation in viewing or photographing scenery.

Sex: Sex was not a statistically significant factor in explaining mean days of participation in viewing or photographing scenery.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for viewing or photographing scenery for years 2005 and 2010. Overall, mean days of viewing or photographing scenery is estimated to increase slightly from 4.01 days per person (43.6 days per participant) in 2000 to 4.02 days per person (44.1 days per participant) in 2005 and then to decrease to 3.99 days per person (44.2 days per participant) in 2010 (See Fig. VP3). The predominant factors driving the changes in mean days of participation per person in viewing or photographing scenery are the aging of the population and the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.018 or an increase in the mean number of days per person of 0.018. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person in viewing or photographing scenery increases by 0.012 for the time period 2000-2005 and declines by 0.017 for the period 2000-2010 (See Table VP2). On net, two factors had positive marginal effects (age and Census Division), while two factors had negative marginal effects (coastal county resident and race/ethnicity). Age and race/ethnicity were the factors with the largest net marginal effects and are therefore the main drivers of the forecasts of mean days of participation per person. On net, the marginal effect of age is an increase in mean days of participation of 0.034 days for the 2000-2005 period and an increase of 0.030 days for the 2000-2010 period. The net effect of race/ethnicity is a decrease in mean days of participation of 0.023 days for the period 2000-2005 and a decrease of 0.042 days for the period 2000-2010.

Table VP2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.018	-0.85	0.019
45-54 years old	0.87	0.011	0.94	0.012
65+ years old	-0.33	0.004	0.08	-0.001
Net Effects Age		0.034		0.030
Census Division				
New England	-0.17	-0.015	-0.32	-0.029
Middle Atlantic	-0.37	-0.024	-0.69	-0.045
South Atlantic	0.29	0.027	0.53	0.049
East South Central	-0.06	-0.004	-0.09	-0.006
West South Central	0.16	0.013	0.29	0.024
East North Central	-0.32	-0.008	-0.59	-0.015
Mountain	0.43	0.010	0.82	0.019
Pacific	0.17	0.018	0.28	0.030
Net Effects Census Division		0.016		0.025
Coastal County Resident	-0.33	-0.012	-0.61	-0.021
Race/Ethnicity				
White, not Hispanic	-2.56	0.094	-4.80	0.178
Black, not Hispanic	0.08	-0.004	0.21	-0.011
Asian, not Hispanic	0.41	-0.024	0.84	-0.050
Hispanic	2.06	-0.089	3.74	-0.160
Net Effects Race/Ethnicity		-0.023		-0.042
Total Net Effects		0.012		-0.017

Hunting Waterfowl

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to increase (See Fig. HW1), as is population. The net effect is an estimated increase in participants from 699.7 thousand in 2000 to 768.0 thousand in 2005 and 834.9 thousand in 2010 (See Fig. HW2). The 68.3 thousand increase in participants from 2000 to 2005 represents a 9.8% increase, while the 135.2 thousand increase in participants from 2000 to 2010 represents a 19.3% increase.

Figure HW1: Hunting Waterfowl Participation Rates by Year

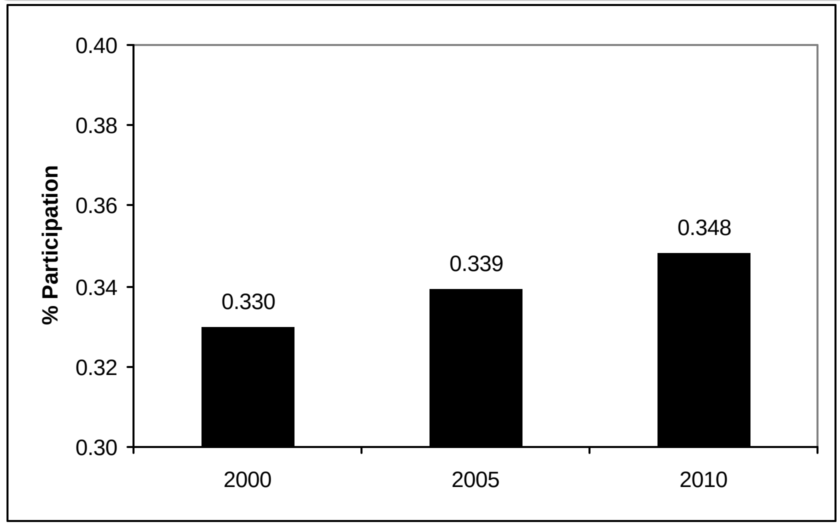
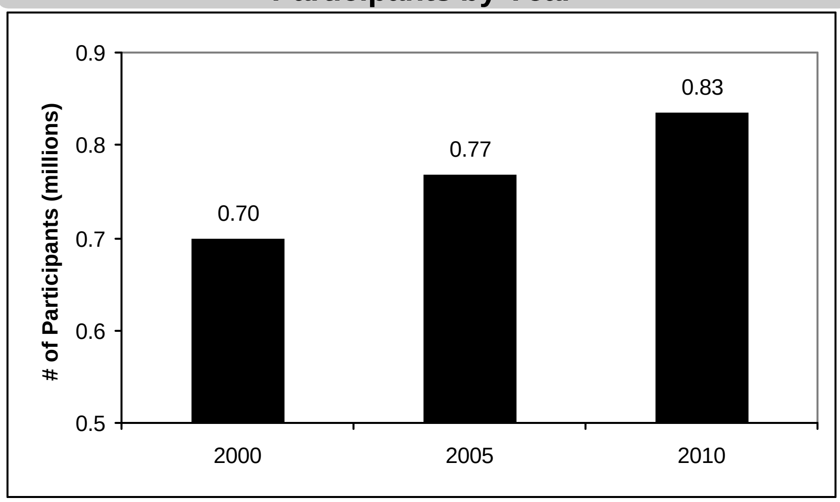


Figure HW2: Hunting Waterfowl Number of Participants by Year



Forecast Equation. Age, place of residence, household income, and sex were all statistically significant factors in explaining participation in hunting waterfowl (see Appendix A, Table A.17 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 99.6% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: In general, as age increases participation in hunting waterfowl declines. However, not all categories of age were statistically significant in the estimated logit equation. Age category 16-24 was included in the base (excluded from equation and therefore in the constant of the estimated equation) in the initial estimation. Subsequently, age categories 25-34 and 55-64 were added to the base, as they were found to be statistically insignificant. The remaining age category coefficients are negative and increase in absolute value (i.e., have a larger impact on participation) as age increases.

Place of Residence: Census Division was included in the estimated equation to capture different aspects of the relationship between place of residence and participation in hunting waterfowl. There are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 1 (New England), Census Division 2 (Middle Atlantic), and Census Division 6 (East North Central) did not have statistically different participation rates than residents of Census Division 7, so we added these Census Divisions to the base. All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions have higher participation rates. Residents of Census Division 5 (West South Central) have the highest participation rates.

Two additional place of residence variables, *Coastal County* and *Urban*, were included in the estimation for most of the other activities/

settings but proved statistically insignificant in the initial estimation of the logit equation for hunting waterfowl and were therefore dropped.

Education: Education was not a statistically significant factor in explaining participation in hunting waterfowl.

Household Income: As the level of annual household income increases participation rates for hunting waterfowl increase; however, only the two highest income levels were statistically significant. Households with income greater than $100,000 have higher participation rates than those with incomes between $50,000 and $100,000. Both of these groups have higher participation rates than all other groups, which are included in the base.

Race/Ethnicity: Race was not a statistically significant factor in explaining participation in hunting waterfowl.

Sex. Males have higher participation rates in hunting waterfowl than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was positive meaning males have higher participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future hunting waterfowl participation rates for years 2005 and 2010. Overall, hunting waterfowl participation rates are estimated to increase from the year 2000 rate of 0.33% to 0.34% in 2005 and to 0.35% in 2010 (See Fig. HW1). There are no readily identifiable factors driving the positive changes in the forecasted participation rates. Examining the marginal effects of each of the explanatory variables offers limited insight into the details of these changes.

Table HW1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
35-44 years old	-1.61	< 0.01	-3.38	< 0.01
45-54 years old	0.87	< -0.01	0.94	< -0.01
65+ years old	-0.33	< 0.01	0.08	< -0.01
Net Effects Age		< 0.01		< 0.01
Census Division				
South Atlantic	0.29	< 0.01	0.53	< 0.01
East South Central	-0.06	< -0.01	-0.09	<- 0.01
West South Central	0.16	< 0.01	0.29	< 0.01
Mountain	0.43	< 0.01	0.82	< 0.01
Pacific	0.17	< 0.01	0.28	< 0.01
Net Effects Census Division		< 0.01		0.01
Household Income				
$50,000-$100,000	0.99	< 0.01	2.15	< 0.01
$100,000+	0.38	< 0.01	0.85	< 0.01
Net Effects Income		< 0.01		0.01
Sex				
Male	0.12	< 0.01	0.20	< 0.01
Total Net Effects		0.01		0.02

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 35 – 44 years old over the 2000 – 2005 period is estimated to be less than + 0.01% or an increase of less than 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 35 – 44 years old is negative, the proportion of the population 35 –44 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate increases 0.01 percentage points for the time period 2000 – 2005 and increases 0.02 percentage points for the period 2000 – 2010 (See Table HW1). All marginal effects were very small, with the largest effect being 0.01 percentage points. On net, four factors had positive marginal effects (age, Census Division, household income, and sex). There we no factors with negative marginal effects.

Days of Hunting Waterfowl

The total number of days of hunting waterfowl is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to increase slightly (See Fig. HW3), and population is projected to increase. The net effect is an estimated increase in total days of participation from 6.5 million in 2000 to 7.0 million in 2005 and to 7.4 million in 2010 (See Fig. HW4). The 461.3 thousand increase in total days from 2000 to 2005 represents a 7.1% increase, while the 882.7 thousand increase from 2000 to 2010 represents a 13.6% increase.

Figure HW3: Mean Days of Hunting Waterfowl per Person by Year

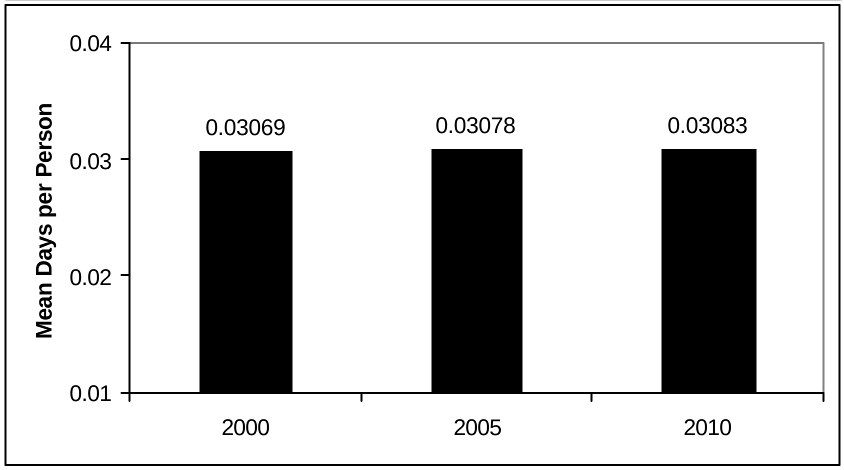
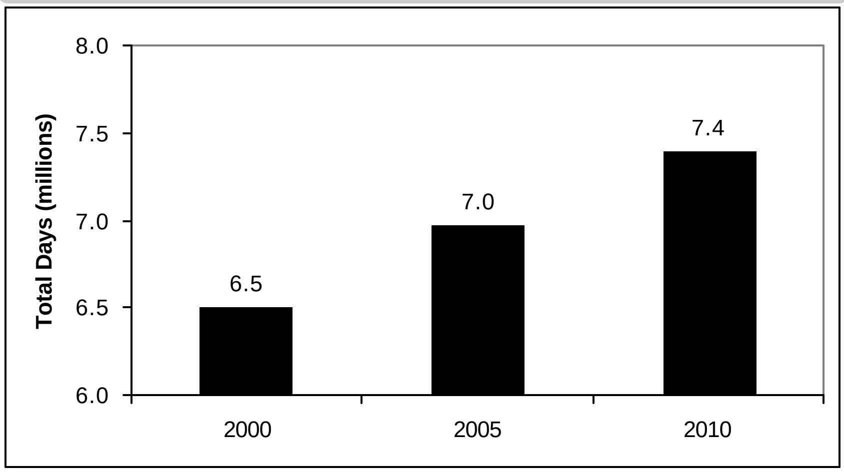


Figure HW4: Total Days of Hunting Waterfowl by Year



Forecast Equation. Sex was the only statistically significant factor in explaining mean days of participation in hunting waterfowl (see Appendix A, Table A.33 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: Age was not a statistically significant factor in explaining mean days of participation in hunting waterfowl.

Place of Residence: Place of residence was not a statistically significant factor in explaining mean days of participation in hunting waterfowl.

Education: Education was not a statistically significant factor in explaining mean days of participation in hunting waterfowl.

Household Income: Household income was not a statistically significant factor in explaining mean days of participation in hunting waterfowl.

Race/Ethnicity: Race/ethnicity was not a statistically significant factor in explaining mean days of participation in hunting waterfowl.

Sex: Males have higher mean days of participation in hunting waterfowl than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for hunting waterfowl for years 2005 and 2010. Overall, mean days of hunting waterfowl is estimated to increase slightly from 0.03069 days per person (9.3 days per partici pant) in 2000 to 0.03078 days per person (9.1 days per participant) in 2005 and to 0.03083 days per person (8.9 days per participant) in 2010 (See Fig. HW3). This is an unusual result, as we have days per person increaseing but days per person declining. These small changes are driven entirely by the changing proportion of males to females in the population.

Bird Watching

Participation in Bird Watching
Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. BW1), while population is projected to increase. The net effect is an estimated increase in participants from 15.2 million in 2000 to 16.1 million in 2005 and 16.9 million in 2010 (See Fig. BW2). The 893.6 thousand increase in participants from 2000 to 2005 represents a 5.9% increase, while the 1.7 million increase in participants from 2000 to 2010 represents a 10.9% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure BW1: Bird Watching Participation Rates by Year

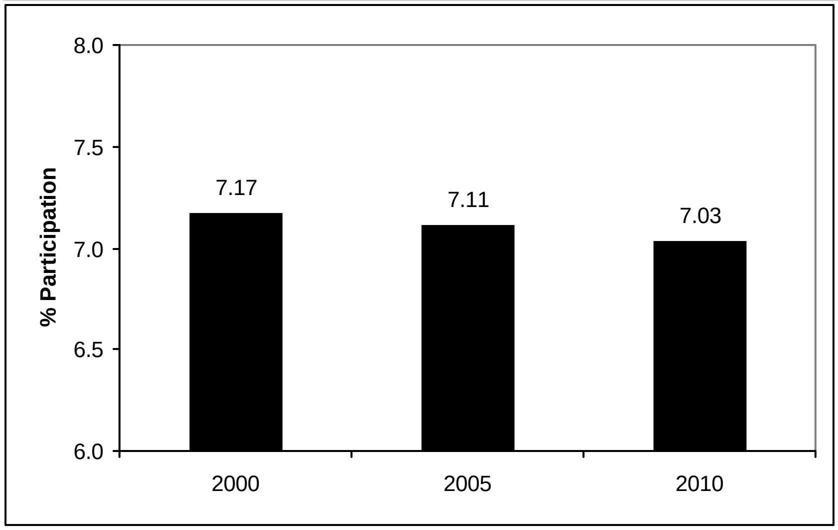
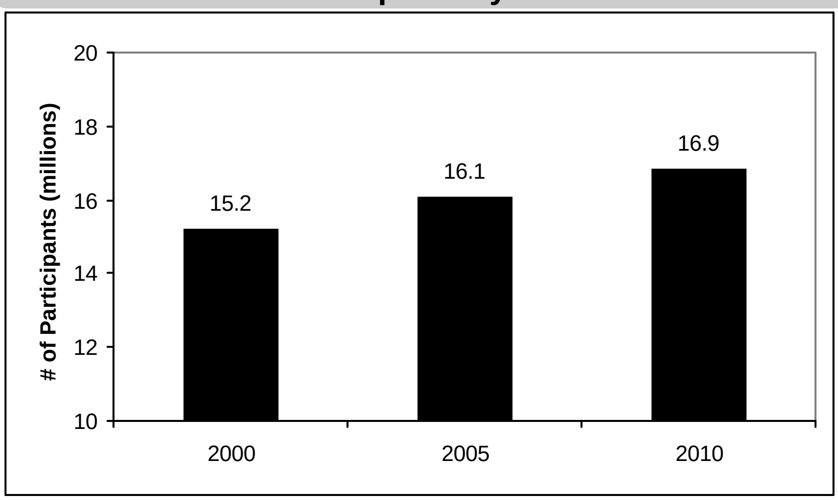


Figure BW2: Bird Watching Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, race/ ethnicity, and sex were all statistically significant factors in explaining participation in bird watching (see Appendix A, Table A.18 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 90.9% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: In general, as age increases participation in bird watching also increases. However, not all categories of age were statistically significant in the estimated logit equation. Age category 16-24 was included in the base (excluded from equation and therefore in the constant of the estimated equation) in the initial estimation. Subsequently, age categories 25-34 and 65 and greater were added to the base, as they were found to be statistically insignificant. The remaining age category coefficients are positive and increase in absolute value (i.e., have a larger impact on participation) as age increases.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in bird watching. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for bird watching in or around marine waters (Great Lakes bird watching not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 1 (New England) have the highest participation rates followed closely by residents of Census Division 9 (Pacific).

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine water than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

A third place of residence variable *Urban* was included in the estimation for most of the other activities/settings but proved statistically insignificant in the initial estimation of the logit equation for bird watching and was therefore dropped.

Education: As the level of educational attainment increases, participation rates for bird watching increase. People with less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that people in this category have higher participation rates than those with less than a high school education, but lower than those with a high school education.

Table BW1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participtation	Change in Factor	Change in Probability of Participation
Age				
35-44 years old	-1.61	-0.04	-3.38	-0.08
45-54 years old	0.87	0.02	0.94	0.03
55-64 years old	1.88	0.06	3.52	0.10
Net Effects Age		0.04		0.05
Census Division				
New England	-0.17	-0.01	-0.32	-0.03
Middle Atlantic	-0.37	-0.02	-0.69	-0.04
South Atlantic	0.29	0.02	0.53	0.04
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	0.01	0.29	0.01
Mountain	0.43	0.01	0.82	0.02
Pacific	0.17	0.01	0.28	0.02
Net Effects Census Division		0.02		0.03
Coastal County Resident	-0.33	-0.01	-0.61	-0.02
Household Income				
$25,000-$50,000	-0.34	< -0.01	-0.90	-0.01
$50,000-$100,000	0.99	0.02	2.15	0.05
$100,000+	0.38	0.01	0.85	0.03
Net Effects Income		0.03		0.07
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	-0.01
Asian, not Hispanic	0.41	< -0.01	0.84	-0.05
Hispanic	2.06	-0.10	3.74	-0.19
Net Effects Race		-0.13		-0.25
Sex				
Male	0.12	< -0.01	0.20	< -0.01
Total Net Effects		-0.06		-0.14

Household Income: As the level of annual household income increases participation rates for bird watching increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. This group was found to be statistically insignificant and was therefore included in the base.

Race/Ethnicity: For race, those classified as *Black, Not Hispanic, Asian, Not Hispanic,* and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Those classified as *Asian, Not Hispanic* have the lowest participation rates in bird watching, followed by those classified as *Black, Not Hispanic* and those classified as *Hispanic*. Estimated coefficients on these three classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic, Asian/Pacific Islander, Not Hispanic*, or *Hispanic* decrease participation rates.

Sex. Males have lower participation rates in bird watching than females. In the logit equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The logit model coefficient was negative meaning males have lower participation rates than females.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future bird watching participation rates for years 2005 and 2010. Overall, bird watching participation rates are estimated to decline from the year 2000 rate of 7.17% to 7.11% in 2005 and to 7.03% in 2010 (See Fig. BW1). The predominant factor driving the negative changes in the forecasted participation rates is the changing distribution of population by racial/ethnic classifications. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/ setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are positive, the marginal effects of one category are negative i.e., decrease the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 35 – 44 years old over the 2000 – 2005 period is estimated to be - 0.04% or a decrease of 0.04 percentage points in the participation rate. Even though the logit model coefficient on age category 35 – 44 years old is positive, the proportion of the population 35 – 44 years old is forecasted to decline resulting in a decrease in the participation rate, holding other factors constant.

Across all factors, the participation rate decreases 0.06 percentage points for the time period 2000 – 2005 and decreases 0.14 percentage points for the period 2000 – 2010 (See Table BW1). On net, three factors had negative marginal effects (coastal county resident, race/ethnicity, and sex), while three factors had positive marginal effects (age, Census Division, and household income). Race/ ethnicity had the largest negative marginal effect and is therefore the main driver of the participation rate forecasts. On net (across all race/ ethnicity categories), the marginal effect of race/ethnicity was a decrease in participation rates of 0.13 percentage points for the 2000 – 2005 period and a decrease of 0.25 percentage points for the 2000 – 2010 period.

Days of Bird Watching

The total number of days of bird watching is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. BW3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 647.6 million in 2000 to 678.1 million in 2005 and to 700.0 million in 2010 (See Fig. BW4). The 30.4 million increase in total days from 2000 to 2005 represents a 4.7% increase, while the 52.4 million increase from 2000 to 2010 represents an 8.1% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, race/ethnicity, and sex were all statistically significant factors in explaining mean days of participation in bird watching (see Appendix A, Table A.34 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in bird watching first decreases, then increases, and finally decreases again. Only age categories 25-34, 45-54, and 55-64 proved statistically significant. All other age categories were included in the base. The coefficient on age category 25-34 was negative, indicating that those classified in this category have the lowest mean days of participation. The coefficients on age categories 45-54 and 55-64 were positive. The coefficient on age category 45-54 was larger in absolute value, meaning that those classified in this age category have the highest mean days of participation.

Place of Residence: Two separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in bird watching. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North

Central) was included in the base, since its residents had the lowest mean days of participation. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different mean days of participation than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest mean days of participation for bird watching in or around marine waters (Great Lakes not included since the Great Lakes are freshwater). All other Census Divisions proved statistically significant, and all but Census Division 8 (Mountain) had positive coefficients, indicating higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation.

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

A third place of residence variable, *Urban*, was included in many of the other estimated equations but was found to be statistically insignificant in explaining mean days of participation in bird watching and was therefore dropped.

Education: As the level of educational attainment increases, mean days of participation in bird watching increases. People with less than a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an “other” category for educational attainment, which is not well defined. Results indicate that people in this category had the highest mean days of participation in bird watching.

Household Income: Household income was not a statistically significant factor in explaining mean days of participation in bird watching.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. In subsequent estimations, the racial/ethnic category *White, Not Hispanic* was found to be statistically insignificant and was added to the base. All other racial/ethnic categories were found to be statistically significant with negative signs on the coefficients, indicating lower mean days of participation. The coefficient on the racial/ethnic category *Asian, Not Hispanic* was the largest in absolute value, followed closely by that on the category *Hispanic*. Those classified in these two racial/ethnic categories have the lowest mean days of participation in bird watching.

Sex: Females have higher mean days of participation in bird watching than males. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was negative, meaning females have higher mean days of participation than males.

Figure BW3: Mean Days of Bird Watching per Person by Year

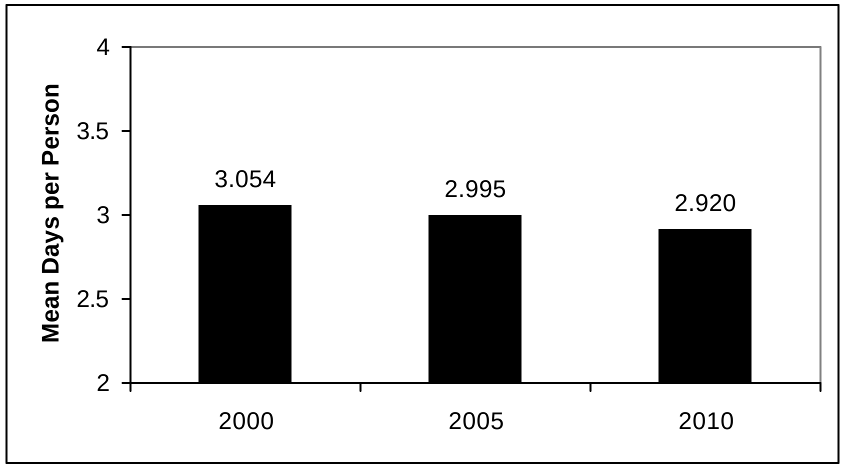
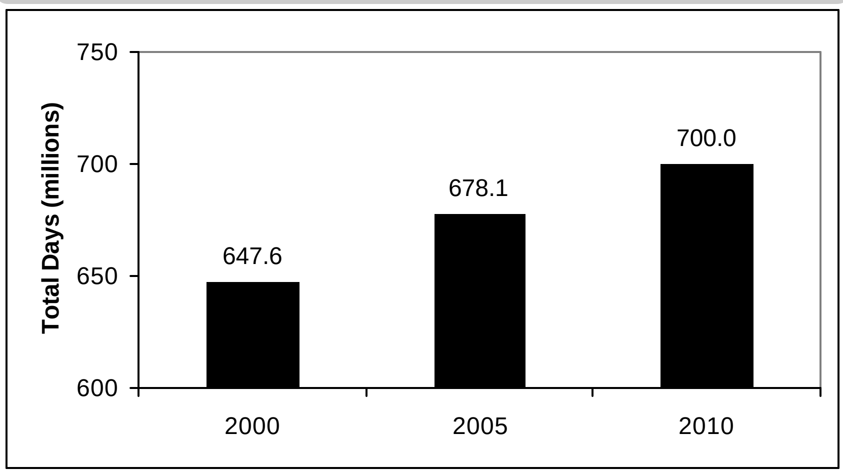


Figure BW4: Total Days of Bird Watching by Year



Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for bird watching for years 2005 and 2010. Overall, mean days of bird watching is estimated to decline from 3.05 days per person (42.6 days per participant) in 2000 to 2.99 days per person (42.1 days per participant) in 2005 and to 2.92 days per person (41.5 days per participant) in 2010 (See Fig. BW3). The predominant factor driving the changes in mean days of participation per person in bird watching is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Table BW2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.013	-0.85	0.013
45-54 years old	0.87	0.014	0.94	0.015
55-64 years old	1.88	0.027	3.52	0.051
Net Effects Age		0.054		0.079
Census Division				
New England	-0.17	-0.009	-0.32	-0.018
Middle Atlantic	-0.37	-0.013	-0.69	-0.025
South Atlantic	0.29	0.017	0.53	0.032
East South Central	-0.06	-0.003	-0.09	-0.004
West South Central	0.16	0.005	0.29	0.009
Mountain	0.43	-0.004	0.82	-0.008
Pacific	0.17	0.013	0.28	0.021
Net Effects Census Division		0.005		0.007
Coastal County Resident	-0.33	-0.011	-0.61	-0.020
Race/Ethnicity				
Black, not Hispanic	-2.56	-0.002	-4.80	-0.006
Asian, not Hispanic	0.41	-0.019	0.84	-0.038
Hispanic	2.06	-0.084	3.74	-0.151
Net Effects Race/Ethnicity		-0.105		-0.195
Sex				
Male	0.12	-0.002	0.20	-0.003
Total Net Effects		-0.060		-0.134

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.013 or an increase in the mean number of days per person of 0.013. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person in bird watching decreases by 0.060 for the time period 2000-2005 and decreases by 0.134 for the period 2000-2010 (See Table BW2). On net, two factors had positive marginal effects (age and Census Division), while three factors had negative marginal effects (coastal county resident, race/ethnicity, and sex). Race/ethnicity was the factor with the largest net marginal effect and was therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a decrease in mean days of participation of 0.105 days for the 2000-2005 period and a decrease of 0.195 days for the 2000-2010 period.

Viewing Other Wildlife

Participation in Viewing Oher Wildlife

Total number of participants is a function of participation rates (i.e., the percent of the population doing the activity) and the total population of the U.S. (the civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, participation rates are estimated to decline (See Fig. VW1), while population is projected to increase. The net effect is an estimated increase in participants from 13.7 million in 2000 to 14.4 million in 2005 and 15.0 million in 2010 (See Fig. VW2). The 736.8 thousand increase in participants from 2000 to 2005 represents a 5.4% increase, while the 1.3 million increase in participants from 2000 to 2010 represents a 9.8% increase. The estimates of number of participants may be understated because the level of educational attainment, which is positively related to participation rates, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Figure VW1: Viewing Other Wildlife Participation Rates by Year

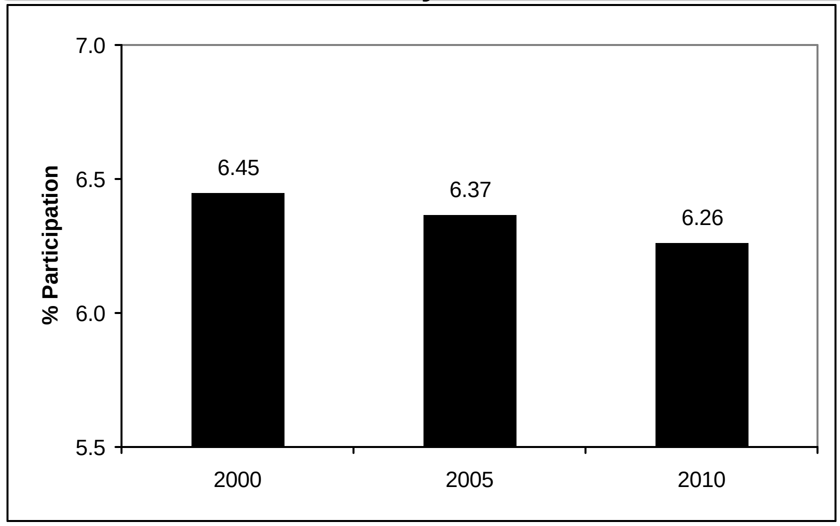
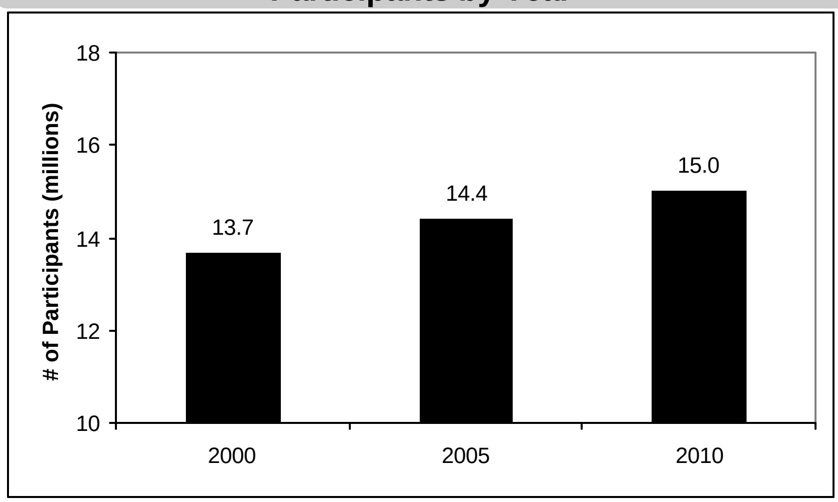


Figure VW2: Viewing Other Wildlife Number of Participants by Year



Forecast Equation. Age, place of residence, level of educational attainment, household income, and race/ethnicity were all statistically significant factors in explaining participation in viewing other wildlife (see Appendix A, Table A.19 for details on the estimated logit equation). The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables. Overall, the logit equation predicted correctly for 92.1% of the sample of 50,495 participants and non-participants. 100% of non-participants were predicted correctly, while 0% of participants were predicted correctly.

Age: In general, as age increases participation in viewing other wildlife declines; however, there is one exception. All categories of age were statistically significant in the estimated logit equation, with age category 16-24 in the base (excluded from equation and therefore in the constant of theestimated equation). All age category coefficients are negative and all but one increase in absolute value (i.e., have a larger impact on participation) as age increases. The coefficient for the age group 35-44 is smaller in absolute value than that for the age group 25-34.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and participation in viewing other wildlife. First, there are nine Census Divisions organized into four Census Regions (See Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower participation rates than those that border marine waters. Our expectations were confirmed in the estimated logit equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest participation rate. In initial estimation, we found that residents of Census Division 6 (East North Central) did not have statistically different participation rates than residents from Census Division 7, so we added it to the base. Census Divisions 6 and 7 make up the Midwest Census Region and residents from that region have the lowest participation rates for viewing other wildlife in or around marine waters (Great Lakes viewing not included since the Great Lakes are freshwater). All the coefficients on the other Census Divisions had positive signs meaning the residents from those regions had higher participation rates. Residents of Census Division 9 (Pacific) have the highest participation rates.

For place of residence, the second variable included to explain participation was *Coastal County*. Residents of coastal counties generally live closer to marine activities than residents of non-coastal counties, so we expect that residents of coastal counties have higher participation rates. The estimated logit equation confirms our expectation.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas given a value of one and residents of rural areas given a value of zero, and thus in the base. Previous research indicated that residents of urban areas had higher participation rates in marine recreation, but there was no information on viewing other wildlife. The logit equation estimation found that residents of urban areas had higher participation rates for viewing other wildlife than residents of rural areas, holding other factors constant.

Education: As the level of educational attainment increases participation rates for viewing other wildlife increase. People with less than a high school education are in the base and have the lowest participation rates. All other levels of educational attainment were statistically significant, with positive signs on the coefficients, and as the level of educational attainment increases the coefficients get larger. There was an

Table VW1: Marginal Effects of Driving Factors on Participation

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Probability of Participation	Change in Factor	Change in Probability of Participation
Age				
25-34 years old	-0.84	0.01	-0.85	0.01
35-44 years old	-1.61	0.01	-3.38	0.03
45-54 years old	0.87	-0.01	0.94	-0.02
55-64 years old	1.88	-0.06	3.52	-0.11
65+ years old	-0.33	0.02	0.08	< -0.01
Net Effects Age		-0.03		-0.08
Census Division				
New England	-0.17	-0.01	-0.32	-0.02
Middle Atlantic	-0.37	-0.01	-0.69	-0.03
South Atlantic	0.29	0.02	0.53	0.03
East South Central	-0.06	< -0.01	-0.09	< -0.01
West South Central	0.16	0.01	0.29	0.01
Mountain	0.43	0.01	0.82	0.02
Pacific	0.17	0.01	0.28	0.02
Net Effects Census Division		0.02		0.04
Coastal County Resident	-0.33	-0.01	-0.61	-0.01
Urban Resident	0.30	< 0.01	0.51	< 0.01
Household Income				
$25,000-$50,000	-0.34	-0.01	-0.90	-0.02
$50,000-$100,000	0.99	0.03	2.15	0.06
$100,000+	0.38	0.02	0.85	0.04
Net Effects Income		0.04		0.08
Race/Ethnicity				
Black, not Hispanic	0.08	< -0.01	0.21	-0.01
Asian, not Hispanic	0.41	-0.02	0.84	-0.05
Hispanic	2.06	-0.09	3.74	-0.16
Net Effects Race		-0.11		-0.22
Total Net Effects		-0.08		-0.19

"other" category for educational attainment, which is not well defined. The estimated coefficient on this category suggests that the people in this category have participation rates somewhere between those with high school degrees and those with college degrees.

Household Income: As the level of annual household income increases participation rates for viewing other wildlife increase. People with the lowest level of annual household income (less than $25,000) are in the base and have the lowest participation rates. All other levels of annual household income were statistically significant, with positive signs on the coefficients, and as the level of annual household income increases the coefficients get larger. For annual household income, a large proportion (over 43%) chose not to provide a survey response. Instead of dropping these people from the sample used to estimate the logit equations, we created a dummy variable for those that didn't provide an income response. Results indicate that those that didn't provide their income had higher participation rates than those with annual household incomes less than $25,000 but lower participation rates than those with annual household incomes between $25,000 and $50,000.

Race/Ethnicity: For race, those classified as *Black, Not Hispanic, Asian, Not Hispanic*, and *Hispanic* had statistically significant coefficients in the estimated logit model. All other categories are included in the base. Those classified as *Asian, Not Hispanic* have the lowest participation rates in viewing other wildlife, followed by those classified as *Hispanic* and those classified as *Black, not Hispanic*. Estimated coefficients on these three classifications were negative meaning that increases in the proportion of the population classified as *Black, Not Hispanic, Asian, Not Hispanic,* or *Hispanic* decrease participation rates.

Sex. Sex was not a statistically significant factor in explaining participation in viewing other wildlife.

Forecasted Participation Rates. The logit equation combined with forecasts of the explanatory variables (described above) was used to estimate future viewing other wildlife participation rates for years 2005 and 2010. Overall, viewing other wildlife rates are estimated to decline from the year 2000 rate of 6.45% to 6.37% in 2005 and to 6.26% in 2010 (See Fig. VW1). The predominant factors driving the negative changes in the forecasted participation rates are the aging population and the changing distribution of population by racial/ethnic classifications. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the probability of participating in a given activity/setting (participation rate) for a unit change in an explanatory variable, holding all other explanatory variables constant. In a logit equation, as used here, marginal effects are dependent on the starting point from which a change is evaluated. For estimating marginal effects, we set all explanatory variables to their mean values in year 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated logit model coefficients for all the age categories are negative, some of the marginal effects of a few age categories are positive i.e., increase the probability of participation (participation rate). For example, the marginal effect (change in the participation rate) for changes in the proportion of the population 25 – 34 years old over the 2000 – 2005 period is estimated to be +0.01% or an increase of 0.01 percentage points in the participation rate. Even though the logit model coefficient on age category 25 – 34 years old is negative, the proportion of the population 25 – 34 years old is forecasted to decline resulting in an increase in the participation rate, holding other factors constant.

Across all factors, the participation rate declines 0.08 percentage points for the time period 2000 – 2005 and declines 0.19 percentage points for the period 2000 – 2010 (See Table VW1). On net, three factors had positive marginal effects (Census Division, urban resident, and household income), while three factors had negative marginal effects (age, coastal county resident, and race/ethnicity). Age and race/ethnicity were the factors with the largest net marginal effects and are therefore the main drivers of the participation rate forecasts. On net (across all age categories), the marginal effect of age was a reduction in participation rates of 0.03 percentage points for the 2000 – 2005 period and a reduction of 0.08 percentage points for the 2000 – 2010 period. And, for race/ethnicity, the net effect is a reduction in participation rates of 0.11 percentage points for the 2000 – 2005 period and a reduction of 0.22 percentage points for the 2000 – 2010 period.

Days of Viewing Other Wildlife

The total number of days of viewing other wildlife is a function of the mean days of participation per person and the total population of the U.S. (civilian noninstitutionalized population 16 years old and older). For forecast years 2005 and 2010, mean days per person is estimated to decline (See Fig. VW3), while population is projected to increase. The net effect is an estimated increase in total days of participation from 350.1 million in 2000 to 358.6 million in 2005 and to 362.6 million in 2010 (See Fig. VW4). The 8.5 million increase in total days from 2000 to 2005 represents a 2.4% increase, while the 12.5 million increase from 2000 to 2010 represents a 3.6% increase. The estimates of total days may be underestimated because the level of educational attainment, which is positively related to mean days of participation per person, was held constant over the forecast period because forecasts of the future level of educational attainment were not available.

Forecast Equation. Age, place of residence, level of educational attainment, race/ethnicity, and sex were all statistically significant factors in explaining mean days of participation in viewing other wildlife (see Appendix A, Table A.35 for details on the estimated negative binomial equation). The forecast equation estimates mean days of participation per person (member of the civilian noninstitutionalized population aged 16 years old or older) as opposed to mean days of participation per participant. The five percent level of significance (T-value Probability less than or equal to 0.05) was used as the cut-off threshold for inclusion of explanatory variables.

Age: As age increases mean days of participation in viewing other wildlife tends to decline. All categories of age were statistically significant, with age category 16-24 in the base (excluded from the equation and therefore included in the constant). The coefficient on each category is interpreted relative to the base. All age category coefficients are negative and, for the most part, increase in absolute value (i.e., have a larger impact on mean days of participation) as age increases. The coefficient on age category 25-34, while still negative, is larger in absolute value than the coefficients on the next two age categories. However, beginning with age category 35-44, as age increases mean days of participation decreases.

Place of Residence: Three separate variables were included in the estimated equation to capture different aspects of the relationship between place of residence and mean days of participation in viewing other wildlife. First, there are nine Census Divisions organized into four Census Regions (see Fig. O1, page 8) for which Census data is organized. Census Divisions are aggregations of states. We expect that the Census Divisions located in the interior of the country would have lower mean days of participation than those that border marine waters. Our expectations were confirmed in the estimated negative binomial equation. Census Division 7 (West North Central) was included in the base, since its residents had the lowest mean days of participation. In initial estimation, we found that residents of Census Division 6 (East North Central) and Census Division 8 (Mountain) did not have statistically different mean days of participation than residents from Census Division 7, so we added them to the base. All other Census Divisions proved statistically significant with positive coefficients, indicating higher mean days of participation. Residents of Census Division 9 (Pacific) had the highest mean days of participation, followed closely by residents of Census Division 4 (East South Central).

For place of residence, the second variable included to explain mean days of participation was *Coastal County*. Residents of coastal counties generally live closer to marine recreation sites than residents of non-coastal counties, so we expect residents of coastal counties to have higher mean days of participation. The estimated negative binomial equation confirms our expectations.

Finally, the third place of residence variable explaining participation was *Urban*. *Urban* is a dummy variable, with residents of urban areas assigned a value of one and residents of rural areas a value of zero. The negative binomial equation estimation found that urban residents had lower mean days of participation in viewing other wildlife than rural residents, holding other factors constant.

Education: As the level of educational attainment increases, mean days of participation in viewing other wildlife increases. People with less than a high school education are in the base and have the lowest mean days of participation. All other levels of educational attainment are statistically significant with positive signs on the coefficients, and as educational attainment increases the coefficients get larger. There was an "other" category for educational attainment, which is not well defined. Results indicate that people in this category had higher mean days of participation than those with less than a high school education but lower mean days of participation than those with a high school education.

Household Income: Household income was not a statistically significant factor in explaining mean days of participation in viewing other wildlife.

Race/Ethnicity: In the initial negative binomial equation estimation, *Native American/Pacific Islander, Not Hispanic* was included in the base. In subsequent estimations, the racial/

Figure VW3: Mean Days of Viewing Other Wildlife per Person by Year

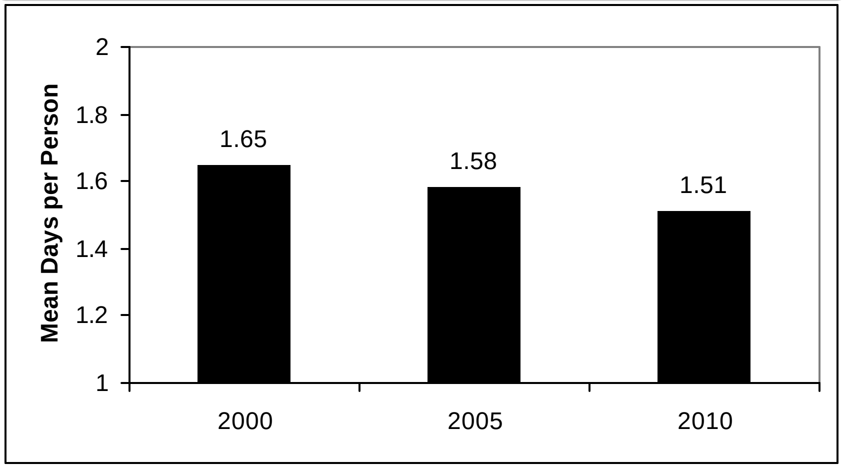
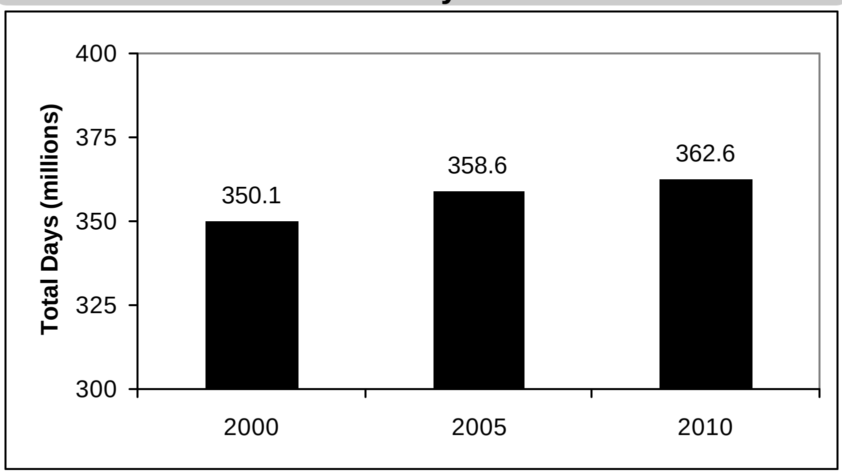


Figure VW4: Total Days of Viewing Other Wildlife by Year



ethnic category *White, Not Hispanic* was found to be statistically insignificant and was added to the base. All other racial/ethnic categories were found to be statistically significant with negative signs on the coefficients, indicating lower mean days of participation. The coefficient on the racial/ethnic category *Asian, Not Hispanic* was the largest in absolute value, followed by that on the category *Hispanic*. Those classified in these two racial/ethnic categories have the lowest mean days of participation in viewing other wildlife.

Sex: Males have higher mean days of participation in viewing other wildlife than females. In the negative binomial equation, a dummy variable was included for sex (*Male*) with a value of one for males and zero for females. The negative binomial model coefficient was positive, meaning males have higher mean days of participation than females.

Table VW2: Marginal Effects of Driving Factors on Days

Factors	Marginal Effects			
	2000-2005		2000-2010	
	Change in Factor	Change in Mean Days of Participation	Change in Factor	Change in Mean Days of Participation
Age				
25-34 years old	-0.84	0.017	-0.85	0.013
35-44 years old	-1.61	0.025	-3.38	0.037
45-54 years old	0.87	-0.015	0.94	-0.012
55-64 years old	1.88	-0.041	3.52	-0.055
65+ years old	-0.33	0.008	0.08	-0.001
Net Effects Age		-0.006		-0.018
Census Division				
New England	-0.17	-0.004	-0.32	-0.008
Middle Atlantic	-0.37	-0.008	-0.69	-0.016
South Atlantic	0.29	0.008	0.53	0.015
East South Central	-0.06	-0.002	-0.09	-0.003
West South Central	0.16	0.003	0.29	0.005
Pacific	0.17	0.006	0.28	0.010
Net Effects Census Division		0.003		0.004
Coastal County Resident	-0.33	-0.003	-0.61	-0.006
Urban Resident	0.30	-0.001	0.51	-0.002
Race/Ethnicity				
Black, not Hispanic	-2.56	-0.001	-4.80	-0.003
Asian, not Hispanic	0.41	-0.012	0.84	-0.025
Hispanic	2.06	-0.047	3.74	-0.083
Net Effects Race/Ethnicity		-0.060		-0.111
Sex				
Male	0.12	0.001	0.20	0.001
Total Net Effects		-0.067		-0.139

Forecasted Mean Days of Participation per Person. The negative binomial equation combined with forecasts of the explanatory variables was used to estimate future mean days per person (as opposed to per participant) for viewing other wildlife for years 2005 and 2010. Overall, mean days of viewing other wildlife is estimated to decline from 1.65 days per person (25.6 days per participant) in 2000 to 1.58 days per person (24.9 days per participant) in 2005 and to 1.51 days per person (24.2 days per participant) in 2010 (See Fig. VW3). The predominant factor driving the changes in mean days of participation per person in viewing other wildlife is the changing distribution of the population by racial/ethnic classification. The details behind these changes can be explained by examining the marginal effects of each of the explanatory variables.

Marginal Effects. Marginal effects are defined as the change in the mean days of participation in a given activity/setting for a unit change in an explanatory variable, holding all other factors constant. For estimating marginal effects, we set all explanatory variables to their mean values in 2000. Instead of choosing arbitrary amounts for a unit change in an explanatory variable, we calculated the unit changes in the explanatory variables from 2000 to 2005 and 2000 to 2010 based on the base year and forecasted values for the explanatory variables.

Marginal effects are a function of both the estimated coefficient on each variable (factor) and the mean value of the variable. So, even though the estimated negative binomial model coefficients for all the age categories are negative, some of the marginal effects for a few categories are positive, i.e., increase the mean days of participation. For example, the marginal effect of changes in the proportion of the population 25-34 years old from 2000-2005 is +0.017 or an increase in the mean number of days per person of 0.017. Even though the negative binomial model coefficient on age category 25-34 is negative, the proportion of the population aged 25-34 is forecasted to decline, resulting in an increase in the mean days of participation per person, holding all other factors constant.

Across all factors, mean days of participation per person in viewing other wildlife decreases by 0.067 for the time period 2000-2005 and decreases by 0.139 for the period 2000-2010 (See Table VW2). On net, two factors had positive marginal effects (Census Division and sex), while four factors had negative marginal effects (age, coastal county resident, urban resident, and race/ethnicity). Race/ethnicity was the factor with the largest net marginal effect and was therefore the main driver of the forecasts of mean days of participation per person. On net, the marginal effect of race/ethnicity is a decrease in mean days of participation of 0.060 days for the 2000-2005 period and a decrease of 0.111 days for the 2000-2010 period.

Appendix A: Estimated Logit and Negative Binomial Equations

Table A.1

Logit Equation for Beach Visitation

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-2.661718640	.57122549E-01	-46.597	.0000	
AGE25_34	-.6163881719	.35400522E-01	-17.412	.0000	.16399380
AGE35_44	-.6360892005	.33817616E-01	-18.809	.0000	.19883681
AGE45_54	-.8986432051	.36347017E-01	-24.724	.0000	.15980702
AGE55_64	-1.132704631	.42053233E-01	-26.935	.0000	.10749007
AGE65P	-1.467766259	.39305474E-01	-37.343	.0000	.16702535
CENDIV1	1.237994520	.47446198E-01	26.093	.0000	.66444775E-01
CENDIV2	.9130759779	.40985558E-01	22.278	.0000	.11975807
CENDIV3	1.397522691	.36564083E-01	38.221	.0000	.17263505
CENDIV4	.9739231261	.49771887E-01	19.568	.0000	.68436574E-01
CENDIV5	.8005565690	.42981965E-01	18.625	.0000	.10954538
CENDIV8	.5517060524	.48447329E-01	11.388	.0000	.90834726E-01
CENDIV9	1.460586109	.38518576E-01	37.919	.0000	.15278117
CCOUNTY	.5453513435	.26051532E-01	20.934	.0000	.48491606
URBAN	.2450395112	.29754978E-01	8.235	.0000	.79722533
EDUCHS	.3772845802	.32543298E-01	11.593	.0000	.29449366
EDUCCOLL	.8744363426	.31810691E-01	27.489	.0000	.38040768
EDUCGRAD	1.195312779	.48053909E-01	24.874	.0000	.65516522E-01
EDUCOTH	.9062794958	.12319831	7.356	.0000	.70150616E-02
INC50	.3680210960	.39519936E-01	9.312	.0000	.18676166
INC100	.6063716252	.40027573E-01	15.149	.0000	.17039632
INC100P	.9783496435	.51005022E-01	19.181	.0000	.61975473E-01
INCMISS	.2015304148	.35211201E-01	5.723	.0000	.43804029
WHITE	.4127761140	.24654625E-01	16.742	.0000	.67990621
MALE	-.6823330856E-01	.21190826E-01	-3.220	.0013	.47873320

Number of observations	50495
Log likelihood function	-27066.12
Restricted log likelihood	-31194.26
Chi-squared	8256.279
Degrees of freedom	24
Significance level	.0000000
% Correct Predictions (participants)	38.19
% Correct Predictions (non-participants)	87.86
% Correct Predictions (total)	71.48
Sample Participation Rate (%)	30.03

Table A.2

Logit Equation for Visiting Watersides besides Beaches

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.372950044	.12146577	-36.002	.0000	
AGE25_34	-.3933898708	.73068704E-01	-5.384	.0000	.16399380
AGE35_44	-.4211604564	.69795635E-01	-6.034	.0000	.19883681
AGE45_54	-.6532322300	.78366098E-01	-8.336	.0000	.15980702
AGE55_64	-.6519066982	.90152533E-01	-7.231	.0000	.10749007
AGE65P	-.7511290921	.83172085E-01	-9.031	.0000	.16702535
CENDIV1	.9646700736	.10098913	9.552	.0000	.66444775E-01
CENDIV2	.5778167910	.95498529E-01	6.051	.0000	.11975807
CENDIV3	.9424551510	.83763691E-01	11.251	.0000	.17263505
CENDIV4	.6839297124	.11891921	5.751	.0000	.68436574E-01
CENDIV5	.6609373286	.98620808E-01	6.702	.0000	.10954538
CENDIV8	.4056811461	.11857648	3.421	.0006	.90834726E-01
CENDIV9	.7679613062	.88107066E-01	8.716	.0000	.15278117
CCOUNTY	.4657613257	.58623381E-01	7.945	.0000	.48491606
URBAN	.1800293307	.69085801E-01	2.606	.0092	.79722533
EDUCCOLL	.3424064639	.51482105E-01	6.651	.0000	.38040768
EDUCGRAD	.5403853952	.85572619E-01	6.315	.0000	.65516522E-01
INC50	.4528019315	.90504748E-01	5.003	.0000	.18676166
INC100	.5355123588	.90987882E-01	5.886	.0000	.17039632
INC100P	.7983704133	.10467766	7.627	.0000	.61975473E-01
INCMISS	.1934485618	.82982647E-01	2.331	.0197	.43804029
MALE	.1464812984	.45650198E-01	3.209	.0013	.47873320

Number of observations	50495
Log likelihood function	-8267.955
Restricted log likelihood	-8643.844
Chi-squared	751.7777
Degrees of freedom	21
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	95.73
Sample Participation Rate (%)	4.50

Table A.3

Logit Equation for Swimming

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-2.875263955	.65373301E-01	-43.982	.0000	
AGE25_34	-.7203738644	.37439994E-01	-19.241	.0000	.16399380
AGE35_44	-.7603259883	.35785157E-01	-21.247	.0000	.19883681
AGE45_54	-1.022433694	.38721651E-01	-26.405	.0000	.15980702
AGE55_64	-1.409217260	.46289719E-01	-30.443	.0000	.10749007
AGE65P	-2.036334939	.47024986E-01	-43.303	.0000	.16702535
CENDIV1	1.351669022	.49476934E-01	27.319	.0000	.66444775E-01
CENDIV2	.9511254669	.43368999E-01	21.931	.0000	.11975807
CENDIV3	1.420934187	.39013455E-01	36.422	.0000	.17263505
CENDIV4	.8423922513	.54551486E-01	15.442	.0000	.68436574E-01
CENDIV5	.5882187512	.47122850E-01	12.483	.0000	.10954538
CENDIV8	.3037170650	.53505725E-01	5.676	.0000	.90834726E-01
CENDIV9	.8242072857	.42129813E-01	19.564	.0000	.15278117
CCOUNTY	.4860911674	.28148961E-01	17.269	.0000	.48491606
URBAN	.4130808758	.33022120E-01	12.509	.0000	.79722533
EDUCHS	.3218964960	.36071940E-01	8.924	.0000	.29449366
EDUCCOLL	.8080045936	.35061298E-01	23.045	.0000	.38040768
EDUCGRAD	1.097783559	.51350975E-01	21.378	.0000	.65516522E-01
EDUCOTH	.3155676799	.14914605	2.116	.0344	.70150616E-02
INC50	.4390840903	.44416174E-01	9.886	.0000	.18676166
INC100	.7073158185	.44378859E-01	15.938	.0000	.17039632
INC100P	1.113291551	.54314569E-01	20.497	.0000	.61975473E-01
INCMISS	.3143773663	.40155970E-01	7.829	.0000	.43804029
WHITE	.5408822042	.32679856E-01	16.551	.0000	.67990621
BLACK	-.7019814019	.48516948E-01	-14.469	.0000	.12919570
MALE	-.1147690180	.22824496E-01	-5.028	.0000	.47873320

Number of observations	50495
Log likelihood function	-23913.46
Restricted log likelihood	-28199.21
Chi-squared	8571.503
Degrees of freedom	25
Significance level	.0000000
% Correct Predictions (participants)	29.45
% Correct Predictions (non-participants)	92.47
% Correct Predictions (total)	75.46
Sample Participation Rate (%)	25.53

<u>Table A.4</u>

<u>Logit Equation for Snorkeling</u>

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.065862065	.12806254	-39.558	.0000	
AGE25_34	-.4318732921	.65492980E-01	-6.594	.0000	.16399380
AGE35_44	-.6289411777	.63881537E-01	-9.845	.0000	.19883681
AGE45_54	-.7411472762	.68440443E-01	-10.829	.0000	.15980702
AGE55_64	-1.235749572	.90289280E-01	-13.687	.0000	.10749007
AGE65P	-1.964004721	.10722384	-18.317	.0000	.16702535
CENDIV1	.3385721761	.79017120E-01	4.285	.0000	.66444775E-01
CENDIV3	.4649943184	.58196003E-01	7.990	.0000	.17263505
CENDIV4	.2308106117	.10017853	2.304	.0212	.68436574E-01
CENDIV8	.3858139818	.85456694E-01	4.515	.0000	.90834726E-01
CENDIV9	.7519864762	.57010993E-01	13.190	.0000	.15278117
CCOUNTY	.4305171934	.50798280E-01	8.475	.0000	.48491606
URBAN	.3202015119	.64692810E-01	4.950	.0000	.79722533
EDUCHS	.2147698570	.72664481E-01	2.956	.0031	.29449366
EDUCCOLL	.8144953096	.67124513E-01	12.134	.0000	.38040768
EDUCGRAD	1.020335807	.89727348E-01	11.372	.0000	.65516522E-01
INC50	.6006028517	.10219268	5.877	.0000	.18676166
INC100	1.094813447	.97928893E-01	11.180	.0000	.17039632
INC100P	1.713770083	.10362035	16.539	.0000	.61975473E-01
INCMISS	.7421060113	.94479681E-01	7.855	.0000	.43804029
WHITE	.7331017871	.52434864E-01	13.981	.0000	.67990621
MALE	.2036231364	.41362550E-01	4.923	.0000	.47873320

Number of observations	50495
Iterations completed	8
Log likelihood function	-9320.779
Restricted log likelihood	-10418.77
Chi-squared	2195.976
Degrees of freedom	21
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	94.00
Sample Participation Rate (%)	5.07

Table A.5

Logit Equation for Scuba Diving

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-6.713010334	.27850635	-24.104	.0000	
AGE25_34	-.4919135565	.11445001	-4.298	.0000	.16399380
AGE35_44	-.7834366889	.11474401	-6.828	.0000	.19883681
AGE45_54	-1.002649078	.12894907	-7.776	.0000	.15980702
AGE55_64	-1.280435503	.16772308	-7.634	.0000	.10749007
AGE65P	-2.433884531	.25453501	-9.562	.0000	.16702535
CENDIV3	.5339002773	.10237290	5.215	.0000	.17263505
CENDIV4	.3693601797	.17938944	2.059	.0395	.68436574E-01
CENDIV8	.6071372073	.14593126	4.160	.0000	.90834726E-01
CENDIV9	.5944201048	.10198762	5.828	.0000	.15278117
CCOUNTY	.2873241098	.92902600E-01	3.093	.0020	.48491606
URBAN	.4097659640	.12755106	3.213	.0013	.79722533
EDUCCOLL	.6284007746	.91505668E-01	6.867	.0000	.38040768
EDUCGRAD	.9531829542	.13846305	6.884	.0000	.65516522E-01
INC50	1.345295807	.25594045	5.256	.0000	.18676166
INC100	1.737135615	.25059545	6.932	.0000	.17039632
INC100P	2.487428452	.25416288	9.787	.0000	.61975473E-01
INCMISS	1.470279834	.24427244	6.019	.0000	.43804029
MALE	.8050602063	.82911319E-01	9.710	.0000	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-3373.130
Restricted log likelihood	-3737.502
Chi-squared	728.7429
Degrees of freedom	18
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	98.48
Sample Participation Rate (%)	1.35

Table A.6

Logit Equation for Surfing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.377978060	.19329000	-27.823	.0000	
AGE25_34	-1.116543977	.10163260	-10.986	.0000	.16399380
AGE35_44	-1.794135381	.11668593	-15.376	.0000	.19883681
AGE45_54	-1.831612569	.12843725	-14.261	.0000	.15980702
AGE55_64	-2.239038392	.18477283	-12.118	.0000	.10749007
AGE65P	-3.543710471	.30218929	-11.727	.0000	.16702535
CENDIV3	.8027983120	.10041184	7.995	.0000	.17263505
CENDIV8	.6704237922	.15469910	4.334	.0000	.90834726E-01
CENDIV9	1.266500686	.86910231E-01	14.573	.0000	.15278117
CCOUNTY	.7310013212	.92078665E-01	7.939	.0000	.48491606
URBAN	.3936818846	.12594599	3.126	.0018	.79722533
EDUCCOLL	.4211386427	.81850690E-01	5.145	.0000	.38040768
EDUCGRAD	.5834686868	.15362955	3.798	.0001	.65516522E-01
INC50	.5262320228	.16118116	3.265	.0011	.18676166
INC100	.6324847952	.15999295	3.953	.0001	.17039632
INC100P	1.361450572	.16577080	8.213	.0000	.61975473E-01
INCMISS	.4739731522	.14413757	3.288	.0010	.43804029
BLACK	-1.684631466	.20542874	-8.201	.0000	.12919570
MALE	.8380651070	.76776306E-01	10.916	.0000	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-3587.560
Restricted log likelihood	-4323.334
Chi-squared	1471.548
Degrees of freedom	18
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	98.51
Sample Participation Rate (%)	1.59

Table A.7

Logit Equation for Wind Surfing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-6.875710030	.40113552	-17.141	.0000	
AGE35_44	-.4281252746	.18687008	-2.291	.0220	.19883681
AGE45_54	-.4846957935	.20463898	-2.369	.0179	.15980702
AGE55_64	-.9086743459	.29698650	-3.060	.0022	.10749007
AGE65P	-2.427054901	.53707822	-4.519	.0000	.16702535
CENDIV1	.4979255850	.21668275	2.298	.0216	.66444775E-01
CCOUNTY	.6573130763	.15714366	4.183	.0000	.48491606
EDUCHS	-.6971879768	.20022456	-3.482	.0005	.29449366
INC50	1.322477542	.40372103	3.276	.0011	.18676166
INC100	1.188367594	.40784882	2.914	.0036	.17039632
INC100P	2.079539974	.41004003	5.072	.0000	.61975473E-01
INCMISS	1.020617720	.39013687	2.616	.0089	.43804029
MALE	.5564771032	.15001370	3.710	.0002	.47873320

Number of observations	50495
Iterations completed	12
Log likelihood function	-1202.642
Restricted log likelihood	-1287.736
Chi-squared	170.1884
Degrees of freedom	12
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	99.62
Sample Participation Rate (%)	0.39

Table A.8

Logit Equation for Fishing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.241756544	.83939815E-01	-50.533	.0000	
AGE25_34	-.2784505723	.51180146E-01	-5.441	.0000	.16399380
AGE35_44	-.2280217875	.48070867E-01	-4.743	.0000	.19883681
AGE45_54	-.3499322303	.51575534E-01	-6.785	.0000	.15980702
AGE55_64	-.4699316799	.59519487E-01	-7.895	.0000	.10749007
AGE65P	-.8897249865	.58536638E-01	-15.199	.0000	.16702535
CENDIV1	1.156239718	.74693741E-01	15.480	.0000	.66444775E-01
CENDIV2	1.013495299	.68623785E-01	14.769	.0000	.11975807
CENDIV3	1.711565683	.61167012E-01	27.982	.0000	.17263505
CENDIV4	1.265643681	.83339510E-01	15.187	.0000	.68436574E-01
CENDIV5	1.477705511	.68807564E-01	21.476	.0000	.10954538
CENDIV8	.4639236888	.96648376E-01	4.800	.0000	.90834726E-01
CENDIV9	1.236557504	.64949972E-01	19.039	.0000	.15278117
CCOUNTY	.8564770048	.38560706E-01	22.211	.0000	.48491606
EDUCHS	.1628072060	.45602818E-01	3.570	.0004	.29449366
EDUCCOLL	.1743350537	.45397653E-01	3.840	.0001	.38040768
EDUCGRAD	-.1522337240	.72867046E-01	-2.089	.0367	.65516522E-01
INC50	.2813677066	.60171595E-01	4.676	.0000	.18676166
INC100	.4981211760	.59859571E-01	8.321	.0000	.17039632
INC100P	.7961537134	.70624490E-01	11.273	.0000	.61975473E-01
INCMISS	.2123414455	.53854115E-01	3.943	.0001	.43804029
BLACK	-.4208688310	.48098958E-01	-8.750	.0000	.12919570
HISPANIC	-.4790462037	.49457616E-01	-9.686	.0000	.15347885
MALE	.8836648343	.31906149E-01	27.696	.0000	.47873320

Number of observations	50495
Iterations completed	7
Log likelihood function	-14993.02
Restricted log likelihood	-16884.62
Chi-squared	3783.190
Degrees of freedom	23
Significance level	.0000000
% Correct Predictions (participants)	0.08
% Correct Predictions (non-participants)	99.99
% Correct Predictions (total)	89.74
Sample Participation Rate (%)	10.32

Table A.9

Logit Equation for Motorboating

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.368434025	.13272968	-32.912	.0000	
AGE25_34	-.1834121155	.60006656E-01	-3.057	.0022	.16399380
AGE35_44	-.2944794939	.57734547E-01	-5.101	.0000	.19883681
AGE45_54	-.4385701911	.62132030E-01	-7.059	.0000	.15980702
AGE55_64	-.5262695897	.71236974E-01	-7.388	.0000	.10749007
AGE65P	-.9965740030	.72627777E-01	-13.722	.0000	.16702535
CENDIV1	.9107290267	.12163561	7.487	.0000	.66444775E-01
CENDIV2	.5715319042	.11927363	4.792	.0000	.11975807
CENDIV3	1.163592781	.11250057	10.343	.0000	.17263505
CENDIV4	.6193571221	.13312765	4.652	.0000	.68436574E-01
CENDIV5	.9194604430	.11741646	7.831	.0000	.10954538
CENDIV6	-.2980778596	.12666491	-2.353	.0186	.13602793
CENDIV8	.3523178384	.13274112	2.654	.0080	.90834726E-01
CENDIV9	.5660297347	.11794673	4.799	.0000	.15278117
CCOUNTY	1.060340459	.50073565E-01	21.176	.0000	.48491606
URBAN	.1104334056	.54353268E-01	2.032	.0422	.79722533
EDUCHS	.2017223972	.58931129E-01	3.423	.0006	.29449366
EDUCCOLL	.4704136254	.56804642E-01	8.281	.0000	.38040768
EDUCGRAD	.4141345209	.80905581E-01	5.119	.0000	.65516522E-01
INC50	.4388877814	.76841056E-01	5.712	.0000	.18676166
INC100	.6783777209	.75618007E-01	8.971	.0000	.17039632
INC100P	1.256621338	.83286774E-01	15.088	.0000	.61975473E-01
INCMISS	.3631386561	.70632600E-01	5.141	.0000	.43804029
BLACK	-1.140958789	.71237000E-01	-16.016	.0000	.12919570
ASIAN	-.8665839125	.11288188	-7.677	.0000	.30794850E-01
HISPANIC	-.6455322352	.61799363E-01	-10.446	.0000	.15347885
MALE	.4015010557	.36458308E-01	11.013	.0000	.47873320

Number of observations	50495
Iterations completed	8
Log likelihood function	-11510.45
Restricted log likelihood	-12993.89
Chi-squared	2966.894
Degrees of freedom	26
Significance level	.0000000
% Correct Predictions (participants)	0.03
% Correct Predictions (non-participants)	99.99
% Correct Predictions (total)	92.12
Sample Participation Rate (%)	7.11

Table A.10

Logit Equation for Sailing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.279338150	.16205099	-32.578	.0000	
AGE25_34	-.4773754429	.86712327E-01	-5.505	.0000	.16399380
AGE35_44	-.6552110399	.84337254E-01	-7.769	.0000	.19883681
AGE45_54	-.6862980146	.88971817E-01	-7.714	.0000	.15980702
AGE55_64	-.7759345772	.10387529	-7.470	.0000	.10749007
AGE65P	-1.162531834	.10681484	-10.884	.0000	.16702535
CENDIV1	1.434913163	.11405656	12.581	.0000	.66444775E-01
CENDIV2	.8933344409	.11309570	7.899	.0000	.11975807
CENDIV3	1.010927414	.10583127	9.552	.0000	.17263505
CENDIV4	.7671177813	.15480834	4.955	.0000	.68436574E-01
CENDIV5	.5968091730	.13296321	4.489	.0000	.10954538
CENDIV8	.5598598648	.15280189	3.664	.0002	.90834726E-01
CENDIV9	1.086385105	.10817153	10.043	.0000	.15278117
CCOUNTY	.6849634971	.73290933E-01	9.346	.0000	.48491606
URBAN	.3657366752	.90474270E-01	4.042	.0001	.79722533
EDUCCOLL	.6887534794	.64364249E-01	10.701	.0000	.38040768
EDUCGRAD	1.265768797	.89856438E-01	14.087	.0000	.65516522E-01
INC50	.5273506615	.12443330	4.238	.0000	.18676166
INC100	.6841311818	.12207114	5.604	.0000	.17039632
INC100P	1.416248863	.12707695	11.145	.0000	.61975473E-01
INCMISS	.5504744095	.11430495	4.816	.0000	.43804029
BLACK	-.7565772414	.10064336	-7.517	.0000	.12919570
ASIAN	-.8415626788	.15355334	-5.481	.0000	.30794850E-01
HISPANIC	-.6921182893	.97104707E-01	-7.128	.0000	.15347885
MALE	-.1127848105	.53338580E-01	-2.115	.0345	.47873320

Number of observations	50495
Iterations completed	8
Log likelihood function	-6160.113
Restricted log likelihood	-6880.743
Chi-squared	1441.260
Degrees of freedom	24
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	96.44
Sample Participation Rate (%)	2.98

Table A.11

Logit Equation for Personal Watercraft Use

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
AGE25_34	-.8264384150	.82046463E-01	-10.073	.0000	.16399380
AGE35_44	-1.177583261	.84837254E-01	-13.880	.0000	.19883681
AGE45_54	-1.657400630	.10698147	-15.492	.0000	.15980702
AGE55_64	-2.151705265	.15770567	-13.644	.0000	.10749007
AGE65P	-3.394999384	.24466096	-13.876	.0000	.16702535
CENDIV1	.4037892923	.14155798	2.852	.0043	.66444775E-01
CENDIV2	.7666833340	.11188493	6.852	.0000	.11975807
CENDIV3	1.208291413	.98805243E-01	12.229	.0000	.17263505
CENDIV4	.9987473616	.14285316	6.991	.0000	.68436574E-01
CENDIV5	.7798289330	.11909470	6.548	.0000	.10954538
CENDIV9	.4447169237	.11217814	3.964	.0001	.15278117
CCOUNTY	.7850644130	.74574482E-01	10.527	.0000	.48491606
URBAN	.4165321135	.99234678E-01	4.197	.0000	.79722533
EDUCCOLL	.4787985017	.66083984E-01	7.245	.0000	.38040768
EDUCGRAD	.3639283184	.12963586	2.807	.0050	.65516522E-01
INC50	.4486299447	.12863580	3.488	.0005	.18676166
INC100	.6925714030	.12609895	5.492	.0000	.17039632
INC100P	1.199909929	.13681558	8.770	.0000	.61975473E-01
INCMISS	.4814510398	.11426418	4.213	.0000	.43804029
MALE	.1367801743	.58153233E-01	2.352	.0187	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-5239.123
Restricted log likelihood	-5960.429
Chi-squared	1442.612
Degrees of freedom	20
Significance level	.0000000
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	97.65
Sample Participation Rate (%)	2.57

Table A.12

Logit Equation for Canoeing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-6.313608905	.28603012	-22.073	.0000	
AGE25_34	-.6894649859	.14193374	-4.858	.0000	.16399380
AGE35_44	-.6640116055	.13182674	-5.037	.0000	.19883681
AGE45_54	-.9919703625	.15408737	-6.438	.0000	.15980702
AGE55_64	-1.036293814	.18324119	-5.655	.0000	.10749007
AGE65P	-1.791418017	.21598549	-8.294	.0000	.16702535
CENDIV1	1.829101717	.23968725	7.631	.0000	.66444775E-01
CENDIV2	1.090647219	.24796314	4.398	.0000	.11975807
CENDIV3	1.887812837	.22282469	8.472	.0000	.17263505
CENDIV4	.9614078407	.34934067	2.752	.0059	.68436574E-01
CENDIV5	1.110725671	.27291372	4.070	.0000	.10954538
CENDIV8	1.140155907	.32382690	3.521	.0004	.90834726E-01
CENDIV9	1.507611121	.23069637	6.535	.0000	.15278117
CCOUNTY	1.161407484	.13634125	8.518	.0000	.48491606
EDUCHS	-.5346426161	.12136264	-4.405	.0000	.29449366
INC50	.4912763988	.20581989	2.387	.0170	.18676166
INC100	.5473332703	.20417348	2.681	.0073	.17039632
INC100P	.9147414455	.21997706	4.158	.0000	.61975473E-01
INCMISS	.3948319245	.18694050	2.112	.0347	.43804029
BLACK	-.7903146732	.16674119	-4.740	.0000	.12919570
HISPANIC	-.7584349143	.15645706	-4.848	.0000	.15347885
MALE	.2633398834	.92852197E-01	2.836	.0046	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-2468.869
Restricted log likelihood	-2750.342
Chi-squared	562.9455
Degrees of freedom	21
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	99.06
Sample Participation Rate (%)	1.05

Table A.13

Logit Equation for Kayaking

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.297651886	.12625449	-41.960	.0000	
AGE25_34	-.4803216073	.11019438	-4.359	.0000	.16399380
AGE35_44	-.8221851404	.11332940	-7.255	.0000	.19883681
AGE45_54	-.9547405218	.12420757	-7.687	.0000	.15980702
AGE55_64	-1.173387400	.15483684	-7.578	.0000	.10749007
AGE65P	-2.287631151	.22080331	-10.360	.0000	.16702535
CENDIV1	1.541144208	.13817018	11.154	.0000	.66444775E-01
CENDIV2	.6200563661	.14880933	4.167	.0000	.11975807
CENDIV3	.8553860355	.13305403	6.429	.0000	.17263505
CENDIV8	.5297015903	.20126337	2.632	.0085	.90834726E-01
CENDIV9	1.153358322	.12694166	9.086	.0000	.15278117
CCOUNTY	.8055604339	.10674630	7.546	.0000	.48491606
EDUCCOLL	.8526969552	.89615620E-01	9.515	.0000	.38040768
EDUCGRAD	1.461258966	.12639329	11.561	.0000	.65516522E-01
INC100	.2393703213	.95482236E-01	2.507	.0122	.17039632
INC100P	.7743067539	.10984365	7.049	.0000	.61975473E-01
BLACK	-1.299067549	.19487865	-6.666	.0000	.12919570

Number of observations	50495
Iterations completed	10
Log likelihood function	-3437.211
Restricted log likelihood	-3916.358
Chi-squared	958.2931
Degrees of freedom	16
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	98.26
Sample Participation Rate (%)	1.33

Table A.14

Logit Equation for Rowing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-6.340571944	.21117721	-30.025	.0000	
AGE25_34	-.3447109589	.17071372	-2.019	.0435	.16399380
AGE35_44	-.3328780754	.15902248	-2.093	.0363	.19883681
AGE45_54	-.7489414701	.19983304	-3.748	.0002	.15980702
AGE65P	-1.210715873	.25338810	-4.778	.0000	.16702535
CENDIV1	1.695170083	.23258822	7.288	.0000	.66444775E-01
CENDIV2	1.054642292	.23443474	4.499	.0000	.11975807
CENDIV3	.9909822793	.22014082	4.502	.0000	.17263505
CENDIV8	.9295123137	.31117208	2.987	.0028	.90834726E-01
CENDIV9	1.231767531	.21662539	5.686	.0000	.15278117
CCOUNTY	.8092200652	.17448607	4.638	.0000	.48491606
EDUCHS	-.4145463792	.15108646	-2.744	.0061	.29449366
INC100P	.4805251221	.18890553	2.544	.0110	.61975473E-01
MALE	.3343595312	.12177039	2.746	.0060	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-1626.653
Restricted log likelihood	-1740.456
Chi-squared	227.6059
Degrees of freedom	13
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	99.45
Sample Participation Rate (%)	0.53

Table A.15

Logit Equation for Water Skiing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.503455781	.22807284	-24.130	.0000	
AGE25_34	-.8335403488	.11674755	-7.140	.0000	.16399380
AGE35_44	-1.239563828	.12317050	-10.064	.0000	.19883681
AGE45_54	-2.075172183	.18342270	-11.314	.0000	.15980702
AGE55_64	-2.488938969	.27117257	-9.178	.0000	.10749007
AGE65P	-2.639663839	.25612896	-10.306	.0000	.16702535
CENDIV3	.7411061220	.97267630E-01	7.619	.0000	.17263505
CENDIV5	.6732913556	.12946797	5.200	.0000	.10954538
CENDIV6	-.9638278496	.20470026	-4.708	.0000	.13602793
CCOUNTY	1.114028550	.10260603	10.857	.0000	.48491606
URBAN	.3239907201	.14380456	2.253	.0243	.79722533
INC50	.5816527334	.20119523	2.891	.0038	.18676166
INC100	.9071672195	.19598644	4.629	.0000	.17039632
INC100P	1.610892680	.20269951	7.947	.0000	.61975473E-01
INCMISS	.5553272956	.17845382	3.112	.0019	.43804029
MALE	.3885708295	.86955521E-01	4.469	.0000	.47873320

Number of observations	50495
Iterations completed	10
Log likelihood function	-2747.273
Restricted log likelihood	-3149.671
Chi-squared	804.7951
Degrees of freedom	15
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	99.00
Sample Participation Rate (%)	1.15

Table A.16

Logit Equation for Viewing or Photographing Scenery

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.135293810	.91202236E-01	-45.342	.0000	
AGE65P	-.4322135388	.51022269E-01	-8.471	.0000	.16702535
CENDIV1	.9142223925	.70118008E-01	13.038	.0000	.66444775E-01
CENDIV2	.4790156820	.67230995E-01	7.125	.0000	.11975807
CENDIV3	.9434065733	.58347502E-01	16.169	.0000	.17263505
CENDIV4	.4753099179	.88740406E-01	5.356	.0000	.68436574E-01
CENDIV5	.5991477263	.71969416E-01	8.325	.0000	.10954538
CENDIV8	.3906484944	.83614080E-01	4.672	.0000	.90834726E-01
CENDIV9	1.267845600	.59376813E-01	21.353	.0000	.15278117
CCOUNTY	.5754997453	.41471162E-01	13.877	.0000	.48491606
URBAN	.1579414113	.48170558E-01	3.279	.0010	.79722533
EDUCHS	.5596057317	.60514094E-01	9.248	.0000	.29449366
EDUCCOLL	1.084751812	.56901339E-01	19.064	.0000	.38040768
EDUCGRAD	1.434685253	.71323262E-01	20.115	.0000	.65516522E-01
EDUCOTH	.9669041391	.18481107	5.232	.0000	.70150616E-02
INC50	.2537883389	.63619565E-01	3.989	.0001	.18676166
INC100	.4288551260	.62647969E-01	6.845	.0000	.17039632
INC100P	.6237091543	.73609309E-01	8.473	.0000	.61975473E-01
INCMISS	.1608654584	.58607600E-01	2.745	.0061	.43804029
BLACK	-.7713445386	.60538963E-01	-12.741	.0000	.12919570
ASIAN	-.7566884871	.88947664E-01	-8.507	.0000	.30794850E-01
HISPANIC	-.7510917755	.59618763E-01	-12.598	.0000	.15347885
MALE	-.2375804035	.32635162E-01	-7.280	.0000	.47873320

Number of observations	50495
Iterations completed	7
Log likelihood function	-13773.51
Restricted log likelihood	-15313.25
Chi-squared	3079.489
Degrees of freedom	22
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	89.02
Sample Participation Rate (%)	9.19

Table A.17

Logit Equation for Hunting Waterfowl

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-7.548226951	.25785351	-29.273	.0000	
AGE35_44	-.4375940095	.19856677	-2.204	.0275	.19883681
AGE45_54	-.7731233849	.24621970	-3.140	.0017	.15980702
AGE65P	-1.071744822	.31781480	-3.372	.0007	.16702535
CENDIV3	1.176172796	.24044872	4.892	.0000	.17263505
CENDIV4	1.272424314	.30882106	4.120	.0000	.68436574E-01
CENDIV5	1.651186848	.24402073	6.767	.0000	.10954538
CENDIV8	.6961583777	.32787036	2.123	.0337	.90834726E-01
CENDIV9	1.096262611	.24830455	4.415	.0000	.15278117
INC100	.5797254458	.19188666	3.021	.0025	.17039632
INC100P	1.565699018	.19334568	8.098	.0000	.61975473E-01
MALE	1.499934559	.19824447	7.566	.0000	.47873320

Number of observations	50495
Iterations completed	11
Log likelihood function	-1057.867
Restricted log likelihood	-1166.545
Chi-squared	217.3560
Degrees of freedom	11
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	99.65
Sample Participation Rate (%)	0.33

Table A.18

Logit Equation for Bird Watching

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.723475811	.87108138E-01	-54.225	.0000	
AGE35_44	.3711646334	.46532503E-01	7.976	.0000	.19883681
AGE45_54	.4034125985	.49016492E-01	8.230	.0000	.15980702
AGE55_64	.4393379207	.56560728E-01	7.768	.0000	.10749007
CENDIV1	1.222607786	.77222262E-01	15.832	.0000	.66444775E-01
CENDIV2	.8179096813	.74315065E-01	11.006	.0000	.11975807
CENDIV3	1.164106148	.66290561E-01	17.561	.0000	.17263505
CENDIV4	.5634313230	.10061382	5.600	.0000	.68436574E-01
CENDIV5	.6747150721	.83211072E-01	8.108	.0000	.10954538
CENDIV8	.3453492449	.98612932E-01	3.502	.0005	.90834726E-01
CENDIV9	1.203234672	.69476717E-01	17.319	.0000	.15278117
CCOUNTY	.5457816956	.44914253E-01	12.152	.0000	.48491606
EDUCHS	.7402403000	.74341752E-01	9.957	.0000	.29449366
EDUCCOLL	1.254516261	.70801846E-01	17.719	.0000	.38040768
EDUCGRAD	1.587796575	.84399610E-01	18.813	.0000	.65516522E-01
EDUCOTH	.5876693593	.24742747	2.375	.0175	.70150616E-02
INC50	.1736559948	.49171705E-01	3.532	.0004	.18676166
INC100	.3454802686	.47126721E-01	7.331	.0000	.17039632
INC100P	.5559809318	.62157209E-01	8.945	.0000	.61975473E-01
BLACK	-.8102468424	.68589231E-01	-11.813	.0000	.12919570
ASIAN	-.9498791931	.11083973	-8.570	.0000	.30794850E-01
HISPANIC	-.7666434974	.70755467E-01	-10.835	.0000	.15347885
MALE	-.1872094991	.36225073E-01	-5.168	.0000	.47873320

Number of observations	50495
Iterations completed	8
Log likelihood function	-11551.26
Restricted log likelihood	-12984.22
Chi-squared	2865.920
Degrees of freedom	22
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	90.90
Sample Participation Rate (%)	7.17

Table A.19

Logit Equation for Viewing Other Wildlife

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.075326770	.10325541	-39.468	.0000	
AGE25_34	-.2527897699	.63392333E-01	-3.988	.0001	.16399380
AGE35_44	-.1467553346	.59347602E-01	-2.473	.0134	.19883681
AGE45_54	-.2682099351	.63117952E-01	-4.249	.0000	.15980702
AGE55_64	-.5129565447	.74737997E-01	-6.863	.0000	.10749007
AGE65P	-.9266277457	.75389299E-01	-12.291	.0000	.16702535
CENDIV1	.8221891116	.82884089E-01	9.920	.0000	.66444775E-01
CENDIV2	.6072861368	.76658214E-01	7.922	.0000	.11975807
CENDIV3	1.047320496	.66408360E-01	15.771	.0000	.17263505
CENDIV4	.5050874418	.99357279E-01	5.084	.0000	.68436574E-01
CENDIV5	.6295384676	.81705673E-01	7.705	.0000	.10954538
CENDIV8	.4490638563	.92796502E-01	4.839	.0000	.90834726E-01
CENDIV9	1.202941398	.68848868E-01	17.472	.0000	.15278117
CCOUNTY	.3975054860	.46426174E-01	8.562	.0000	.48491606
URBAN	.1057560338	.53759481E-01	1.967	.0492	.79722533
EDUCHS	.4234686073	.66614760E-01	6.357	.0000	.29449366
EDUCCOLL	.8518963284	.63633436E-01	13.388	.0000	.38040768
EDUCGRAD	1.152002350	.82430898E-01	13.975	.0000	.65516522E-01
EDUCOTH	.5275079676	.23737024	2.222	.0263	.70150616E-02
INC50	.3039866553	.73313440E-01	4.146	.0000	.18676166
INC100	.4623493131	.72347936E-01	6.391	.0000	.17039632
INC100P	.7326529506	.83034438E-01	8.823	.0000	.61975473E-01
INCMISS	.1521894571	.67976141E-01	2.239	.0252	.43804029
BLACK	-.6290877537	.65814333E-01	-9.559	.0000	.12919570
ASIAN	-.9761661510	.11529300	-8.467	.0000	.30794850E-01
HISPANIC	-.7094012079	.67308109E-01	-10.540	.0000	.15347885

Number of observations	50495
Iterations completed	7
Log likelihood function	-11364.08
Restricted log likelihood	-12316.47
Chi-squared	1904.782
Degrees of freedom	25
Significance level	.0000000
% Correct Predictions (participants)	0
% Correct Predictions (non-participants)	100
% Correct Predictions (total)	92.08
Sample Participation Rate (%)	6.45

Table A.20

Negative Binomial Equation for Beach Visitation

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-1.468124568	.57217186E-01	-25.659	.0000	
AGE25_34	-.8314463529	.41120286E-01	-20.220	.0000	.17892232
AGE35_44	-.9256105970	.41720599E-01	-22.186	.0000	.20890426
AGE45_54	-1.151491848	.45500157E-01	-25.307	.0000	.19641362
AGE55_64	-1.066519947	.41203266E-01	-25.884	.0000	.12946645
AGE65P	-1.290508991	.38449394E-01	-33.564	.0000	.14764066
CENDIV1	1.310192378	.65290079E-01	20.067	.0000	.68489228E-01
CENDIV2	.8996580934	.57310012E-01	15.698	.0000	.10325153
CENDIV3	1.508161102	.44867333E-01	33.614	.0000	.17152047
CENDIV4	1.323718463	.49034831E-01	26.995	.0000	.79900427E-01
CENDIV5	.8087388506	.46207869E-01	17.502	.0000	.98559281E-01
CENDIV6	.1785809921	.38013540E-01	4.698	.0000	.14598846
CENDIV8	.3698694878	.48316327E-01	7.655	.0000	.99220161E-01
CENDIV9	1.775776046	.46568563E-01	38.133	.0000	.11961933
CCOUNTY	.8306004745	.27957579E-01	29.709	.0000	.40329118
URBAN	.2032119382	.25237463E-01	8.052	.0000	.63915936
EDUCHS	.6874727919	.31339039E-01	21.937	.0000	.27891351
EDUCCOLL	1.139535557	.33567681E-01	33.947	.0000	.49054941
EDUCGRAD	1.365231280	.67252158E-01	20.300	.0000	.11316474
EDUCOTH	1.417144764	.10007678	14.161	.0000	.84592677E-02
INC50	.3549481105	.36379935E-01	9.757	.0000	.21681279
INC100	.4404316866	.46001218E-01	9.574	.0000	.20824338
INC100P	.8446015820	.69639049E-01	12.128	.0000	.70582015E-01
INCMISS	.1910493094	.29742101E-01	6.424	.0000	.37070979
WHITE	.6819223548	.27027587E-01	25.231	.0000	.82878795
ASIAN	.5354934488	.73182385E-01	7.317	.0000	.15883156E-01

Number of observations	45394
Iterations completed	34
Log likelihood function	-64027.45
Restricted log likelihood	-289944.0

Table A.21

Negative Binomial Equation for Visiting Watersides Besides Beaches

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-3.602858506	.14777734	-24.380	.0000	
AGE25_34	-1.128979713	.20907070	-5.400	.0000	.17892232
AGE35_44	-.8124042751	.16956472	-4.791	.0000	.20890426
AGE45_54	-1.111310125	.18048341	-6.157	.0000	.19641362
AGE55_64	-1.269251892	.20646914	-6.147	.0000	.12946645
AGE65P	-1.725033316	.19302222	-8.937	.0000	.14764066
CENDIV1	1.882246945	.22969012	8.195	.0000	.68489228E-01
CENDIV2	1.373125070	.17181370	7.992	.0000	.10325153
CENDIV3	2.160529851	.13407819	16.114	.0000	.17152047
CENDIV4	1.477372552	.17480928	8.451	.0000	.79900427E-01
CENDIV5	1.810701911	.15718385	11.520	.0000	.98559281E-01
CENDIV8	.6000063922	.18683858	3.211	.0013	.99220161E-01
CENDIV9	2.099557998	.15262031	13.757	.0000	.11961933
CCOUNTY	.8684702081	.10219992	8.498	.0000	.40329118
EDUCHS	.9299417224	.14312941	6.497	.0000	.27891351
EDUCCOLL	1.361916019	.16056815	8.482	.0000	.49054941
EDUCGRAD	1.633618461	.26306063	6.210	.0000	.11316474
EDUCOTH	1.890538962	.43009547	4.396	.0000	.84592677E-02
INC50	.6138250154	.13297346	4.616	.0000	.21681279
INC100	.4655414066	.14790252	3.148	.0016	.20824338
INC100P	.9181512163	.26882101	3.415	.0006	.70582015E-01
MALE	.3734125028	.97301437E-01	3.838	.0001	.43582852

Number of observations	45394
Iterations completed	28
Log likelihood function	-10338.84
Restricted log likelihood	-85651.13
Chi-squared	150624.6
Degrees of freedom	1
Significance level	.0000000

Table A.22

Negative Binomial Equation for Swimming

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-.9494396956	.15270897	-6.217	.0000	
AGE25_34	-.9422335076	.50268306E-01	-18.744	.0000	.17892232
AGE35_44	-1.042068161	.49046389E-01	-21.247	.0000	.20890426
AGE45_54	-1.506202740	.55957586E-01	-26.917	.0000	.19641362
AGE55_64	-1.694142426	.56263407E-01	-30.111	.0000	.12946645
AGE65P	-2.138626182	.48636640E-01	-43.972	.0000	.14764066
CENDIV1	1.517376464	.86012014E-01	17.641	.0000	.68489228E-01
CENDIV2	1.135304033	.60931550E-01	18.632	.0000	.10325153
CENDIV3	1.677234726	.60700760E-01	27.631	.0000	.17152047
CENDIV4	1.149074776	.60800671E-01	18.899	.0000	.79900427E-01
CENDIV5	.8798029256	.56303236E-01	15.626	.0000	.98559281E-01
CENDIV6	.4652502100	.51264976E-01	9.075	.0000	.14598846
CENDIV8	.4233844889	.58094366E-01	7.288	.0000	.99220161E-01
CENDIV9	1.406022823	.61495408E-01	22.864	.0000	.11961933
CCOUNTY	.7497209598	.33672410E-01	22.265	.0000	.40329118
URBAN	.2807763483	.29963973E-01	9.370	.0000	.63915936
EDUCHS	.5737397778	.35865820E-01	15.997	.0000	.27891351
EDUCCOLL	.9639520979	.39057255E-01	24.680	.0000	.49054941
EDUCGRAD	1.098045717	.78405035E-01	14.005	.0000	.11316474
EDUCOTH	.7864098497	.13495492	5.827	.0000	.84592677E-02
INC50	.4523845121	.42092384E-01	10.747	.0000	.21681279
INC100	.4855441107	.55058331E-01	8.819	.0000	.20824338
INC100P	.9228057329	.90290662E-01	10.220	.0000	.70582015E-01
INCMISS	.1393044706	.36166031E-01	3.852	.0001	.37070979
WHITE	.3256008134	.13779340	2.363	.0181	.82878795
BLACK	-.9949293995	.13950741	-7.132	.0000	.74282945E-01
ASIAN	.5519011556	.15996431	3.450	.0006	.15883156E-01
HISPANIC	-.6232425690	.13988226	-4.455	.0000	.66925144E-01

Number of observations	45394
Iterations completed	35
Log likelihood function	-53278.09

Table A.23

Negative Binomial Equation for Snorkeling

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.376626863	.17630815	-24.824	.0000	
AGE25_34	-.5304785638	.15445391	-3.435	.0006	.17892232
AGE35_44	-.9067989096	.13109030	-6.917	.0000	.20890426
AGE45_54	-1.280660156	.16117494	-7.946	.0000	.19641362
AGE55_64	-1.854180852	.16487278	-11.246	.0000	.12946645
AGE65P	-3.380763011	.19406420	-17.421	.0000	.14764066
CENDIV1	.5388101588	.18433426	2.923	.0035	.68489228E-01
CENDIV3	1.558848316	.12577101	12.394	.0000	.17152047
CENDIV4	.6042599979	.20113804	3.004	.0027	.79900427E-01
CENDIV5	.8001826706	.13490534	5.931	.0000	.98559281E-01
CENDIV6	.9121728313	.15955754	5.717	.0000	.14598846
CENDIV8	.8459361151	.18108049	4.672	.0000	.99220161E-01
CENDIV9	1.892667677	.15259637	12.403	.0000	.11961933
CCOUNTY	1.196115041	.10265560	11.652	.0000	.40329118
EDUCHS	1.185884574	.14906852	7.955	.0000	.27891351
EDUCCOLL	1.464451390	.13959672	10.491	.0000	.49054941
EDUCGRAD	1.966317481	.22215750	8.851	.0000	.11316474
INC50	.9679953412	.14641811	6.611	.0000	.21681279
INC100	1.049209018	.14341771	7.316	.0000	.20824338
INC100P	1.686081446	.26159282	6.445	.0000	.70582015E-01
INCMISS	.6174530301	.11758484	5.251	.0000	.37070979
BLACK	-1.071022625	.15420242	-6.946	.0000	.74282945E-01
HISPANIC	-1.365939607	.12735621	-10.725	.0000	.66925144E-01
MALE	.2987809730	.86988131E-01	3.435	.0006	.43582852

Number of observations	45394
Iterations completed	31
Log likelihood function	-8903.897
Restricted log likelihood	-42886.12
Chi-squared	67964.45
Degrees of freedom	1
Significance level	.0000000

Table A.24

Negative Binomial Equation for Scuba Diving

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-3.768132367	.69787887	-5.399	.0000	
AGE35_44	-.6950416328	.22934745	-3.031	.0024	.20890426
AGE45_54	-1.128969396	.32275738	-3.498	.0005	.19641362
AGE55_64	-1.407282304	.31360495	-4.487	.0000	.12946645
AGE65P	-3.008161293	.42342749	-7.104	.0000	.14764066
CENDIV3	1.432139669	.26023493	5.503	.0000	.17152047
CENDIV5	1.183644055	.30373617	3.897	.0001	.98559281E-01
CENDIV8	1.586487942	.37384394	4.244	.0000	.99220161E-01
CENDIV9	1.690926196	.40651708	4.160	.0000	.11961933
CCOUNTY	1.052188827	.23983278	4.387	.0000	.40329118
URBAN	.5795199616	.21314692	2.719	.0066	.63915936
EDUCCOLL	.9744015129	.19863211	4.906	.0000	.49054941
EDUCGRAD	1.224326714	.39630776	3.089	.0020	.11316474
INC100P	1.080493681	.51206035	2.110	.0349	.70582015E-01
WHITE	-1.737842881	.67309319	-2.582	.0098	.82878795
BLACK	-3.188730939	.70414403	-4.529	.0000	.74282945E-01
ASIAN	-2.559134729	.89107462	-2.872	.0041	.15883156E-01
HISPANIC	-3.587644626	.75850563	-4.730	.0000	.66925144E-01
MALE	1.375605487	.20614300	6.673	.0000	.43582852

Number of observations	45394
Iterations completed	26
Log likelihood function	-2926.724
Restricted log likelihood	-13359.87
Chi-squared	20866.29
Degrees of freedom	1
Significance level	.0000000

Table A.25

Negative Binomial Equation for Surfing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.907903631	.32139977	-15.270	.0000	
AGE25_34	-1.024449932	.25700037	-3.986	.0001	.17892232
AGE35_44	-2.305462188	.23424360	-9.842	.0000	.20890426
AGE45_54	-2.771432223	.26034561	-10.645	.0000	.19641362
AGE55_64	-4.045436402	.37343855	-10.833	.0000	.12946645
AGE65P	-5.194774770	.33721617	-15.405	.0000	.14764066
CENDIV3	1.235618043	.18925925	6.529	.0000	.17152047
CENDIV5	.6331771711	.24033590	2.635	.0084	.98559281E-01
CENDIV8	1.848188575	.22911346	8.067	.0000	.99220161E-01
CENDIV9	2.398951280	.18792463	12.765	.0000	.11961933
CCOUNTY	1.668722769	.13945298	11.966	.0000	.40329118
EDUCCOLL	1.022673402	.17793111	5.748	.0000	.49054941
EDUCGRAD	1.408314780	.32711413	4.305	.0000	.11316474
EDUCOTH	3.008590067	1.0202303	2.949	.0032	.84592677E-02
INC50	1.432615856	.28368538	5.050	.0000	.21681279
INC100	1.205802906	.26699866	4.516	.0000	.20824338
INC100P	2.223716552	.38490357	5.777	.0000	.70582015E-01
INCMISS	1.322265577	.25740294	5.137	.0000	.37070979
BLACK	-2.672779324	.24867266	-10.748	.0000	.74282945E-01
MALE	1.505265629	.13894331	10.834	.0000	.43582852

Number of observations	45394
Iterations completed	28
Log likelihood function	-5023.696
Restricted log likelihood	-53799.12
Chi-squared	97550.86
Degrees of freedom	1
Significance level	.0000000

Table A.26

Negative Binomial Equation for Wind Surfing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-4.327956459	.14281633	-30.304	.0000	
AGE55_64	-1.442509622	.28425765	-5.075	.0000	.12946930
AGE65P	-3.754023298	1.5402506	-2.437	.0148	.14764391
INC100P	3.141711871	1.4467169	2.172	.0299	.70583570E-01

Number of observations	45393
Iterations completed	11
Log likelihood function	-1102.680
Restricted log likelihood	-3914.158
Chi-squared	5622.957
Degrees of freedom	1
Significance level	.0000000

Table A.27

Negative Binomial Equation for Fishing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-2.761734846	.14092449	-19.597	.0000	
AGE35_44	-.2256639404	.64485968E-01	-3.499	.0005	.20890426
AGE45_54	-.4384958066	.72364269E-01	-6.060	.0000	.19641362
AGE55_64	-.4103611324	.77478667E-01	-5.296	.0000	.12946645
AGE65P	-.8773511945	.58787421E-01	-14.924	.0000	.14764066
CENDIV1	1.442694281	.12689094	11.370	.0000	.68489228E-01
CENDIV2	1.353988498	.95009055E-01	14.251	.0000	.10325153
CENDIV3	2.134856505	.92688925E-01	23.032	.0000	.17152047
CENDIV4	1.416868183	.93914953E-01	15.087	.0000	.79900427E-01
CENDIV5	1.835151618	.10008543	18.336	.0000	.98559281E-01
CENDIV6	.3206730162	.77869228E-01	4.118	.0000	.14598846
CENDIV8	.9352213414	.10317992	9.064	.0000	.99220161E-01
CENDIV9	1.663419054	.79899919E-01	20.819	.0000	.11961933
CCOUNTY	1.373425695	.50541981E-01	27.174	.0000	.40329118
EDUCHS	.6002685272	.58965376E-01	10.180	.0000	.27891351
EDUCCOLL	.4819145624	.62180245E-01	7.750	.0000	.49054941
EDUCGRAD	.3138254108	.86492665E-01	3.628	.0003	.11316474
EDUCOTH	1.786261783	.15345711	11.640	.0000	.84592677E-02
INC50	.3745793884	.57146155E-01	6.555	.0000	.21681279
INC100	.3111976679	.69786856E-01	4.459	.0000	.20824338
INC100P	.8182277368	.81815358E-01	10.001	.0000	.70582015E-01
WHITE	-.6650208319	.11097144	-5.993	.0000	.82878795
BLACK	-1.049296399	.12737884	-8.238	.0000	.74282945E-01
HISPANIC	-1.388817954	.14087465	-9.859	.0000	.66925144E-01
MALE	1.280253609	.48569045E-01	26.359	.0000	.43582852

Number of observations	45394
Iterations completed	32
Log likelihood function	-24769.77
Restricted log likelihood	-139246.3
Chi-squared	228953.1
Degrees of freedom	1
Significance level	.0000000

Table A.28

Negative Binomial Equation for Motorboating

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-2.752884232	.26947401	-10.216	.0000	
AGE25_34	-.4926416886	.10388281	-4.742	.0000	.17892232
AGE35_44	-.8479452133	.11602731	-7.308	.0000	.20890426
AGE45_54	-.7781895750	.11918032	-6.530	.0000	.19641362
AGE55_64	-.9443712224	.12296878	-7.680	.0000	.12946645
AGE65P	-1.483917400	.11687680	-12.696	.0000	.14764066
CENDIV1	1.247738527	.12895898	9.675	.0000	.68489228E-01
CENDIV2	.7304969252	.11902126	6.138	.0000	.10325153
CENDIV3	1.674441212	.90477980E-01	18.507	.0000	.17152047
CENDIV4	.7086346175	.12101794	5.856	.0000	.79900427E-01
CENDIV5	1.321067419	.10814698	12.215	.0000	.98559281E-01
CENDIV8	.6848836233	.92379941E-01	7.414	.0000	.99220161E-01
CENDIV9	1.265044413	.80573612E-01	15.700	.0000	.11961933
CCOUNTY	1.455467788	.67750109E-01	21.483	.0000	.40329118
EDUCHS	.6790612222	.88873602E-01	7.641	.0000	.27891351
EDUCCOLL	1.160646619	.88907316E-01	13.055	.0000	.49054941
EDUCGRAD	1.237333561	.13186816	9.383	.0000	.11316474
INC50	.7444926885	.97236706E-01	7.656	.0000	.21681279
INC100	.6582046507	.85640944E-01	7.686	.0000	.20824338
INC100P	1.354292216	.16060642	8.432	.0000	.70582015E-01
INCMISS	.3576160395	.71803826E-01	4.980	.0000	.37070979
WHITE	-.5875370006	.26494467	-2.218	.0266	.82878795
BLACK	-2.342456764	.28118612	-8.331	.0000	.74282945E-01
ASIAN	-2.418838326	.32475836	-7.448	.0000	.15883156E-01
HISPANIC	-1.916648324	.27600118	-6.944	.0000	.66925144E-01
MALE	.9606309034	.60676836E-01	15.832	.0000	.43582852

Number of observations	45394
Iterations completed	33
Log likelihood function	-17047.34
Restricted log likelihood	-100515.8
Chi-squared	166937.0

Table A.29

Negative Binomial Equation for Sailing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.381719814	.20579863	-26.150	.0000	
AGE25_34	-1.644985641	.18117454	-9.080	.0000	.17892232
AGE35_44	-.8491815610	.15560709	-5.457	.0000	.20890426
AGE45_54	-1.431015082	.18208930	-7.859	.0000	.19641362
AGE55_64	-.9689921271	.19064272	-5.083	.0000	.12946645
AGE65P	-1.656380980	.19603671	-8.449	.0000	.14764066
CENDIV1	2.263885019	.18010718	12.570	.0000	.68489228E-01
CENDIV2	.8427028801	.20530583	4.105	.0000	.10325153
CENDIV3	1.055705237	.17522775	6.025	.0000	.17152047
CENDIV4	.7498352842	.18538978	4.045	.0001	.79900427E-01
CENDIV5	.3888693042	.14894541	2.611	.0090	.98559281E-01
CENDIV9	1.439281359	.16613357	8.663	.0000	.11961933
CCOUNTY	1.077390139	.11962658	9.006	.0000	.40329118
URBAN	.5150151733	.11096171	4.641	.0000	.63915936
EDUCHS	1.015477432	.18369659	5.528	.0000	.27891351
EDUCCOLL	2.037054555	.17471683	11.659	.0000	.49054941
EDUCGRAD	2.445882010	.26265495	9.312	.0000	.11316474
INC50	.9669724157	.15597492	6.200	.0000	.21681279
INC100	.7349672370	.17868500	4.113	.0000	.20824338
INC100P	2.050875896	.27500974	7.457	.0000	.70582015E-01
INCMISS	.6307000747	.15492506	4.071	.0000	.37070979

Number of observations	45394
Iterations completed	28
Log likelihood function	-6939.522
Restricted log likelihood	-31401.19
Chi-squared	48923.34
Degrees of freedom	1
Significance level	.0000000

Table A.30

Negative Binomial Equation for Personal Watercraft Use

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-3.387918331	.20266130	-16.717	.0000	
AGE25_34	-1.334842805	.22335387	-5.976	.0000	.17892232
AGE35_44	-1.587842260	.21999829	-7.218	.0000	.20890426
AGE45_54	-2.467348054	.22871667	-10.788	.0000	.19641362
AGE55_64	-2.198604321	.26441411	-8.315	.0000	.12946645
AGE65P	-3.954867631	.27957477	-14.146	.0000	.14764066
CENDIV3	1.585712111	.13804082	11.487	.0000	.17152047
CENDIV4	.7300184460	.24144125	3.024	.0025	.79900427E-01
CCOUNTY	1.617125581	.12915169	12.521	.0000	.40329118
URBAN	.3209887787	.10824869	2.965	.0030	.63915936
EDUCHS	.6300212550	.20225195	3.115	.0018	.27891351
EDUCCOLL	1.087059884	.19255035	5.646	.0000	.49054941
EDUCGRAD	1.262401212	.22849584	5.525	.0000	.11316474
INC50	-.3761210235	.15427793	-2.438	.0148	.21681279
INCMISS	-.3140024094	.12333618	-2.546	.0109	.37070979
MALE	.7876827514	.12281685	6.413	.0000	.43582852

Number of observations	45394
Iterations completed	23
Log likelihood function	-5959.860
Restricted log likelihood	-27465.42
Chi-squared	43011.12
Degrees of freedom	1
Significance level	.0000000

Table A.31

Negative Binomial Equation for Water Skiing

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-3.253661432	.25157740	-12.933	.0000	
AGE25_34	-.6827586873	.33837200	-2.018	.0436	.17892232
AGE35_44	-1.187305292	.28400794	-4.181	.0000	.20890426
AGE45_54	-1.388104672	.28320704	-4.901	.0000	.19641362
AGE55_64	-3.857711855	.38911905	-9.914	.0000	.12946645
AGE65P	-4.182235319	1.5660018	-2.671	.0076	.14764066
CENDIV6	-2.052900406	.20217272	-10.154	.0000	.14598846
CCOUNTY	1.709565572	.18682988	9.150	.0000	.40329118
INC50	.6067024859	.17133957	3.541	.0004	.21681279
INC100P	4.063528621	1.5544763	2.614	.0089	.70582015E-01
MALE	.5604687398	.20654517	2.714	.0067	.43582852

Number of observations	45394
Iterations completed	20
Log likelihood function	-3241.572
Restricted log likelihood	-20894.17
Chi-squared	35305.19
Degrees of freedom	1
Significance level	.0000000

Table A.32

Negative Binomial Equation for Viewing or Photographing Scenery

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-1.310123951	.43003737	-3.047	.0023	
AGE25_34	-.5481008993	.12056003	-4.546	.0000	.17892232
AGE45_54	.3114737516	.10479110	2.972	.0030	.19641362
AGE65P	-.3264342307	.10160782	-3.213	.0013	.14764066
CENDIV1	2.275920018	.24513871	9.284	.0000	.68489228E-01
CENDIV2	1.643444716	.16905422	9.721	.0000	.10325153
CENDIV3	2.311708702	.16803479	13.757	.0000	.17152047
CENDIV4	1.689528340	.16851097	10.026	.0000	.79900427E-01
CENDIV5	2.007199919	.16418109	12.226	.0000	.98559281E-01
CENDIV6	.6485367243	.14159017	4.580	.0000	.14598846
CENDIV8	.5695236751	.16037233	3.551	.0004	.99220161E-01
CENDIV9	2.648831365	.18023806	14.696	.0000	.11961933
CCOUNTY	.8735844284	.93724245E-01	9.321	.0000	.40329118
EDUCHS	.7804907926	.91114497E-01	8.566	.0000	.27891351
EDUCCOLL	1.307593249	.84613843E-01	15.454	.0000	.49054941
EDUCGRAD	1.596077226	.24280908	6.573	.0000	.11316474
INCMISS	-.5352951234	.77729316E-01	-6.887	.0000	.37070979
WHITE	-.9056053936	.41215882	-2.197	.0280	.82878795
BLACK	-1.252674588	.42051613	-2.979	.0029	.74282945E-01
ASIAN	-1.486900121	.48762106	-3.049	.0023	.15883156E-01
HISPANIC	-1.088584063	.41373248	-2.631	.0085	.66925144E-01

Number of observations	45394
Iterations completed	27
Log likelihood function	-23949.46
Restricted log likelihood	-355108.1
Chi-squared	662317.4
Degrees of freedom	1
Significance level	.0000000

Table A.33

Negative Binomial Equation for Hunting Waterfowl

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-5.383881055	.20350764	-26.455	.0000	
MALE	2.224554207	.43599886	5.102	.0000	.43582852

Number of observations	45394
Iterations completed	2
Log likelihood function	-1127.470
Restricted log likelihood	-6480.412
Chi-squared	10705.88
Degrees of freedom	1
Significance level	.0000000

Table A.34

Negative Binomial Equation for Bird Watching

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-2.551410454	.10602714	-24.064	.0000	
AGE25_34	-.5001821609	.97490517E-01	-5.131	.0000	.17892232
AGE45_54	.5236143003	.10375793	5.046	.0000	.19641362
AGE55_64	.4687678577	.10975523	4.271	.0000	.12946645
CENDIV1	1.803980692	.23681548	7.618	.0000	.68489228E-01
CENDIV2	1.187191940	.12986502	9.142	.0000	.10325153
CENDIV3	1.950440133	.11531996	16.913	.0000	.17152047
CENDIV4	1.478769871	.15855747	9.326	.0000	.79900427E-01
CENDIV5	.9513174389	.10547710	9.019	.0000	.98559281E-01
CENDIV8	-.3086446745	.12466146	-2.476	.0133	.99220161E-01
CENDIV9	2.476664941	.14113738	17.548	.0000	.11961933
CCOUNTY	1.092619149	.83232360E-01	13.127	.0000	.40329118
EDUCHS	1.148074057	.10104535	11.362	.0000	.27891351
EDUCCOLL	1.668654079	.96564654E-01	17.280	.0000	.49054941
EDUCGRAD	2.021599516	.19253418	10.500	.0000	.11316474
EDUCOTH	2.507303331	.36208713	6.925	.0000	.84592677E-02
BLACK	-.9172426481	.11613561	-7.898	.0000	.74282945E-01
ASIAN	-1.500226097	.23348511	-6.425	.0000	.15883156E-01
HISPANIC	-1.355563477	.12219856	-11.093	.0000	.66925144E-01
MALE	-.4142784586	.77430873E-01	-5.350	.0000	.43582852

Number of observations	45394
Iterations completed	26
Log likelihood function	-19374.24
Restricted log likelihood	-275308.5
Chi-squared	511868.5
Degrees of freedom	1
Significance level	.0000000

Table A.35

Negative Binomial Equation for Viewing Other Wildlife

Variable(x)	Coefficient(β)	Standard Error(β)	T-value (β)	Prob. T-value	Mean of x
Constant	-1.962380061	.13956989	-14.060	.0000	
AGE25_34	-1.261580346	.16633366	-7.585	.0000	.17892232
AGE35_44	-.9308122231	.14898789	-6.248	.0000	.20890426
AGE45_54	-1.086931305	.17118164	-6.350	.0000	.19641362
AGE55_64	-1.342741960	.16559946	-8.108	.0000	.12946645
AGE65P	-1.510223388	.16696221	-9.045	.0000	.14764066
CENDIV1	1.481370876	.18740414	7.905	.0000	.68489228E-01
CENDIV2	1.393390053	.15446302	9.021	.0000	.10325153
CENDIV3	1.736846946	.13641143	12.732	.0000	.17152047
CENDIV4	1.929518177	.19268678	10.014	.0000	.79900427E-01
CENDIV5	1.066664303	.14542968	7.335	.0000	.98559281E-01
CENDIV9	2.128731762	.17763211	11.984	.0000	.11961933
CCOUNTY	.5885457464	.99324792E-01	5.925	.0000	.40329118
URBAN	-.2638485286	.98302892E-01	-2.684	.0073	.63915936
EDUCHS	1.479156683	.12421942	11.908	.0000	.27891351
EDUCCOLL	2.013474849	.12053187	16.705	.0000	.49054941
EDUCGRAD	2.365457724	.21424314	11.041	.0000	.11316474
EDUCOTH	.9963278633	.48041903	2.074	.0381	.84592677E-02
INC50	.1599405892	.10544068	1.517	.1293	.21681279
BLACK	-.7092690541	.15065236	-4.708	.0000	.74282945E-01
ASIAN	-1.780240714	.24113011	-7.383	.0000	.15883156E-01
HISPANIC	-1.390618910	.13165426	-10.563	.0000	.66925144E-01
MALE	.4210754076	.82716661E-01	5.091	.0000	.43582852

Number of observations	45394
Iterations completed	31
Log likelihood function	-17378.07
Restricted log likelihood	-195641.4
Chi-squared	356526.6
Degrees of freedom	1
Significance level	.0000000

I. Explanation of Calculations: Participation Estimation

We begin with the following model:

$$\ln[P_i / (1- P_i)] = \alpha + b_1x_1 + b_2x_2 + \ldots + b_kx_k \qquad \textbf{(Eq. 1)}$$

P_i = probability that an individual will participate in a given coastal activity

α = model constant

x_i's = variables for socioeconomic attributes (age, race, sex, income, etc.; constant across activities)

β_j's = coefficients for the socioeconomic variables (different for each activity)

The model is the logit model and estimates the natural logarithm (log to the base e) of the odds ratio $[P_i / (1- P_i)]$ of participation in each activity/setting as a function of various socioeconomic variables. To get an estimate of the probability of participation in a given activity/setting, we have to solve Eq. 1 for P_i. Eq. 2 below is used to derive P_i.

$$P_i = 1 / (1 + \exp(-\alpha - \Sigma\, b_jx_j) \qquad \textbf{(Eq. 2)}$$

In order to use this model for forecasting, we need projections of the values of the x_i's. We obtained projected growth rates for these variables from a dataset purchased from Woods and Poole. We projected values for the x_i's by applying these growth rates to our sample means; however, we run into two problems, one on the right hand side, and one on the left hand side.

1. On the right hand side, the x_i's taken from the Woods and Poole data set are for the entire US population and are therefore not relevant to our sample, the non-institutionalized population age 16 years old and older. We normalize these estimates so that they are on a scale consistent with our sample. To do so we develop a set of multiplicative correction factors to equate the Poole numbers with our sample means.
2. On the left hand side, the probability of participation estimated by the model for the baseline year 2000 differs from the estimated baseline probabilities as found in Leeworthy (2001), even with the normalized x_i's. In order to resolve this problem, we adjust the constant α so that the estimated probabilities are equal to those reported in Leeworthy (2001). In this way the model is calibrated to forecast perfectly in the baseline year. Future forecasts of the probabilities of participation in each recreation activity/setting are then based on future changes in the socioeconomic variables.

The normalization of the right hand side variables and the forecasts of participation are contained in the Excel workbook "NSRE 2000 Participation.xls". The normalization of the right hand side variables is found in spreadsheets *Normalization*, *Inc Normalization* and *Race Normalization*. There are 19 spreadsheets, one for each activity/setting, which contain the forecasts of participation. A more detailed description of the normalization process and an example of the forecasting calculations for one activity/setting (visiting beaches) are provided below. The normalization and estimation processes are repeated for days of participation in the Excel workbook "NSRE 2000 Days.xls".

II. Example Calculations: Participation Estimation

The letters and formulae in this document relate to various worksheets in the Excel workbook "NSRE 2000 Participation.xls." Letters in ( ) represent spreadsheet columns.

A. Normalizing Data

1) The first step is to derive estimates of the growth rates of the right hand side variables. This is done in the *Poole Projections* spreadsheet. First, estimates of the explanatory socioeconomic variables for 2000, 2005 and 2010 are in columns B, C and D, respectively. The growth rate in column E is simply the 2005 value over the 2000 value (E = C / B), and that in column F is 2010 over 2000 (F = D / B).

2) Most of the right hand side variables are normalized in a two-step process in the *Normalization* spreadsheet. These calculations are described here. The exceptions are treated below.

   a) We start in column B with the Poole numbers for 2000. These represent the entire US population, so they must be normalized to the NSRE sample, which is weighted to the civilian noninstitutionalized population 16 years old and older.

   b) Using Correction Factor 1 (D) the Poole data is normalized to the Census 2000 (C) data for the population aged 16 years old or older. (D = C / B)

   c) Using Correction Factor 2 (F) the Census data (C) is normalized to our sample means (E). (F = E / C)

   d) The calculation is checked using the Poole to Sample column (G), which should equal the sample means column (E). (G = (B * D) * F)

   e) For the variables *ccounty* and *urban*, estimates for the civilian noninstitutionalized population 16 years old and older were not available. So a one-step normalization from Poole (B) directly to our sample means (E) was conducted. In this case, only the Correction Factor 2 (F = E / B) is used.

3) There are separate normalization worksheets for variables related to income and race/ethnicity, as the Poole and Census data did not map perfectly onto our data, and appropriate adjustments had to be made.

   a) For income (*Inc Normalization* spreadsheet), Correction Factor 1 (D = C / B) is first used to normalize Poole (B) to Census (C). Next, the Census (C) distribution is normalized to our sample data (E), which has a missing category for income, whereas the Census data does not. In the Census Converted for IncMiss column (F) this problem is corrected. The relative shares of the income groups are preserved, but a new group for income missing is created, which has the same share of the population as it does in the sample data (E). ($F_k = C_k$ * SUM (E2:E5)). After this, the Correction Factor 2 (G = F / E) is applied, and the results are checked against the Poole to Sample column ($H_k = (B_k * D_k)$ * SUM (E2:E5) * G_k).

   b) For race, the Census data has two categories that are not present in either the Poole data or the NSRE sample (Other, not Hispanic & 2 or more races, not Hispanic). These categories are dropped, which make up only a small percentage of the population (<1.5%). The remaining categories are adjusted so that they add up to 100% i.e., keeping their relative shares constant ($D_k = C_k$ / SUM(C2:C6)). Poole data (B) is then normalized to the adjusted Census data (D) using Correction Factor 1 (E = D / B). The Census data (D) is then normalized to our sample means (F) using Correction Factor 2 (G = F / D), and the results are checked with the Poole to Sample column (H = (B * E) * G).

4) Once all the right hand side variables in the baseline year were normalized, the same normalization procedures were applied to these variables (factors) for the forecast years. This was carried out in the *Normalization* spreadsheet for all variables except education, for which projections from Poole were not available. Education level was held constant in the forecast period. NSRE sample means (E) are multiplied by the 2000-2005 growth rates from the *Poole Projections* spreadsheet (H) to get 2005 projections (I = E * H). To get 2010 projections (K) we multiply the NSRE sample means (E) by the 2005-2010 growth rate (K = E * H).

5) The 2005 and 2010 projections (I, L) add up to slightly more than 100% for several categories of our socioeconomic variables (age, Census division, income, race). This is because the growth rates we apply come from the Poole numbers, which are slightly different from our sample means. In order to resolve this, we adjust these numbers so that they total 100%, keeping their relative shares constant. The detailed formulas are provided below.

   a) Age (rows 2-7):

   Adjusted 2005 Projections: $J_k = I_k$ / SUM(I2:I7); $k \in [2,7]$

   Adjusted 2010 Projections: $M_k = L_k$ / SUM(L2:L7); $k \in [2,7]$

   b) Census Division (rows 8-16)

   Adjusted 2005 Projections: $J_k = I_k$ / SUM(I8:I16); $k \in [8,16]$

   Adjusted 2010 Projections: $M_k = L_k$ / SUM(L8:L16); $k \in [8,16]$

   c) Race (rows 29-33)

   Adjusted 2005 Projections: $J_k = I_k$ / SUM(I29:I33); $k \in [29,33]$

   Adjusted 2010 Projections: $M_k = L_k$ / SUM(L29:L33); $k \in [29,33]$

   d) Income (rows 24-28)

   Because we assume that the share of missing income responses will remain the same over time, the calculations for income are more complicated. Instead of adjusting the parameters on the income groups so that their sum equals 100%, we must adjust so that the sum equals 100% minus the missing share.

   Adjusted 2005 Projections: $J_k = I_k$ / (SUM(I24:I27)/(1-I28)); $k \in [24,28]$

   Adjusted 2010 Projections: $M_k = L_k$ / (SUM(L24:L27)/(1-L28)); $k \in [24,28]$

4) Forecasts of the civilian non-institutionalized population 16 years old and older are derived using the growth rate of the general population 16 years old and older from the Census.

B. Forecasting Participation (example for Visiting Beaches)

1) From the normalization and projection process we have sample means for 2000 (C) and projections of sample means for the years 2005 (H) and 2010 (N). We also have coefficients from our estimated model (B,G,M), which remain constant across the baseline and forecast years.

2) We multiply the means by the coefficients to get the βx_i's (D = B * C) for the baseline year) and (2005: I = G * H ; 2010: O = M * N) for the forecast years.

3) We then sum the βx_i's to derive the estimate of the log of the odds ratio (sum of column D for the base year, column I for 2005 and column O for 2010). Eq. 2 is then used to solve for the estimated participation rate. For the base year 2000, this yields the field 'Predicted Participation' (D37 = 1/(1+EXP(-(B2+SUM(D3:D35)))). 'Predicted Participation' ≈ 0.218. This differs significantly from the probability from our sample, 'Estimated Participation' = 0.3003 (D40). We therefore adjust the constant, in this case increasing α from –2.66 to –2.23. The new constant '*Adj Constant*' (D2), when plugged into Eq. 2 gives us 'Adjusted Participation' (D39), which is virtually equal to 'Observed Participation' (D40). The number of participants reported in the baseline year (D41) is equal to the "Observed Participation" (D40) multiplied by the estimated civilian noninstitutionalized population 16 years old and older (*Normalization* spreadsheet; C38).

4) For the forecast years, the model, with the adjusted constant α, is used with the forecasted right hand side variable means to estimate the probability of participation. The estimate of the number of participants is the 'Adjusted Participation' (2005:I39, 2010:O39) times the appropriate estimate of the sample population (*Normalization* spreadsheet; 2005:I38, 2010:L38).

5) We also derive the marginal effects on the probability of participation of an incremental change in each of our explanatory variables. For each variable we examine the marginal effect resulting from the forecasted change in that variable both for the period 2000-2005 and for the period 2000-2010. All other variables remain at the 2000 means. The formulas are as follows:

   '00-'05: J_k =((1/(1+EXP(-(D2+SUM(D3:D35)-D_k+I_k))))-D39); $k \in [3,35]$

   '00-'10: P_k =((1/(1+EXP(-(D2+SUM(D3:D35)-D_k+O_k))))-D39); $k \in [3,35]$

III. Explanation of Calculations: Days Estimation

We begin with the following model:

$$\ln[Y_i] = \alpha + b_1x_1 + b_2x_2 + \ldots + b_kx_k + \varepsilon \qquad \textbf{(Eq. 3)}$$

Y= number of days of participation per person in the sample population

α = model constant

x_i's = variables for socioeconomic attributes (age, race, sex, income, etc.; constant across activities)

β_j's = coefficients for the socioeconomic variables (different for each activity)

ε = additional error term of Negative Binomial Model due to inequality of mean and variance

The model is the negative binomial model, which is a count data model that treats days as integer values (1, 2, 3…). The negative binomial model estimates the natural logarithm (log to the base e) of the days of participation (Y) in each activity/setting as a function of various socioeconomic variables. To get an estimate of the days of participation in a given activity/setting, we have to solve Eq. 3 for Y. Eq. 4 below is used to derive Y.

$$Y_i = \exp(\alpha + \Sigma\, b_jx_j) \qquad \textbf{(Eq. 4)}$$

Here we are estimating the days of participation in a given activity/setting per person in the sample population. In order to obtain the total number of days of participation, we multiply the days of participation per person (Y) by the population.

In our estimation of days of participation, we run into the same right and left hand side problems that we saw when estimating participation rates, and we resolve these two problems in the same fashion. Namely, we normalize the estimates of our x_i's and we adjust our constant α so that our model predicts perfectly in the baseline year. Initially, the constants were adjusted so that the mean days of participation per person predicted by the model in the baseline year was in line with the sample mean. However, the estimates of total days of participation stemming form these adjustments were far below the estimates derived from the results of Leeworthy and Wiley (2001). As a result, the constants were readjusted so that the predicted mean days of participation were very close to those derived Leeworthy and Wiley (2001). The values for observed mean days of participation per person were calculated in the *Days per Person* spreadsheet. See the explanation of participation rate calculations above for a more detailed description of the normalization process.

The calculations explained above may be found in the Excel workbook "NSRE 2000 Days.xls".

IV. Example Calculations: Days Estimation

The letters and formulae in this document relate to various worksheets in the Excel workbook "NSRE 2000 Days.xls." Letters in ( ) represent spreadsheet columns.

A. Normalizing Data

The normalization process for days is identical to that for participation rate. Please see the above description for more detail.

B. Forecasting Days (example for Visiting Beaches)

1) From the normalization and projection process we have sample means for 2000 (C) and projections of sample means for the years 2005 (H) and 2010 (N). We also have coefficients from our estimated model (B,G,M), which remain constant across the baseline and forecast years.

2) We multiply the means by the coefficients to get the βx_i's (D = B * C) for the baseline year) and (2005: I = G * H ; 2010: O = M * N) for the forecast years.

3) We then sum the βx_i's to derive the estimate of the days of participation (sum of column D for the base year, column I for 2005 and column O for 2010). Eq. 4 is then used to solve for the estimated participation rate. For the base year 2000, this yields the field 'Predicted Days per Person' (D37 = EXP(B2+SUM(D3:D35)). 'Predicted Days per Person' ≈ 2.05. This differs significantly from the value of mean days of participation derived from Leeworthy and Wiley (2001), 'Observed Days per Person' ≈ 3.34 (D40). We therefore adjust the constant, in this case increasing α from –1.47 to –0.98. The new constant '*Adj Constant*' (D2), when plugged into Eq. 4 gives us 'Adjusted Days per Person' (D39), which is virtually equal to 'Observed Days per Person' (D40). The target value of mean days per person is derived in the *Days per Person* worksheet by dividing our estimate of total days of participation by the number of participants. Essentially, we multiply our estimated number of participants for 2000 by the mean days per participant found in Leeworthy and Wiley (2001) and divide by the sample population (*Days per Person* worksheet; $B_k = (C_k * D_k) / B_{22}$). The total days of participation for the baseline year (D41) is equal to the "Observed Days per Person" (D40) multiplied by the estimated civilian noninstitutionalized population 16 years old and older (*Normalization* spreadsheet; C38). This value of total days is equal to that found in Column E of the *Days per Person* Worksheet.

4) For the forecast years, the model, with the adjusted constant α, is used with the forecasted right hand side variable means to estimate the probability of participation. The estimate of the number of participants is the 'Adjusted Days per Person' (2005:I39, 2010:O39) times the appropriate estimate of the sample population (*Normalization* spreadsheet; 2005:I38, 2010:L38).

5) We also derive the marginal effects on the per capita days of participation of an incremental change in each of our explanatory variables. For each variable we examine the marginal effect resulting from the forecasted change in that variable both for the period 2000-2005 and for the period 2000-2010. All other variables remain at the 2000 means. The formulas are as follows:

‘00-‘05: J_k =EXP(SUM(D2:D35)-D_k+I_k))-D39; $k \in [3,35]$

‘00-‘10: P_k =EXP(SUM(D2:D35)-D_k+O_k))-D39; $k \in [3,35]$

V. Column Explanations: Participation and Days Forecast Spread Sheets

(Excel Workbooks NSRE 2000 Participation.xls and NSRE 2000 Days.xls)

The following Worksheets and Columns are identical for the Participation and Days Workbooks:

Poole Projections Worksheet

-contains parameters from Woods & Poole for 2000, 2005 and 2010 (B,C,D)

-derives growth rates for 2000-2005 and 2000-2010 from parameters (E,F)

Normalization Worksheet

Poole 2000 (B)	Parameters from Woods and Poole dataset. Percent distributions for each socio-economic variable for the entire population in 2000.
Census 2000 16+ (C)	Parameters from Census 2000 for the population aged 16+. Percent distributions for each socioeconomic variable for the entire population 16 years old and older.
Correction Factor 1 (D)	= **Census 2000 16+ / Poole 2000**; normalizes Poole to Census.
Sample Means (E)	Observed sample means from NSRE weighted to the Census's civilian noninstitutionalized population 16 years old and older.
Correction Factor 2 (F)	=**Sample Means / Census 2000 16+** (except for 1-step normalization) normalizes Census entire population 16 years old and older to the NSRE sample weighted to the Census's civilian noninstitutionalized population 16 years old and older.
Poole to Sample (G)	Intended to verify calculations; should = **Sample Means.**
2000-2005 Growth (H)	Growth rate from *Poole Projections* worksheet.
2005 Projections (I)	Application of **2000-2005 Growth** to **Sample Means.**
Adj. 2005 Projections (J)	**2005 Projections** adjusted so that sum for entire population equals 100%.
2010 Growth (K)	Growth rate from *Poole Projections* worksheet.
2010 Projections (L)	Application of **2000-2010 Growth** to **Sample Means.**
Adj. 2010 Projections (M)	**2010 Projections** adjusted so that sum for entire population equals 100%.

Inc Normalization Worksheet

-accounts for absence of income missing category in Poole and Census data

-otherwise very similar to *Normalization* Worksheet

Census Converted for IncMiss (F) For the Income variable, converts census parameters to account for missing values, keeping the relative shares between groups constant.

Race Normalization Worksheet

-accounts for differences in race categories between census and sample data

-otherwise very similar to *Normalization* Worksheet

Adjust Census to 100% (D) Eliminates 2 categories (other, not Hispanic and 2 or more races, not Hispanic) from the census data, as there were no matching categories in the sample data. Relative shares again stay constant.

The following Worksheet and Column descriptions apply solely to the Participation Workbook:

Individual Activity Worksheets

-1 for each of 19 coastal recreation activities

Coeff (B,G,M) These are the coefficients from our LIMDEP estimation. The same coefficients are used in each year.

Mean (C,H,N) These are the normalized and projected means from the *Normalization* Worksheet. Observed values are used in 2000, projected values in 2005 and 2010.

Beta*X (D,I,O) This is simply the product of the coefficients and the means, which summed equal the estimated natural logarithm of the odds ratio.

Predicted Participation (D37) The predicted participation rate for an activity/setting using the estimated logit equations and sample means for the explanatory variables in the base year 2000.

Adj Constant (D2, I2, O2) The logit equation constant is adjusted so that the equations perfectly predict participation rates for base year 2000. Forecasts for years 2005 and 2010 are then based on marginal changes in explanatory variables from base year 2000.

Adjusted Participation (D39, I39, O39) The predicted participation rates for each activity/setting derived using the estimated logit equations and the sample and projected means of the explanatory variables, and using the adjusted constant to equilibrate the predicted participation rate and the observed participation rate in the base year 2000. Forecasts of participation rates are then based on marginal changes in explanatory variables from the base year.

Observed Participation (D40) — The estimated participation rates in each activity/setting based on the NSRE 2000 data and as found in Leeworthy (2001) and Leeworthy and Wiley (2001).

Marginal Effects (J,P) — This is a calculation of the change in the probability of participation resulting from a forecasted incremental change in one explanatory variable, all other variables being held constant at the 2000 mean.

Participants (D39, I39, O39) — The number of estimated participants in each activity/setting for years 2000, 2005 and 2010. Estimated participants are equal to the estimated participation rates multiplied by the forecastedcivilian noninstitutionalized population 16 years old and older.

Final Projections Worksheet

-Reports the results from the individual activity worksheets

The following Worksheet and Column descriptions apply solely to the Days Workbook:

Individual Activity Worksheets

-1 for each of 19 coastal recreation activities

Coeff (B,G,M) — These are the coefficients from our LIMDEP estimation. The same coefficients are used in each year.

Mean (C,H,N) — These are the normalized and projected means from the *Normalization* Worksheet. Observed values are used in 2000, projected values in 2005 and 2010.

Beta*X (D,I,O) — This is simply the product of the coefficients and the means, which summed equal the estimated natural logarithm of the odds ratio.

Predicted Days per Person (D37) — The predicted days of participation per person for and activity/setting using the estimated negative binomial equations and sample means for the explanatory variables in the base year 2000.

Adj Constant (D2, I2, O2) — The negative binomial equation constant is adjusted so that the equations perfectly predict 2000 days per person for base year 2000. Forecasts for years 2005 and 2010 are then based on marginal changes in explanatory variables from base year 2000.

Adjusted Days per Person (D39, I39, O39) — The predicted days of participation per person for each activity/setting derived using the estimated negative binomial equations and the sample and projected means of the explanatory variables, and using the adjusted constant to equilibrate the predicted participation rate and the observed participation rate in the base year 2000. Forecasts of participation rates are then based on marginal changes in explanatory variables from the base year.

Observed Days per Person (D40) The days of participation per person in each activity/setting from the *Days per Person* Worksheet.

Marginal Effects (J, P) This is a calculation of the change in the days of participation resulting from a forecasted incremental change in one explanatory variable, all other variables being held constant at the 2000 mean.

Total Days (D41, I41, O41) The number of estimated participants in each activity/setting for years 2000, 2005 and 2010. Estimated participants are equal to the estimated participation rates (D39, I39, O39) multiplied by the forecasted civilian noninstitutionalized population 16 years old and older.

Days per Person Worksheet

-Derives the value of mean days of participation per person to which baseline predictions will be adjusted

Baseline Days per Person These are the target values for mean days of participation per (B) person for our adjustments of the model constants in the individual activity worksheets.

2000 Days per Participant (C) These are the values of days per participant found in Leeworthy and Wiley (2001).

2000 Participants (D) These are the estimates of participants from our logit models of participation.

2000 Total Days These are the values of total days from which our baseline target values of days per person are derived.

Days Worksheet

-Reports the results from the individual activity worksheets

***Letters in ( ) after column names indicate columns in Excel Worksheets**

Appendix C: Participation Rates for Individual Demographic Variables by Activity/Setting

Table C.1: Participation Rates for Age Groups by Activity/Setting

	16-24	25-34	35-44	45-54	55-64	65+
Visiting Beaches	37.10	34.72	34.31	30.53	23.32	16.13
Visiting Watersides Besides Beaches	6.09	4.80	4.88	3.95	3.69	2.85
Swimming	34.77	30.59	29.98	25.78	17.87	9.48
Snorkeling	6.57	6.49	6.44	5.54	3.07	1.29
Scuba Diving	2.15	1.77	1.53	1.40	0.69	0.22
Surfing	4.25	2.02	0.95	0.99	0.57	0.12
Wind Surfing	0.71	0.49	0.35	0.46	0.13	0.02
Fishing	12.50	11.46	12.10	10.48	8.76	5.68
Motorboating	7.83	8.55	8.66	7.40	5.82	3.69
Sailing	3.49	3.32	3.43	3.26	2.53	1.52
Personal Watercraft Use	5.76	3.19	2.63	1.58	0.97	0.20
Canoeing	1.82	1.10	1.01	0.85	0.75	0.42
Kayaking	1.82	2.19	1.39	1.27	0.73	0.26
Rowing	0.70	0.76	0.49	0.42	0.44	0.57
Water Skiing	2.67	1.56	1.02	0.51	0.25	0.30
Viewing or Photographing Scenery	7.11	9.47	11.42	11.51	9.29	6.17
Hunting Waterfowl	0.59	0.23	0.34	0.21	0.39	0.17
Bird-Watching	3.66	6.50	9.50	9.82	8.76	5.66
Viewing other Wildlife	6.18	6.84	8.31	7.61	5.48	3.70

Table C.2: Participation Rates for Census Divisions by Activity/Setting

	New England	Middle Atlantic	South Atlantic	East South Central	West South Central	East North Central	West North Central	Mountain	Pacific
Visiting Beaches	42.93	33.58	40.52	24.59	24.41	16.47	13.34	17.97	44.70
Visiting Watersides Besides Beaches	7.18	5.04	6.23	3.54	3.95	2.58	2.01	2.68	5.92
Swimming	44.94	31.90	36.75	21.13	19.78	15.81	11.23	13.93	29.01
Snorkeling	7.13	4.84	6.11	3.37	3.37	4.19	3.36	3.91	7.65
Scuba Diving	1.34	1.33	1.78	1.09	0.95	0.80	0.95	1.20	2.10
Surfing	1.42	1.01	2.23	0.36	0.83	0.73	0.56	0.98	4.22
Wind Surfing	0.61	0.58	0.38	0.24	0.53	0.22	0.16	0.38	0.40
Fishing	14.18	10.99	18.44	7.78	11.64	3.29	2.70	3.01	13.69
Motorboating	13.73	8.99	11.51	3.67	6.77	3.14	2.42	2.87	8.16
Sailing	8.04	3.73	3.46	1.96	1.65	1.49	1.01	1.32	4.53
Personal Watercraft Use	2.54	3.48	4.71	2.08	2.54	1.25	0.91	1.04	2.63
Canoeing	2.09	1.00	2.02	0.30	0.66	0.36	0.07	0.15	1.86
Kayaking	4.26	1.33	1.40	0.39	0.26	0.65	0.23	0.55	2.93
Rowing	1.59	0.71	0.63	0.20	0.27	0.03	0.20	0.36	0.92
Water Skiing	1.20	1.53	2.19	1.06	1.29	0.37	0.35	0.60	1.04
Viewing or Photographing Scenery	16.12	8.87	11.39	5.29	6.71	5.78	4.53	4.93	15.67
Hunting Waterfowl	0.19	0.03	0.57	0.46	0.64	0.07	0.05	0.17	0.54
Bird-Watching	15.20	7.53	10.59	4.64	4.49	3.75	2.94	3.54	10.23
Viewing other Wildlife	10.28	6.31	9.02	4.11	4.85	3.80	3.18	3.30	10.26

Table C.3: Participation Rates for Income Group by Activity/Setting

	< $25k	$25-50k	$50-100k	$100k+	Missing
Visiting Beaches	20.75	30.69	40.07	49.58	26.28
Visiting Watersides Besides Beaches	2.88	4.79	5.68	8.45	3.91
Swimming	15.03	26.18	35.57	44.49	22.29
Snorkeling	1.90	4.31	7.96	14.83	4.02
Scuba Diving	0.22	1.09	1.84	4.39	1.25
Surfing	0.77	1.38	1.59	3.87	1.66
Wind Surfing	0.11	0.54	0.34	0.87	0.37
Fishing	7.12	10.30	13.82	17.64	9.05
Motorboating	3.61	7.02	10.51	17.89	5.52
Sailing	1.31	2.63	3.79	9.43	2.48
Personal Watercraft Use	1.20	2.20	2.48	5.55	2.62
Canoeing	0.67	0.97	1.07	2.26	1.05
Kayaking	0.87	1.23	1.90	3.14	1.06
Rowing	0.46	0.49	0.53	1.10	0.50
Water Skiing	0.41	0.95	1.43	3.37	1.08
Viewing or Photographing Scenery	5.91	9.87	13.46	17.45	7.18
Hunting Waterfowl	0.16	0.29	0.42	1.19	0.25
Bird-Watching	4.57	7.65	10.98	15.02	5.26
Viewing other Wildlife	4.47	7.16	9.45	13.52	4.65

Table C.4: Participation Rates for Educational Attainment by Activity/Setting

	< High School	High School	College	Grad, Prof., PhD	Other
Visiting Beaches	20.93	24.77	37.38	46.03	33.44
Visiting Watersides Besides Beaches	3.67	3.87	5.08	7.12	3.66
Swimming	17.09	21.32	31.89	40.28	21.14
Snorkeling	2.95	3.37	7.05	9.70	1.03
Scuba Diving	0.94	0.88	1.73	2.86	0.36
Surfing	2.11	1.02	1.65	2.12	0.00
Wind Surfing	0.48	0.27	0.37	0.71	0.00
Fishing	9.02	10.12	11.33	10.82	9.94
Motorboating	4.56	5.91	9.04	11.52	5.04
Sailing	1.86	1.66	3.78	8.52	2.16
Personal Watercraft Use	2.77	1.89	3.03	2.47	1.43
Canoeing	1.35	0.49	1.12	2.07	0.84
Kayaking	0.84	0.62	1.72	3.78	2.39
Rowing	0.58	0.44	0.54	0.68	2.14
Water Skiing	1.34	1.22	1.17	1.18	0.00
Viewing or Photographing Scenery	3.97	6.43	12.99	18.93	14.28
Hunting Waterfowl	0.36	0.22	0.38	0.30	0.63
Bird-Watching	2.03	5.55	10.14	16.84	5.80
Viewing other Wildlife	3.12	4.91	8.85	12.57	5.45

Table C.5: Participation Rates for Race/Ethnicity by Activity/Setting

	White, not Hispanic	Black, not Hispanic	Native, not Hispanic	Asian, not Hispanic	Hispanic
Visiting Beaches	30.96	26.09	22.60	46.47	25.70
Visiting Watersides Besides Beaches	4.56	3.99	3.64	5.57	3.91
Swimming	28.43	14.53	16.08	32.68	19.66
Snorkeling	5.71	2.43	3.16	8.14	3.09
Scuba Diving	1.47	0.94	1.85	2.19	0.73
Surfing	1.62	0.45	1.05	4.18	1.47
Wind Surfing	0.36	0.21	1.51	0.78	0.55
Fishing	10.40	9.86	13.59	9.42	9.55
Motorboating	8.17	4.16	7.02	5.02	4.66
Sailing	3.48	1.38	3.34	2.74	1.98
Personal Watercraft Use	2.41	2.60	4.04	2.85	2.98
Canoeing	0.97	0.88	1.20	3.17	0.74
Kayaking	1.52	0.29	0.04	3.02	0.73
Rowing	0.50	0.17	0.81	0.20	1.01
Water Skiing	1.13	0.98	1.82	0.69	1.47
Viewing or Photographing Scenery	10.48	5.45	7.26	12.49	5.39
Hunting Waterfowl	0.40	0.12	0.16	0.00	0.28
Bird-Watching	8.51	4.23	6.77	6.61	3.45
Viewing other Wildlife	7.39	4.11	7.10	5.10	4.06

Table C.6: Participation Rates for Coastal County Residence by Activity/Setting

	Coastal County Resident	Non Coastal County Resident
Visiting Beaches	39.34	21.34
Visiting Watersides Besides Beaches	6.18	2.92
Swimming	33.28	18.29
Snorkeling	6.52	3.72
Scuba Diving	1.70	1.03
Surfing	2.34	0.9
Wind Surfing	0.52	0.27
Fishing	15.08	5.88
Motorboating	10.76	3.7
Sailing	4.47	1.58
Personal Watercraft Use	3.75	1.48
Canoeing	1.82	0.34
Kayaking	2.15	0.57
Rowing	0.85	0.24
Water-Skiing	1.78	0.56
Viewing or Photographing Scenery	12.75	5.86
Migratory Bird Hunting	0.33	0.33
Bird-Watching	9.88	4.64
Viewing other Wildlife	8.72	4.33

Table C.7: Participation Rates for Urban Residence by Activity/Setting

	Urban Resident	Rural Resident
Visiting Beaches	32.47	20.36
Visiting Watersides Besides Beaches	4.86	3.05
Swimming	27.70	16.92
Snorkeling	5.58	3.07
Scuba Diving	1.52	0.68
Surfing	1.77	0.91
Wind Surfing	0.40	0.34
Fishing	10.89	8.08
Motorboating	7.64	5
Sailing	3.32	1.6
Personal Watercraft Use	2.88	1.34
Canoeing	1.18	0.57
Kayaking	1.49	0.7
Rowing	0.56	0.43
Water-Skiing	1.28	0.66
Viewing or Photographing Scenery	9.91	6.34
Migratory Bird Hunting	0.35	0.27
Bird-Watching	7.62	5.4
Viewing other Wildlife	6.84	4.91

Table C.8: Participation Rates for Sex by Activity/Setting

	Male	Female
Visiting Beaches	30.92	29.23
Visiting Watersides Besides Beaches	4.98	4.06
Swimming	26.11	25
Snorkeling	5.87	4.35
Scuba Diving	2.03	0.73
Surfing	2.31	0.94
Wind Surfing	0.52	0.27
Fishing	14.22	6.78
Motorboating	8.45	5.9
Sailing	3.13	2.83
Personal Watercraft Use	2.87	2.3
Canoeing	1.33	0.8
Kayaking	1.47	1.21
Rowing	0.64	0.44
Water-Skiing	1.44	0.89
Viewing or Photographing Scenery	8.60	9.72
Migratory Bird Hunting	0.54	0.14
Bird-Watching	6.91	7.41
Viewing other Wildlife	6.67	6.25