APPENDIX A—Detailed information regarding forest ownership, water yield, surface drinking water intakes, and percent of water originating on State and private forest (SPF) lands in the 13 Southern States

This appendix provides detailed information regarding forest ownership, water yield, surface drinking water intakes, and water originating on State and private forest (SPF) lands in the 13 Southern States. We quantified surface water supply originating on forest lands using the Water Supply Stress Index (WaSSI) hydrologic model and linked water from seven forest ownership types to surface drinking water intakes within and downstream of each State using the U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Information System (SDWIS) database of surface drinking water intakes. Results for each State are provided in summary text and maps.

When reviewing these materials, the assumptions and caveats detailed in the Methods section of this paper should be carefully considered. The intent of this analysis was to quantify the role of SPF lands in providing surface water supply to the 7,582 surface drinking water intakes in the 13 Southern States. This was a large scale for analysis, and, as such, it was not practical to review and correct locations, communities, and population-served data for individual intakes. The population and communities served by water from SPF lands in this analysis should be considered estimates; users are encouraged to verify results with locally collected data where available.

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STATE OF ALABAMA

Summary

State and private forest (SPF) lands cover about two-thirds of Alabama (figs. A.AL.1 and A.AL.2; table A.AL.1). About 63.6 percent of all Alabama surface water originates on SPF lands (fig. A.AL.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 60.4 percent of the land area of SPF and 60.5 percent of surface water from SPF. Corporate-owned forests contribute 34.5 percent of surface water from SPF and account for 34.7 percent of land area of SPF. Average annual water yield in Alabama is about 545 mm (fig. A.AL.4). Alabama has a total of 315 surface drinking water intakes where at least some available water comes from SPF (fig. A.AL.5). About 70.3 percent of the total population of Alabama is served by surface drinking water overall, and Alabama SPF surface drinking water serves about 70.2 percent of the State population, or 3.4 million people, to some degree. About 1.5 million people in Alabama are getting more than half of their surface drinking water from SPF within the State (fig. A.AL.6). State and private forest lands in Alabama also supply water to 77 surface drinking water intakes in other States (Florida, Georgia, Illinois, Kentucky, Louisiana, Mississippi, and Tennessee) (fig. A.AL.7), which collectively serve about 1.6 million people in 50 communities (fig. A.AL.8). Many public water systems in Alabama utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.AL.9 by population served (symbol size) and percentage of water from SPF lands in Alabama (symbol color). The Birmingham detail map (fig. A.AL.10) adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.AL.11) of the Tuscaloosa Water & Sewer public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Alabama, where three surface drinking water intakes receive about 82.9 percent of their water from SPF and serve about 0.2 million people.

Table A.AL.1—Land area by land cover and forest ownership type in Alabama

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	96 212	23,774,675
Nonforest	41 626	10,286,035
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	5449	1,346,572
Tribal (public)	<1	139
State (public)	2982	736,923
Local (public)	745	184,140
Corporate (private)	31 540	7,793,705
Family (private)	54 809	13,543,685
Other private	686	169,511

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

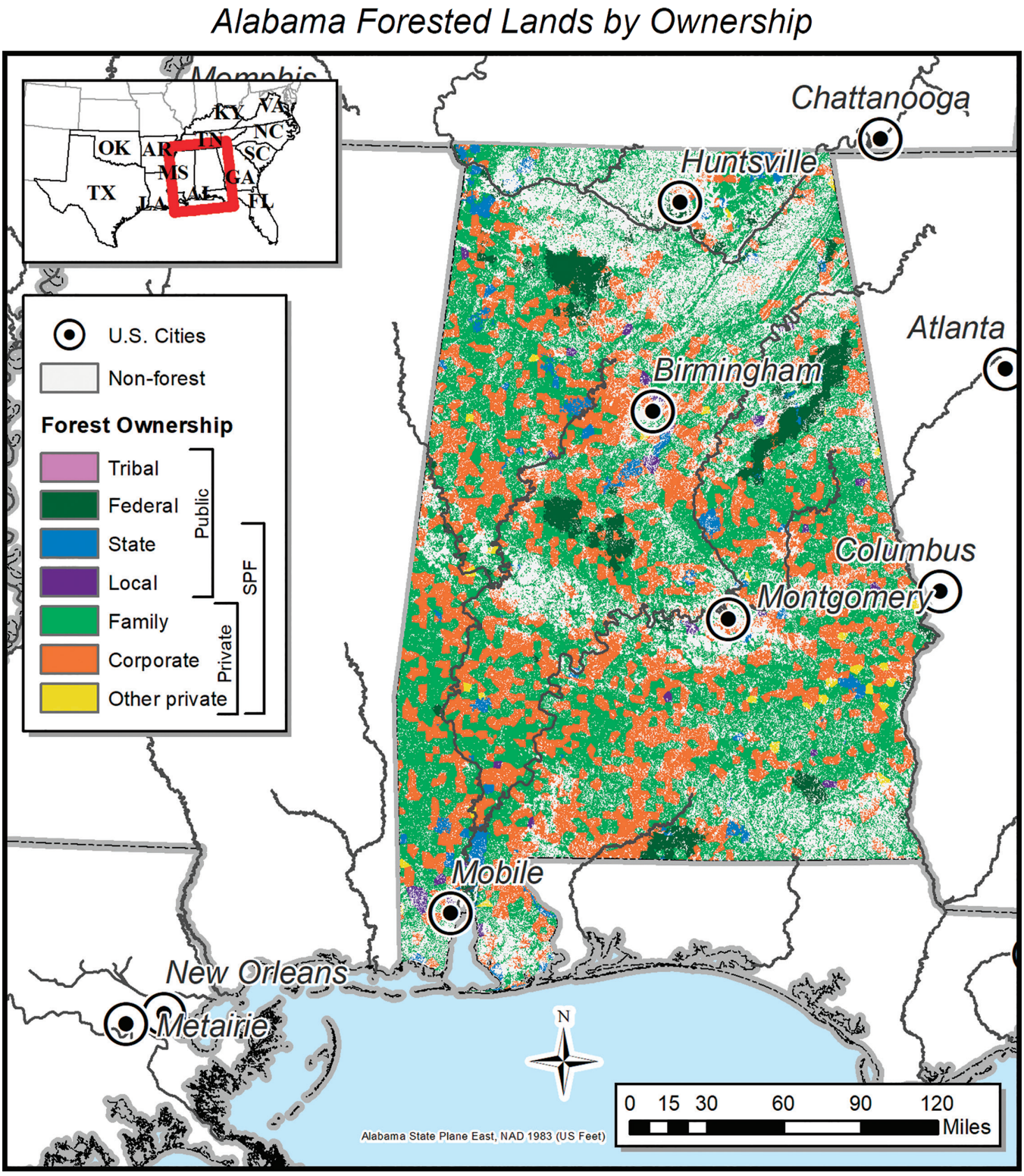


Figure A.AL.1—Alabama nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

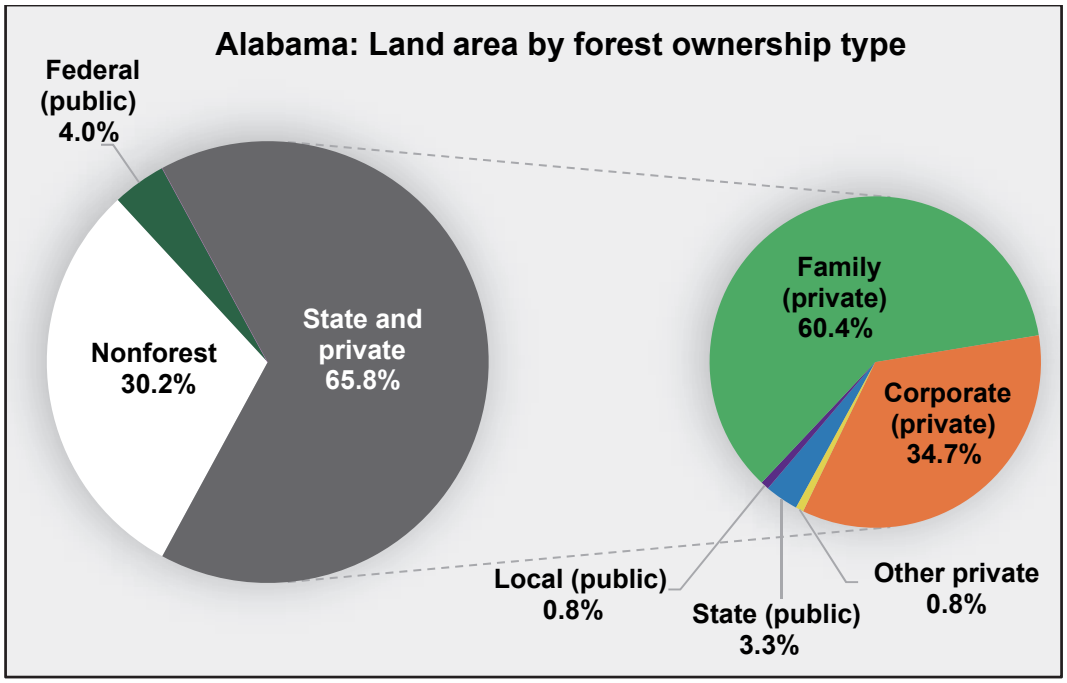


Figure A.AL.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

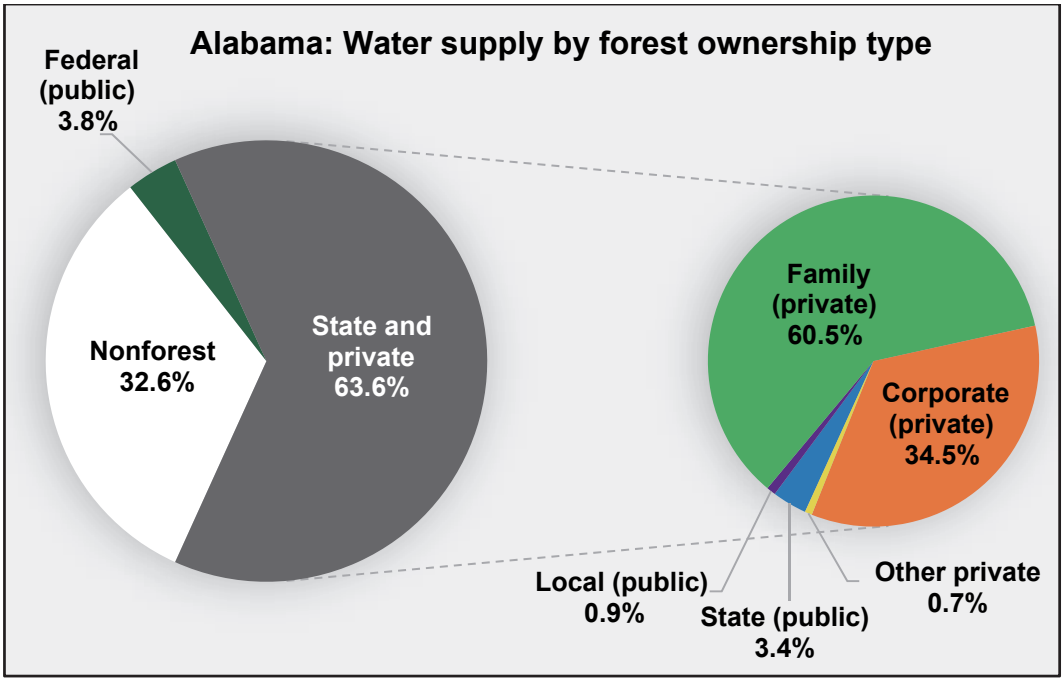


Figure A.AL.3—Percentage of Alabama's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Alabama

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

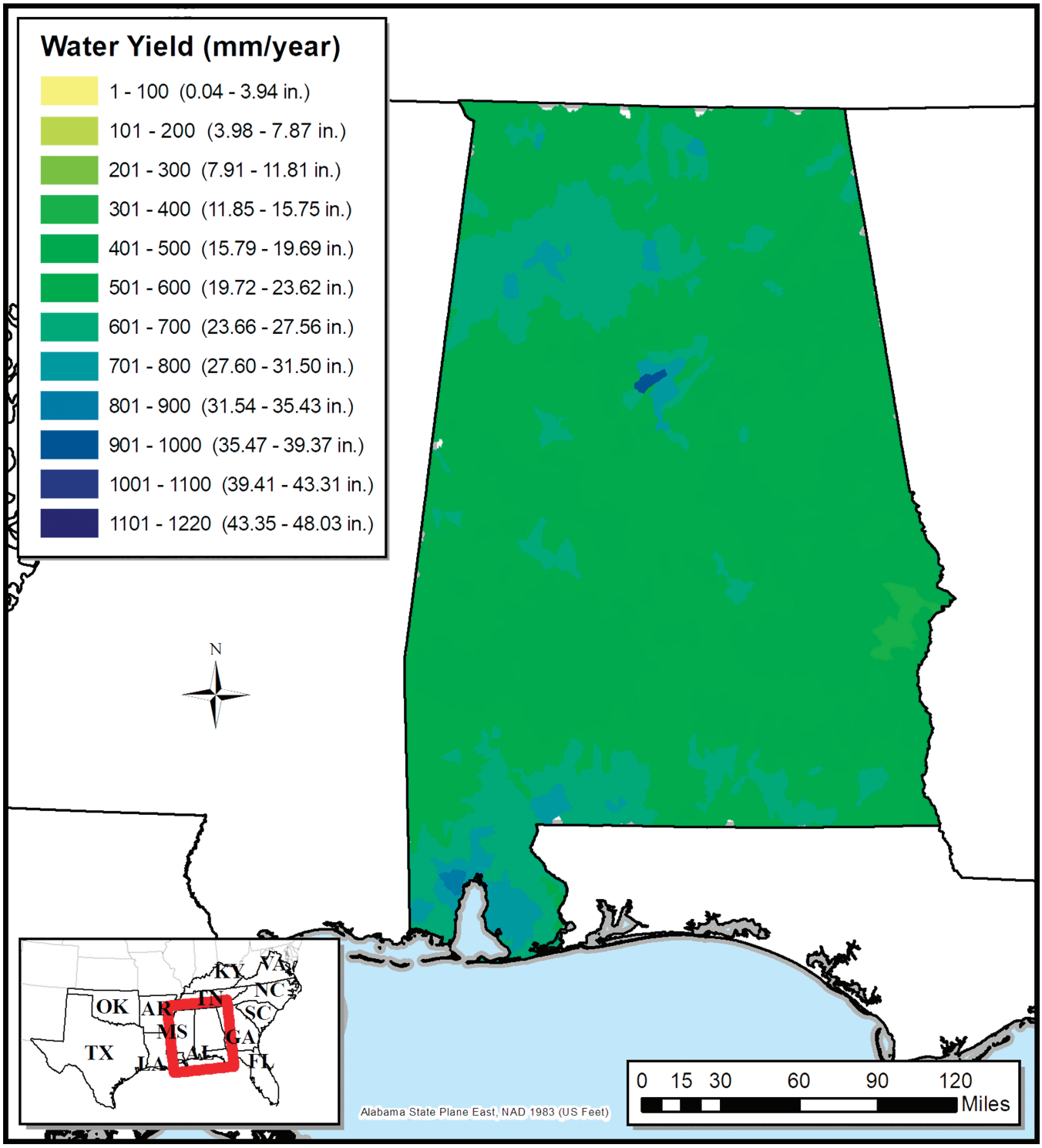


Figure A.AL.4—Estimated mean annual water yield by 12-digit hydrologic units in Alabama, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Alabama State and Private Forests

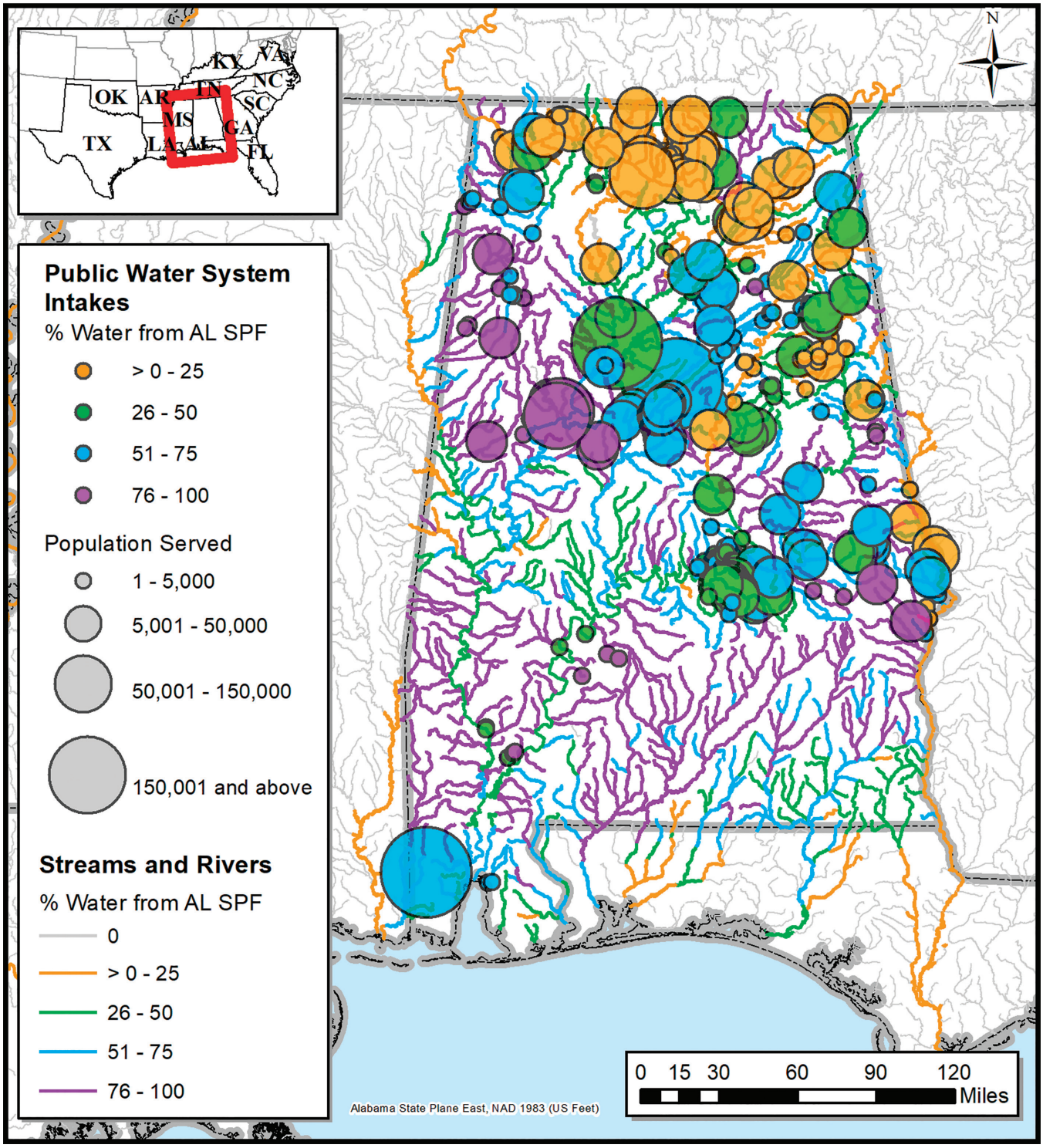


Figure A.AL.5—(A) Alabama streams by percentage of Alabama SPF water content, surface drinking water intakes within Alabama by percentage of Alabama SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 315 surface drinking water intakes within the State serve a population of 3,420,451 in 112 communities. Note: See figures A.AL.5 parts B and C on separate pages for streams and intakes only.

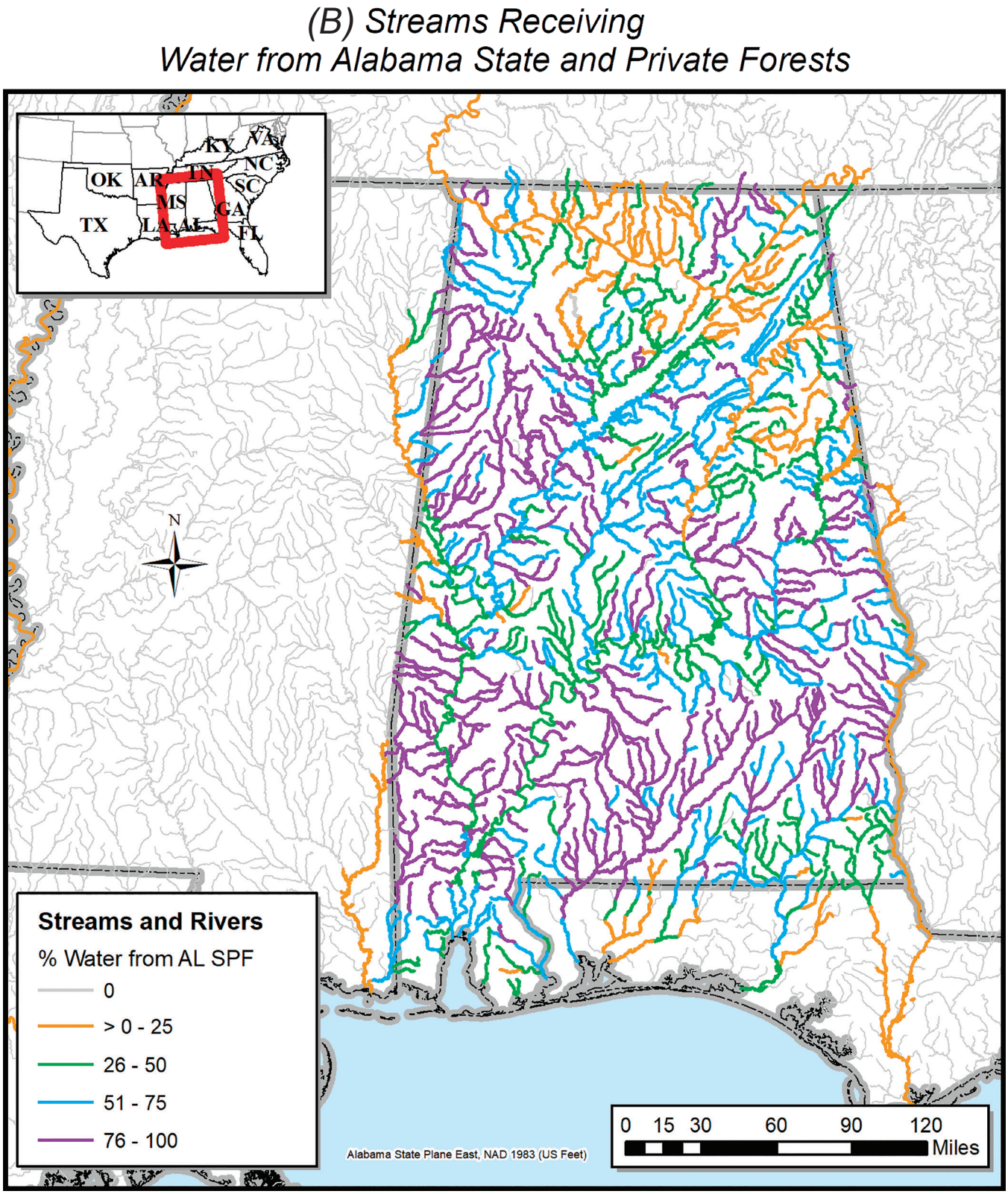


Figure A.AL.5—(B) Alabama streams by percentage of Alabama SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Alabama State and Private Forests

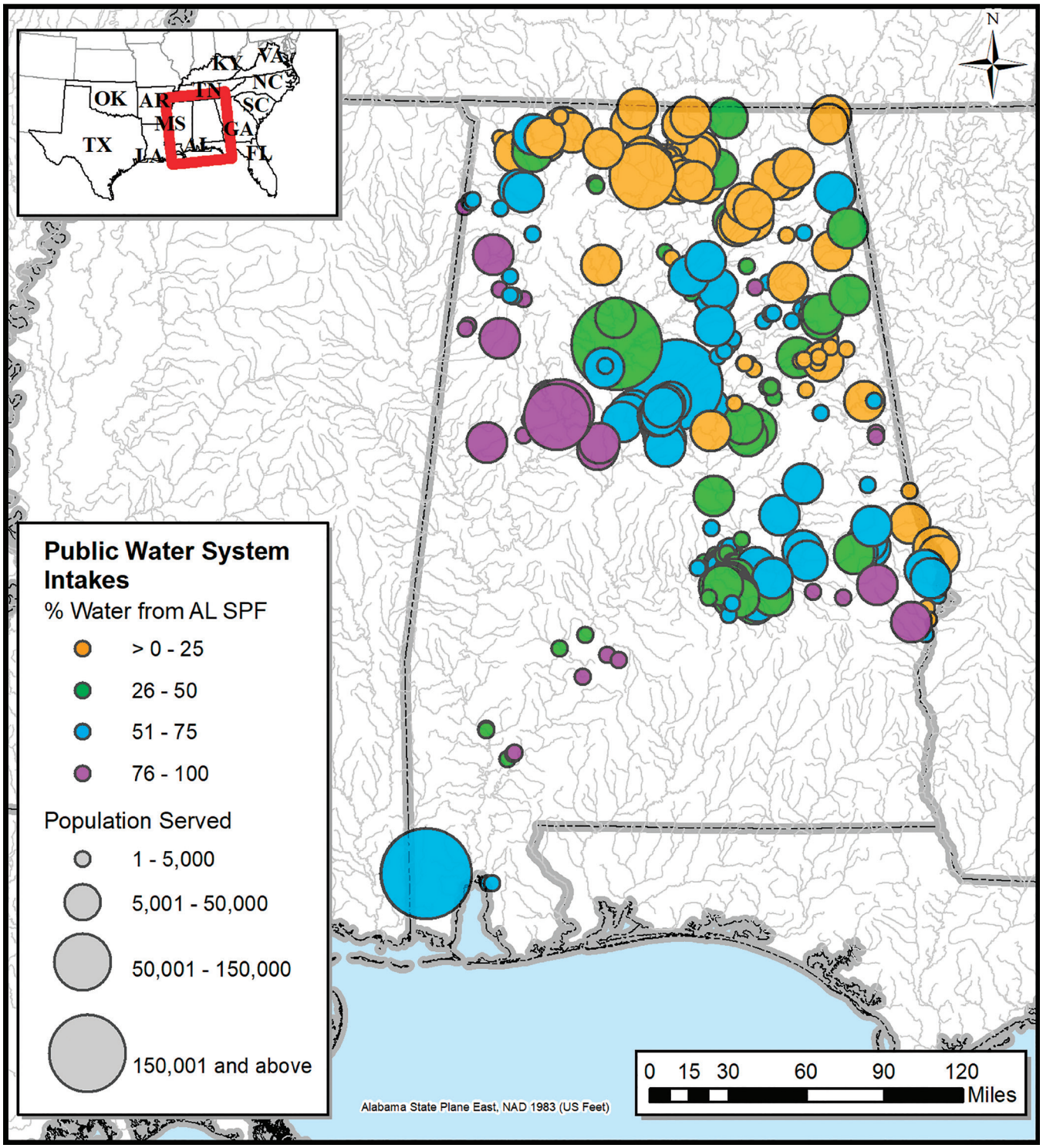


Figure A.AL.5—(C) Surface drinking water intakes within Alabama by percentage of Alabama SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 315 surface drinking water intakes within the State serve a population of 3,420,451 in 112 communities.

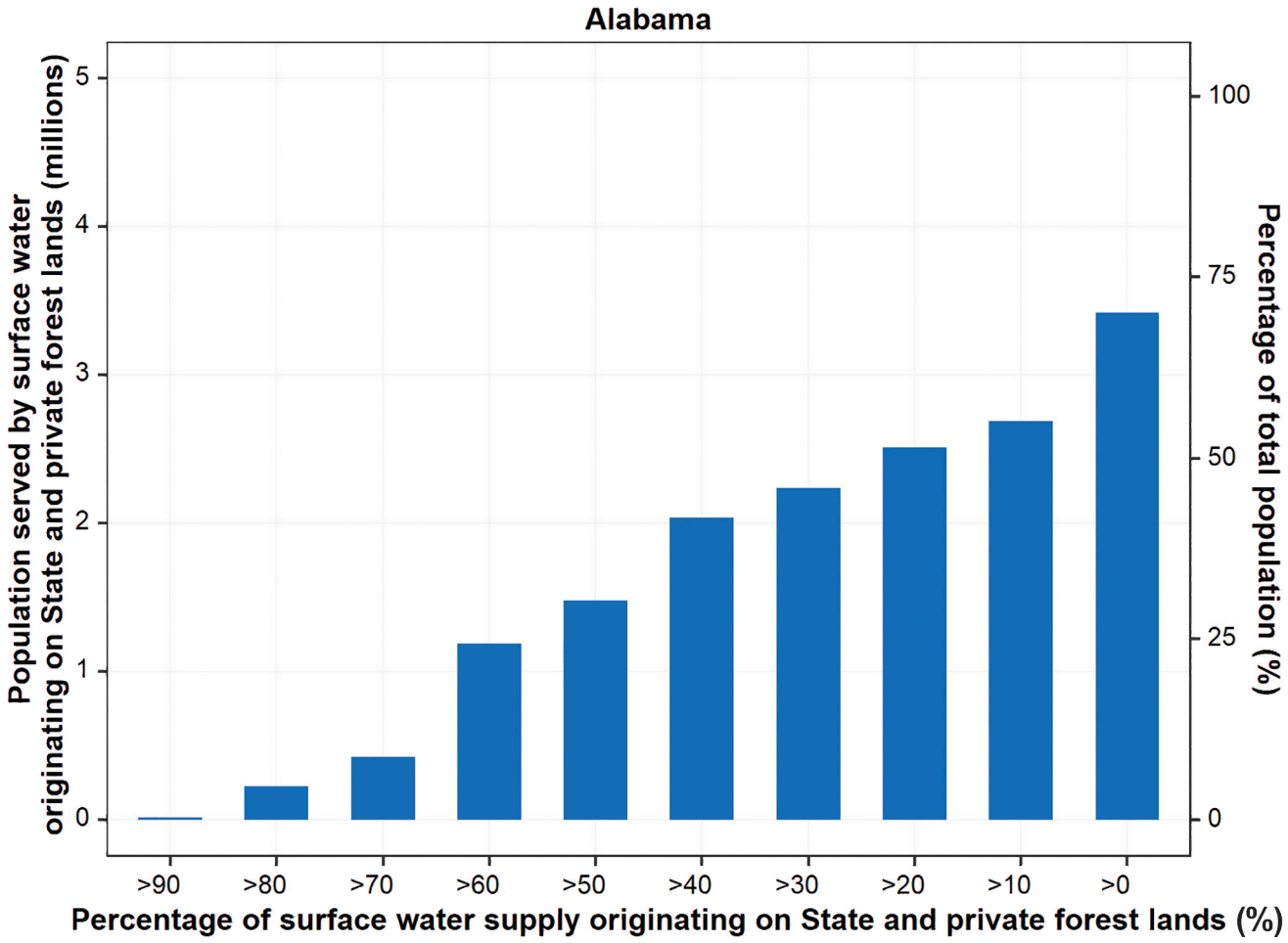


Figure A.AL.6—Cumulative frequency of population served according to percentage of water coming from Alabama SPF lands.

Public Water System Intakes Outside of Alabama Receiving Water from Alabama State and Private Forests

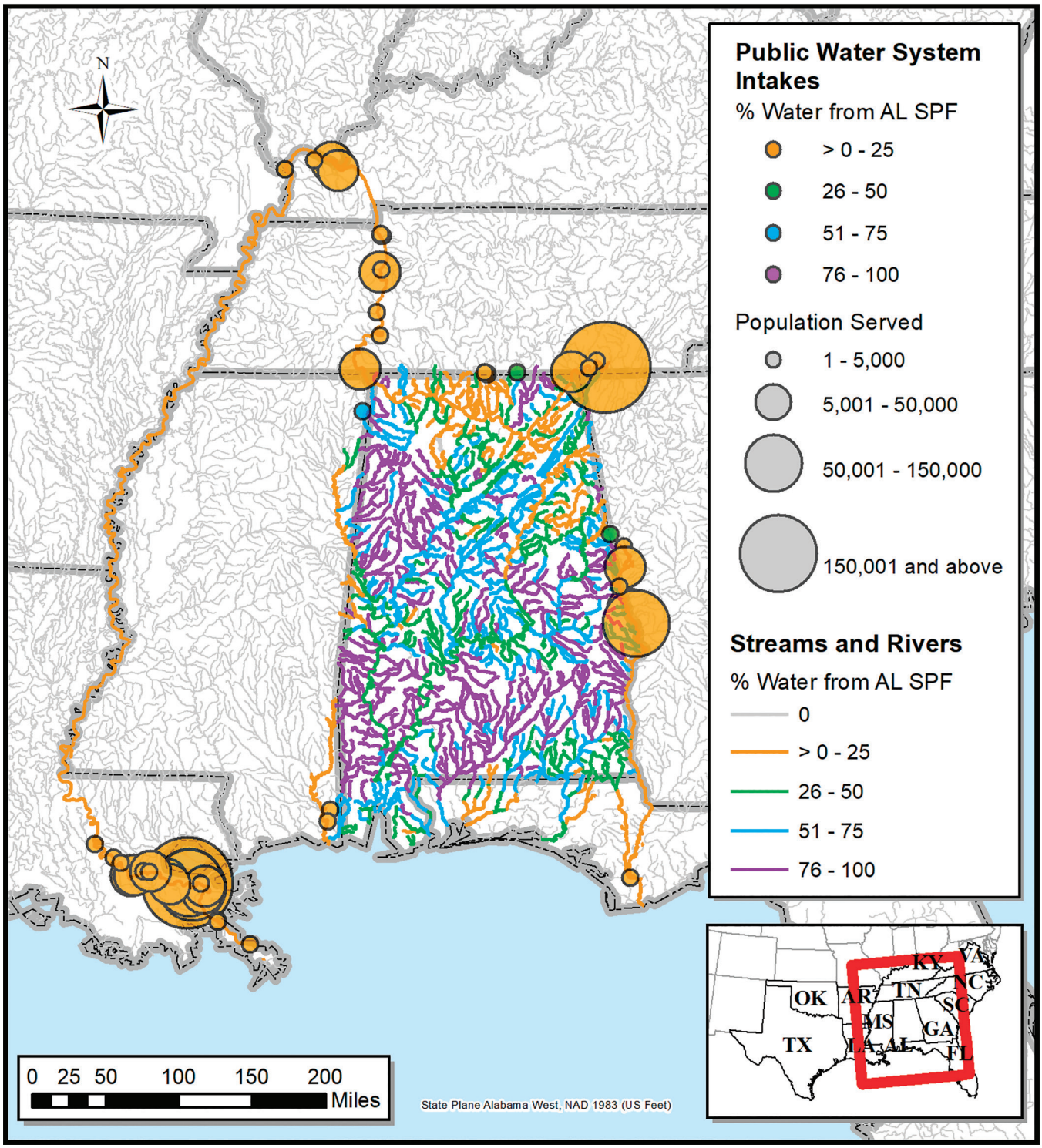


Figure A.AL.7—Alabama streams by percentage of Alabama SPF water content, surface drinking water intakes downstream of Alabama by percentage of Alabama SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 77 surface drinking water intakes outside the State but carrying Alabama SPF water serve a population of 1,594,695 in 50 communities.

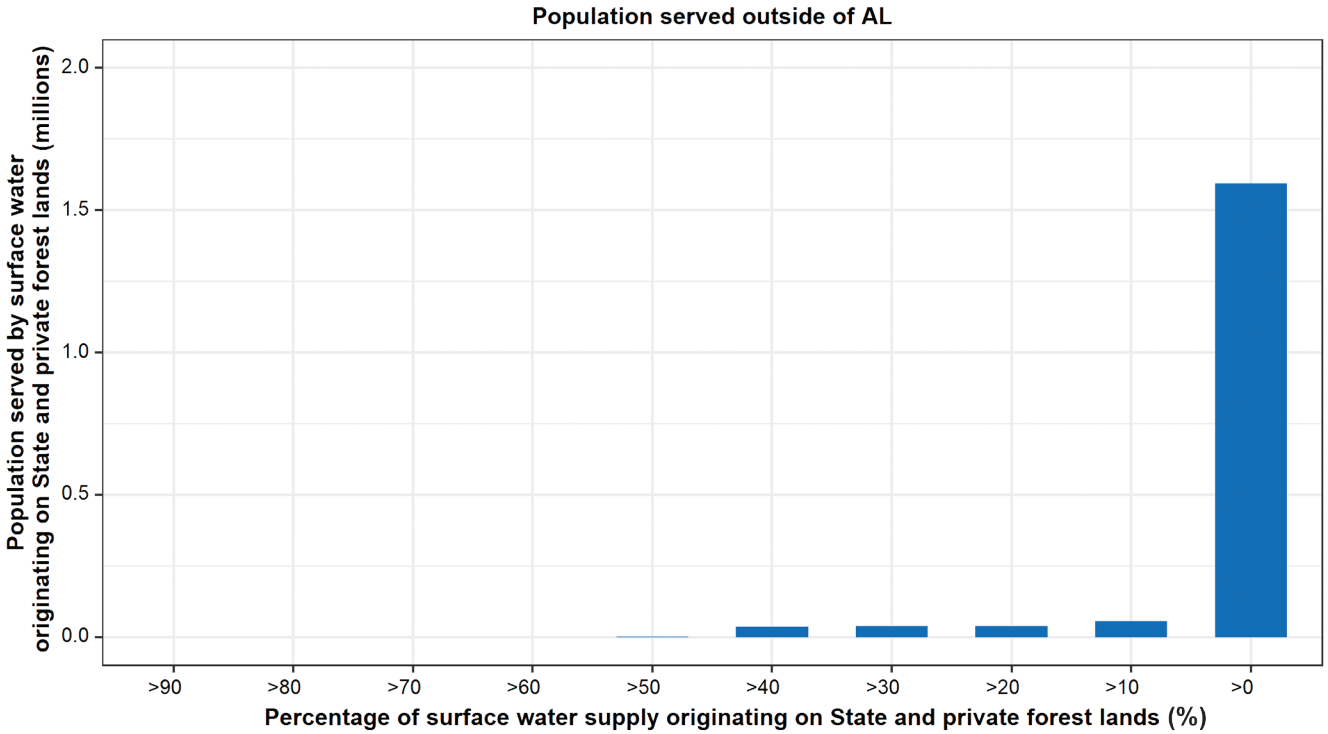


Figure A.AL.8—Cumulative frequency of non-Alabama population served according to percentage of water coming from Alabama SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol) Receiving Water from Alabama State and Private Forests

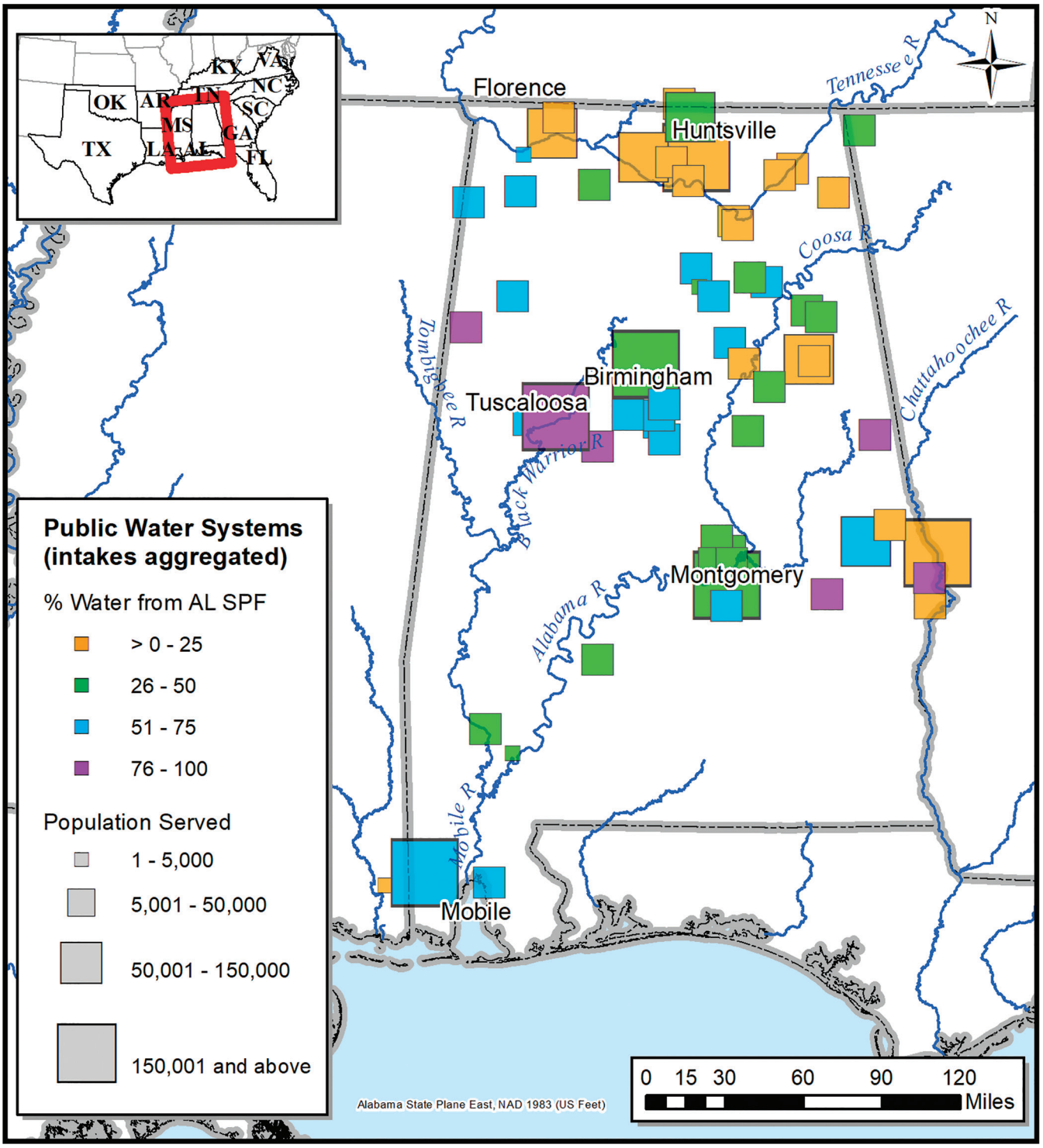


Figure A.AL.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Streams and Intrastate Public Water System Intakes in the Birmingham, AL, Area Receiving Water from Alabama State and Private Forests

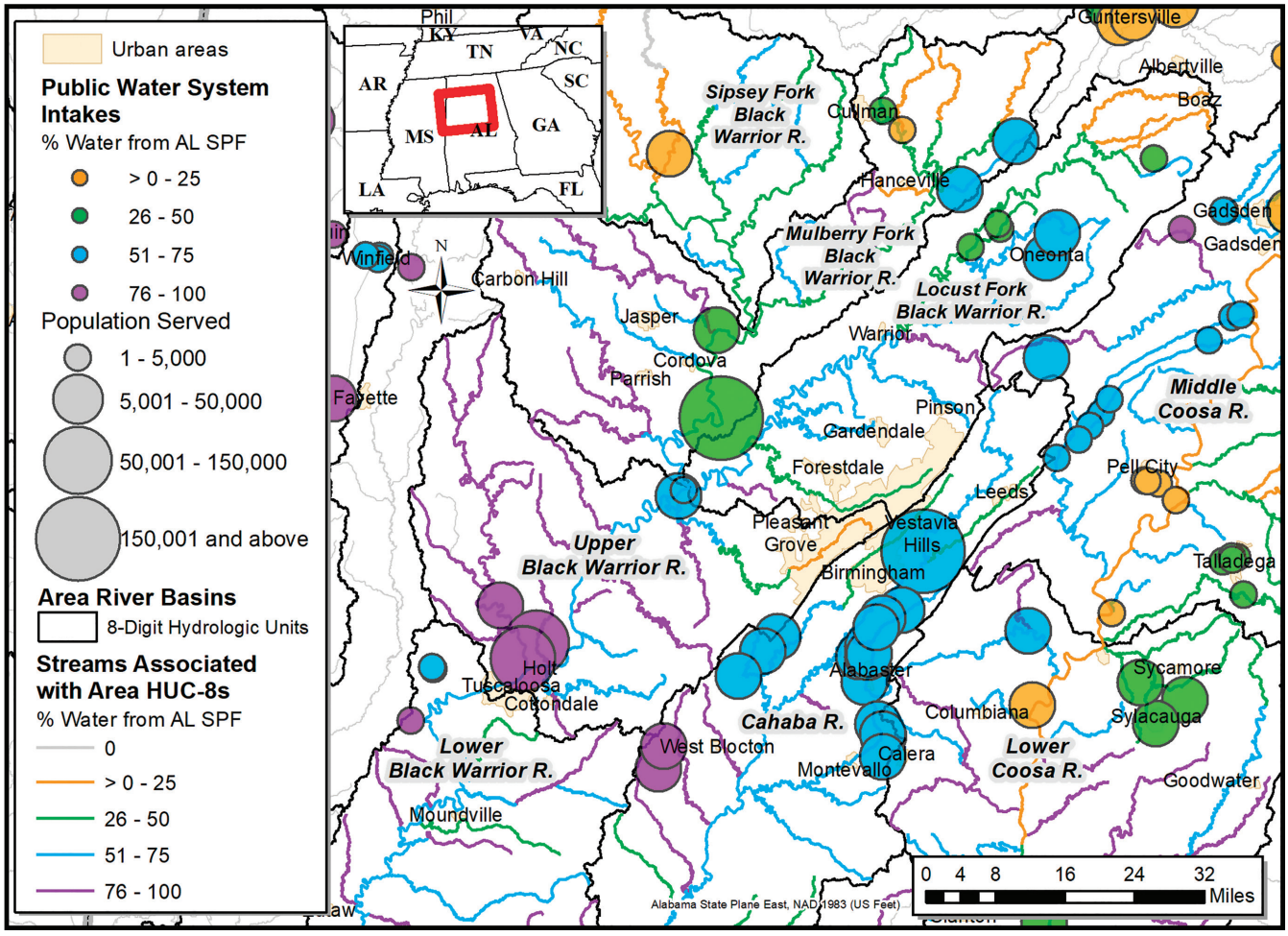


Figure A.AL.10—Local-scale detail showing percentage of water from Alabama SPF for streams and surface drinking water intakes around Birmingham, AL.

Tuscaloosa, AL, Case Study

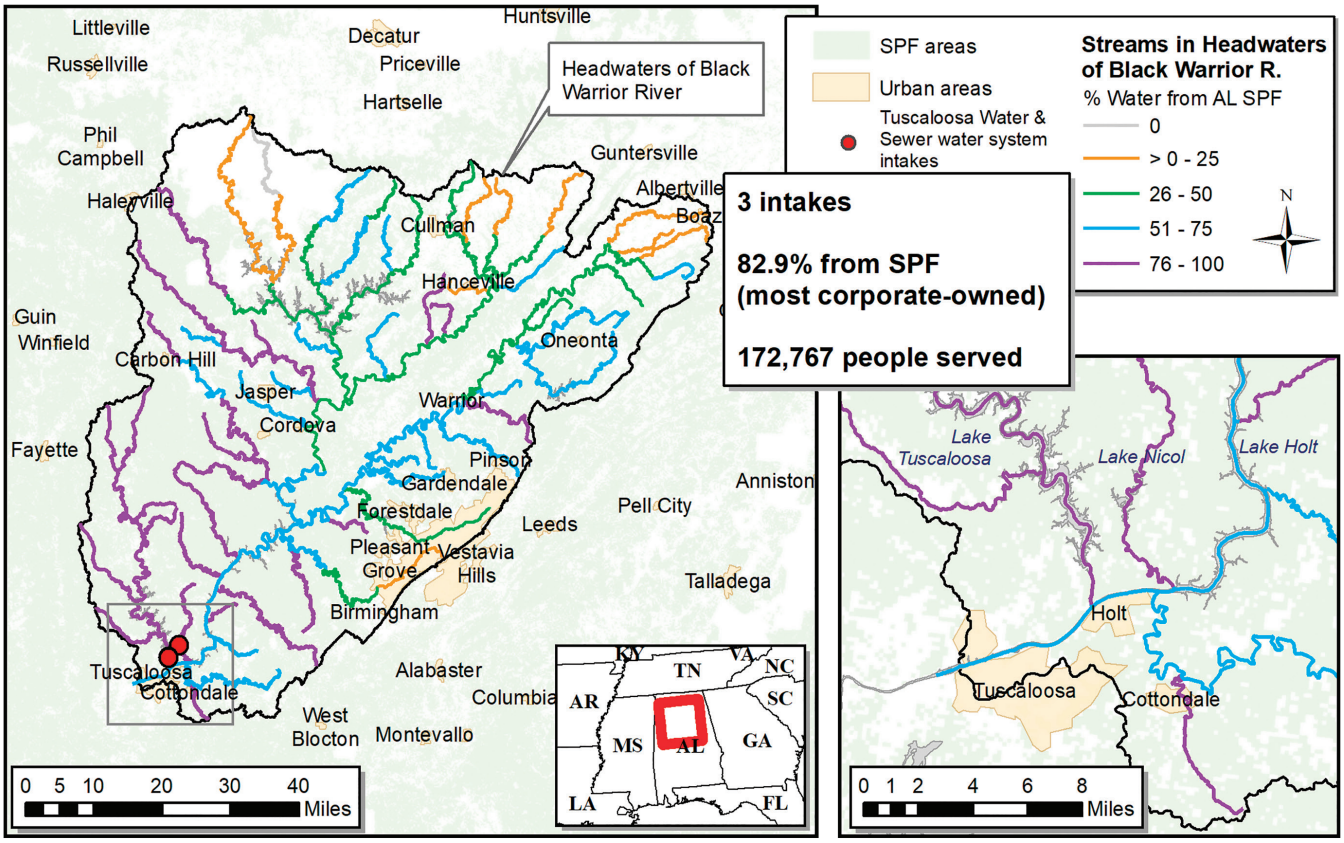


Figure A.AL.11—Case study of the Tuscaloosa Water & Sewer public water supply system, Tuscaloosa, AL, illustrating SPF water in streams supplying the three surface drinking water intakes. When this water reaches the intakes, 82.9 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is corporate-owned.

STATE OF ARKANSAS

Summary

State and private forest (SPF) lands cover almost half of Arkansas (figs. A.AR.1 and A.AR.2; table A.AR.1). About 43.7 percent of all Arkansas surface water originates on SPF lands (fig. A.AR.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 52.1 percent of the land area of SPF and 51.4 percent of surface water from SPF. Corporate-owned forests contribute 36.2 percent of surface water from SPF and account for 35.4 percent of land area of SPF. Average annual water yield in Arkansas is about 511 mm (fig. A.AR.4). Arkansas has a total of 189 surface drinking water intakes where at least some available water comes from SPF (fig. A.AR.5). About 61.1 percent of the total population of Arkansas is served by surface drinking water overall, and Arkansas SPF surface drinking water also serves about 61.1 percent of the State population, or 1.8 million people, to some degree. About 0.6 million people in Arkansas are getting more than half of their surface drinking water from SPF within the State (fig. A.AR.6). State and private forest lands in Arkansas also supply water to 99 surface drinking water intakes in other States (Louisiana, Missouri, and Oklahoma) (fig. A.AR.7), which collectively serve about 1.7 million people in 83 communities (fig. A.AR.8). Many public water systems in Arkansas utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.AR.9 by population served (symbol size) and percentage of water from SPF lands in Arkansas (symbol color). The Little Rock detail map (fig. A.AR.10) adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.AR.11) of the Central Arkansas Water public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Arkansas, where three surface drinking water intakes receive about 63.5 percent of their water from SPF and serve about 0.3 million people.

Table A.AR.1—Land area by land cover and forest ownership type in Arkansas

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	80 126	19,799,300
Nonforest	63 414	15,669,885
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	15 235	3,764,549
Tribal (public)	18	4,443
State (public)	4240	1,047,827
Local (public)	291	71,795
Corporate (private)	22 969	5,675,763
Family (private)	33 826	8,358,492
Other private	3547	876,431

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

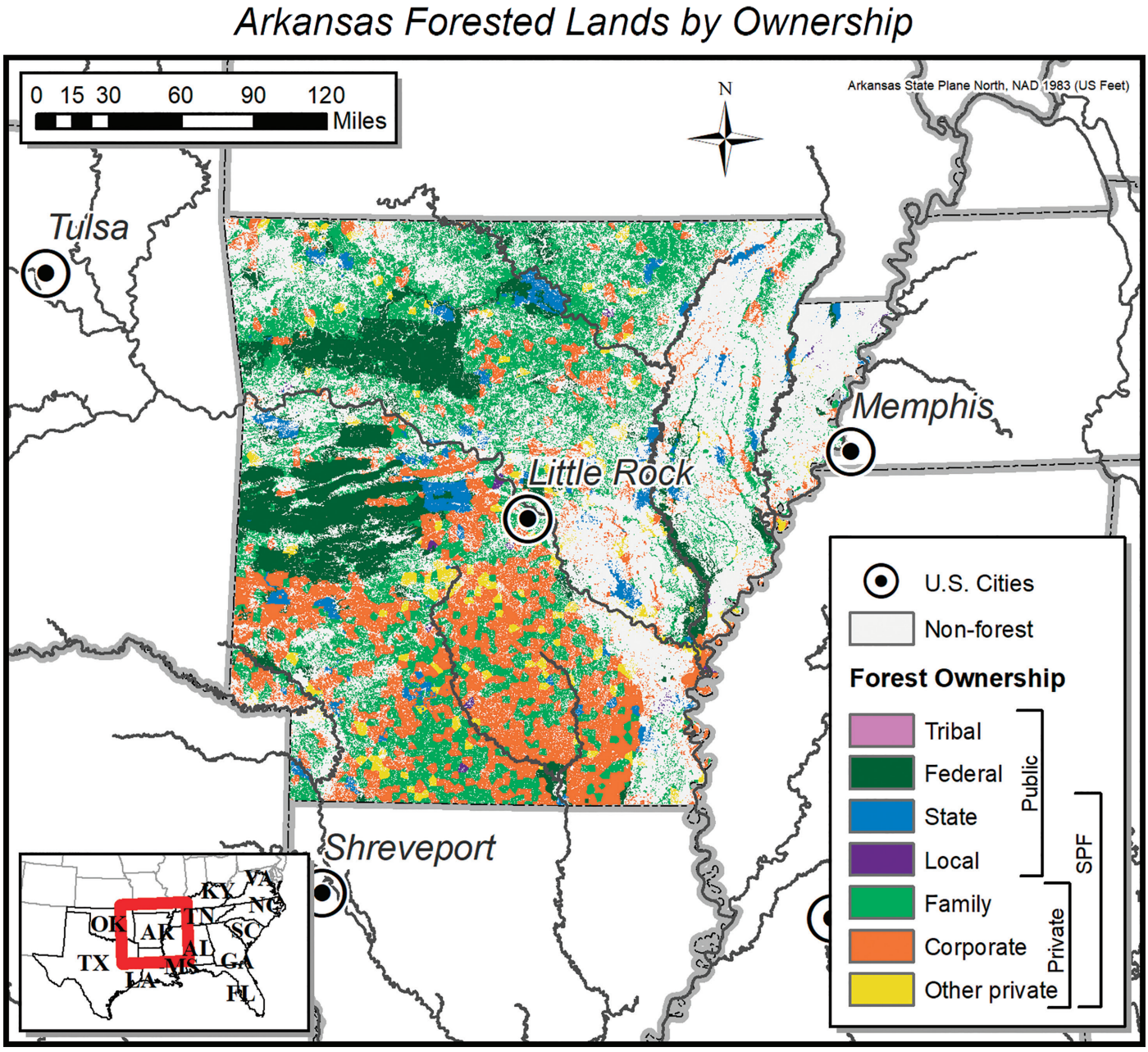


Figure A.AR.1—Arkansas nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

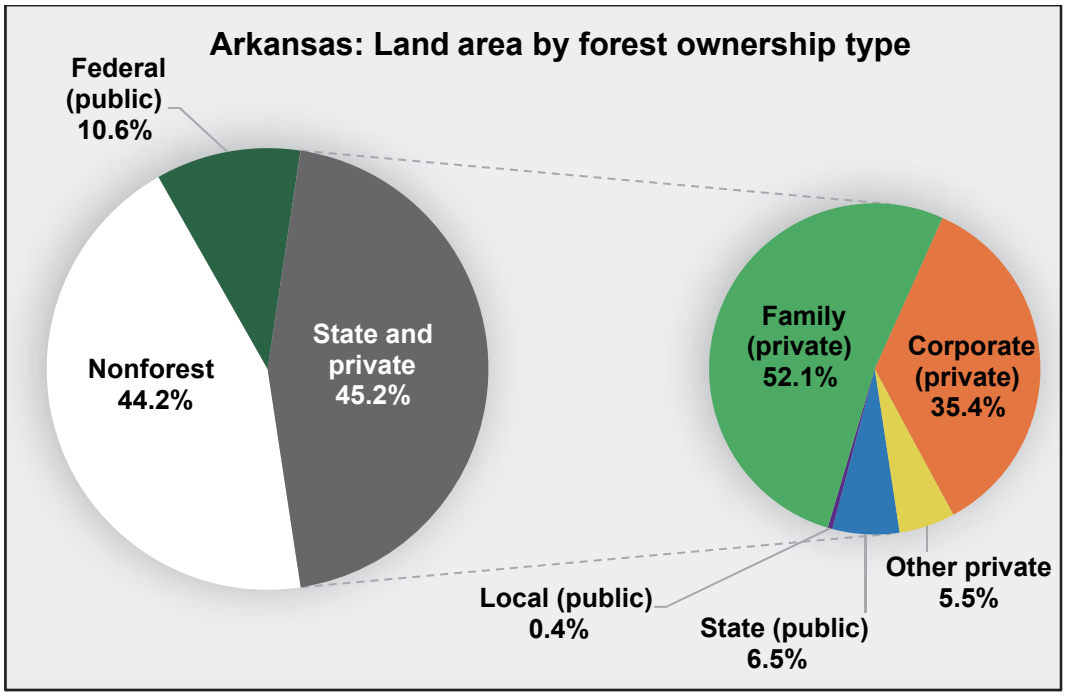


Figure A.AR.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

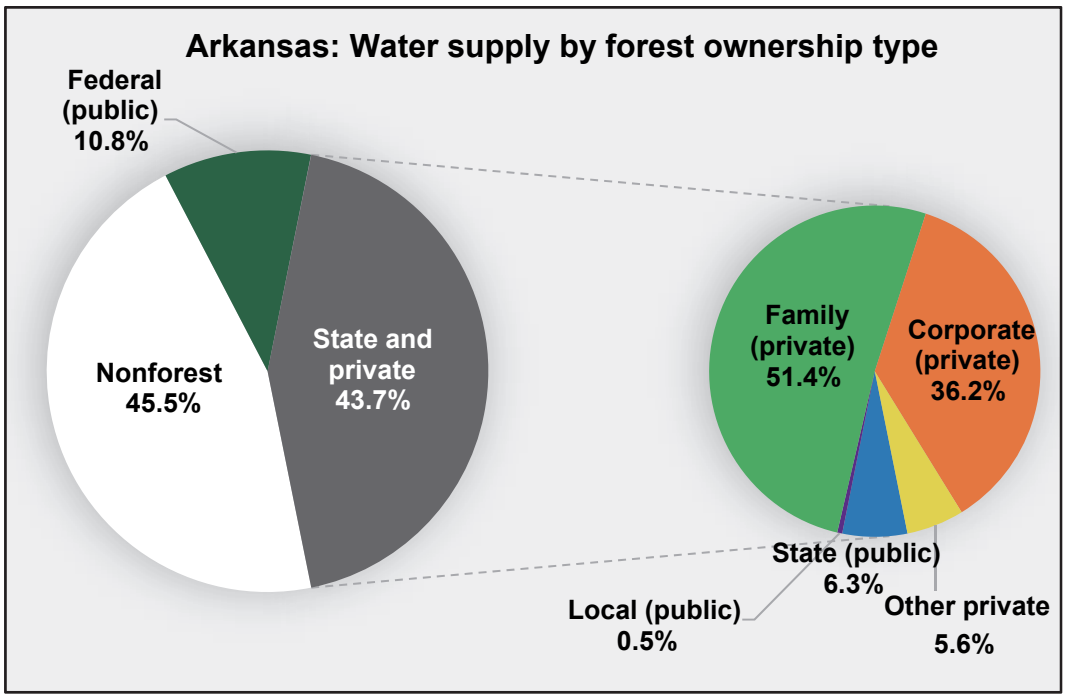


Figure A.AR.3—Percentage of Arkansas's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

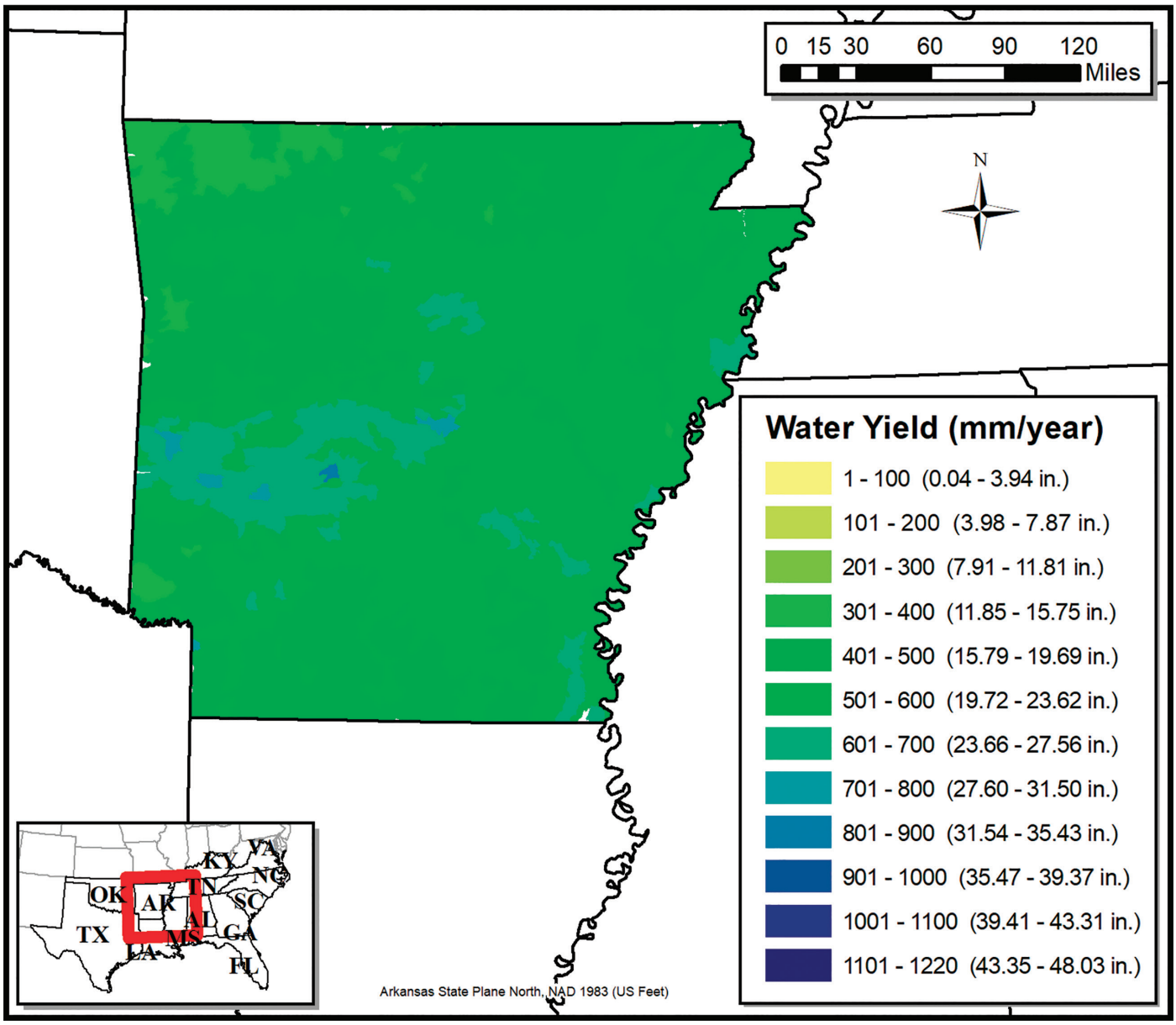


Figure A.AR.4—Estimated mean annual water yield by 12-digit hydrologic units in Arkansas, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Arkansas State and Private Forests

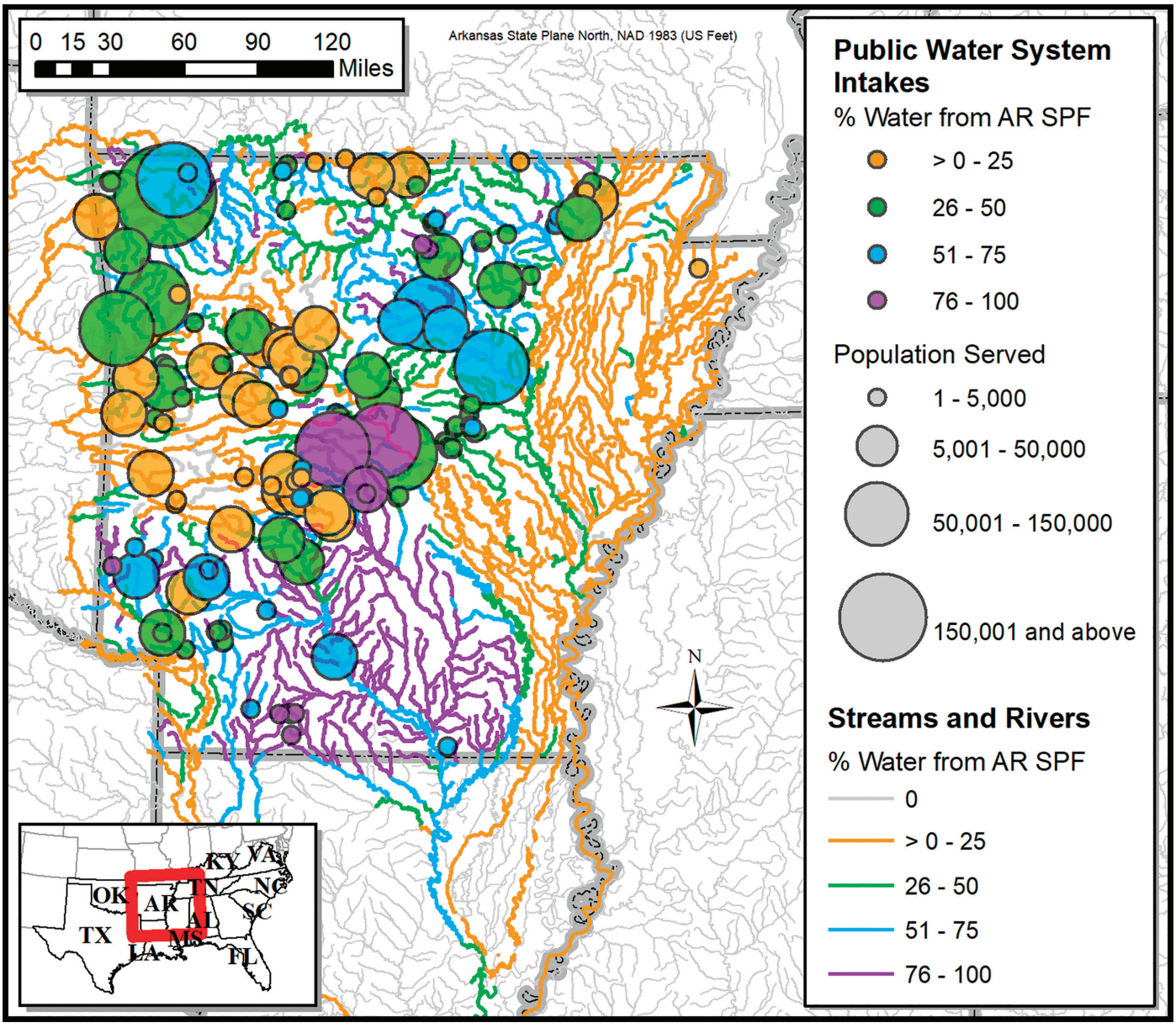


Figure A.AR.5—(A) Arkansas streams by percentage of Arkansas SPF water content, surface drinking water intakes within Arkansas by percentage of Arkansas SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 189 surface drinking water intakes within the State serve a population of 1,833,698 in 100 communities. Note: See figures A.AR.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Arkansas State and Private Forests

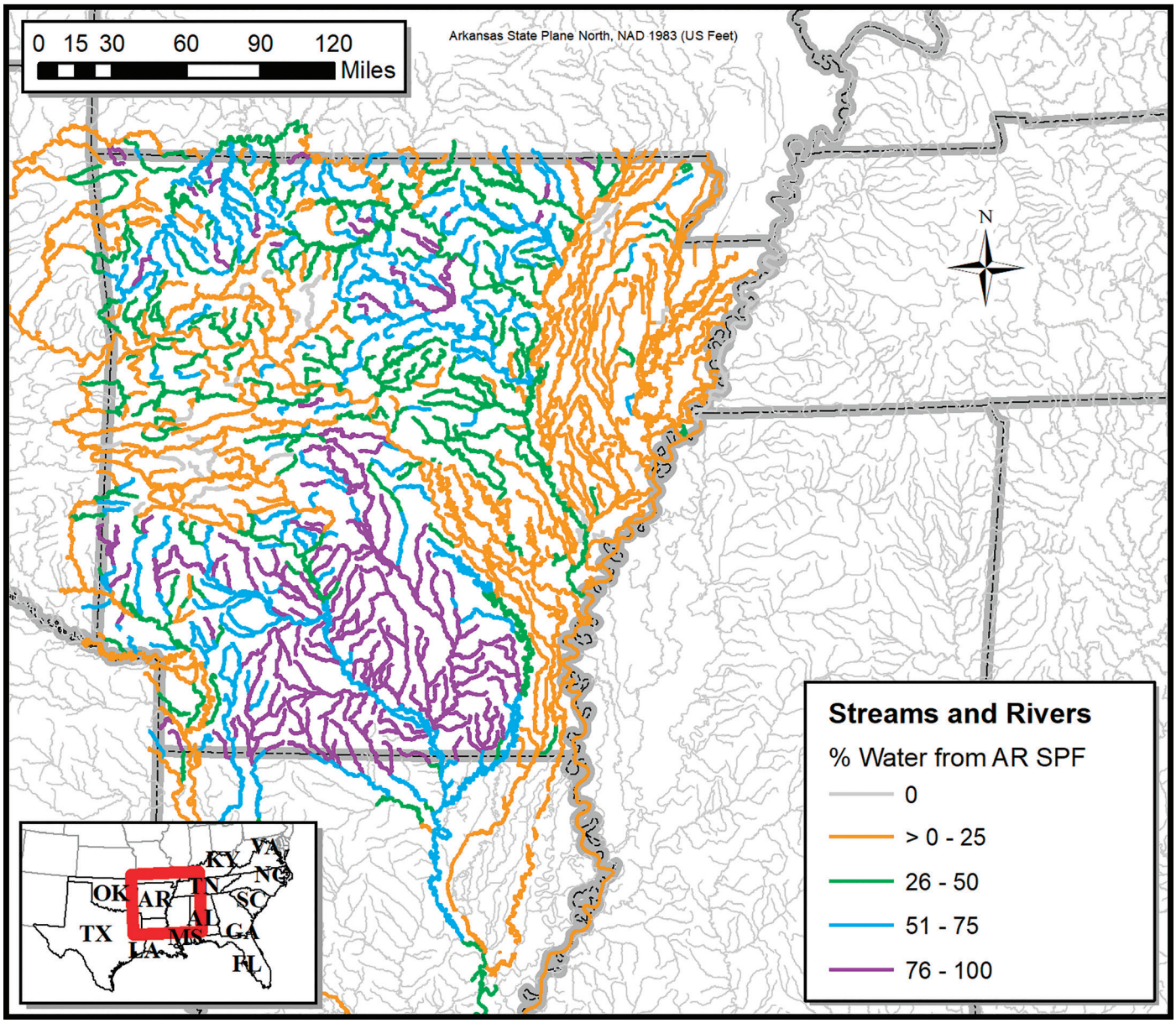


Figure A.AR.5—(B) Arkansas streams by percentage of Arkansas SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Arkansas State and Private Forests

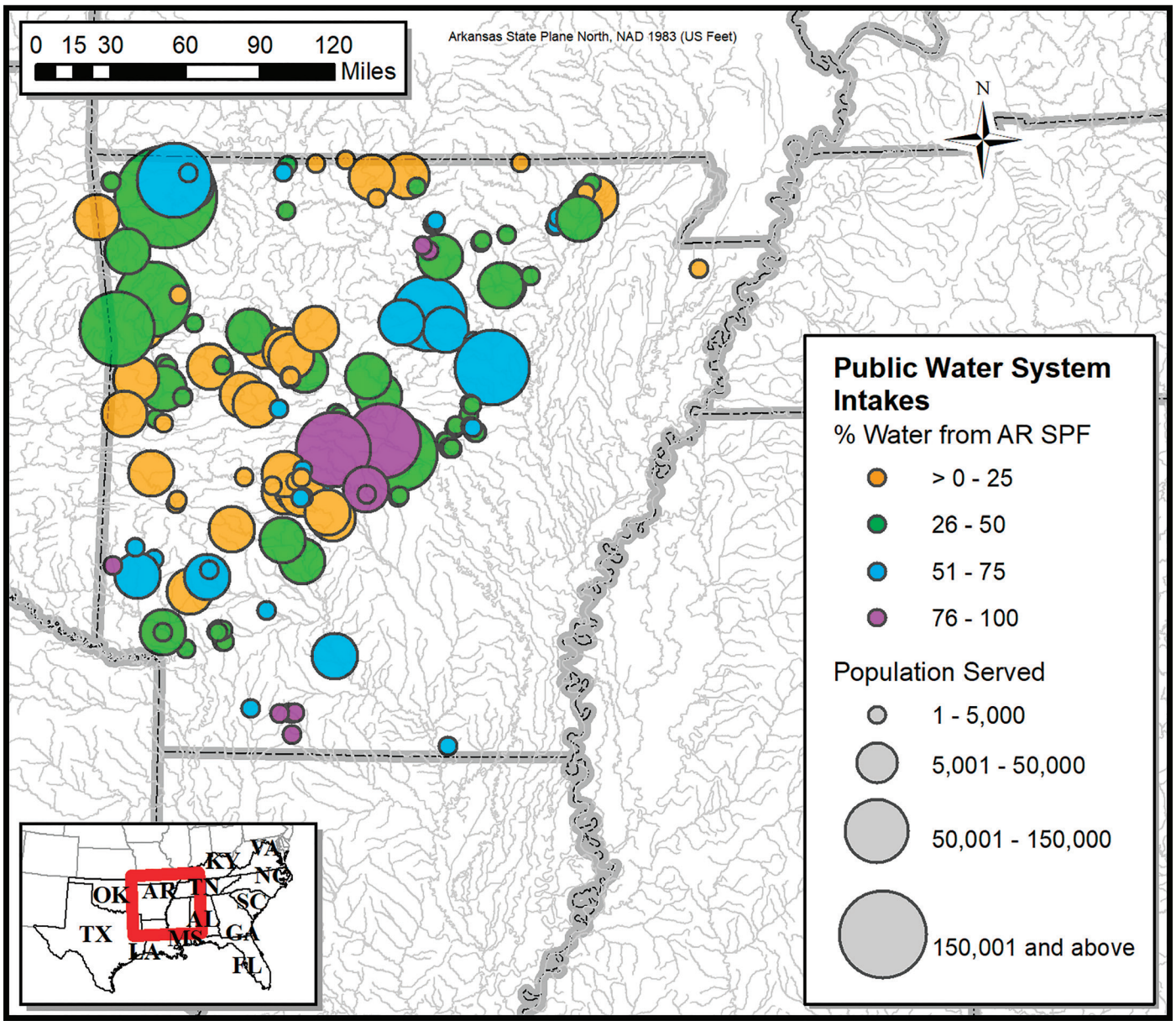


Figure A.AR.5—(C) Surface drinking water intakes within Arkansas by percentage of Arkansas SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 189 surface drinking water intakes within the State serve a population of 1,833,698 in 100 communities.

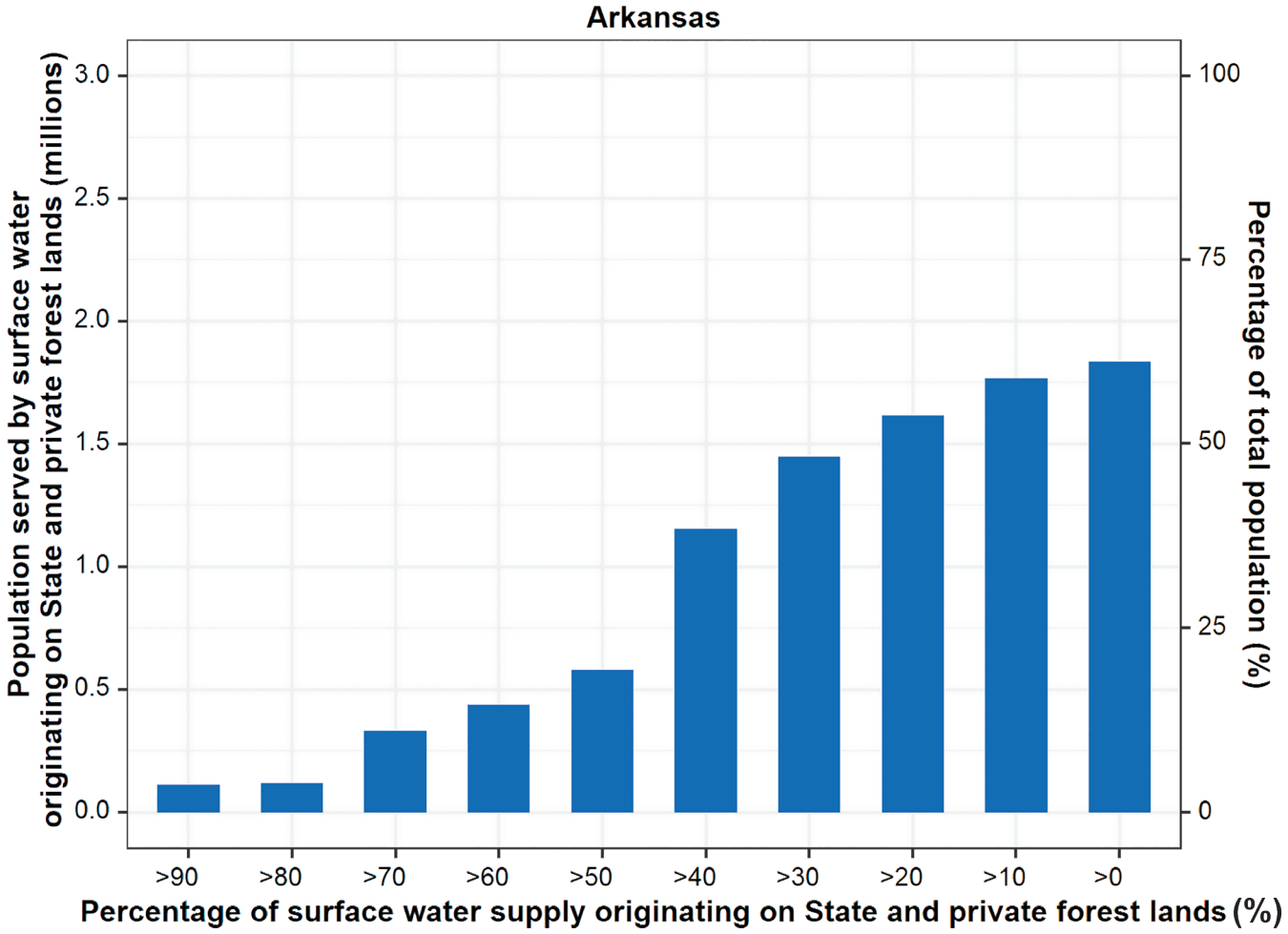


Figure A.AR.6—Cumulative frequency of population served according to percentage of water coming from Arkansas SPF lands.

Public Water System Intakes Outside of Arkansas Receiving Water from Arkansas State and Private Forests

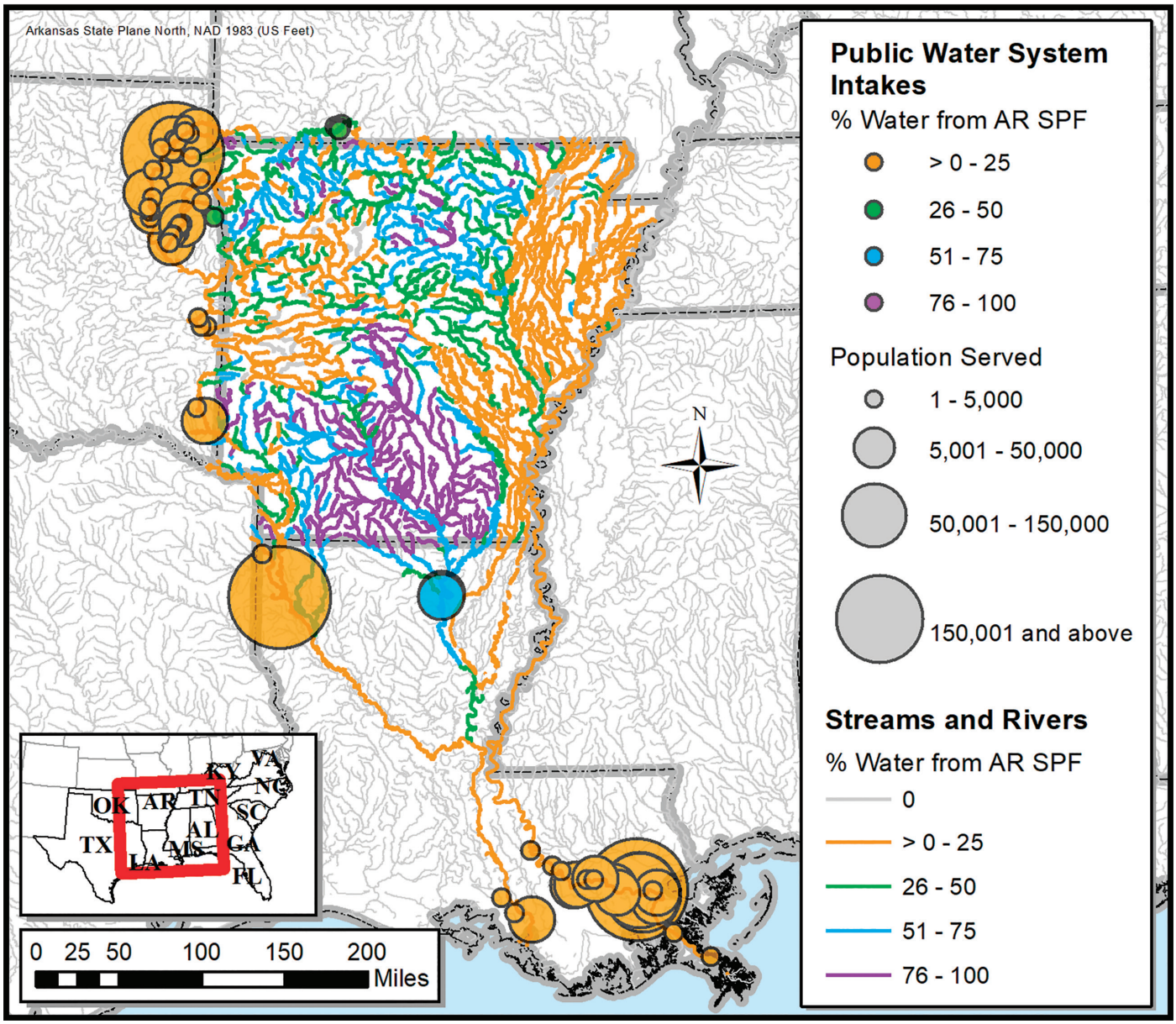


Figure A.AR.7—Arkansas streams by percentage of Arkansas SPF water content, surface drinking water intakes downstream of Arkansas by percentage of Arkansas SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 99 surface drinking water intakes outside the State but carrying Arkansas SPF water serve a population of 1,710,089 in 83 communities.

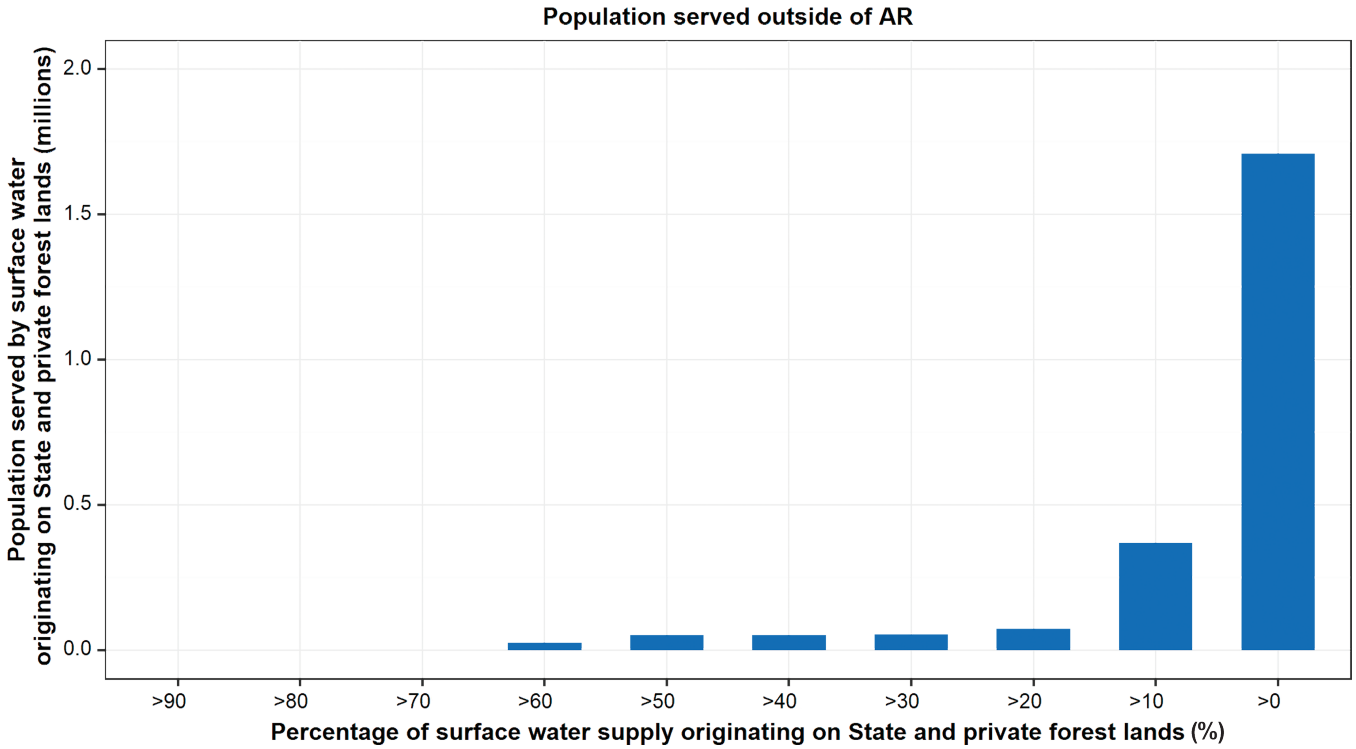


Figure A.AR.8—Cumulative frequency of non-Arkansas population served according to percentage of water coming from Arkansas SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol) Receiving Water from Arkansas State and Private Forests

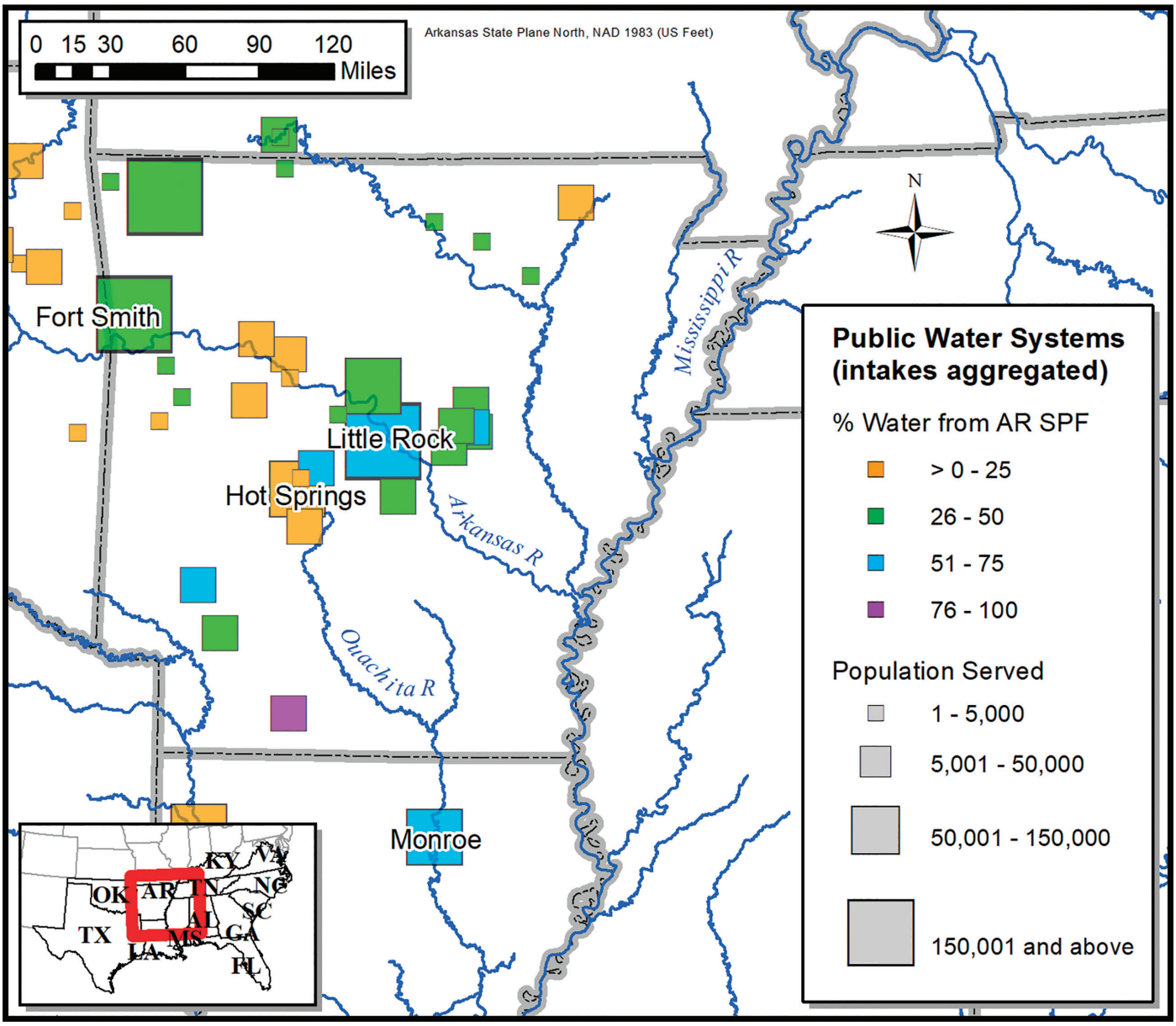


Figure A.AR.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Streams and Intrastate Public Water System Intakes in the Little Rock, AR, Area Receiving Water from Arkansas State and Private Forests

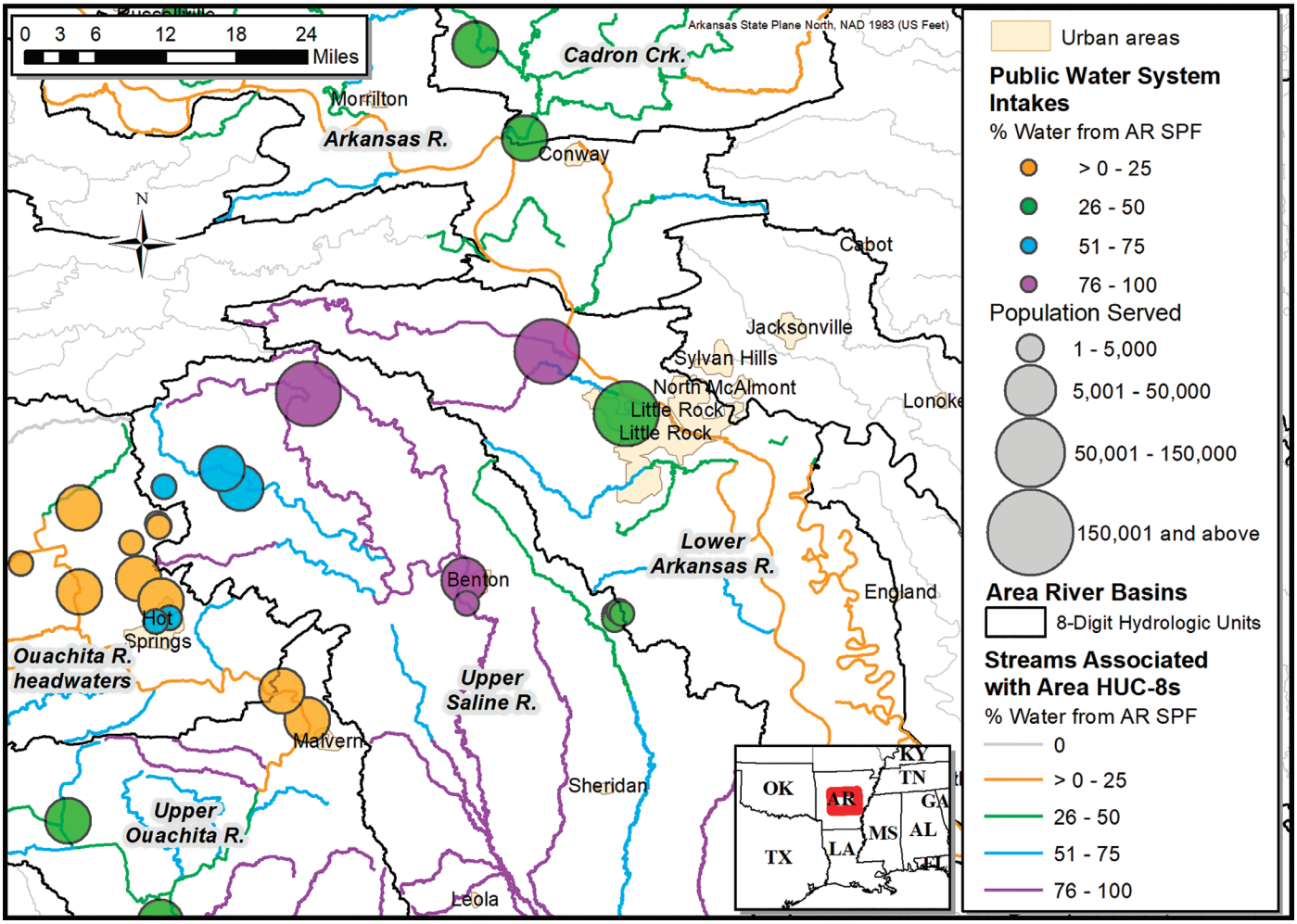


Figure A.AR.10—Local-scale detail showing percentage of water from Arkansas SPF for streams and surface drinking water intakes around Little Rock, AR.

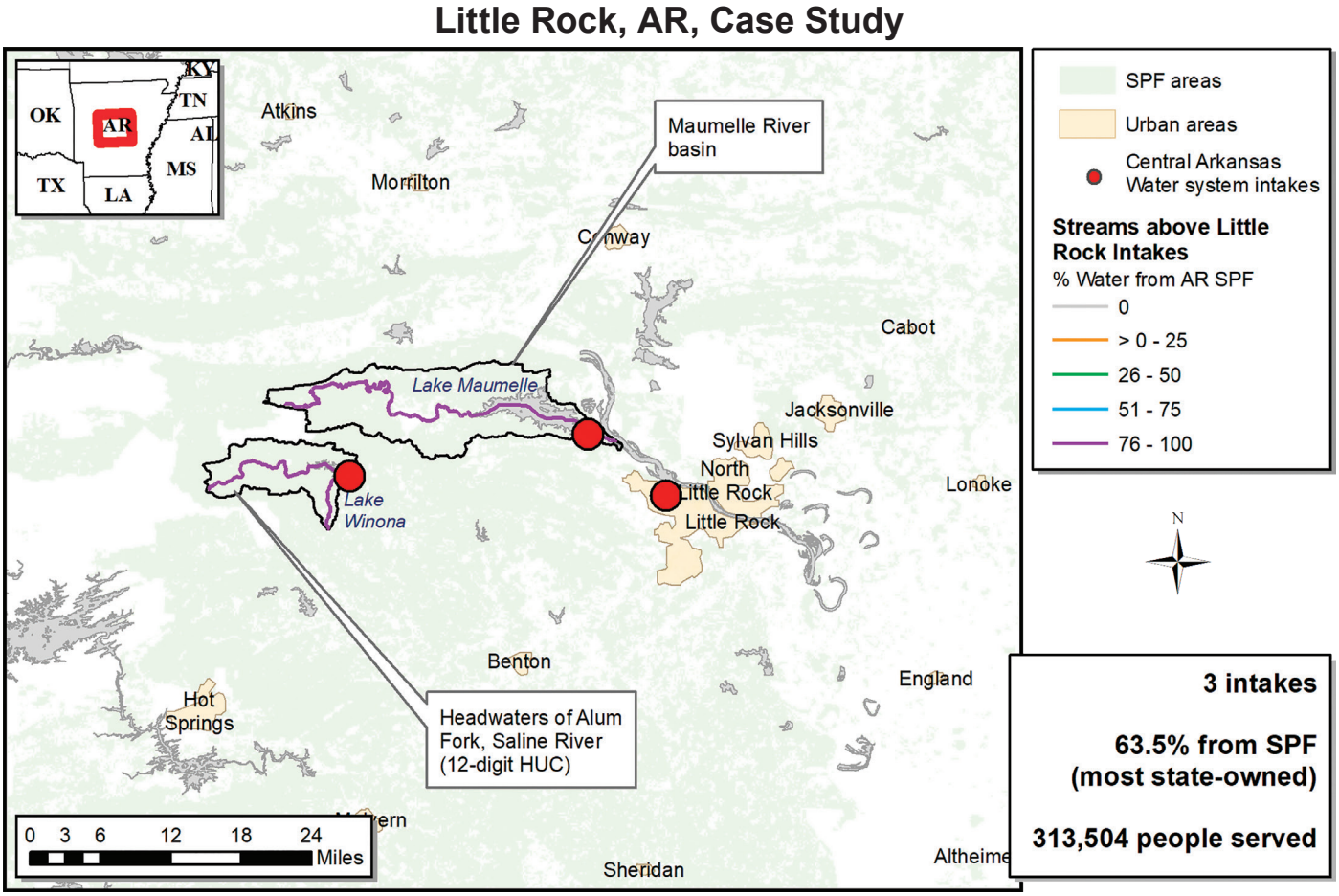


Figure A.AR.11—Case study of the Central Arkansas Water public water supply system, Little Rock, AR, illustrating SPF water in streams supplying the three surface drinking water intakes. When this water reaches the intakes, 63.5 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is State-owned.

STATE OF FLORIDA

Summary

State and private forest (SPF) lands cover about 39.8 percent of Florida (figs. A.FL.1 and A.FL.2; table A.FL.1). About 36.6 percent of all Florida surface water originates on SPF lands (fig. A.FL.3). The majority of SPF land area is in, and surface water is from, corporate-owned forests, accounting for about 46.0 percent of the land area of SPF and 44.9 percent of surface water from SPF. Family-owned forests contribute 28.3 percent of surface water from SPF and account for 26.5 percent of land area of SPF. Average annual water yield in Florida is about 467 mm (fig. A.FL.4). Florida has a total of 716 surface drinking water intakes where at least some available water comes from SPF (fig. A.FL.5). About 15.6 percent of the total population of Florida is served by surface drinking water overall, and Florida SPF surface drinking water serves about 15.5 percent of the State population, or 3.3 million people, to some degree. About 0.1 million people in Florida are getting more than half of their surface drinking water from SPF within the State (fig. A.FL.6). State and private forest lands in Florida also supply water to one surface drinking water intake in Alabama, serving about 7,000 people (figs. A.FL.5 and A.FL.7). Many public water systems in Florida utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.FL.8 by population served (symbol size) and percentage of water from SPF lands in Florida (symbol color). The Tampa Bay and Sarasota detail maps (figs. A.FL.9 and A.FL.10) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.FL.11) of the City of Tampa Water Department public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Florida, where fifteen surface drinking water intakes receive about 21.2 percent of their water from SPF and serve about 0.6 million people.

Table A.FL.1—Land area by land cover and forest ownership type in Florida

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	71 656	17,706,524
Nonforest	80 171	19,810,625
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	10 934	2,701,818
Tribal (public)	334	82,496
State (public)	14 458	3,572,611
Local (public)	1930	477,012
Corporate (private)	27 796	6,868,533
Family (private)	15 989	3,951,001
Other private	215	53,053

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

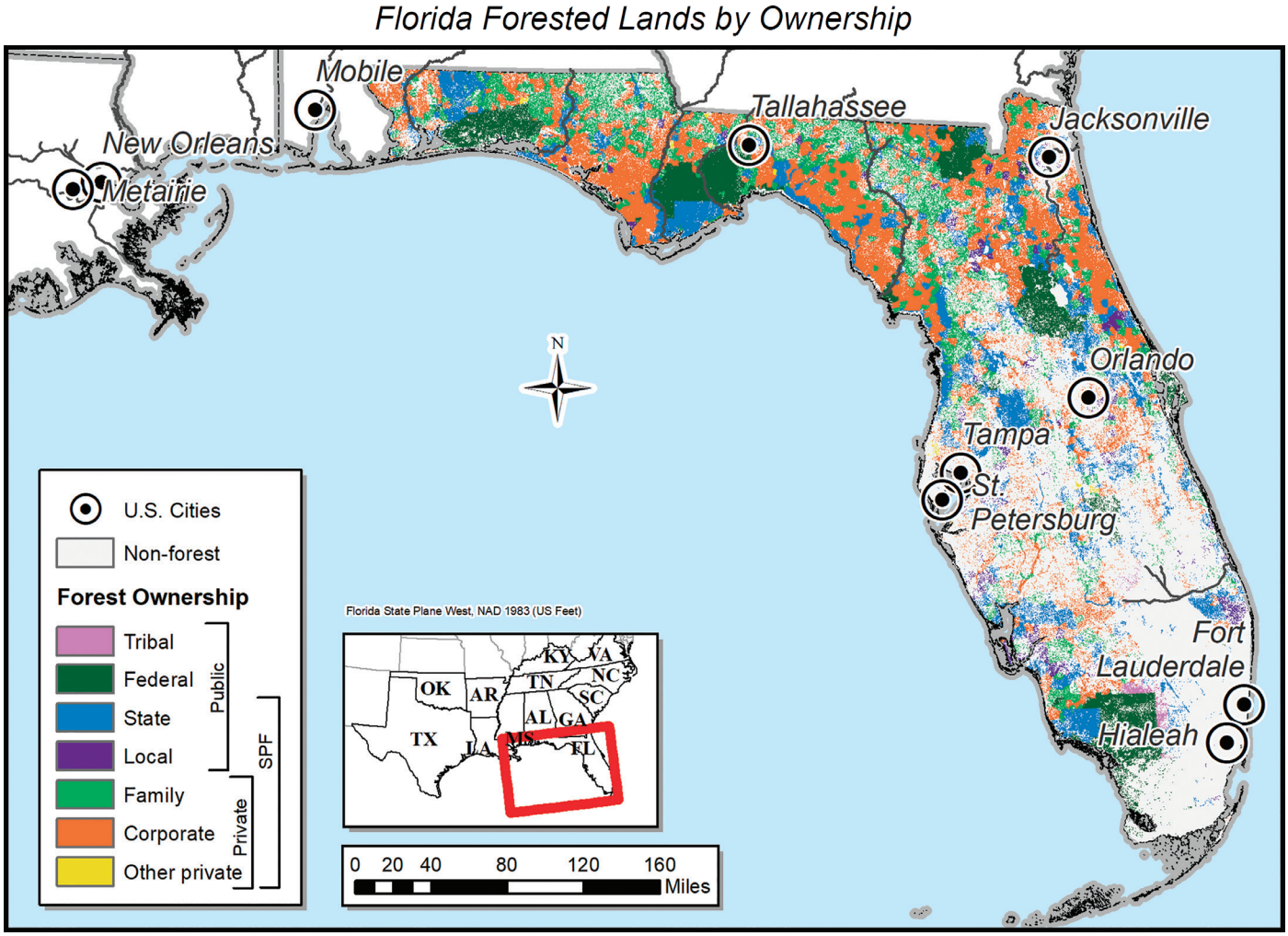


Figure A.FL.1—Florida nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

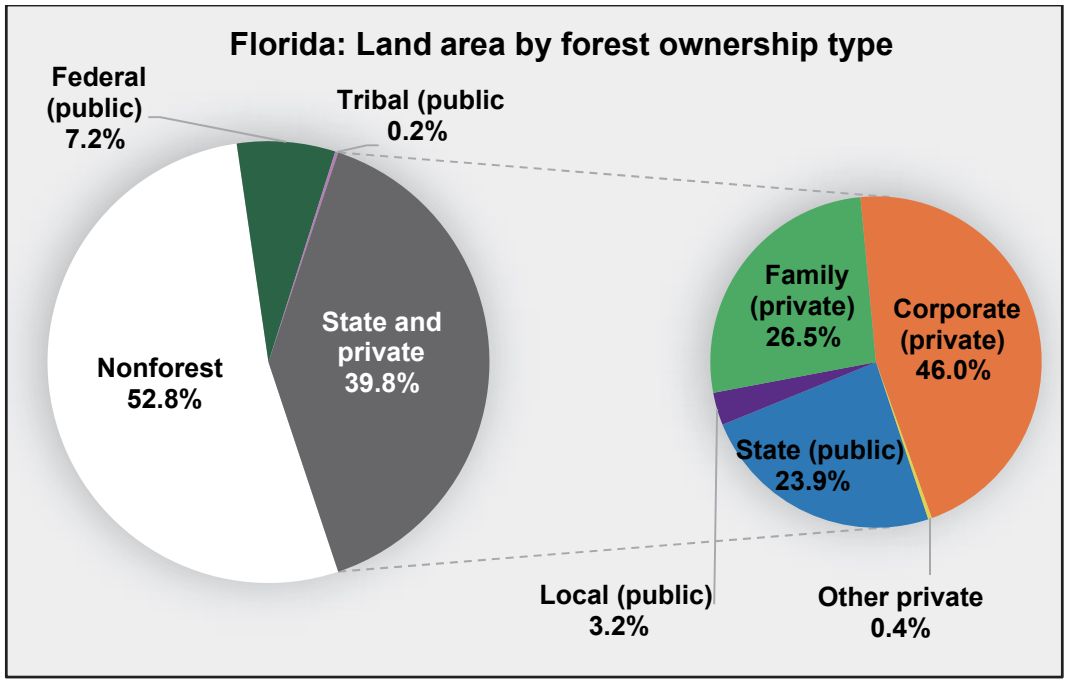


Figure A.FL.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: due to rounding, percentages may not total exactly 100.

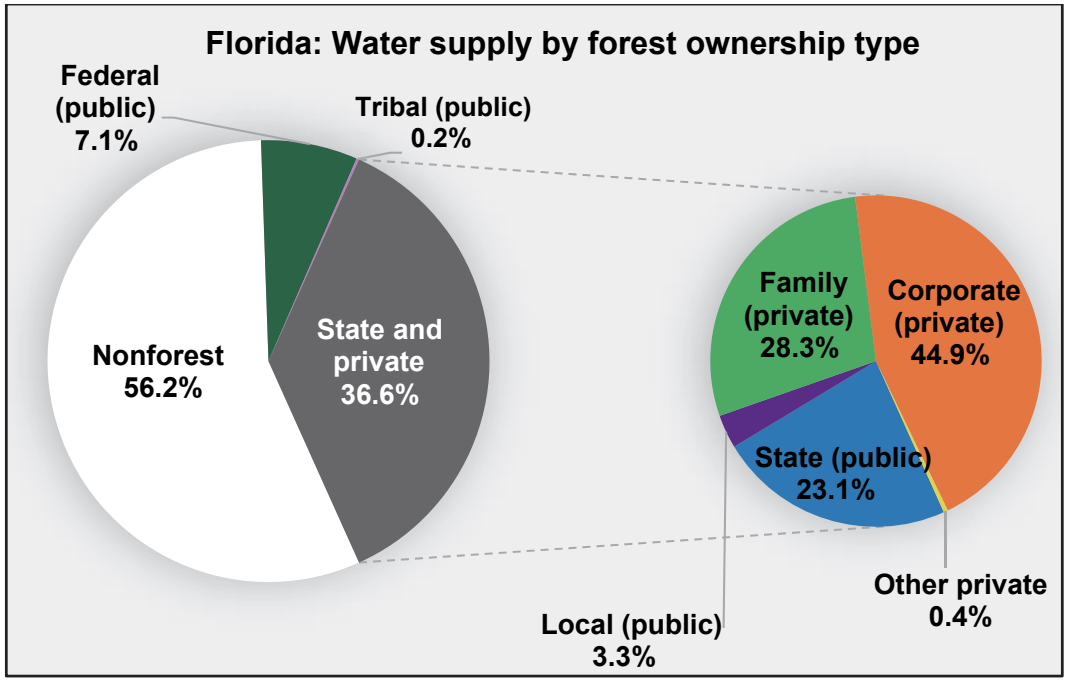


Figure A.FL.3—Percentage of Florida's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Florida

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

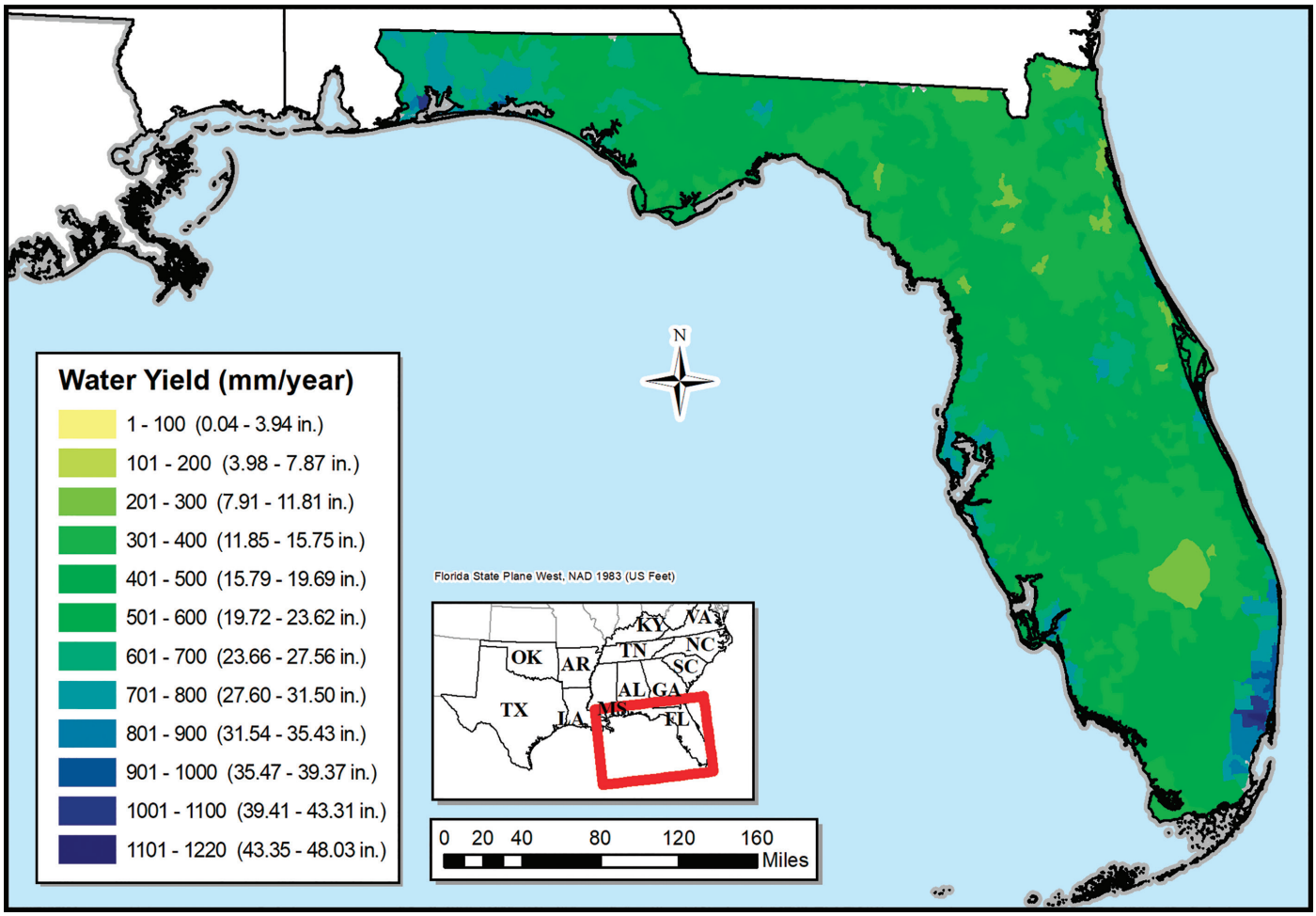


Figure A.FL.4—Estimated mean annual water yield by 12-digit hydrologic units in Florida, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Public Water System Intakes Receiving Water from Florida State and Private Forests

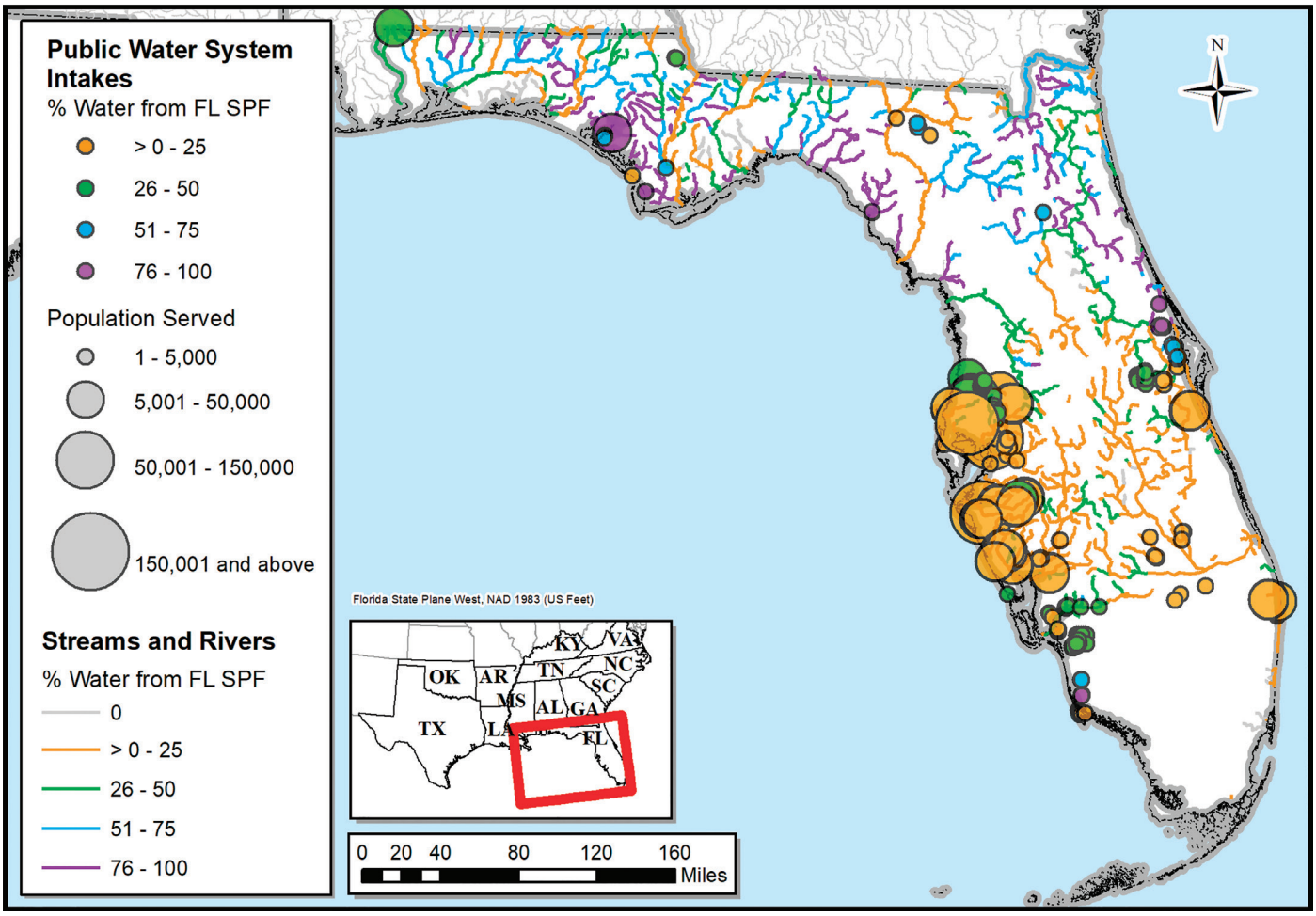


Figure A.FL.5—(A) Florida streams by percentage of Florida SPF water content, surface drinking water intakes within and just outside of Florida by percentage of Florida SPF surface water available at intake (symbol color), and population served by each intake (symbol size). Within the State, 716 surface drinking water intakes serve a population of 3,273,931 in 47 communities. Outside the State, one surface water intake carries Florida SPF water and serves a population of about 7,000 in Alabama. Note: See figures A.FL.5 parts B and C on separate pages for streams and intakes only.

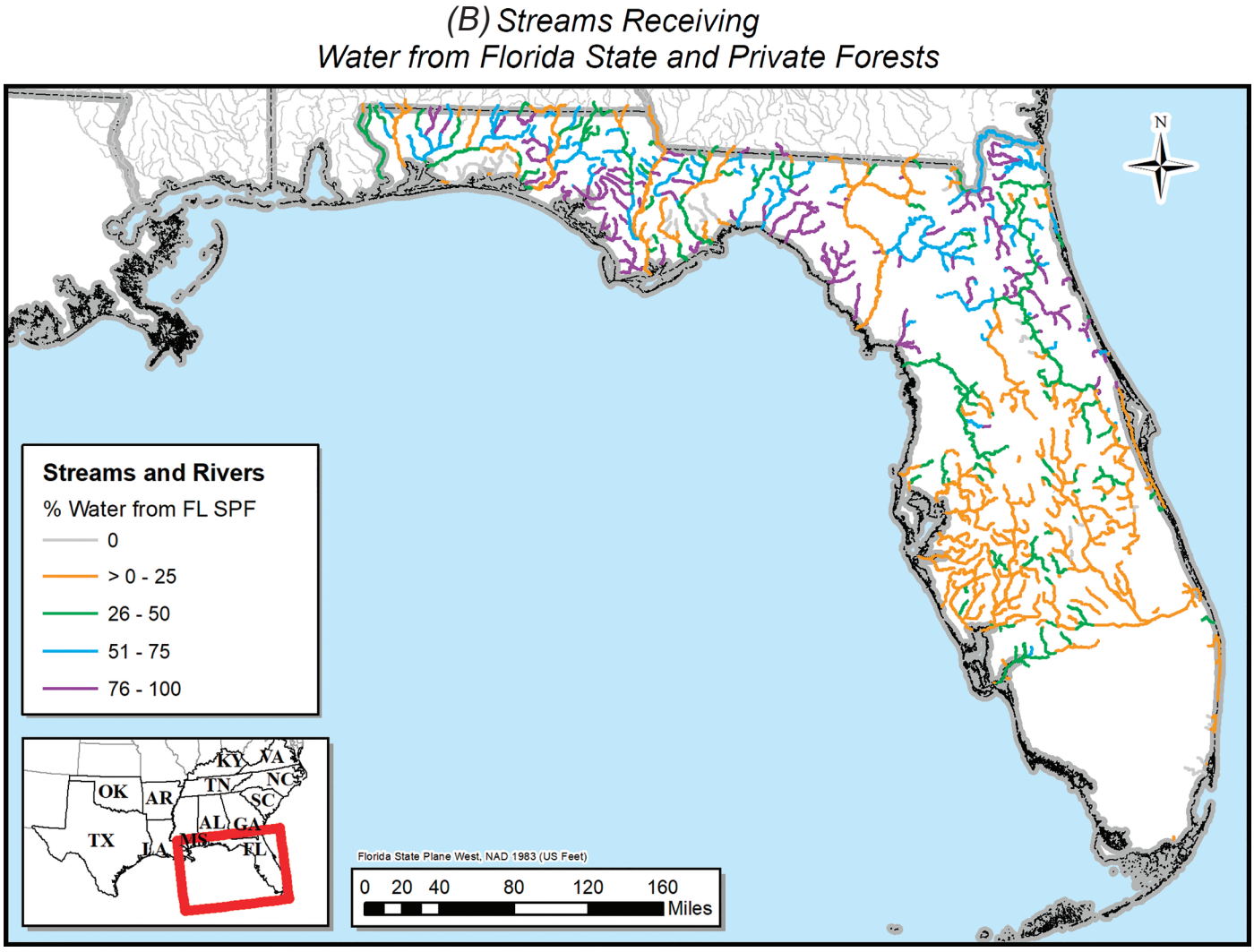


Figure A.FL.5—(B) Florida streams by percentage of Florida SPF water content.

(C) Public Water System Intakes Receiving Water from Florida State and Private Forests

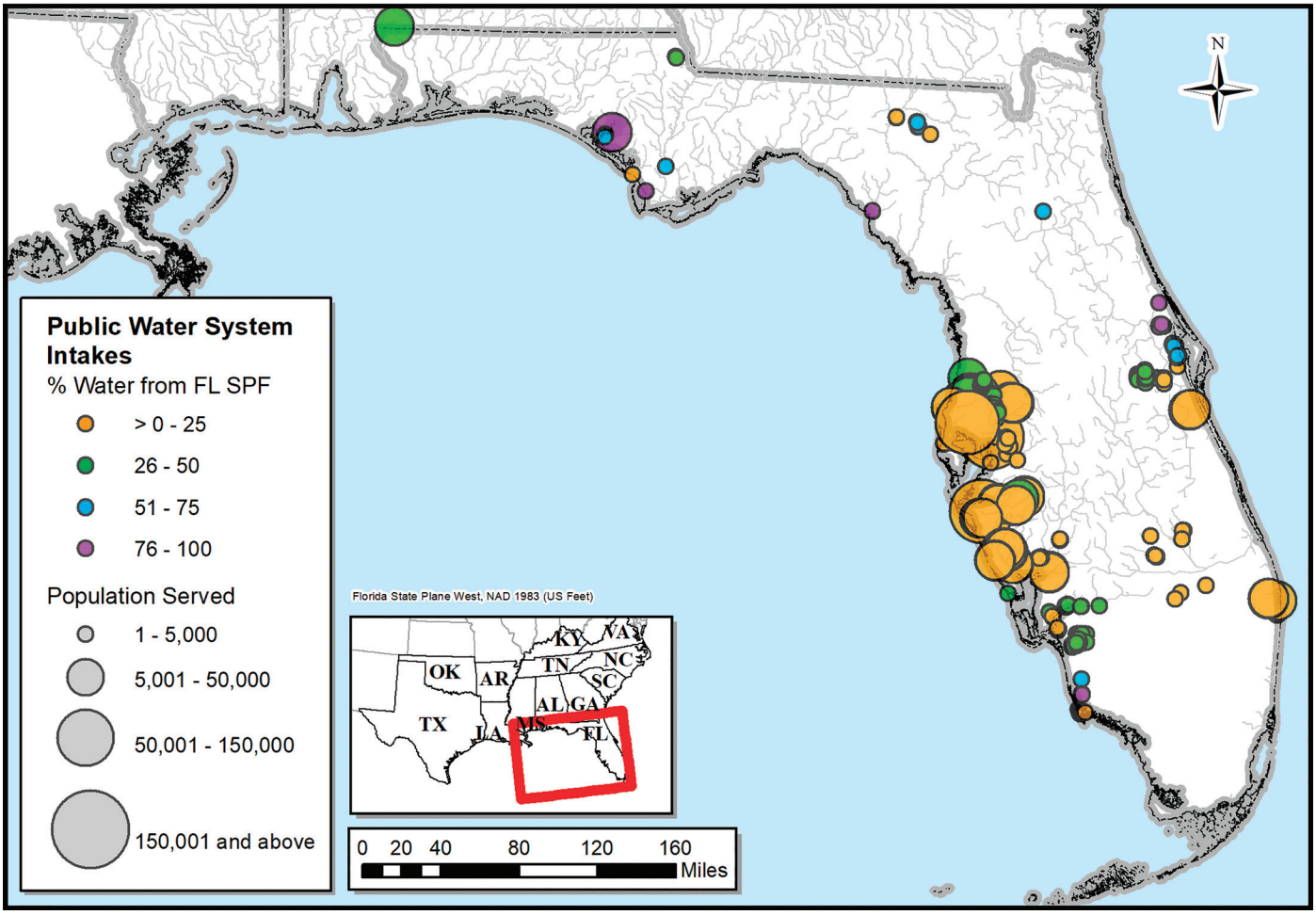


Figure A.FL.5—(C) Surface drinking water intakes within and just outside of Florida by percentage of Florida SPF surface water available at intake (symbol color) and population served by each intake (symbol size). Within the State, 716 surface drinking water intakes serve a population of 3,273,931 in 47 communities. Outside the State, one surface water intake carries Florida SPF water and serves a population of about 7,000 in Alabama.

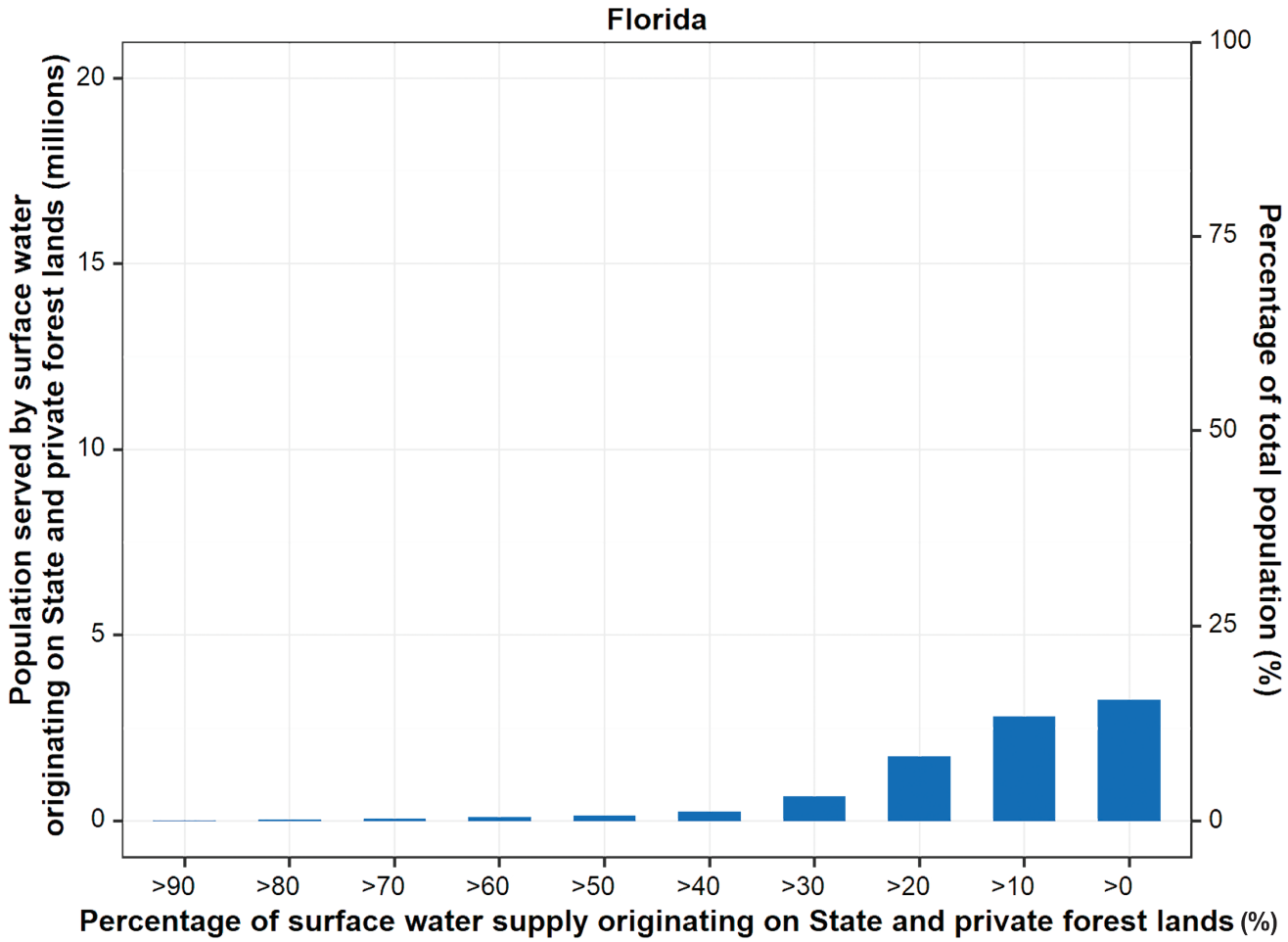


Figure A.FL.6—Cumulative frequency of population served according to percentage of water coming from Florida SPF lands.

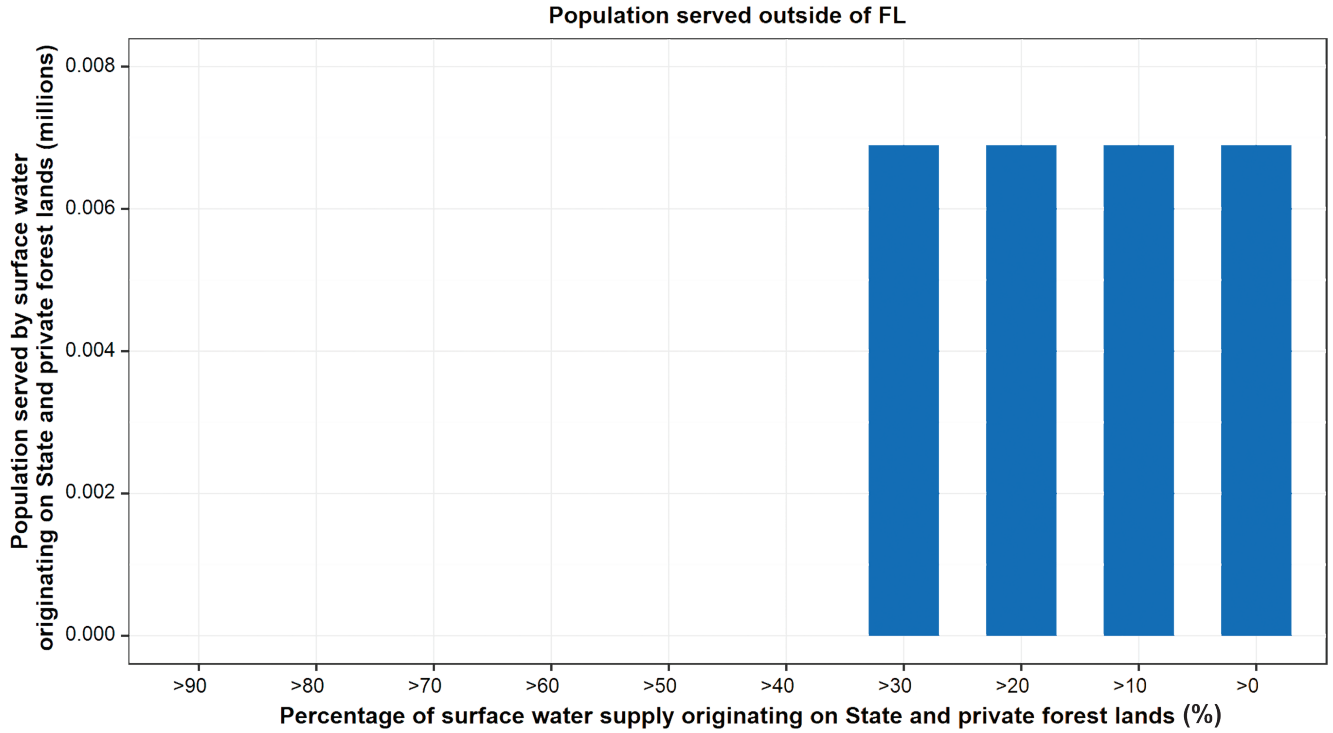


Figure A.FL.7—Cumulative frequency of non-Florida population served according to percentage of water coming from Florida SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Florida State and Private Forests

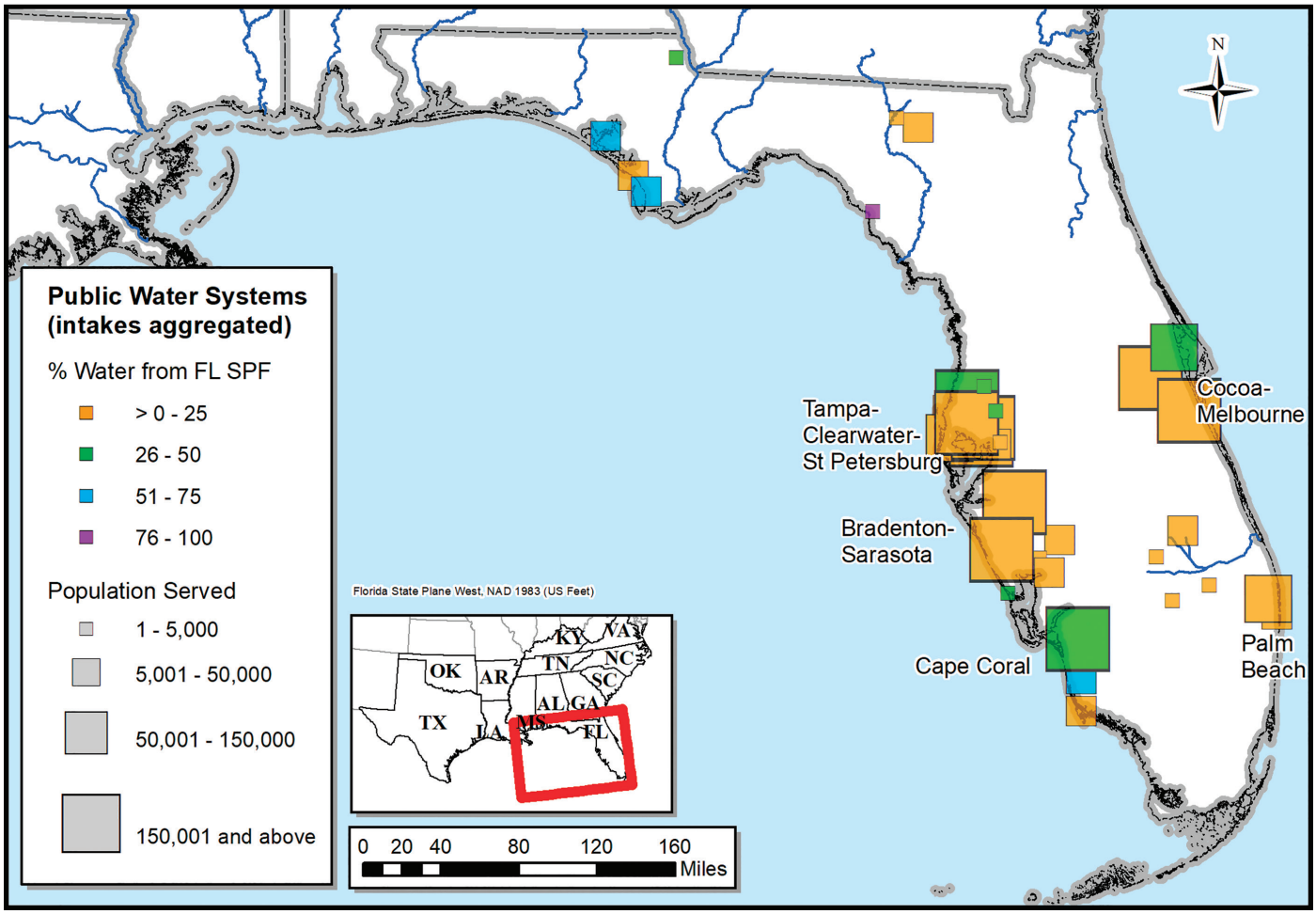


Figure A.FL.8—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Tampa Bay Detail

Streams and Public Water System Intakes in the Tampa Bay, FL, Area Receiving Water from Florida State and Private Forests

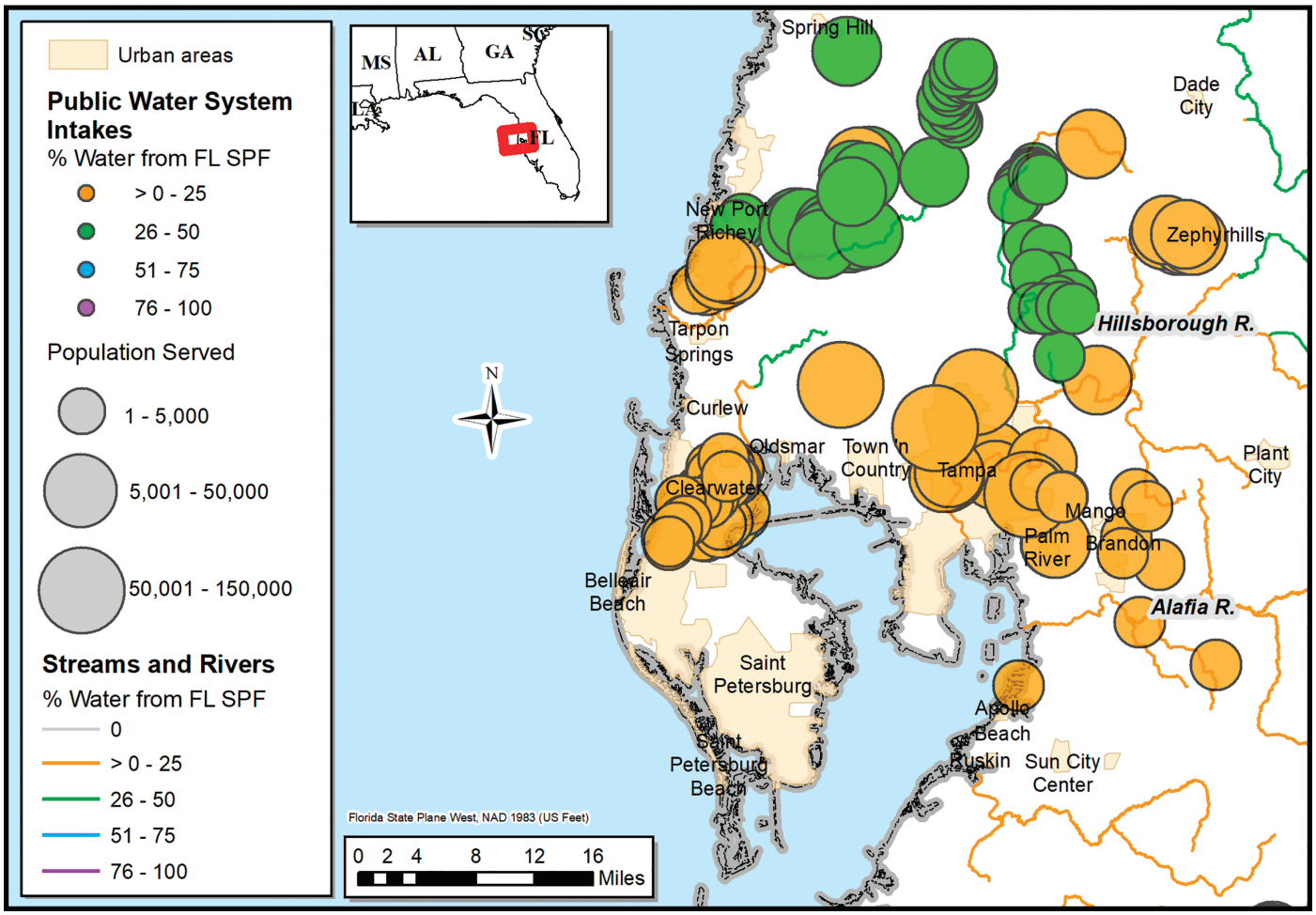


Figure A.FL.9—Local-scale detail showing percentage of water from Florida SPF for streams and surface drinking water intakes around Tampa Bay.

Sarasota Detail

Streams and Public Water System Intakes in the Sarasota, FL, Area Receiving Water from Florida State and Private Forests

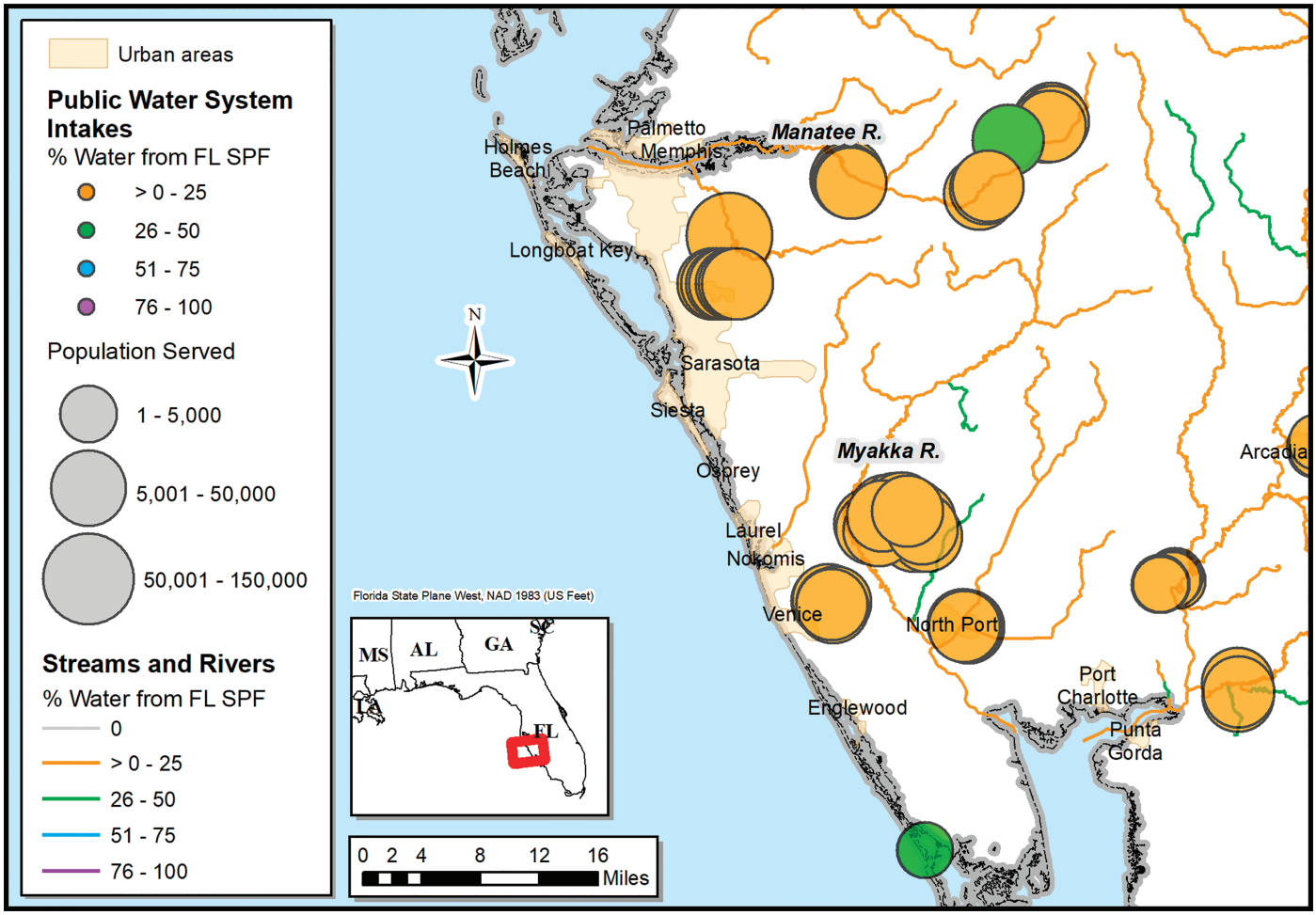


Figure A.FL.10—Local-scale detail showing percentage of water from Florida SPF for streams and surface drinking water intakes around Sarasota, FL.

Tampa, FL, Case Study

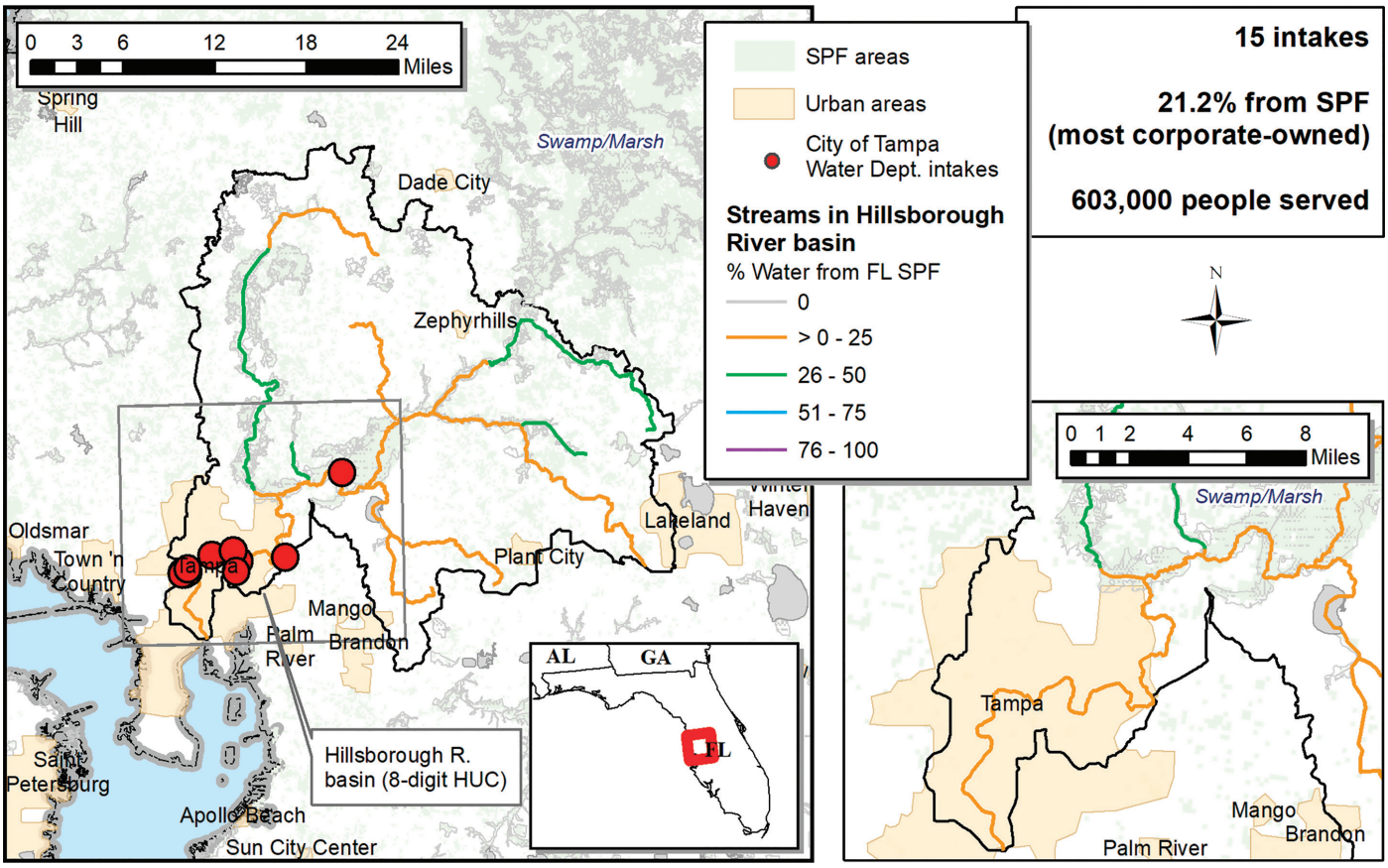


Figure A.FL.11—Case study of the City of Tampa Water Department public water supply system, Tampa, FL, illustrating SPF water in streams supplying the 15 surface drinking water intakes. When this water reaches the intakes, 21.2 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is corporate-owned.

STATE OF GEORGIA

Summary

State and private forest (SPF) lands cover about 59.3 percent of Georgia (figs. A.GA.1 and A.GA.2; table A.GA.1). About 54.6 percent of all Georgia surface water originates on SPF lands (fig. A.GA.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 56.2 percent of the SPF land area and 57.4 percent of surface water from SPF. Corporate-owned forests contribute 36.3 percent of surface water from SPF and account for 37.7 percent of land area of SPF. Average annual water yield in Georgia is about 427 mm (fig. A.GA.4). Georgia has a total of 404 surface drinking water intakes where at least some available water comes from SPF (fig. A.GA.5). About 56.8 percent of the total population of Georgia is served by surface drinking water overall, and Georgia SPF surface drinking water also serves about 56.8 percent of the State population, or 5.9 million people, to some degree. About 1.1 million people in Georgia are getting more than half of their surface drinking water from SPF within the State (fig. A.GA.6). State and private forest lands in Georgia also supply water to 185 surface drinking water intakes in other States (Alabama, Florida, Illinois, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee) (fig. A.GA.7), which collectively serve about 2.5 million people in 116 communities (fig. A.GA.8). Many public water systems in Georgia utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.GA.9 by population served (symbol size) and percentage of water from SPF lands in Georgia (symbol color). The detail maps for Athens-Watkinsville, Atlanta's Metropolitan North Georgia Water Planning District, and Savannah (figs. A.GA.10, A.GA.11, and A.GA.12) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.GA.13) focused on the upper Chattahoochee River Basin encompasses several public water supply systems of the Greater Atlanta area, and presents an example of the important role SPF lands play in providing water supply to this major urban region. The figure demonstrates that for each of the public water supply systems shown, there are either one or two (at Gainesville) surface drinking water supply intakes, with the percentage of water received from SPF lands ranging from about 34 (downstream at Atlanta proper) to 43 (upstream at Gainesville) and population served varying from about 138,000 at Forsyth County to 743,000 at DeKalb County.

Table A.GA.1—Land area by land cover and forest ownership type in Georgia

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	103 578	25,594,497
Nonforest	53 641	13,255,062
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	10 361	2,560,318
Tribal (public)	0	0
State (public)	3026	747,643
Local (public)	1493	368,860
Corporate (private)	35 104	8,674,296
Family (private)	52 418	12,952,707
Other private	1176	290,673

[a]State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

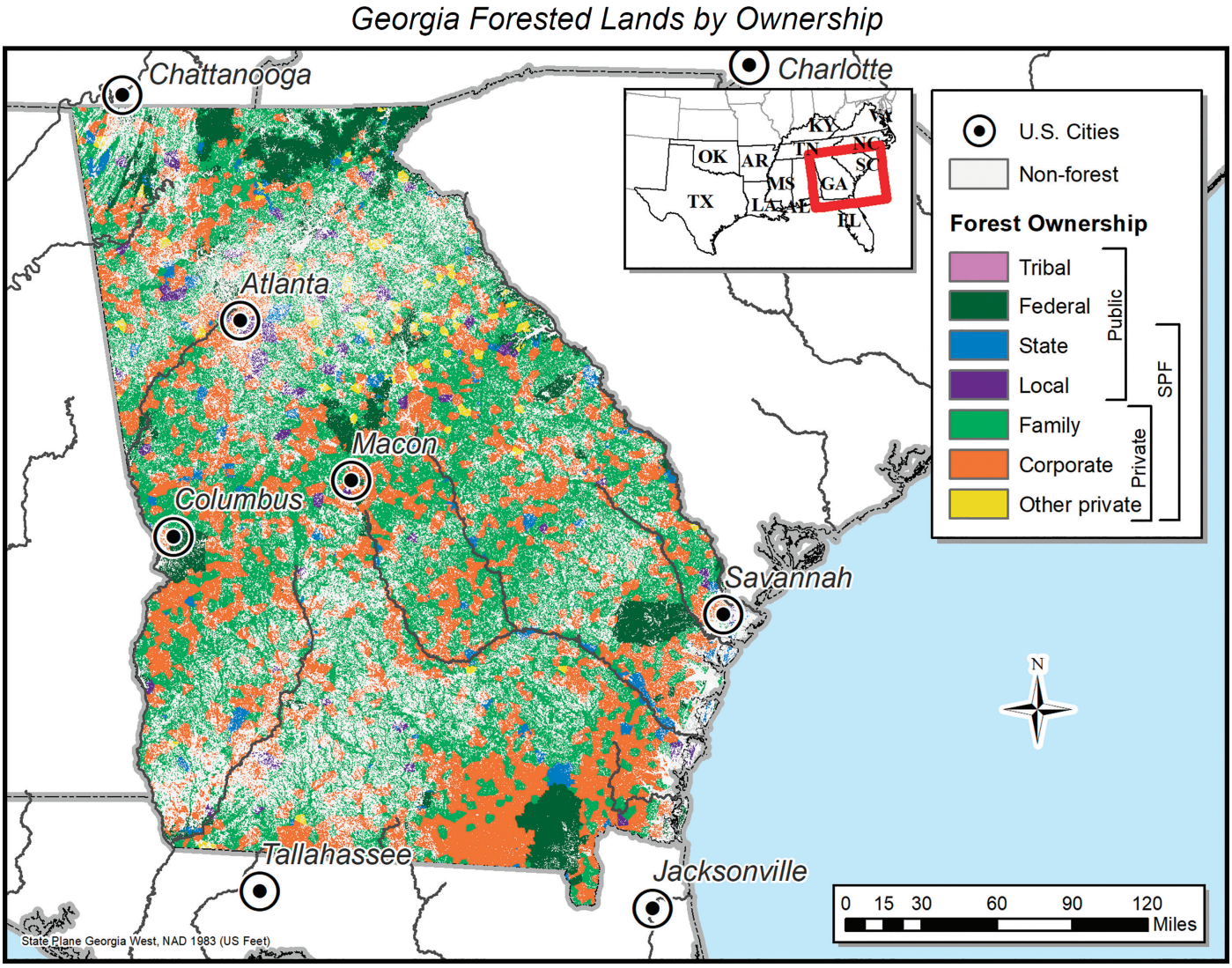


Figure A.GA.1—Georgia nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

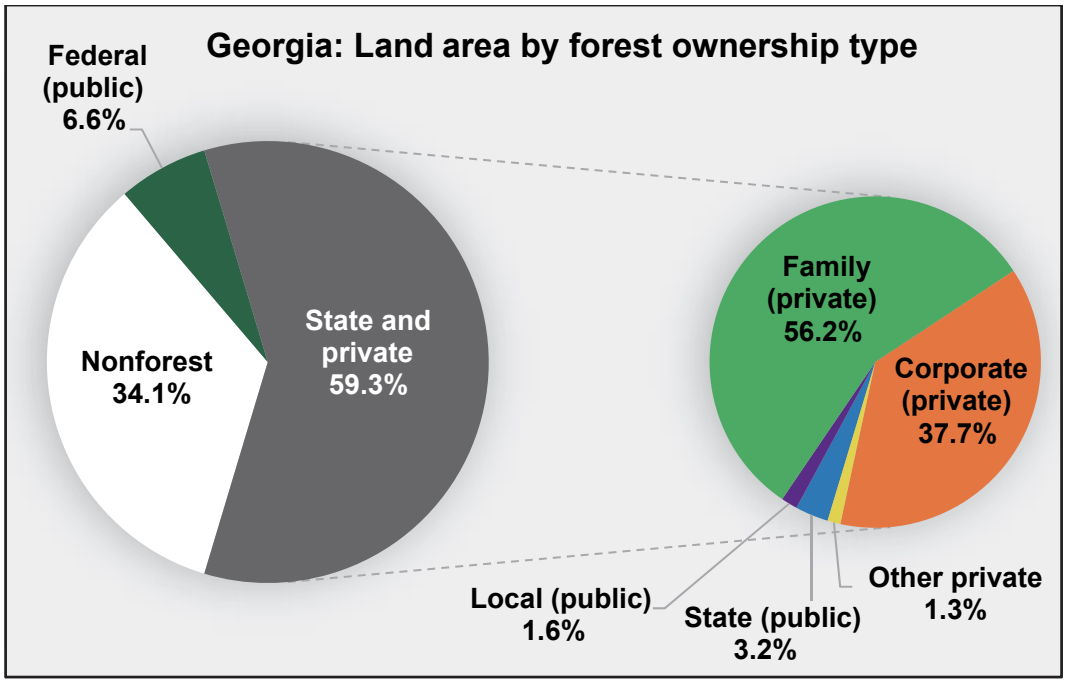


Figure A.GA.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

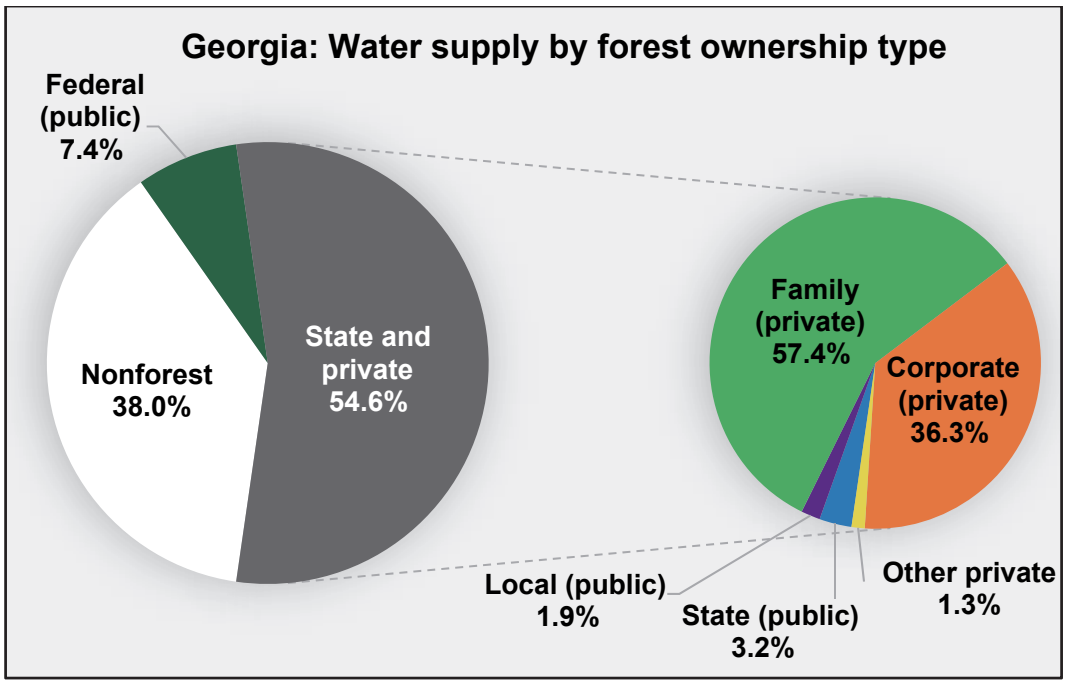


Figure A.GA.3—Percentage of Georgia's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Georgia

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

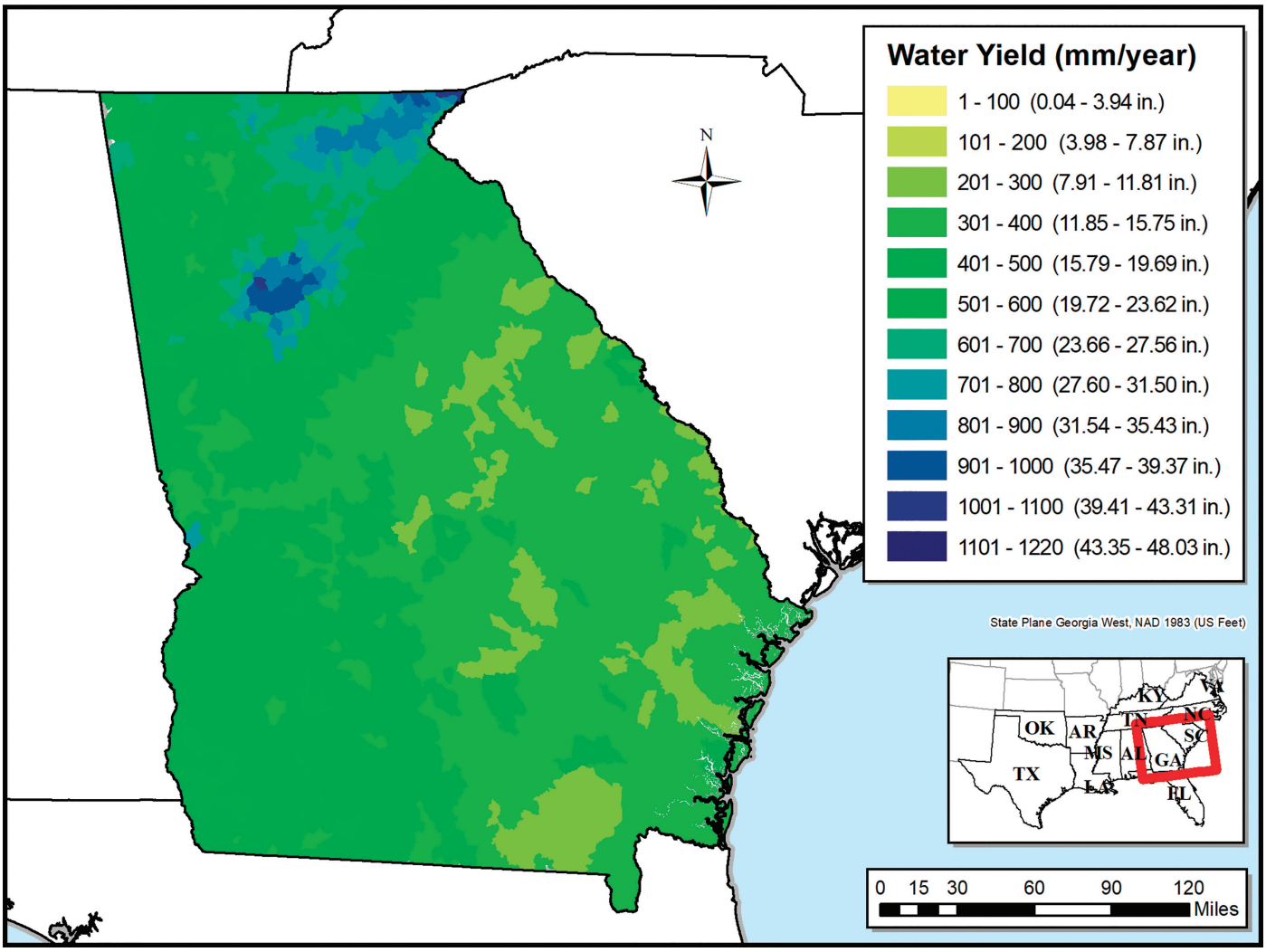


Figure A.GA.4—Estimated mean annual water yield by 12-digit hydrologic units in Georgia, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Georgia State and Private Forests

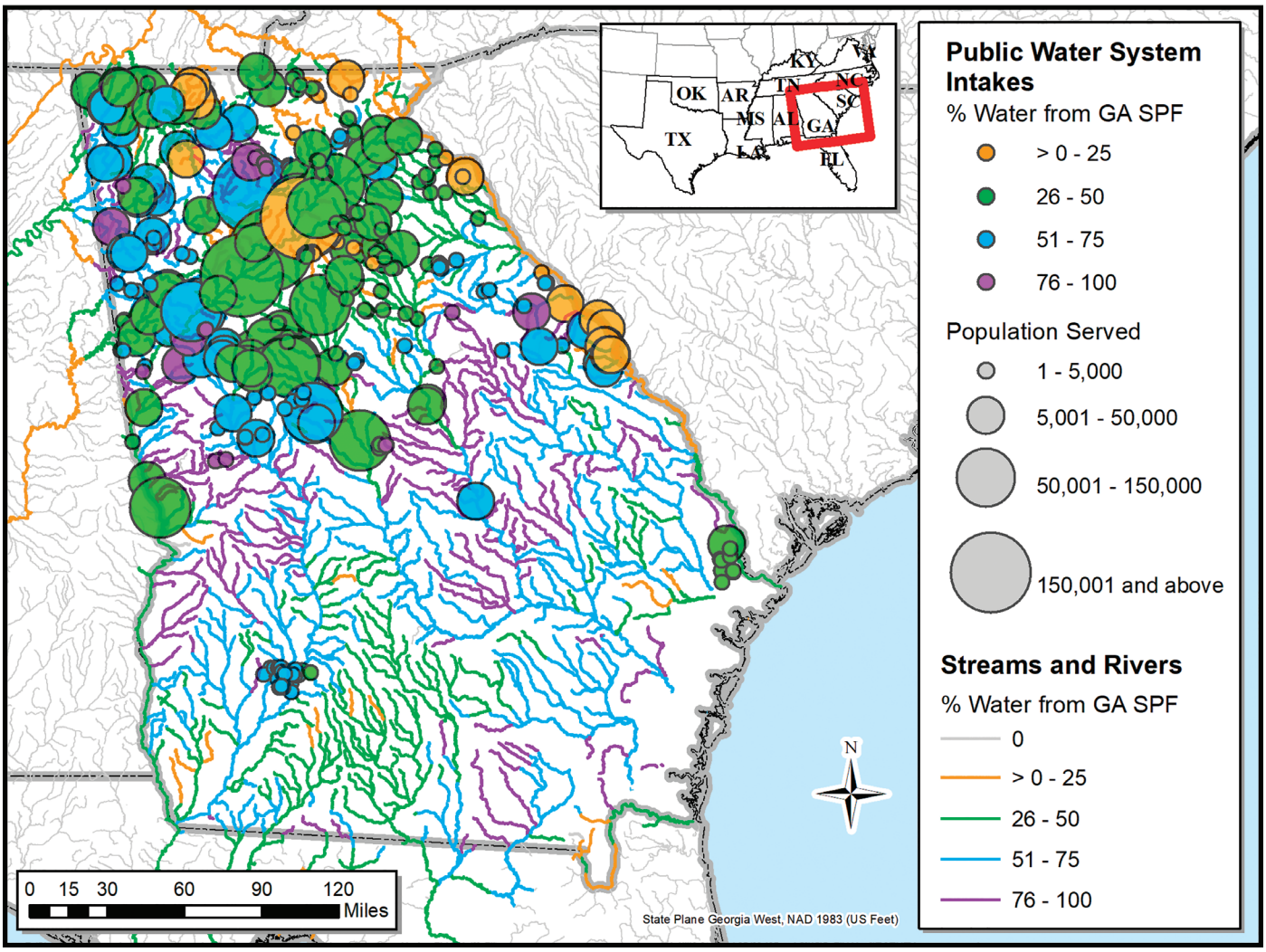


Figure A.GA.5—(A) Georgia streams by percentage of Georgia SPF water content, surface drinking water intakes within Georgia by percentage of Georgia SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 404 surface drinking water intakes within the State serve a population of 5,910,180 in 146 communities. Note: See figures A.GA.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving
Water from Georgia State and Private Forests

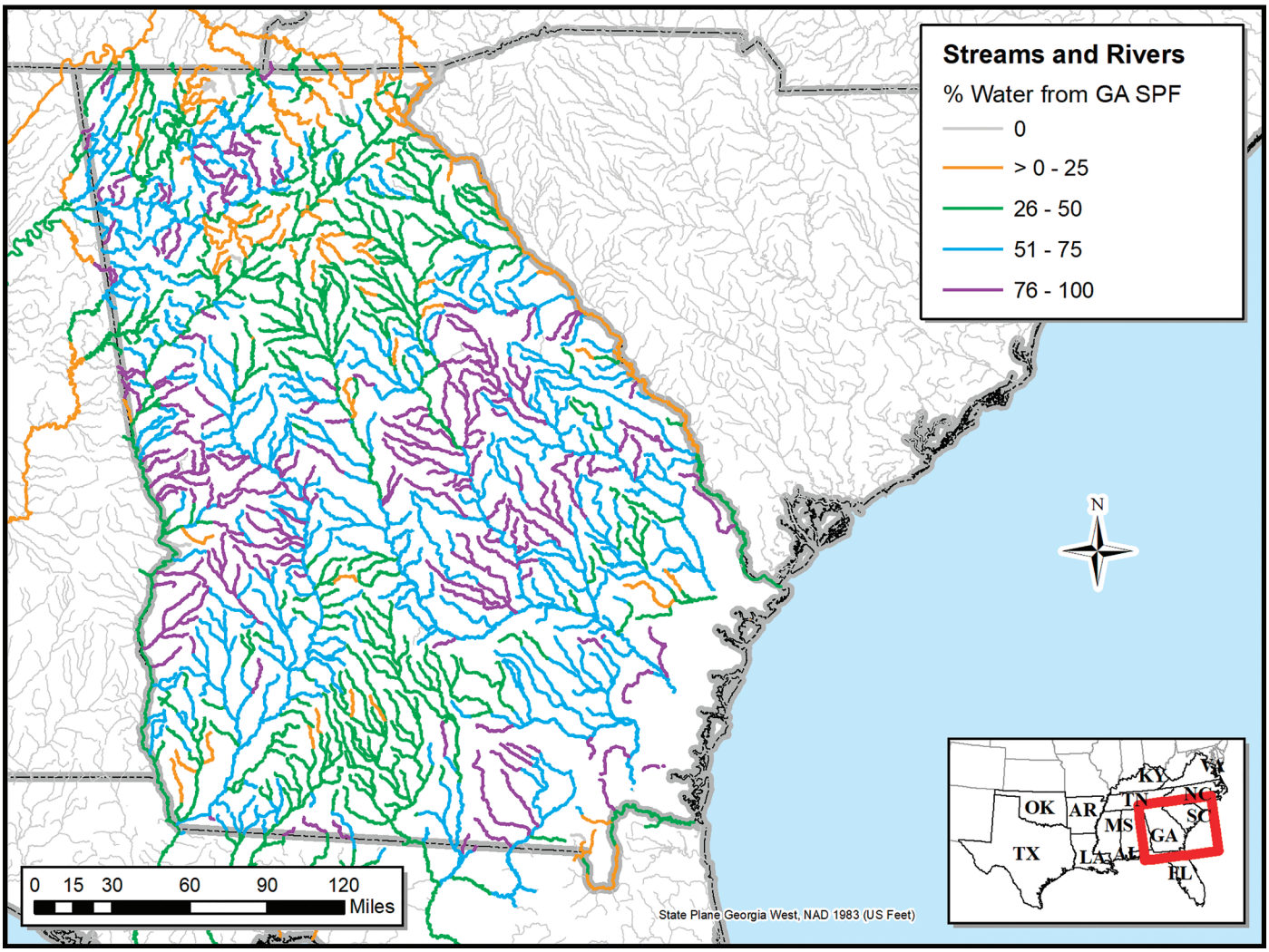


Figure A.GA.5—(B) Georgia streams by percentage of Georgia SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Georgia State and Private Forests

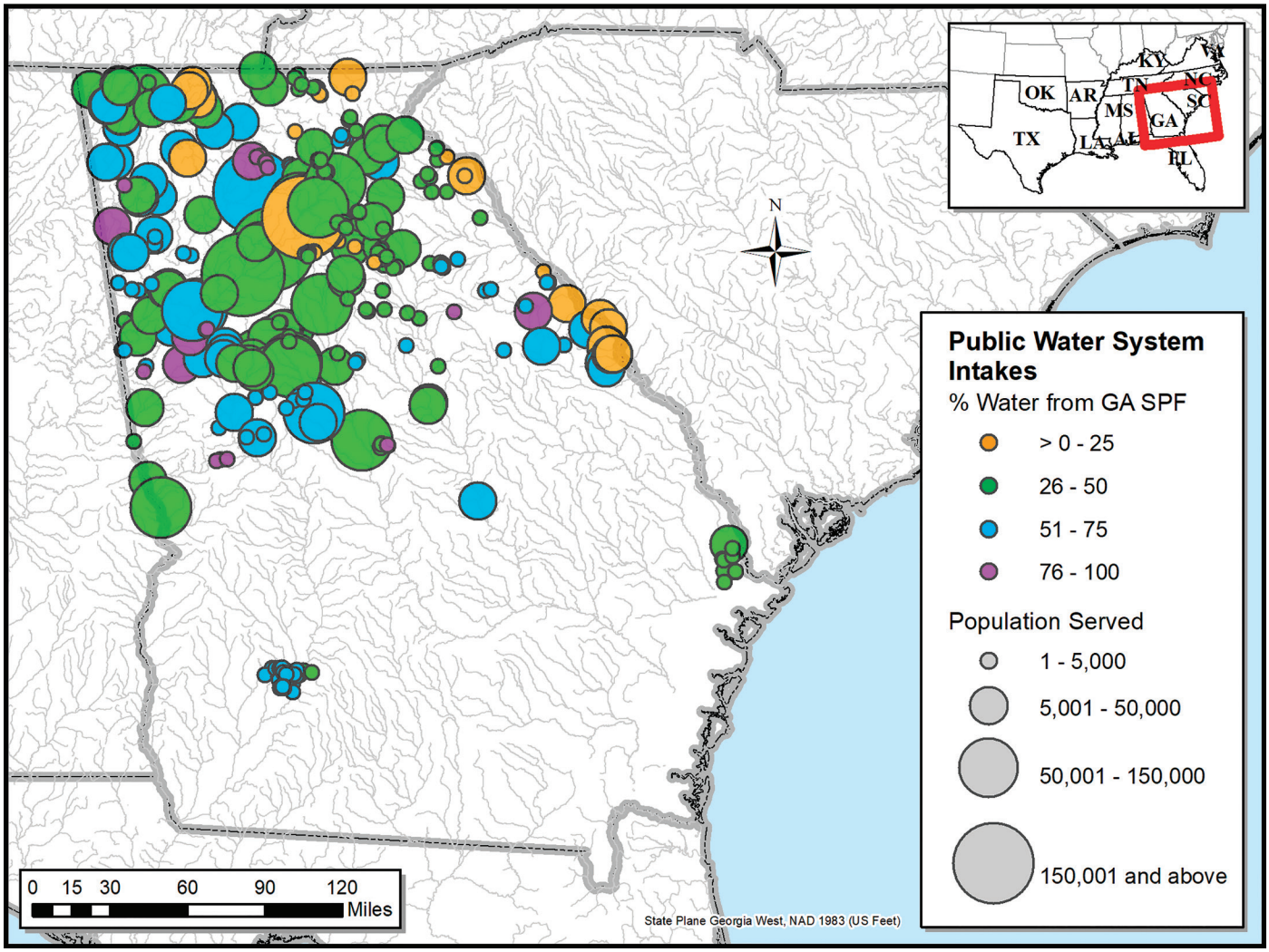


Figure A.GA.5—(C) Surface drinking water intakes within Georgia by percentage of Georgia SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 404 surface drinking water intakes within the State serve a population of 5,910,180 in 146 communities.

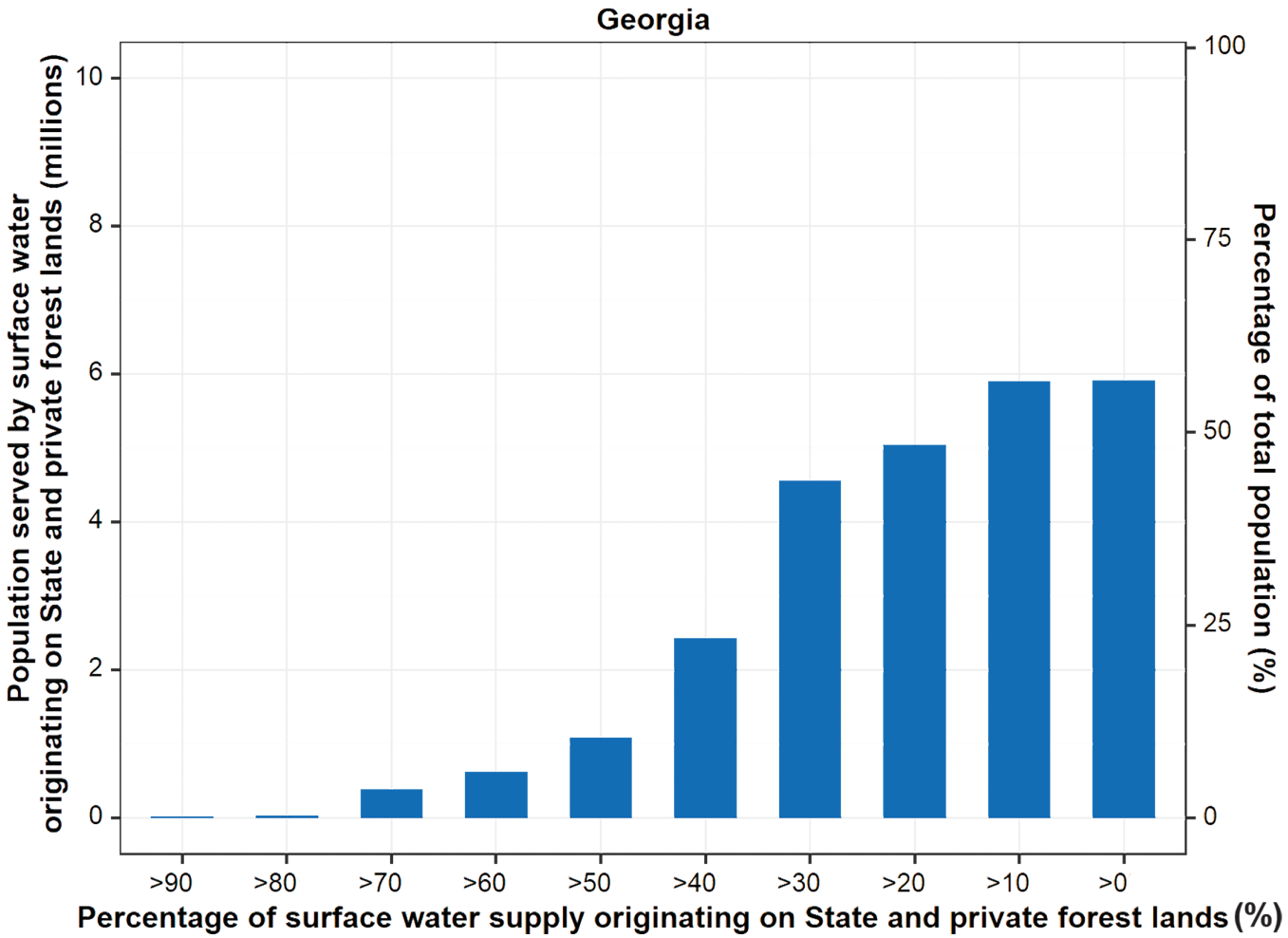


Figure A.GA.6—Cumulative frequency of population served according to percentage of water coming from Georgia SPF lands.

Public Water System Intakes Outside of Georgia Receiving Water from Georgia State and Private Forests

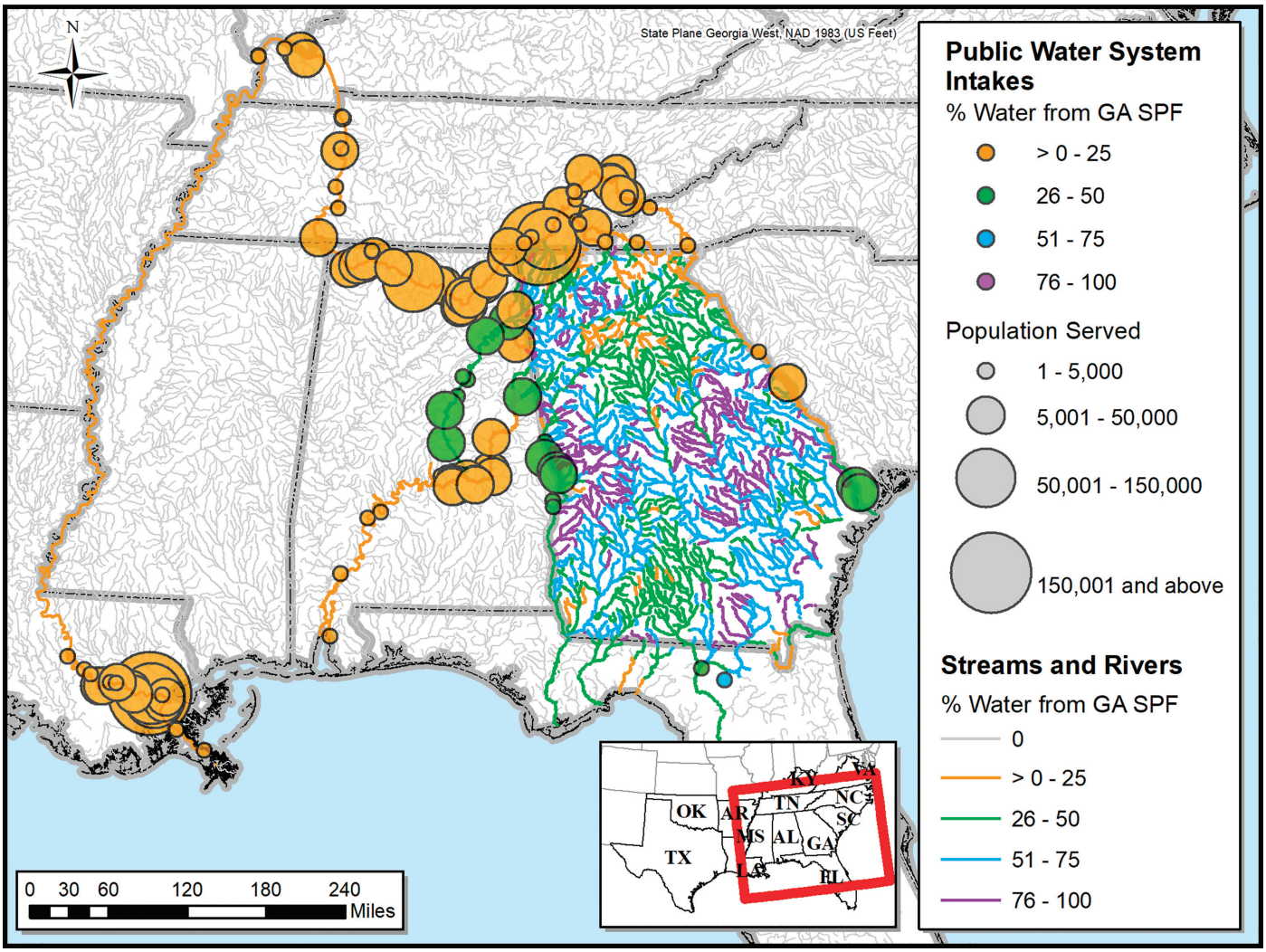


Figure A.GA.7—Georgia streams by percentage of Georgia SPF water content, surface drinking water intakes downstream of Georgia by percentage of Georgia SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 185 surface drinking water intakes outside the State but carrying Georgia SPF water serve a population of 2,485,244 in 116 communities.

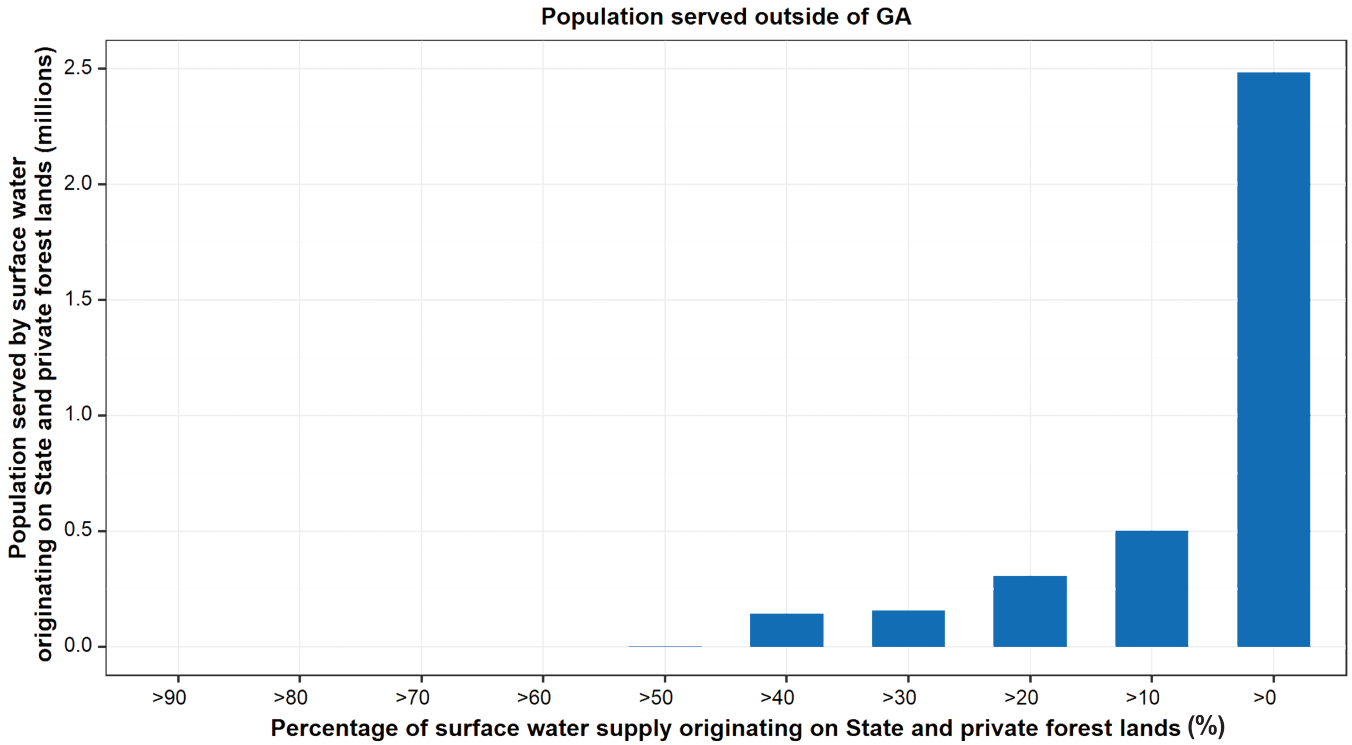


Figure A.GA.8—Cumulative frequency of non-Georgia population served according to percentage of water coming from Georgia SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Georgia State and Private Forests

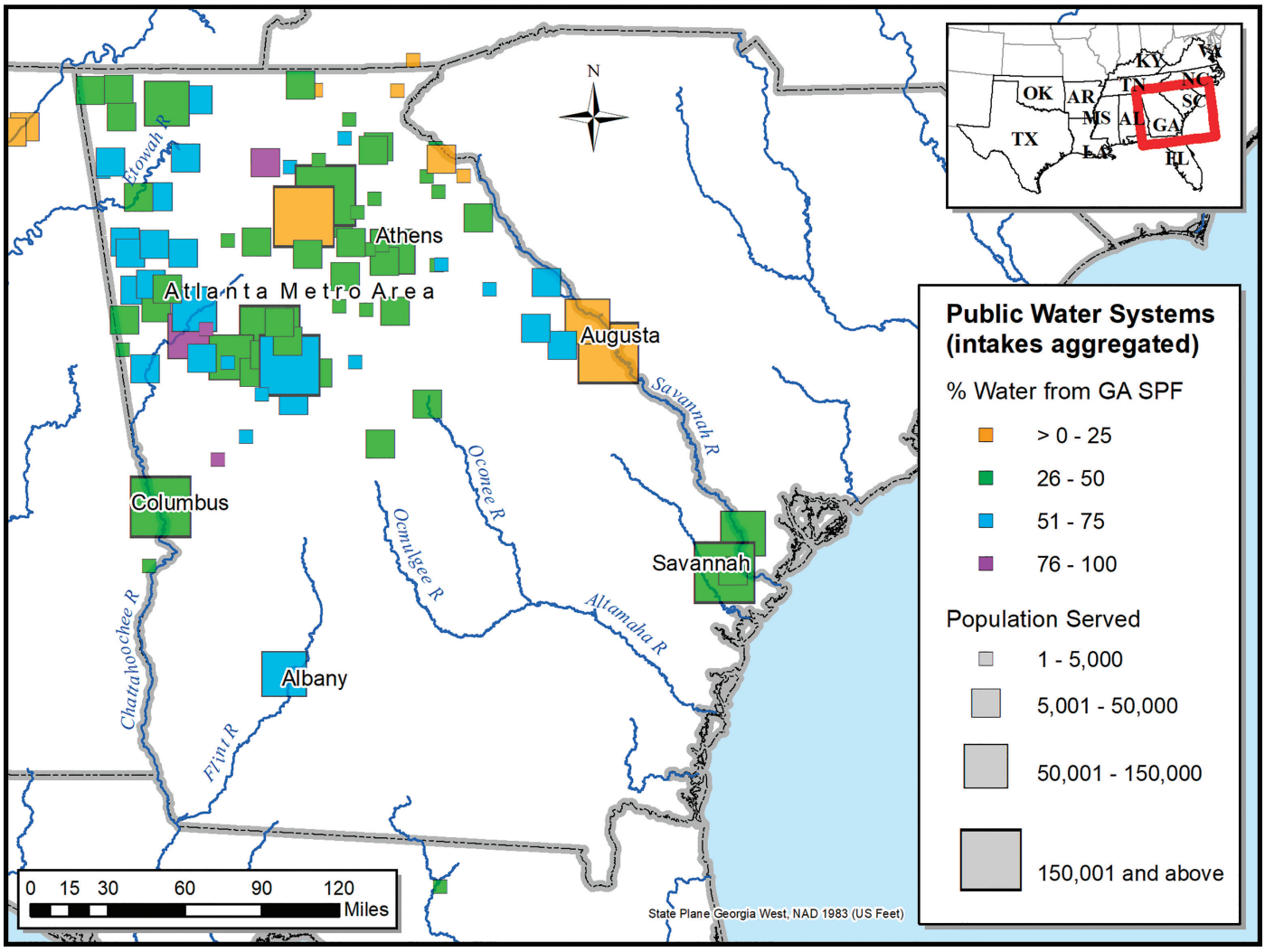


Figure A.GA.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Athens-Watkinsville Detail

Streams and Public Water System Intakes of Athens-Watkinsville, GA, Area Receiving Water from Georgia State and Private Forests

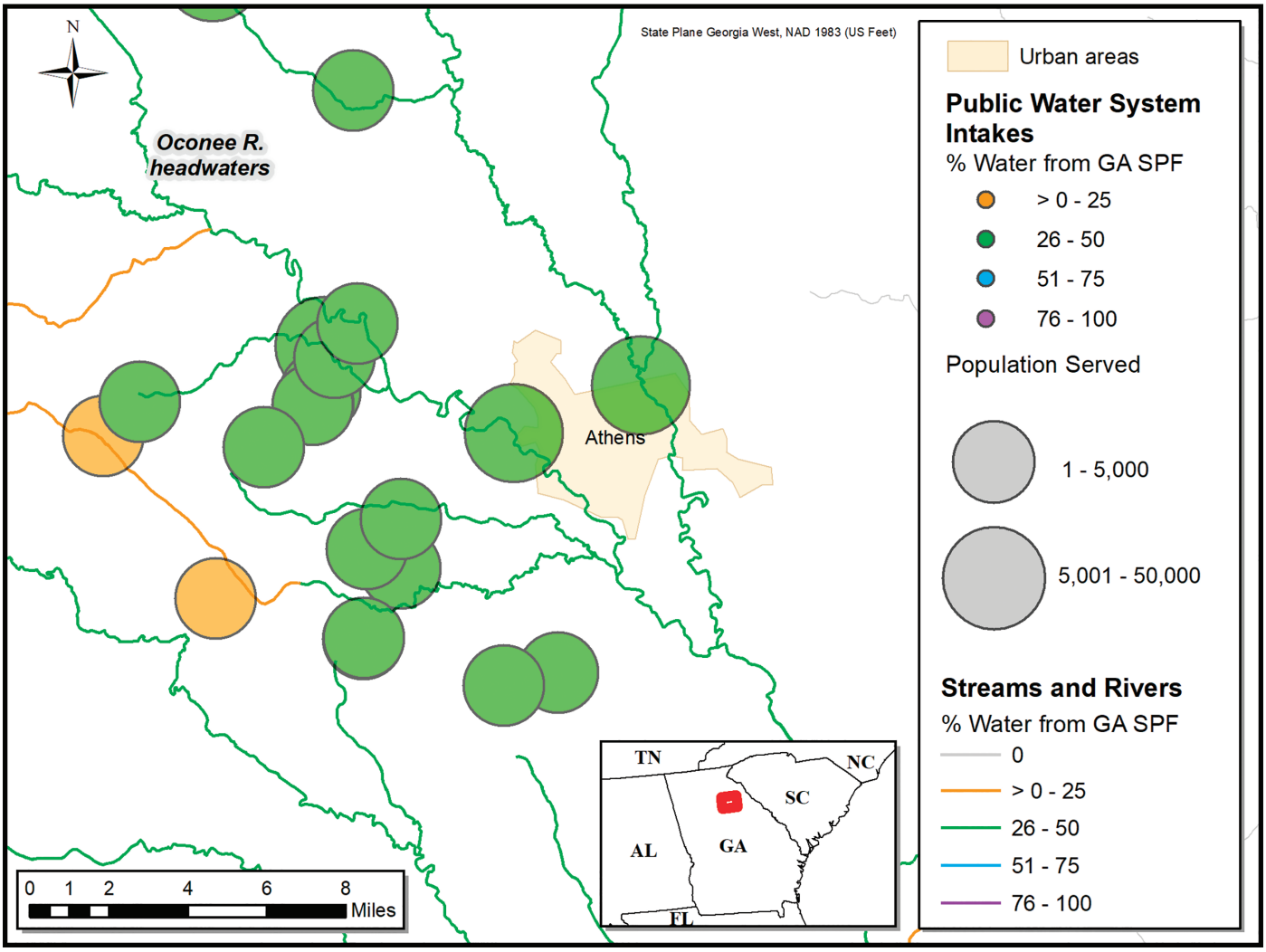


Figure A.GA.10—Local-scale detail showing percentage of water from Georgia SPF for streams and surface drinking water intakes around Athens and Watkinsville, GA.

Atlanta Detail

Public Water System Intakes of Metropolitan North Georgia Water Planning District (MNGWPD) Receiving Water from Georgia State and Private Forests

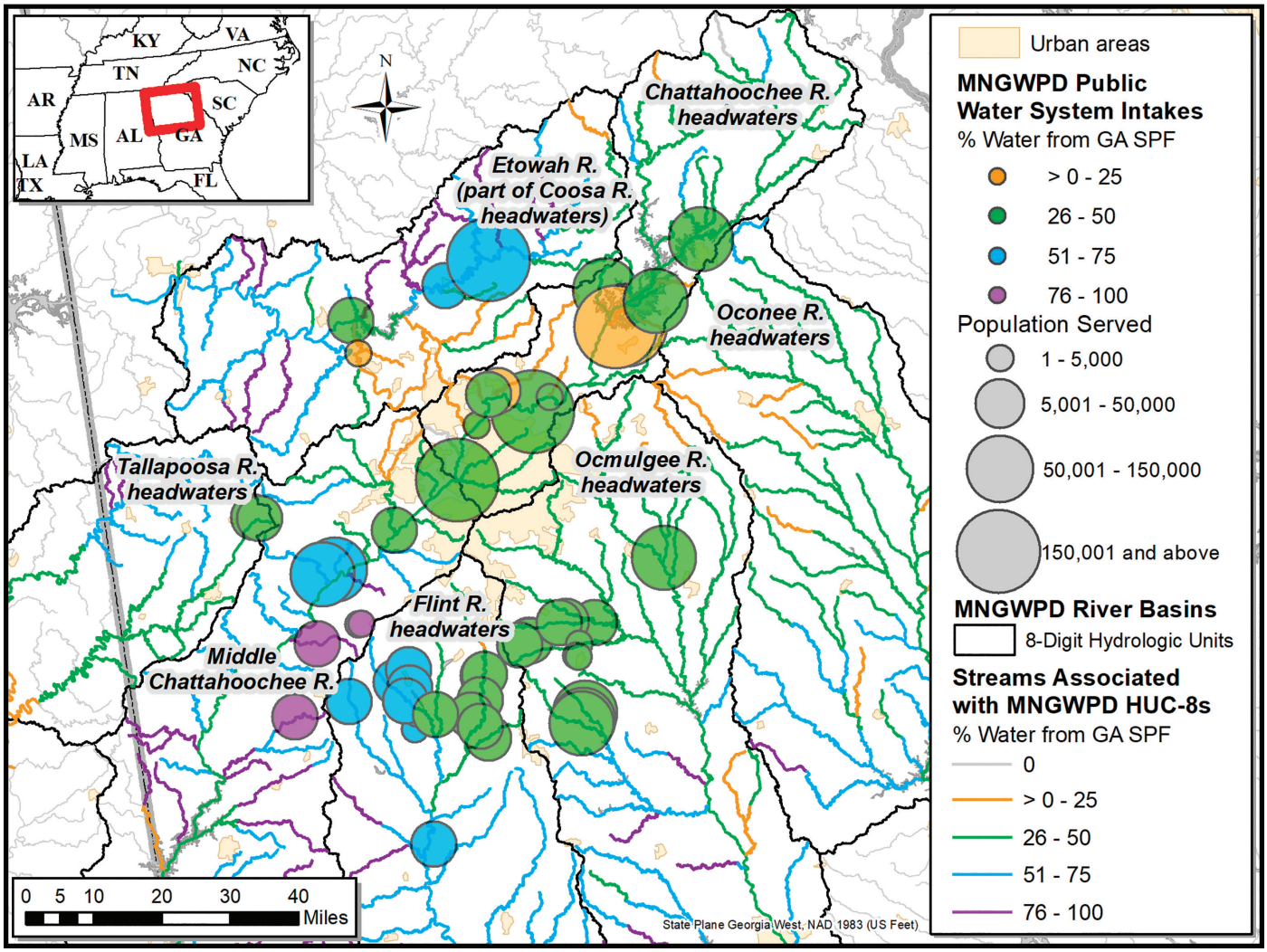


Figure A.GA.11—Local-scale detail showing percentage of water from Georgia SPF for streams and surface drinking water intakes associated with the Metropolitan North Georgia Water Planning District (MNGWPD), Atlanta, GA, metro area.

Savannah Detail

Public Water System Intakes of Savannah, GA, Area
Receiving Water from Georgia State and Private Forests

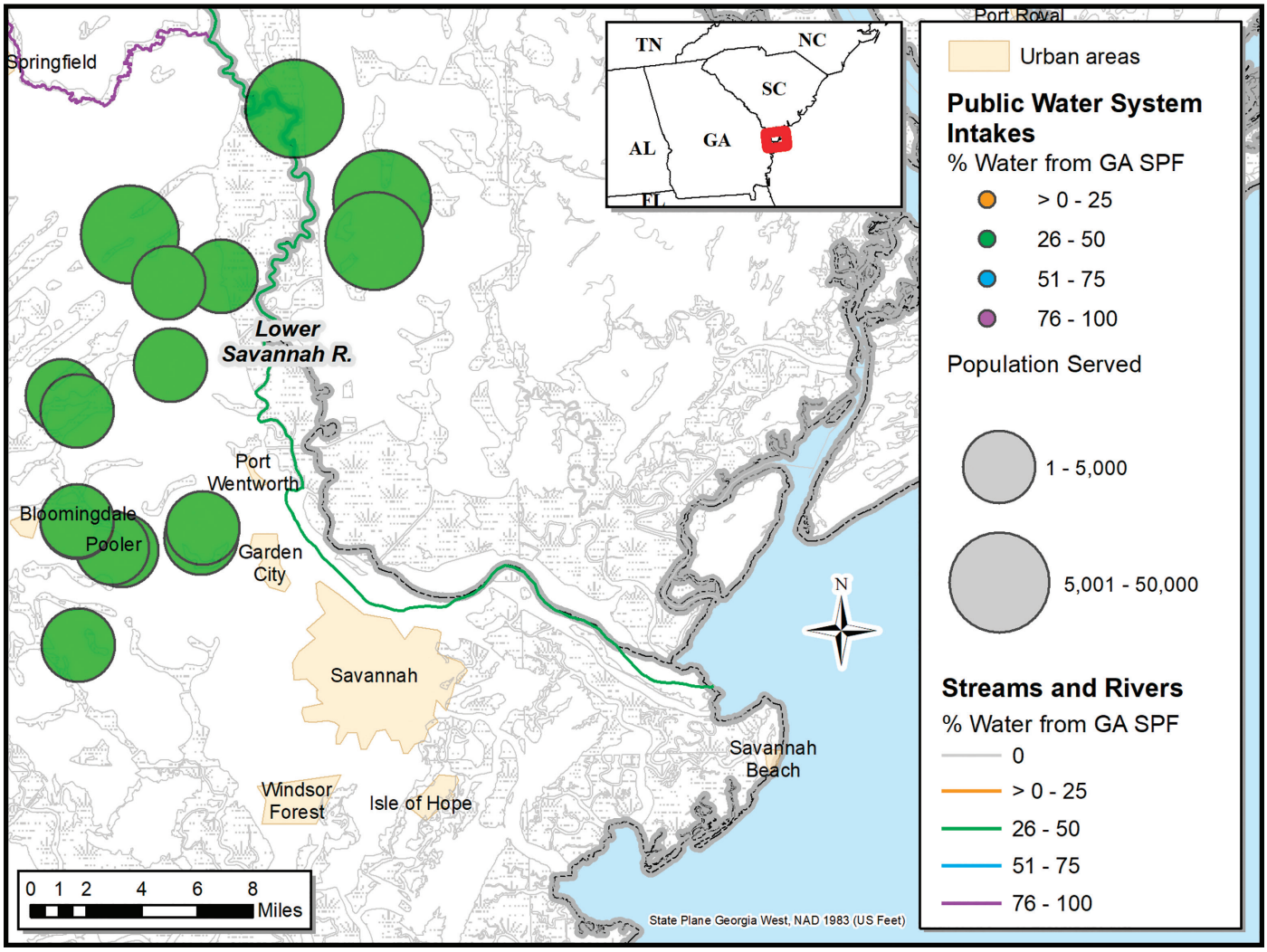


Figure A.GA.12—Local-scale detail showing percentage of water from Georgia SPF for streams and surface drinking water intakes around Savannah, GA.

Upper Chattahoochee, GA, Case Study

Selected Systems within Greater Atlanta Area

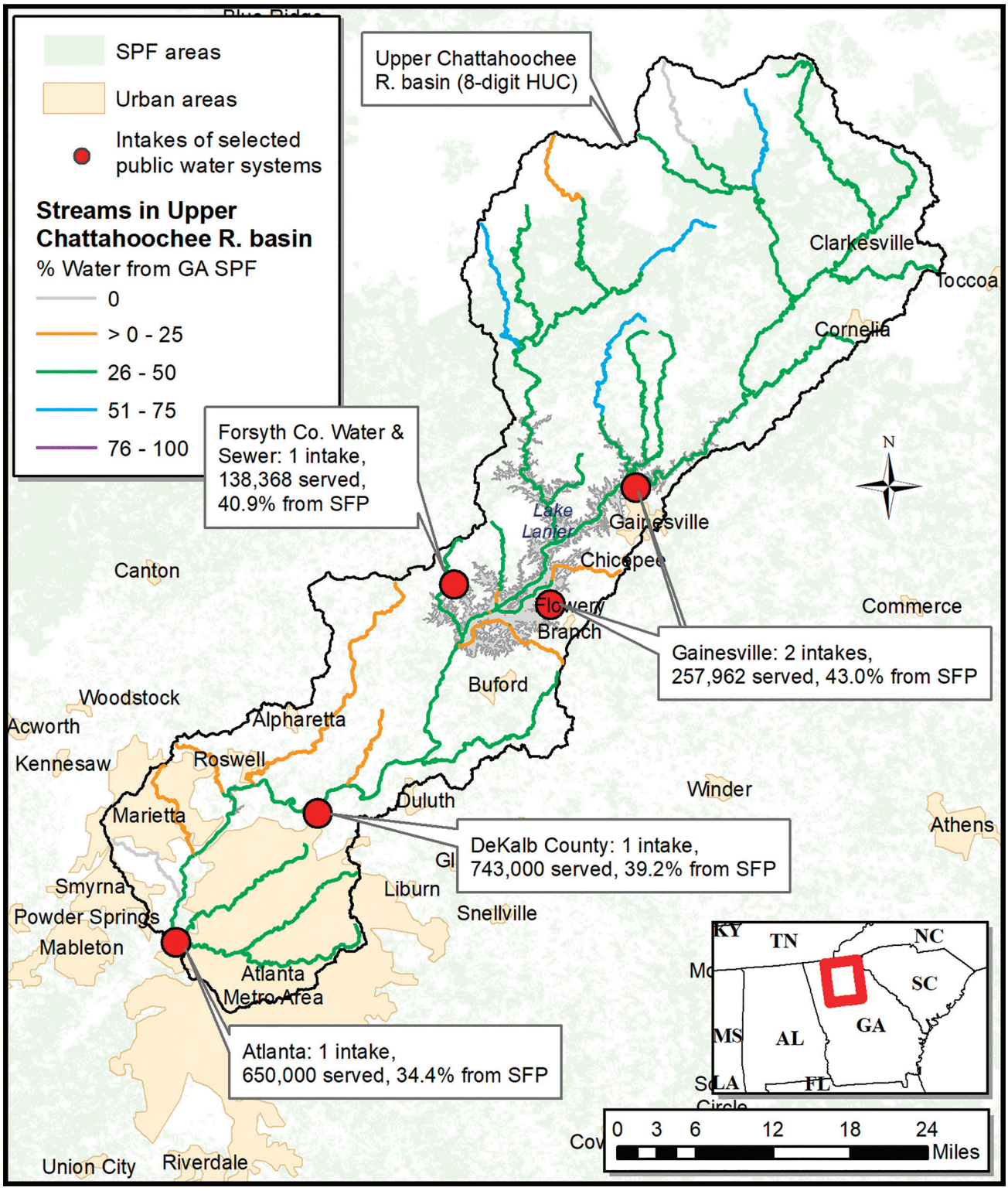


Figure A.GA.13—Case study of selected public water supply systems in the upper Chattahoochee River Basin (Atlanta metro area and Gainesville, GA). The surface drinking water intakes for these systems receive from 43.0 percent SPF water in the Chattahoochee headwaters for Gainesville, GA, down to 34.4 percent for the city of Atlanta proper.

STATE OF KENTUCKY

Summary

State and private forest (SPF) lands cover 42.7 percent of Kentucky (figs. A.KY.1 and A.KY.2; table A.KY.1). About 39.8 percent of all Kentucky surface water originates on SPF lands (fig. A.KY.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 78.4 percent of the SPF land area and 79.0 percent of surface water from SPF. Corporate-owned forests contribute 15.0 percent of surface water from SPF and account for 15.5 percent of land area of SPF. Average annual water yield in Kentucky is about 503 mm (fig. A.KY.4). Kentucky has a total of 214 surface drinking water intakes where at least some available water comes from SPF (fig. A.KY.5). About 66.9 percent of the total population of Kentucky is served by surface drinking water overall, and Kentucky SPF surface drinking water also serves about 66.9 percent of the State population, or 3.0 million people, to some degree. About 0.8 million people in Kentucky are getting more than half of their surface drinking water from SPF within the State (fig. A.KY.6). State and private forest lands in Kentucky also supply water to 83 surface drinking water intakes in other States (Illinois, Indiana, Louisiana, Ohio, Tennessee, and West Virginia) (fig. A.KY.7), which collectively serve about 2.8 million people in 64 communities (fig. A.KY.8). Many public water systems in Kentucky utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.KY.9 by population served (symbol size) and percentage of water from SPF lands in Kentucky (symbol color). The Louisville-Lexington detail map (fig. A.KY.10) adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.KY.11) of the Kentucky-American Water Company presents an example of the important role SPF lands play in providing water supply to a single community in Kentucky, where four surface drinking water intakes receive about 54.8 percent of their water from SPF and serve about 0.3 million people.

Table A.KY.1—Land area by land cover and forest ownership type in Kentucky

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	52 816	13,051,086
Nonforest	56 698	14,010,471
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	6070	1,499,922
Tribal (public)	0	0
State (public)	2207	545,373
Local (public)	272	67,094
Corporate (private)	7261	1,794,330
Family (private)	36 665	9,060,203
Other private	341	84,164

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

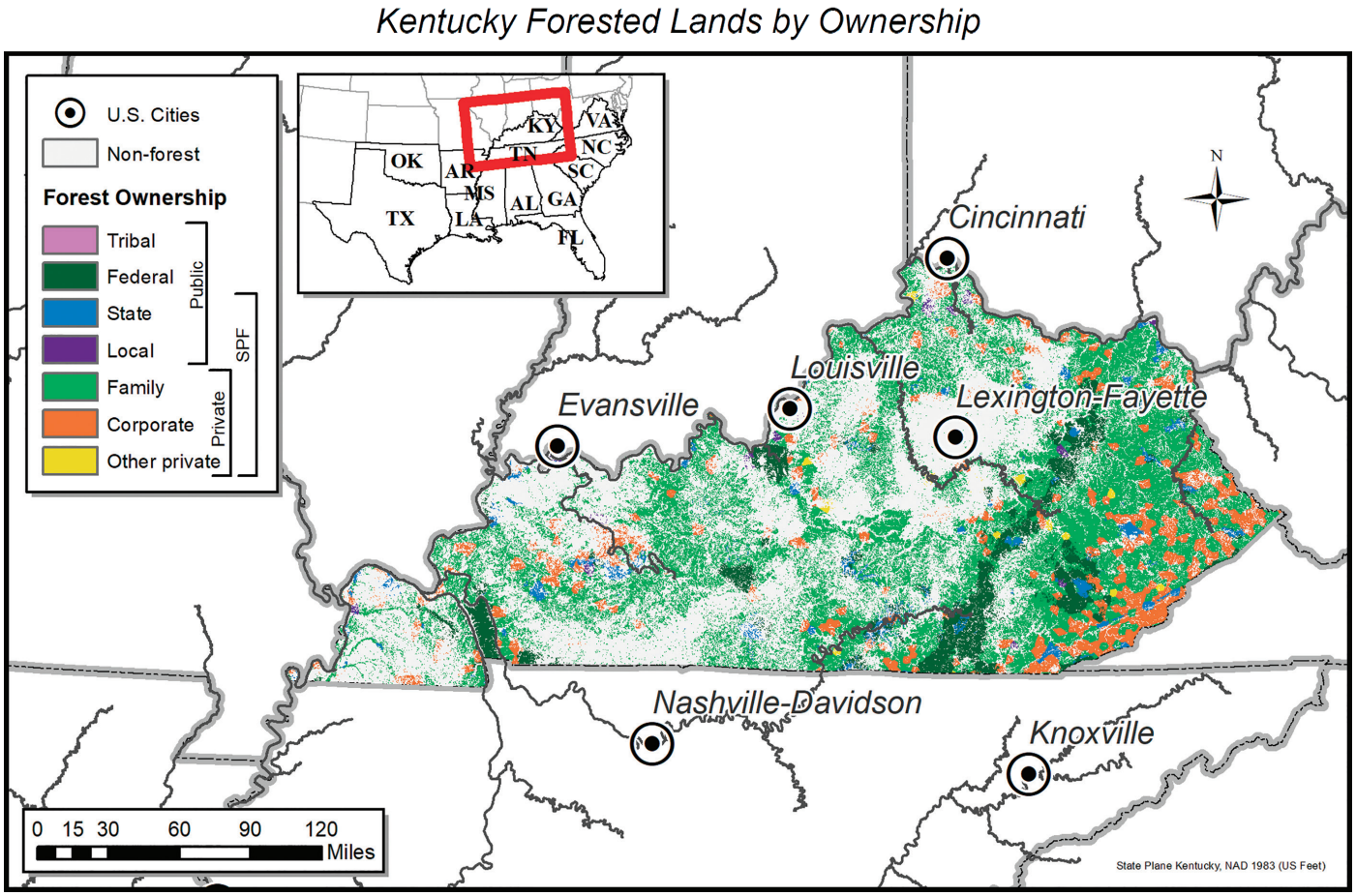


Figure A.KY.1—Kentucky nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

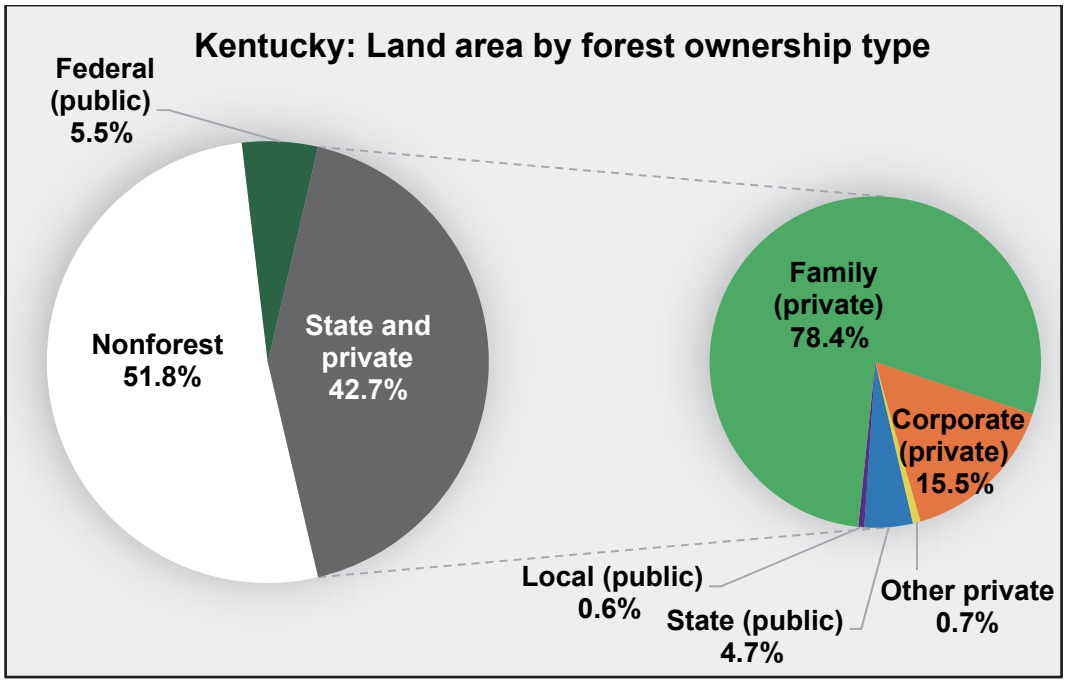


Figure A.KY.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

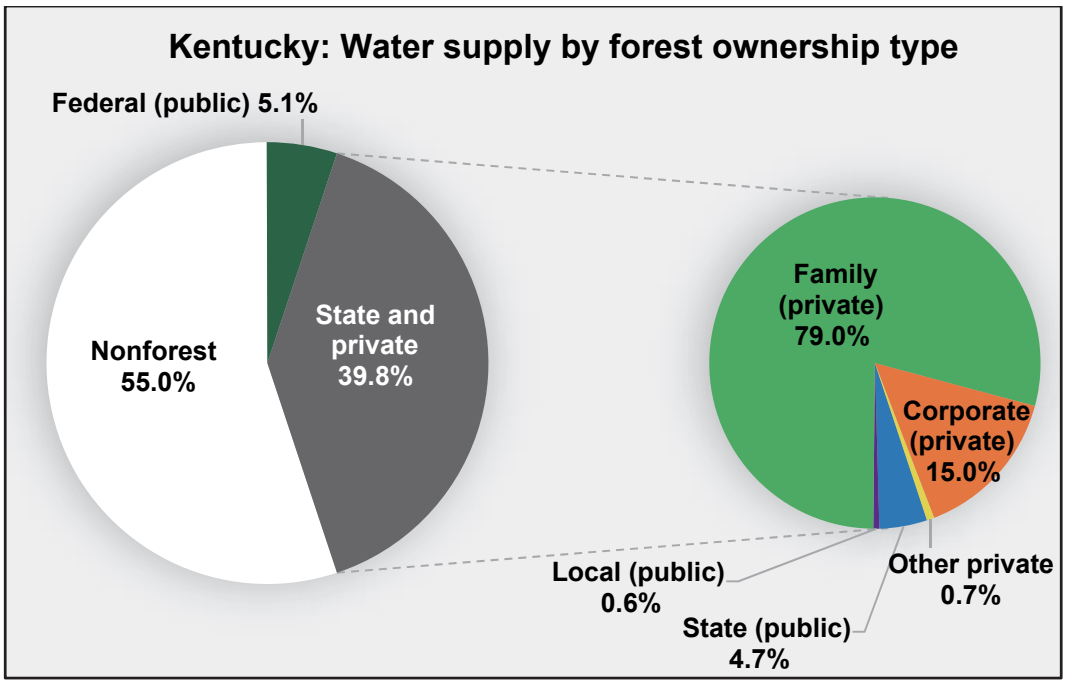


Figure A.KY.3—Percentage of Kentucky's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

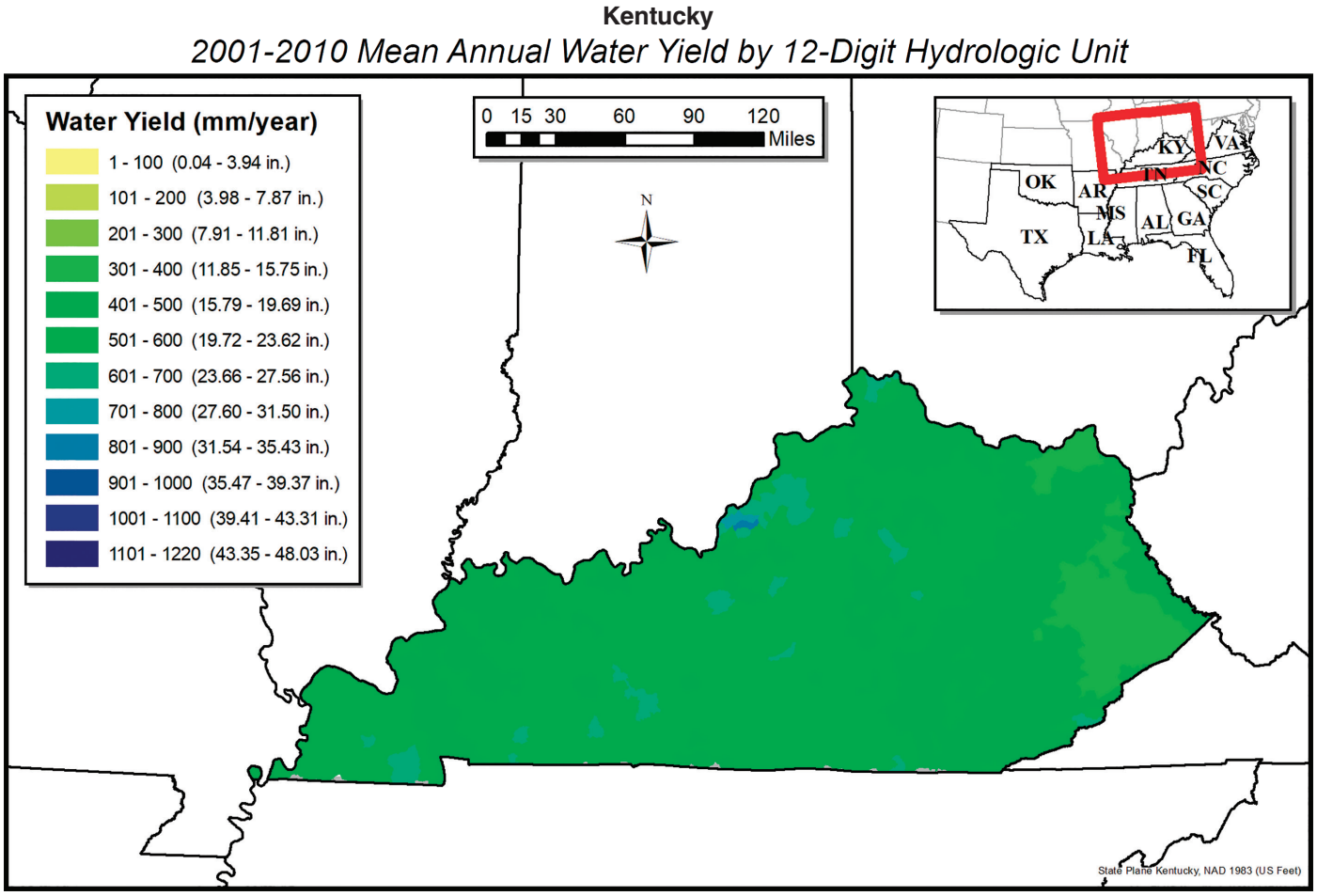


Figure A.KY.4—Estimated mean annual water yield by 12-digit hydrologic units in Kentucky, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Kentucky State and Private Forests

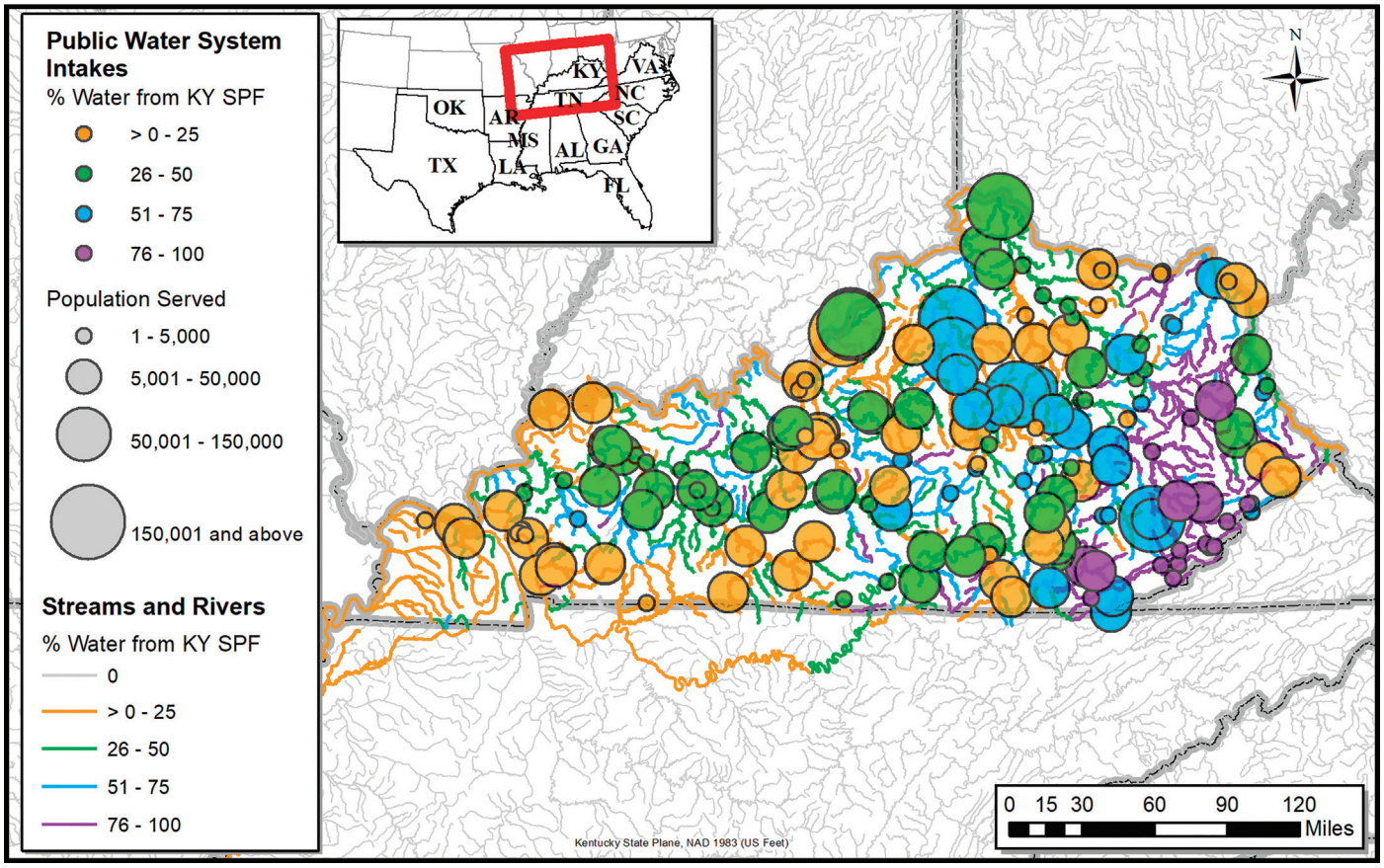


Figure A.KY.5—(A) Kentucky streams by percentage of Kentucky SPF water content, surface drinking water intakes within Kentucky by percentage of Kentucky SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 214 surface drinking water intakes within the State serve a population of 2,980,618 in 140 communities. Note: See figures A.KY.5 parts B and C on separate pages for streams and intakes only.

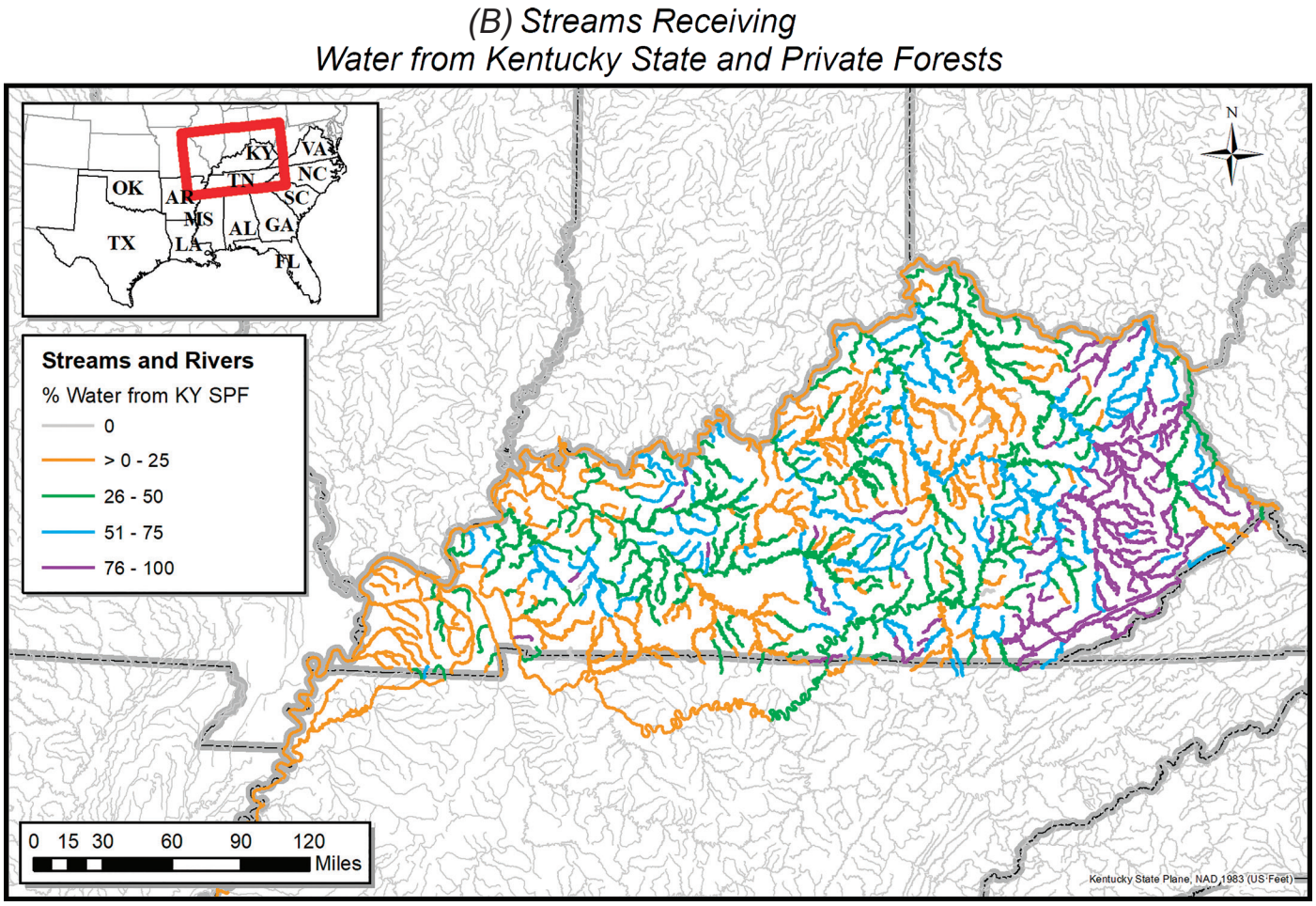


Figure A.KY.5—(B) Kentucky streams by percentage of Kentucky SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Kentucky State and Private Forests

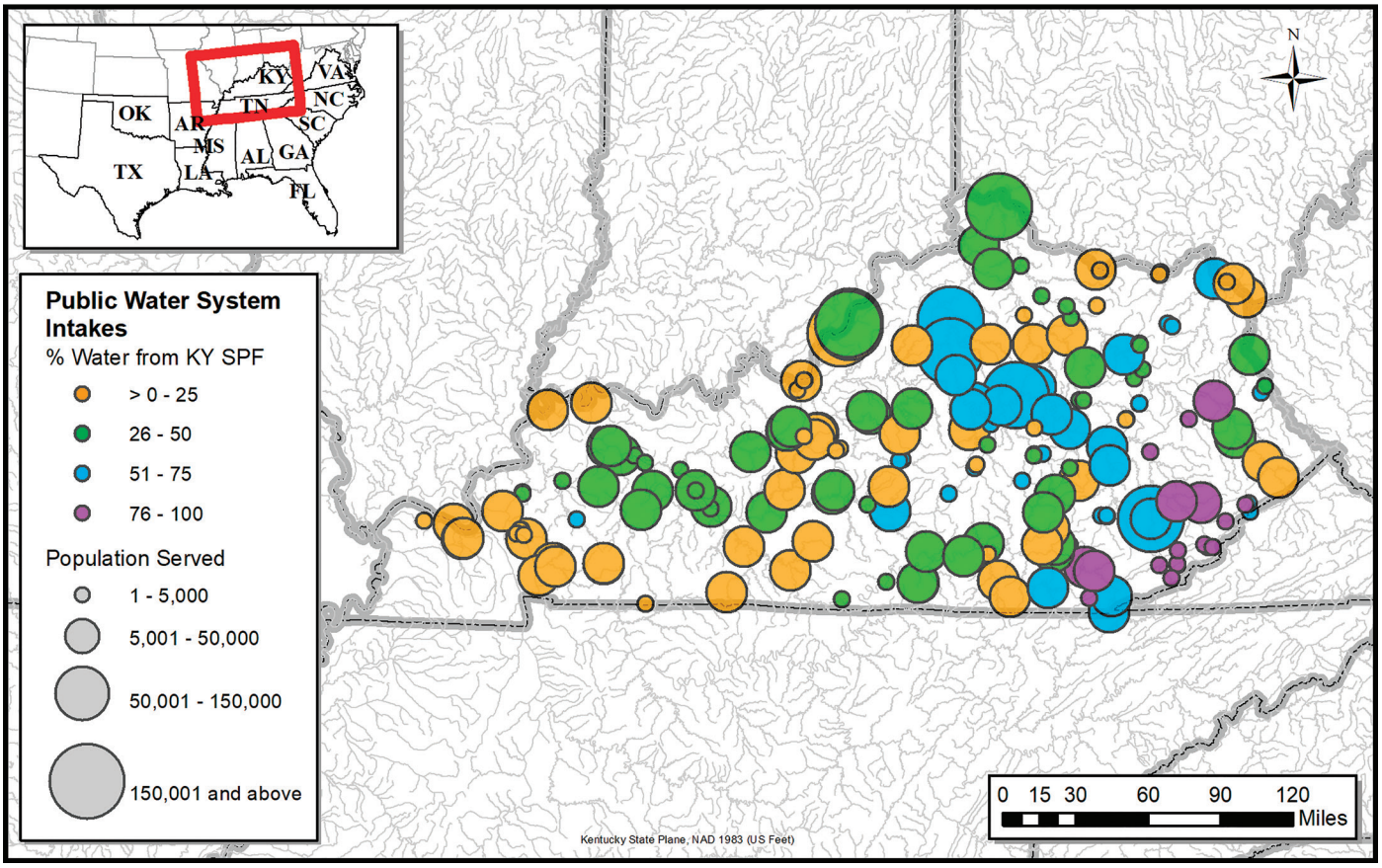


Figure A.KY.5—(C) Surface drinking water intakes within Kentucky by percentage of Kentucky SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 214 surface drinking water intakes within the State serve a population of 2,980,618 in 140 communities.

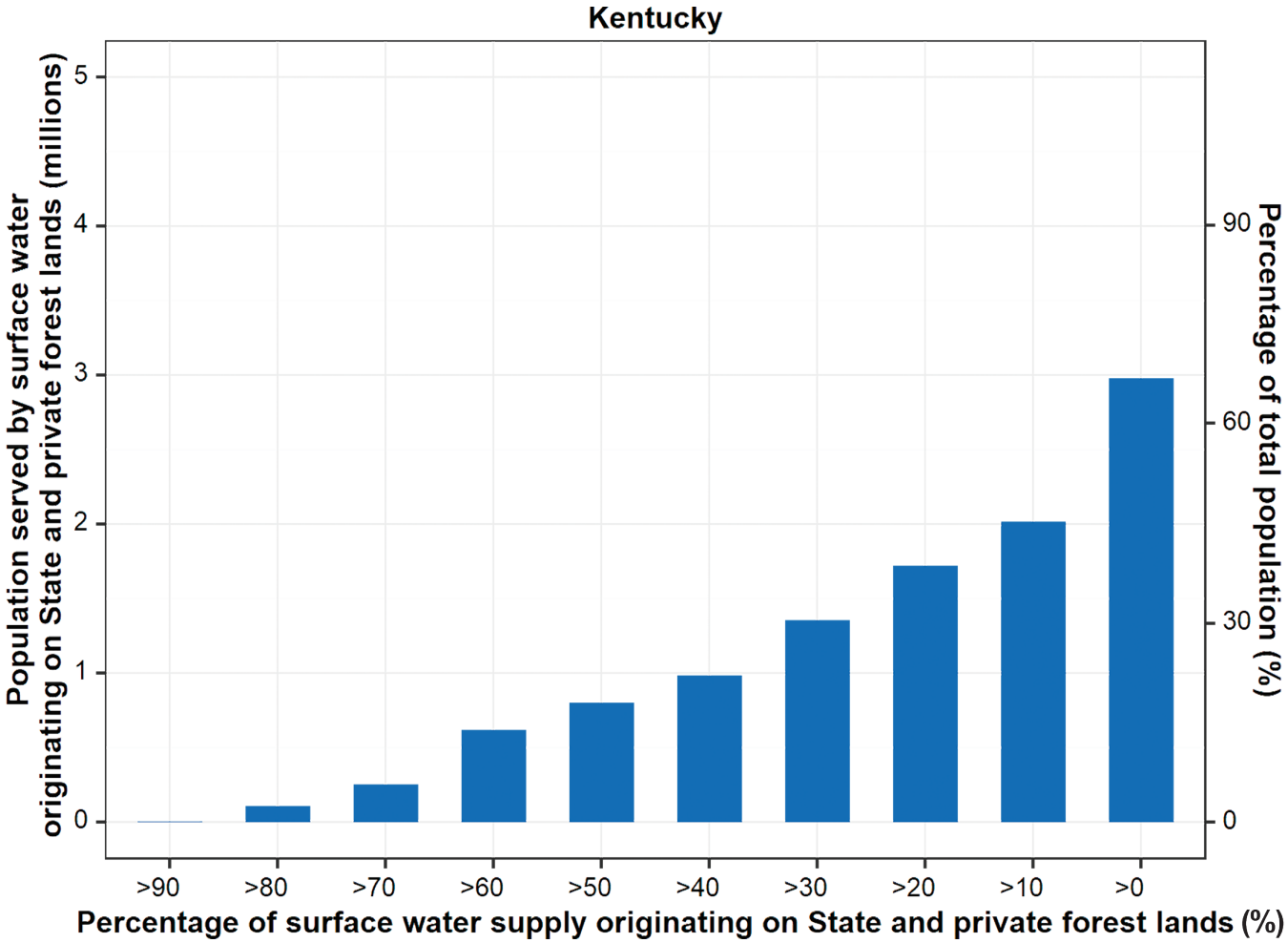


Figure A.KY.6—Cumulative frequency of population served according to percentage of water coming from Kentucky SPF lands.

Public Water System Intakes Outside of Kentucky Receiving Water from Kentucky State and Private Forests

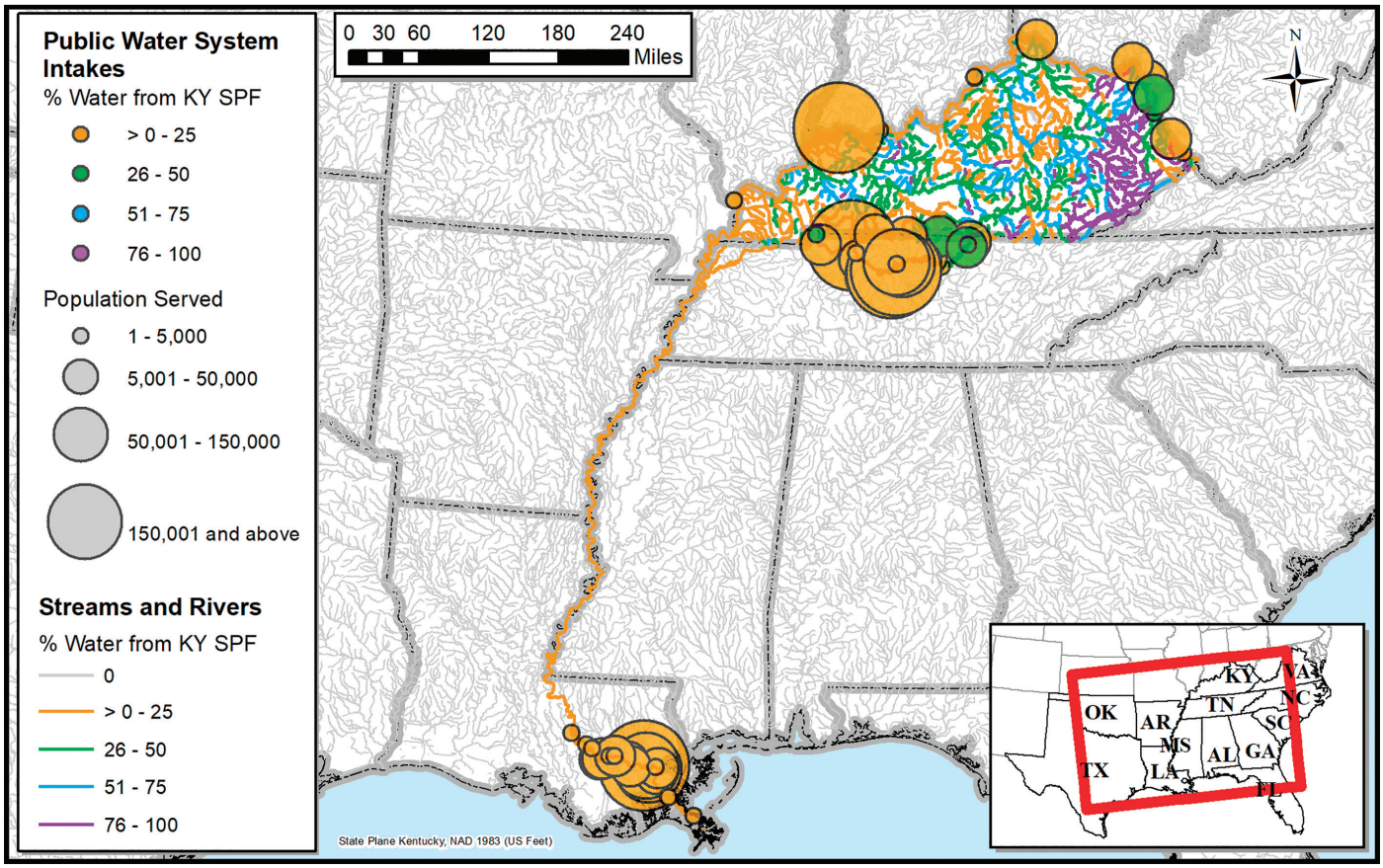


Figure A.KY.7—Kentucky streams by percentage of Kentucky SPF water content, surface drinking water intakes downstream of Kentucky by percentage of Kentucky SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 83 surface drinking water intakes outside the State but carrying Kentucky SPF water serve a population of 2,843,724 in 64 communities.

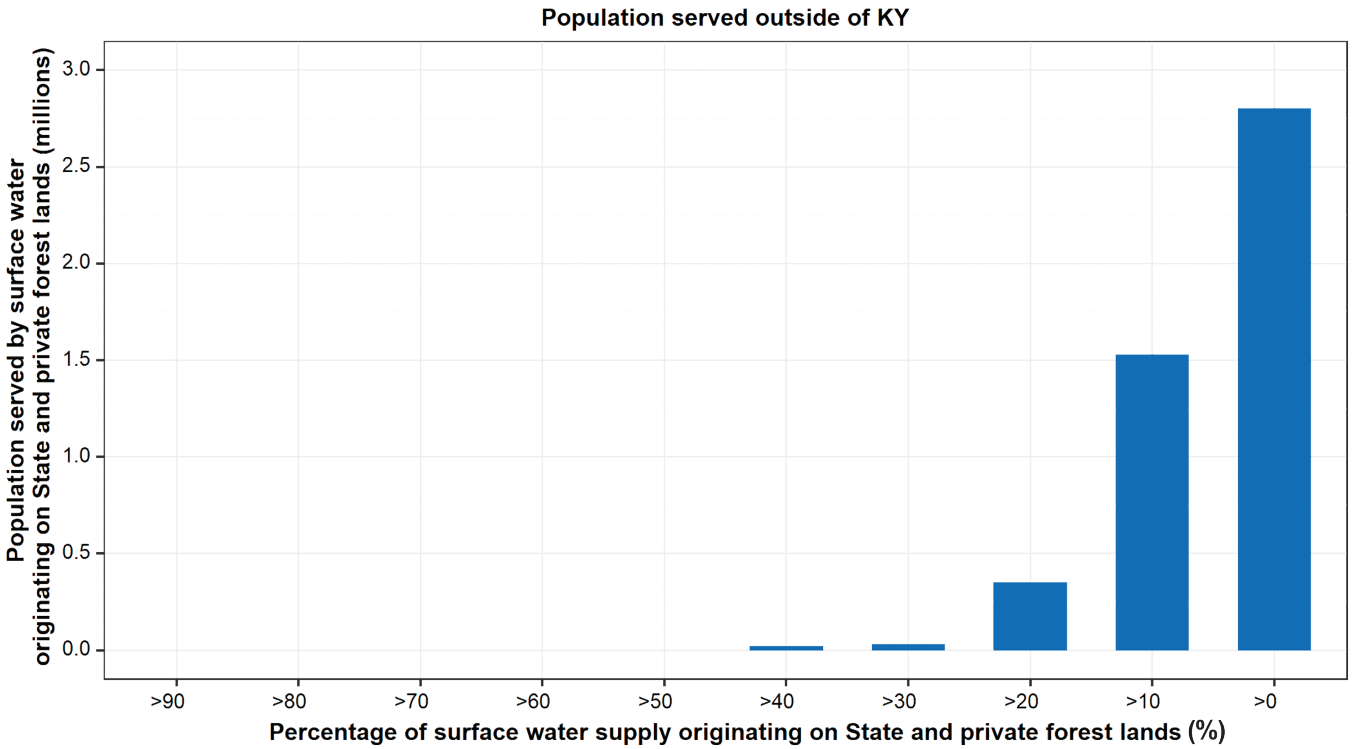


Figure A.KY.8—Cumulative frequency of non-Kentucky population served according to percentage of water coming from Kentucky SPF lands.

Multi-Intake Public Water System (Aggregated to Single Symbol)
Receiving Water from Kentucky State and Private Forests

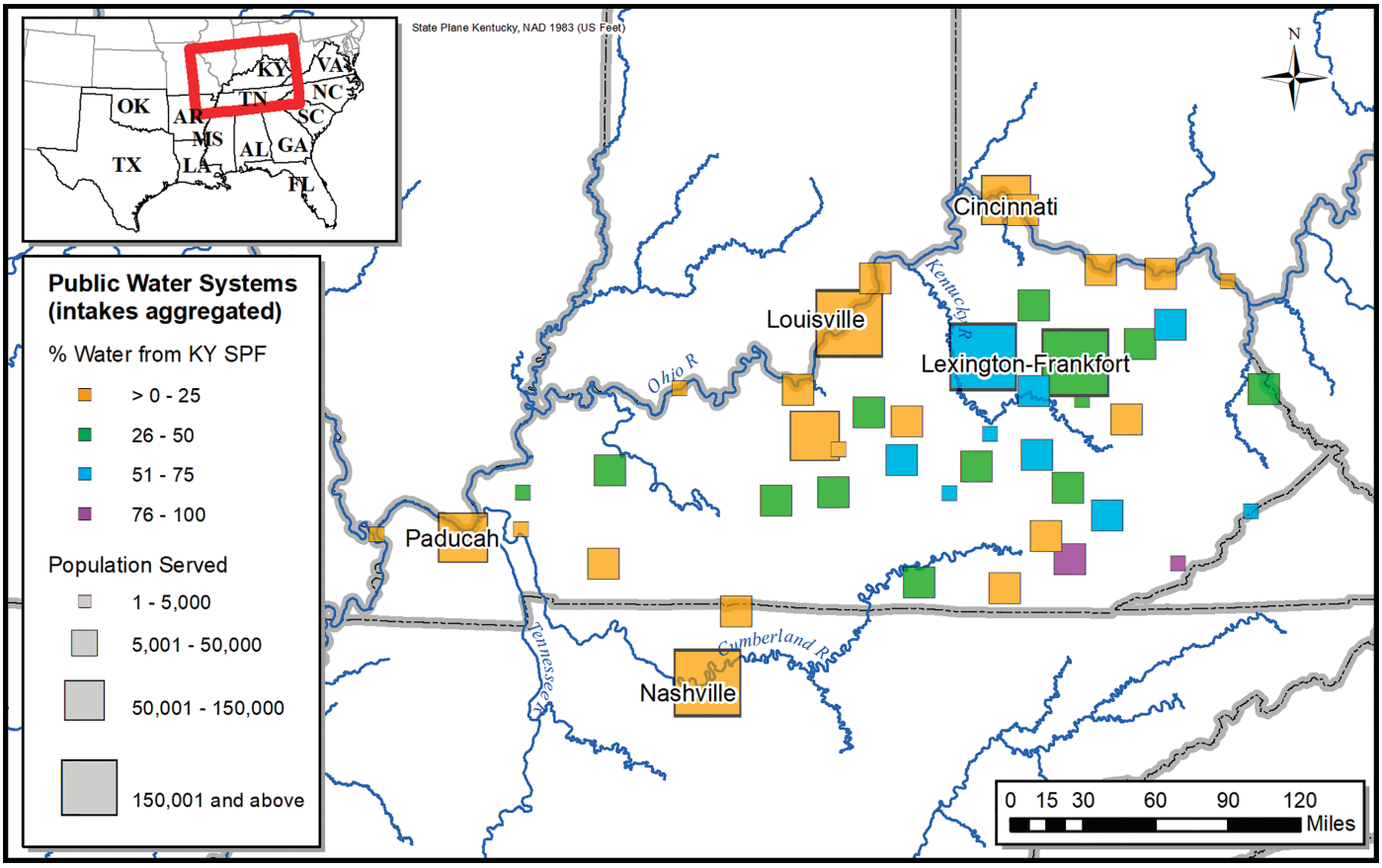


Figure A.KY.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Louisville-Lexington Detail

Streams and Intrastate Public Water System Intakes in Louisville-Lexington, KY, Area Receiving Water from Kentucky State and Private Forests

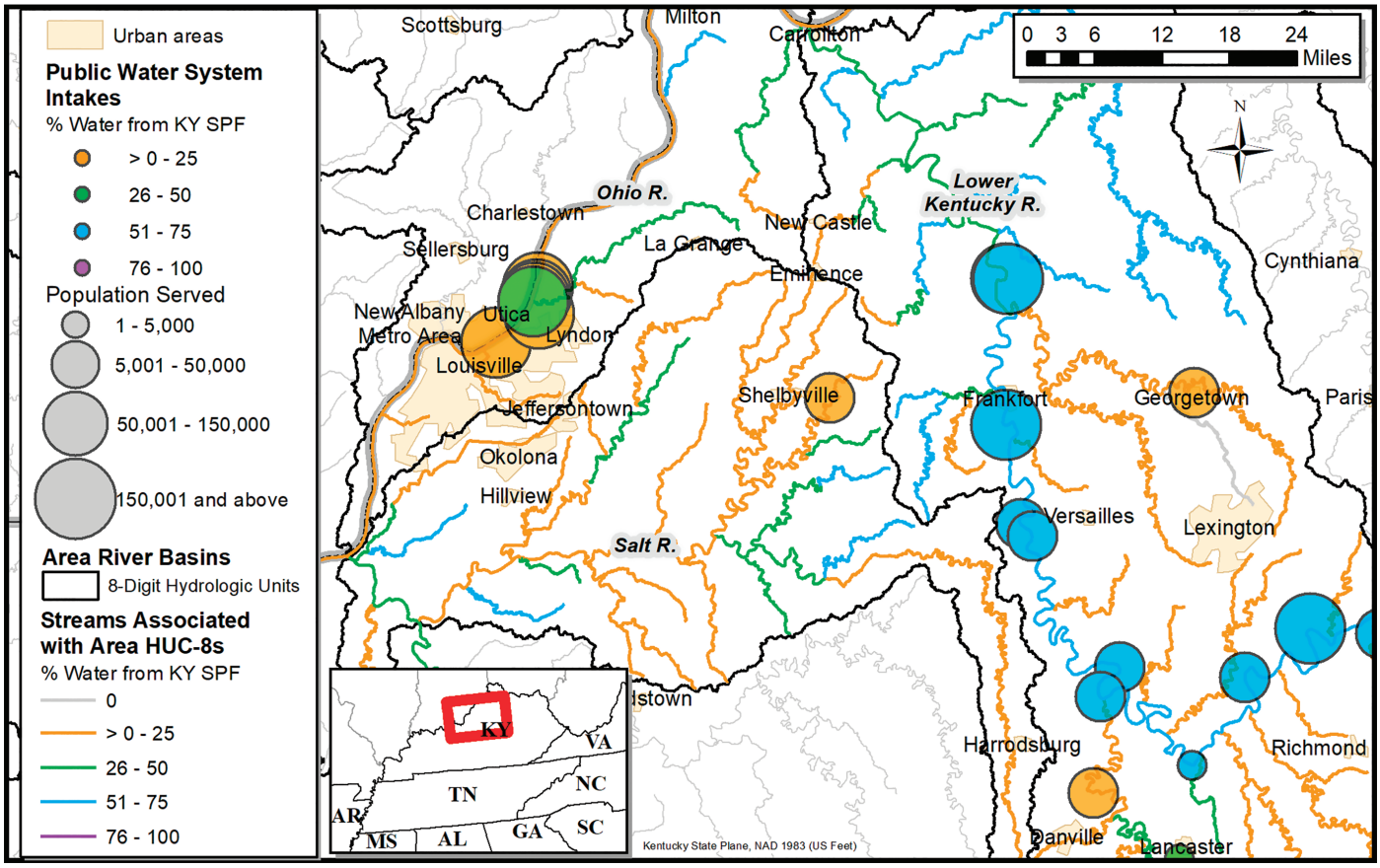


Figure A.KY.10—Local-scale detail showing percentage of water from Kentucky SPF for streams and surface drinking water intakes around Louisville and Lexington, KY.

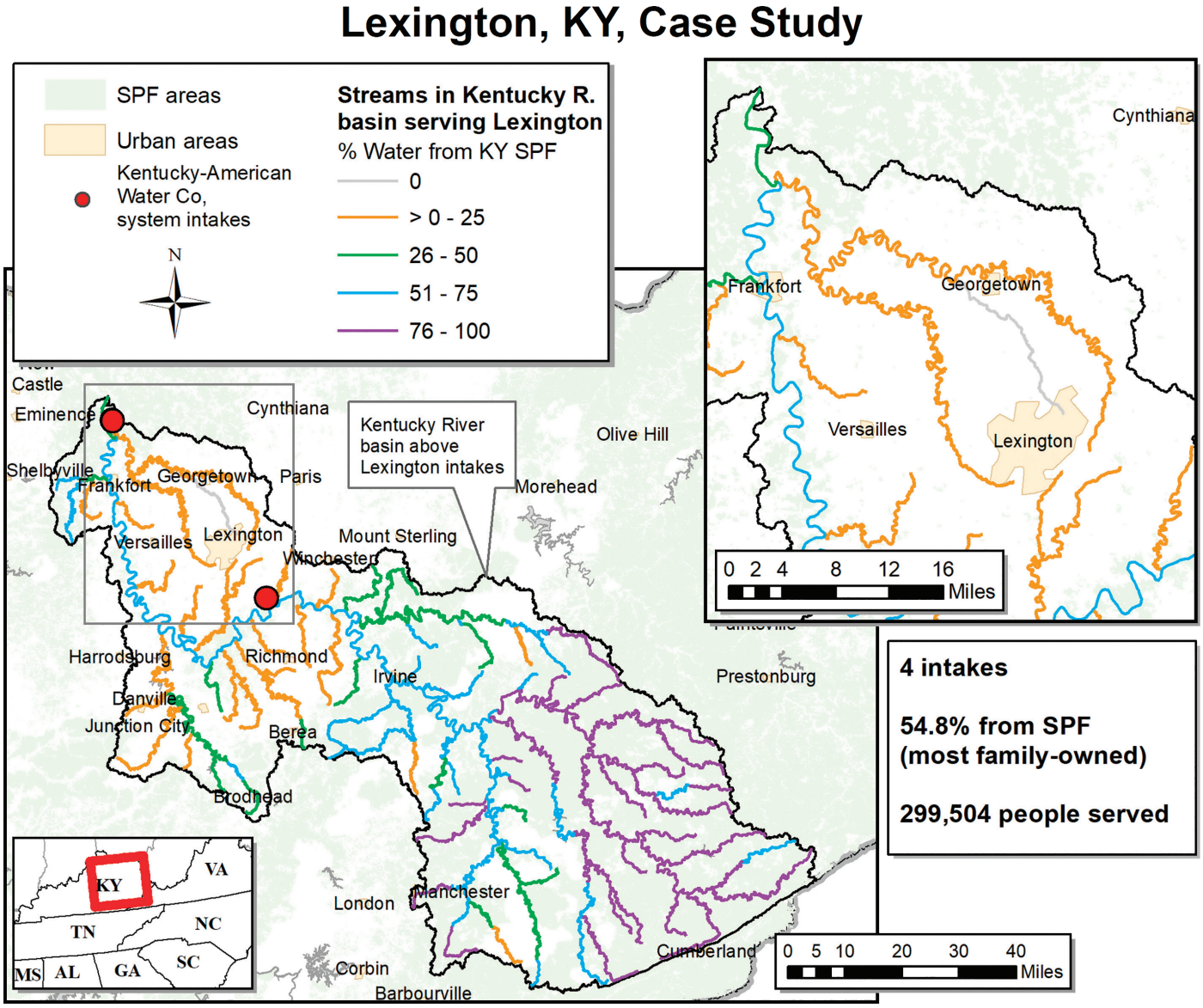


Figure A.KY.11—Case study of the Kentucky-American Water Company Public water supply system, Lexington, KY, illustrating SPF water in streams supplying the four surface drinking water intakes. When this water reaches the intakes, 54.8 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF LOUISIANA

Summary

State and private forest (SPF) lands cover 45.7 percent of Louisiana (figs. A.LA.1 and A.LA.2; table A.LA.1). About 41.2 percent of all Louisiana surface water originates on SPF lands (fig. A.LA.3). The majority of SPF land area is in, and surface water is from, corporate-owned forests, accounting for about 50.9 percent of the SPF land area and 50.5 percent of surface water from SPF. Family-owned forests contribute 39.3 percent of surface water from SPF and account for 39.4 percent of land area of SPF. Average annual water yield in Louisiana is about 587 mm (fig. A.LA.4). Louisiana has a total of 100 surface drinking water intakes where at least some available water comes from SPF (fig. A.LA.5). About 37.0 percent of the total population of Louisiana is served by surface drinking water overall, and Louisiana SPF surface drinking water also serves about 37.0 percent of the State population, or 1.7 million people, to some degree. About 70,000 people in Louisiana are getting more than half of their surface drinking water from SPF within the State (fig. A.LA.6). State and private forest lands in Louisiana also supply water to 11 surface drinking water intakes in other States (Arkansas and Texas) (fig. A.LA.7), which collectively serve about 10,000 people in eight communities (fig. A.LA.8). Some public water systems in Louisiana utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.LA.9 by population served (symbol size) and percentage of water from SPF lands in Louisiana (symbol color). The detail map of southeastern Louisiana (fig. A.LA.10), encompassing New Orleans and Baton Rouge, adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.LA.11) of the Natchitoches Water System public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Louisiana, where a single surface drinking water intake receives 71.9 percent of its water from SPF and serves about 30,000 people.

Table A.LA.1—Land area by land cover and forest ownership type in Louisiana

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	63 710	15,742,997
Nonforest	63 293	15,640,076
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	5605	1,385,051
Tribal (public)	34	8,423
State (public)	3987	985,113
Local (public)	818	202,233
Corporate (private)	29 575	7,308,056
Family (private)	22 861	5,649,030
Other private	830	205,091

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

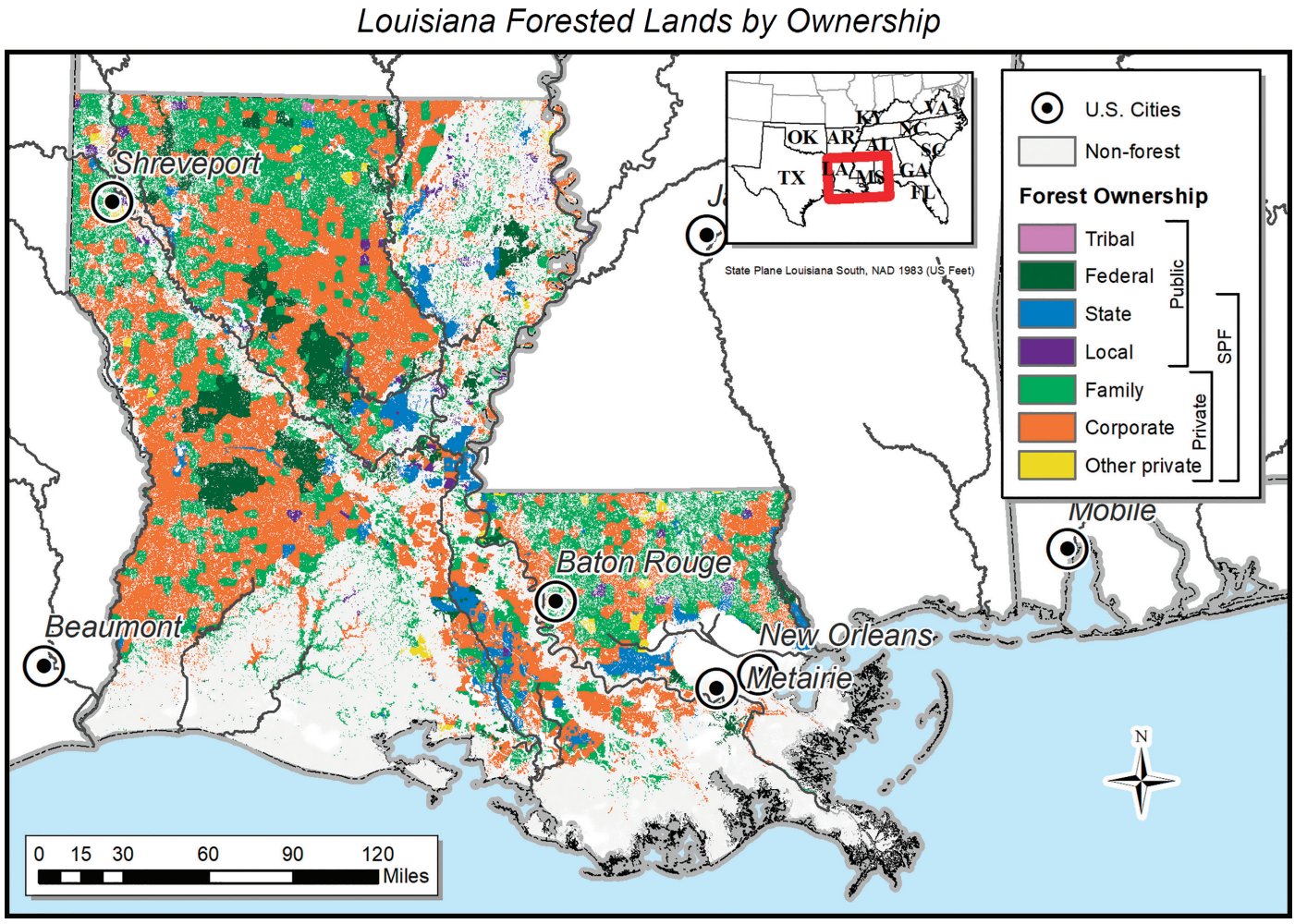


Figure A.LA.1—Louisiana nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

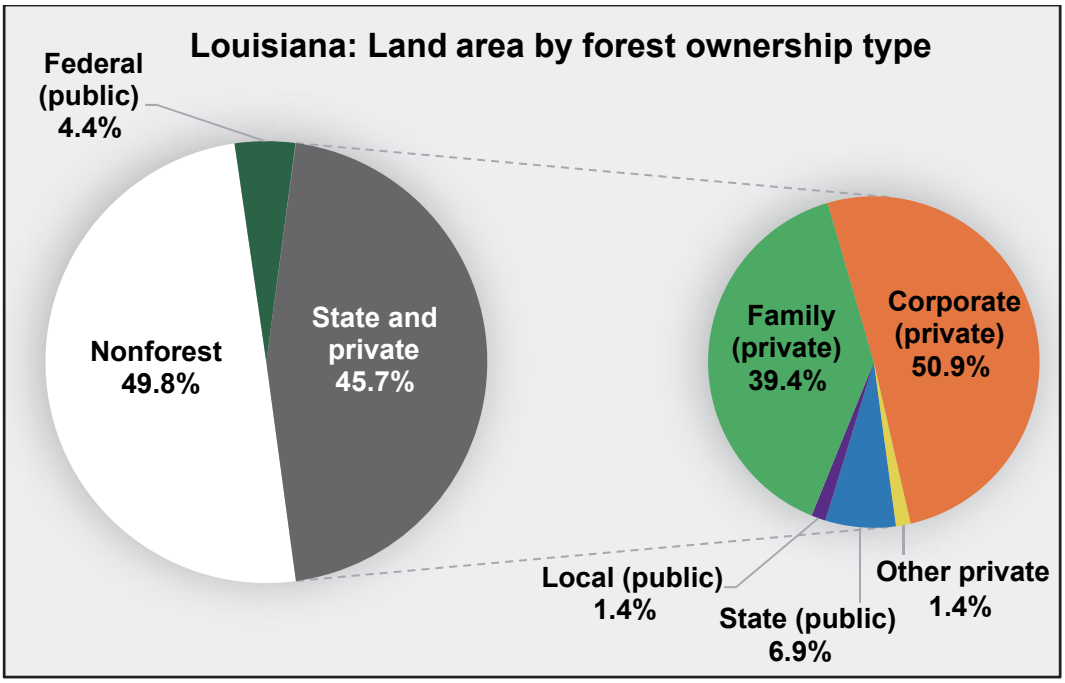


Figure A.LA.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

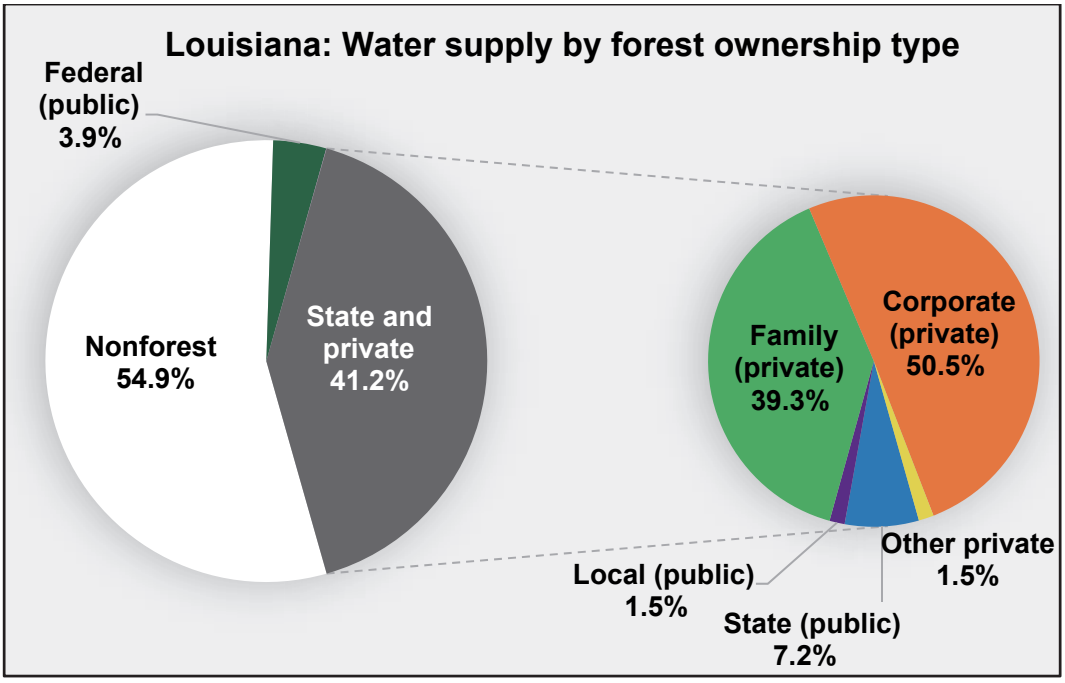


Figure A.LA.3—Percentage of Louisiana's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

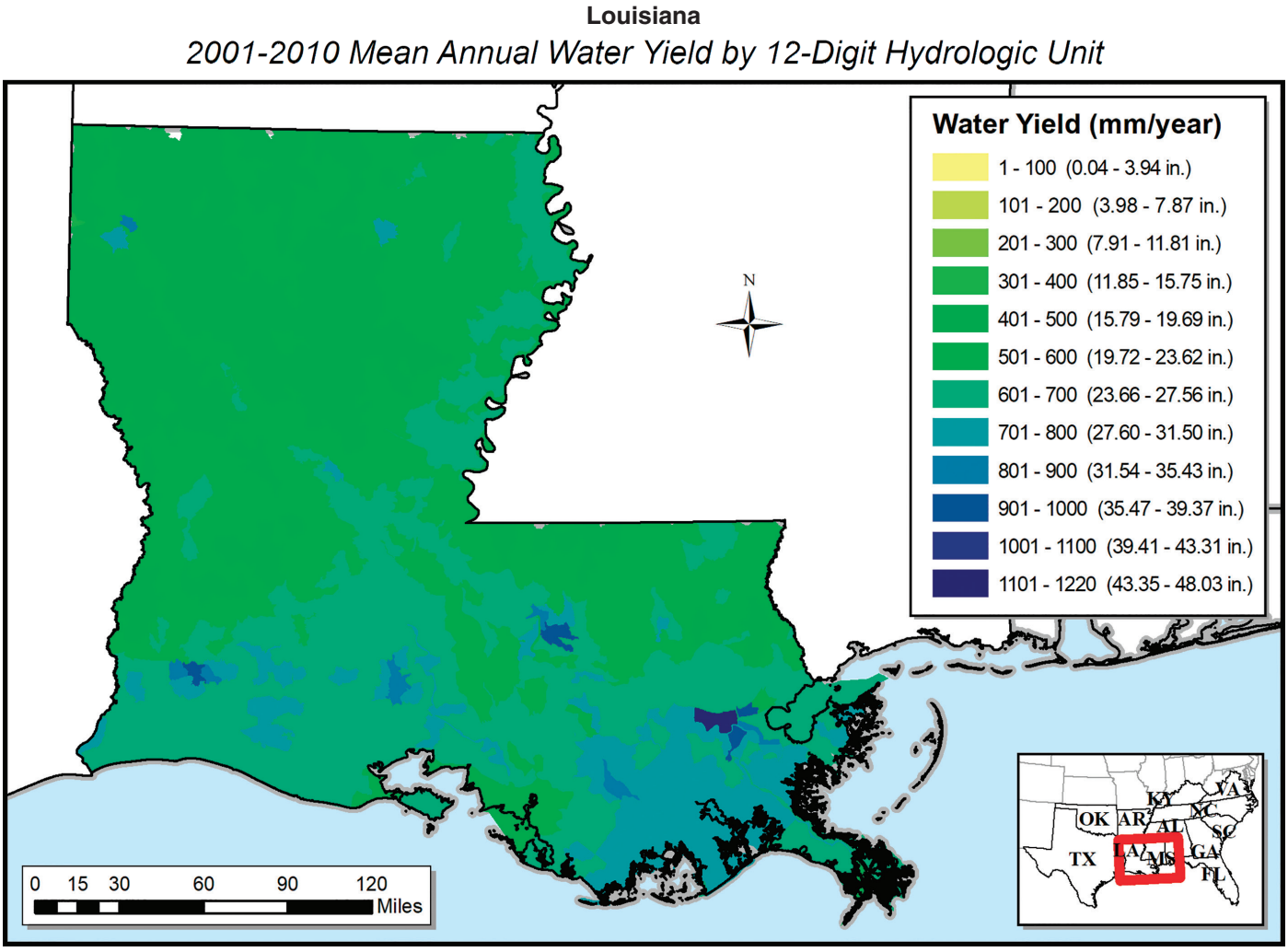


Figure A.LA.4—Estimated mean annual water yield by 12-digit hydrologic units in Louisiana, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Louisiana State and Private Forests

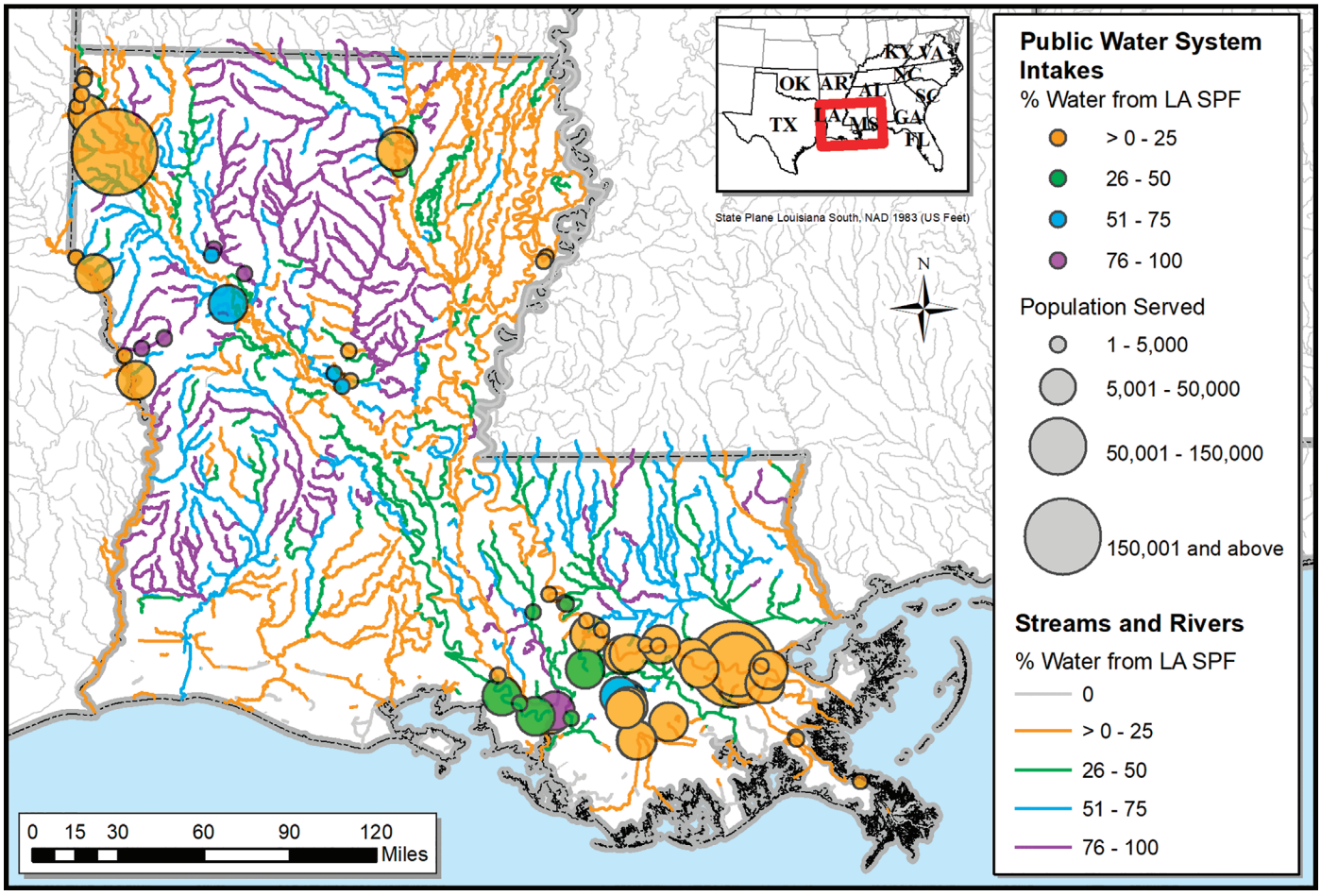


Figure A.LA.5—(A) Louisiana streams by percentage of Louisiana SPF water content, surface drinking water intakes within Louisiana by percentage of Louisiana SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 100 surface drinking water intakes within the State serve a population of 1,728,676 in 61 communities. Note: See figures A.LA.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Louisiana State and Private Forests

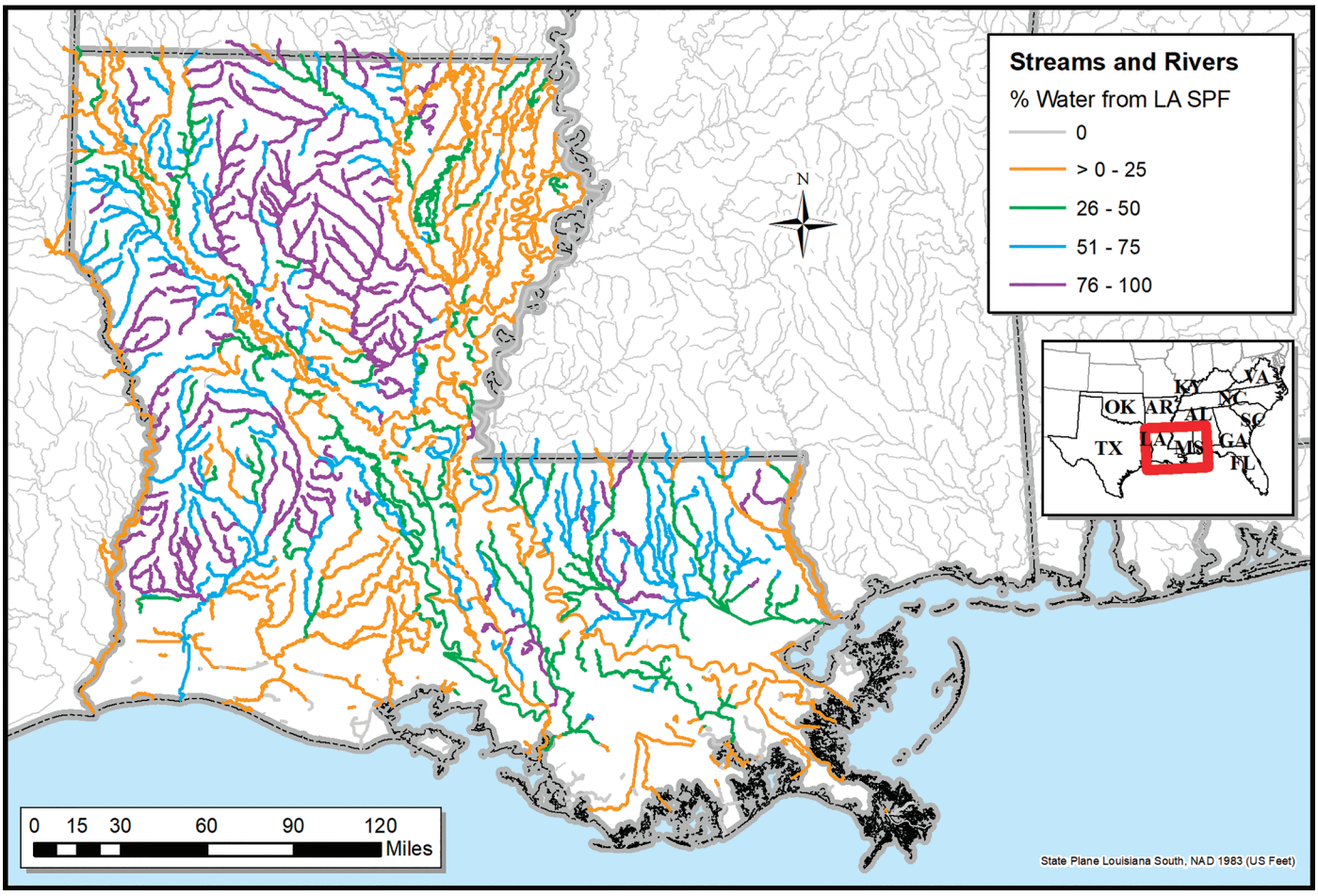


Figure A.LA.5—(B) Louisiana streams by percentage of Louisiana SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Louisiana State and Private Forests

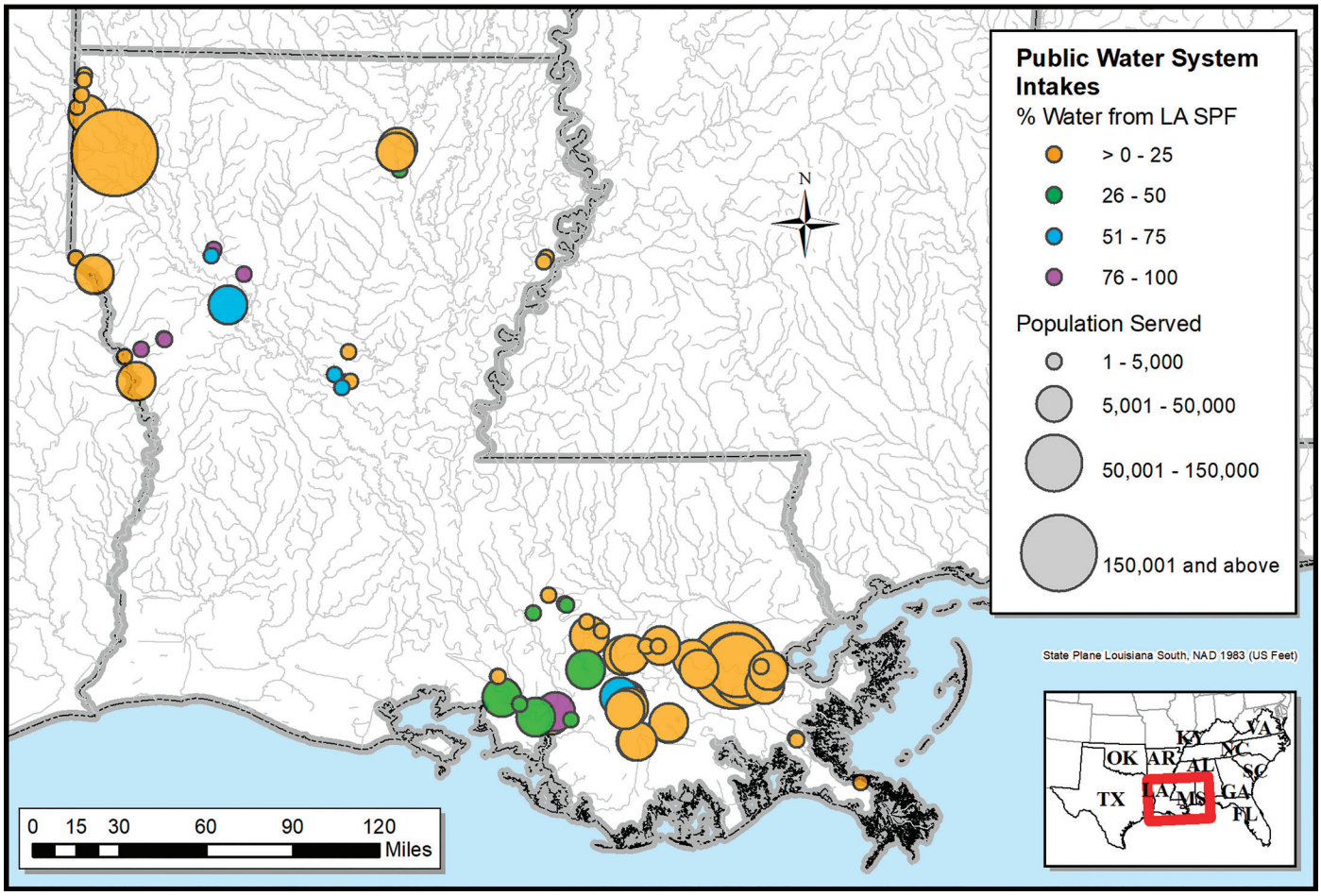


Figure A.LA.5—(C) Surface drinking water intakes within Louisiana by percentage of Louisiana SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 100 surface drinking water intakes within the State serve a population of 1,728,676 in 61 communities.

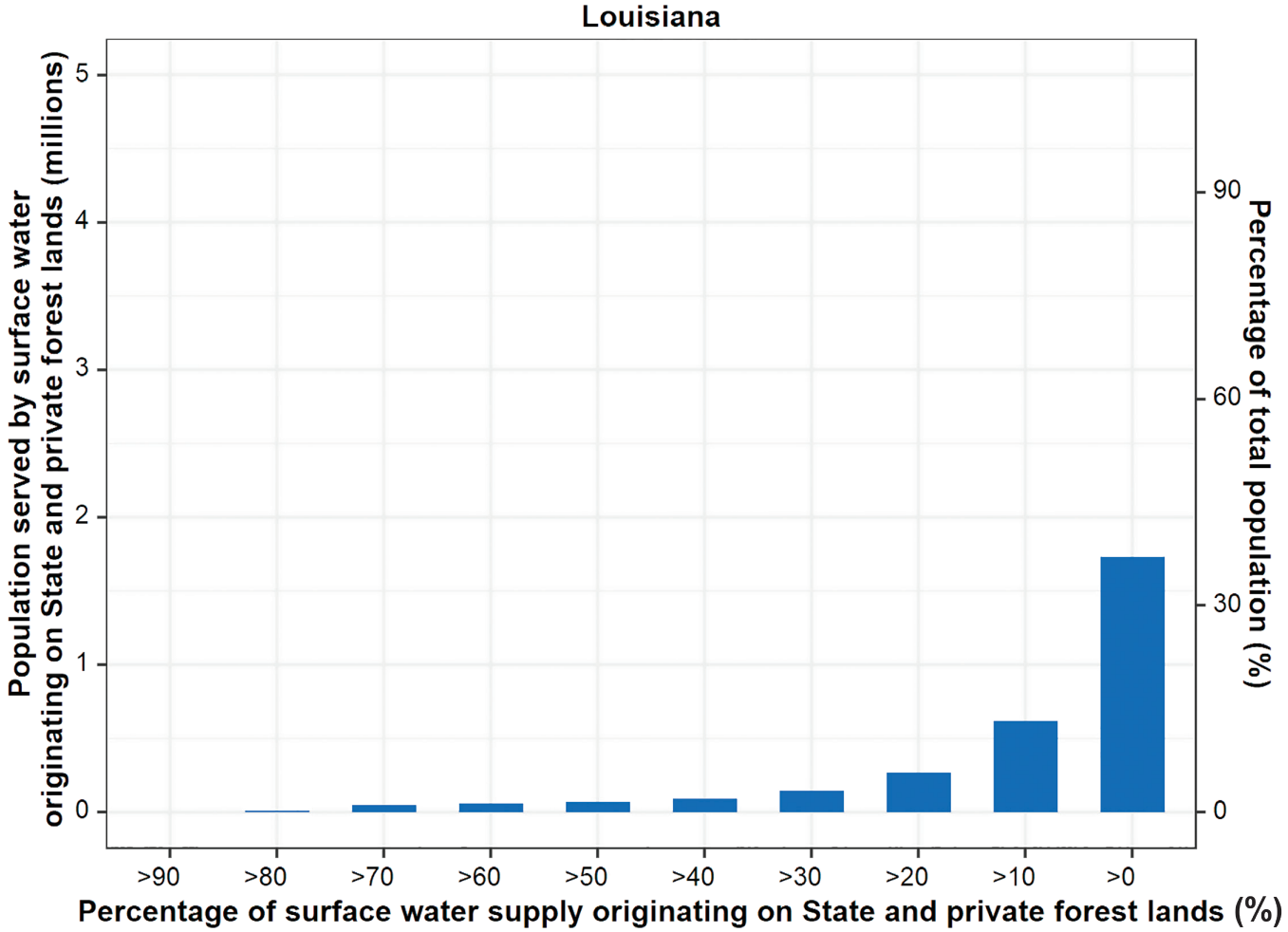


Figure A.LA.6—Cumulative frequency of population served according to percentage of water coming from Louisiana SPF lands.

Public Water System Intakes Outside of Louisiana Receiving Water from Louisiana State and Private Forests

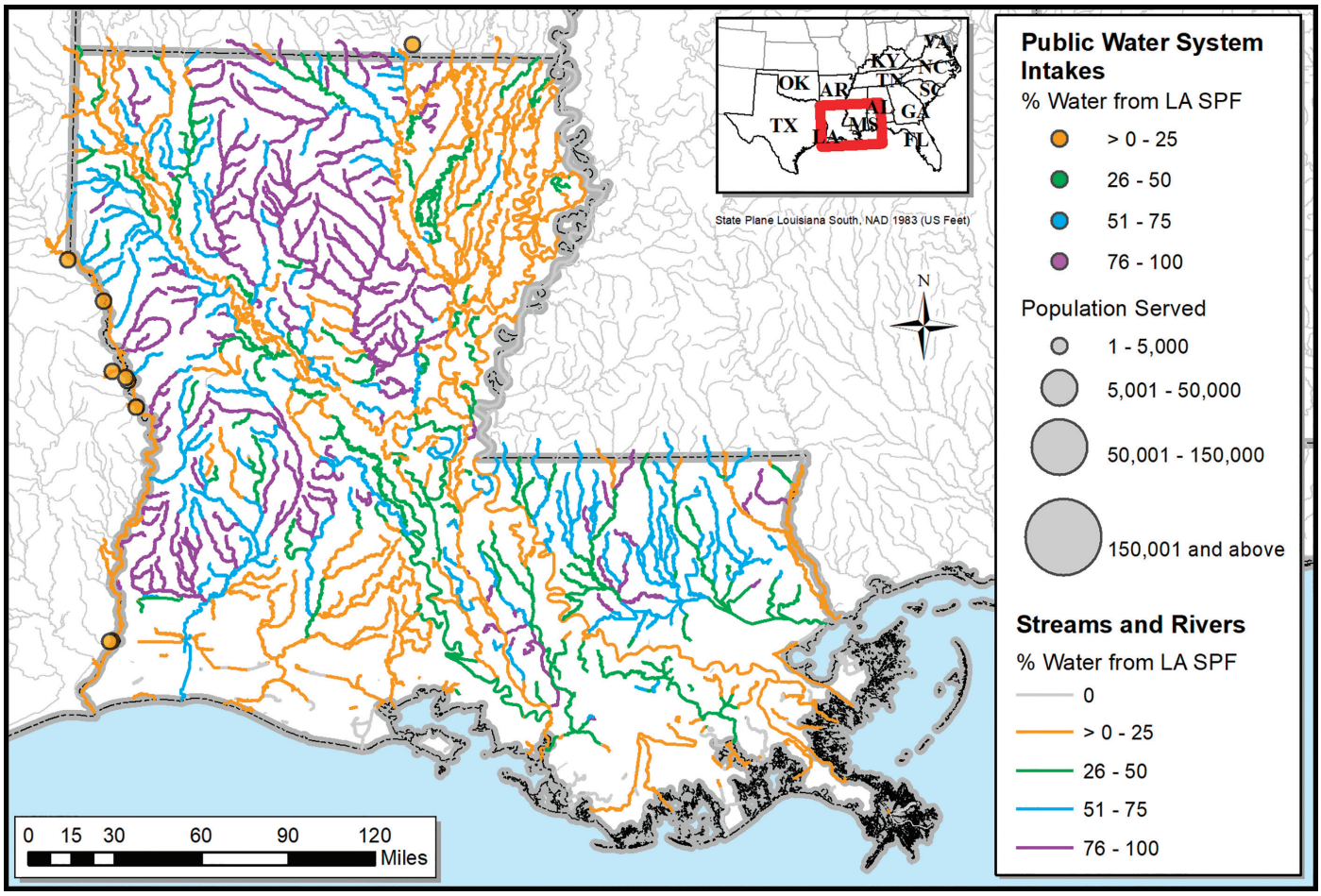


Figure A.LA.7—Louisiana streams by percentage of Louisiana SPF water content, surface drinking water intakes downstream of Louisiana by percentage of Louisiana SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 11 surface drinking water intakes outside the State but carrying Louisiana SPF water serve a population of 9,587 in eight communities.

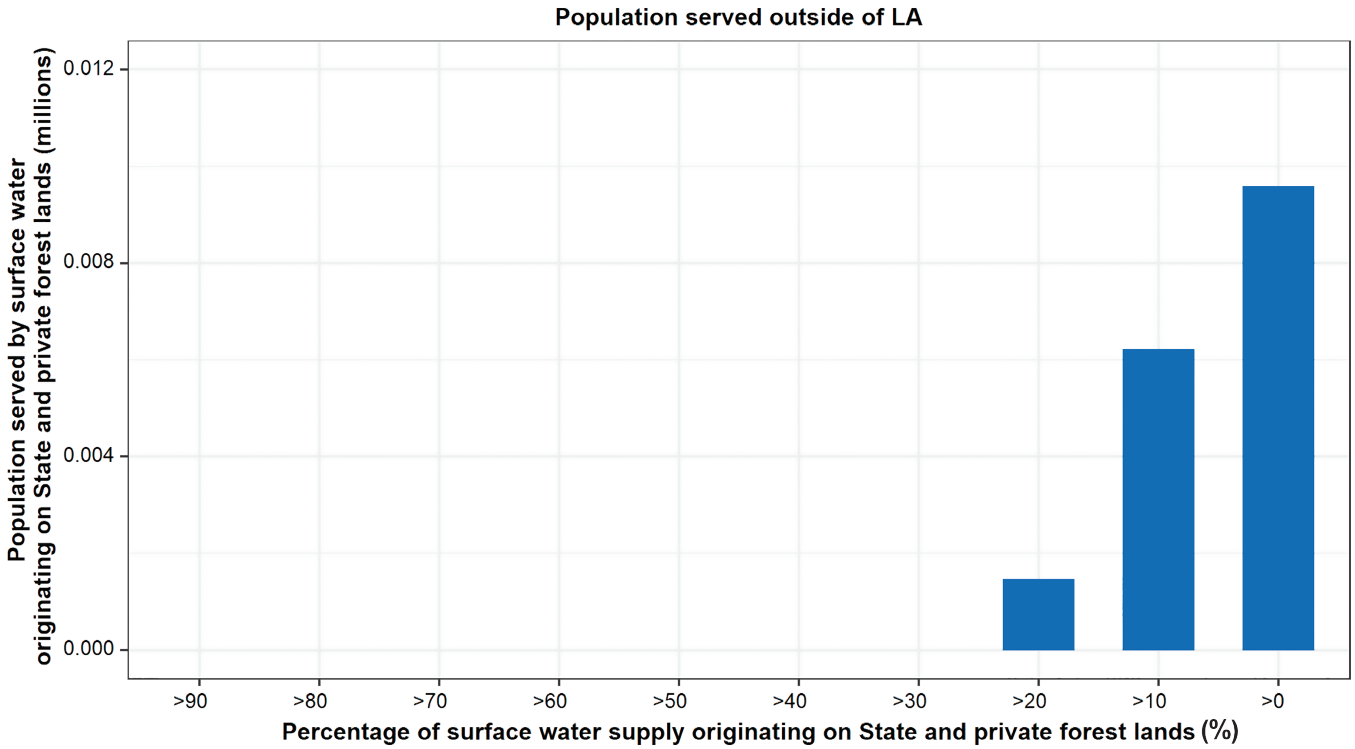


Figure A.LA.8—Cumulative frequency of non-Louisiana population served according to percentage of water coming from Louisiana SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Louisiana State and Private Forests

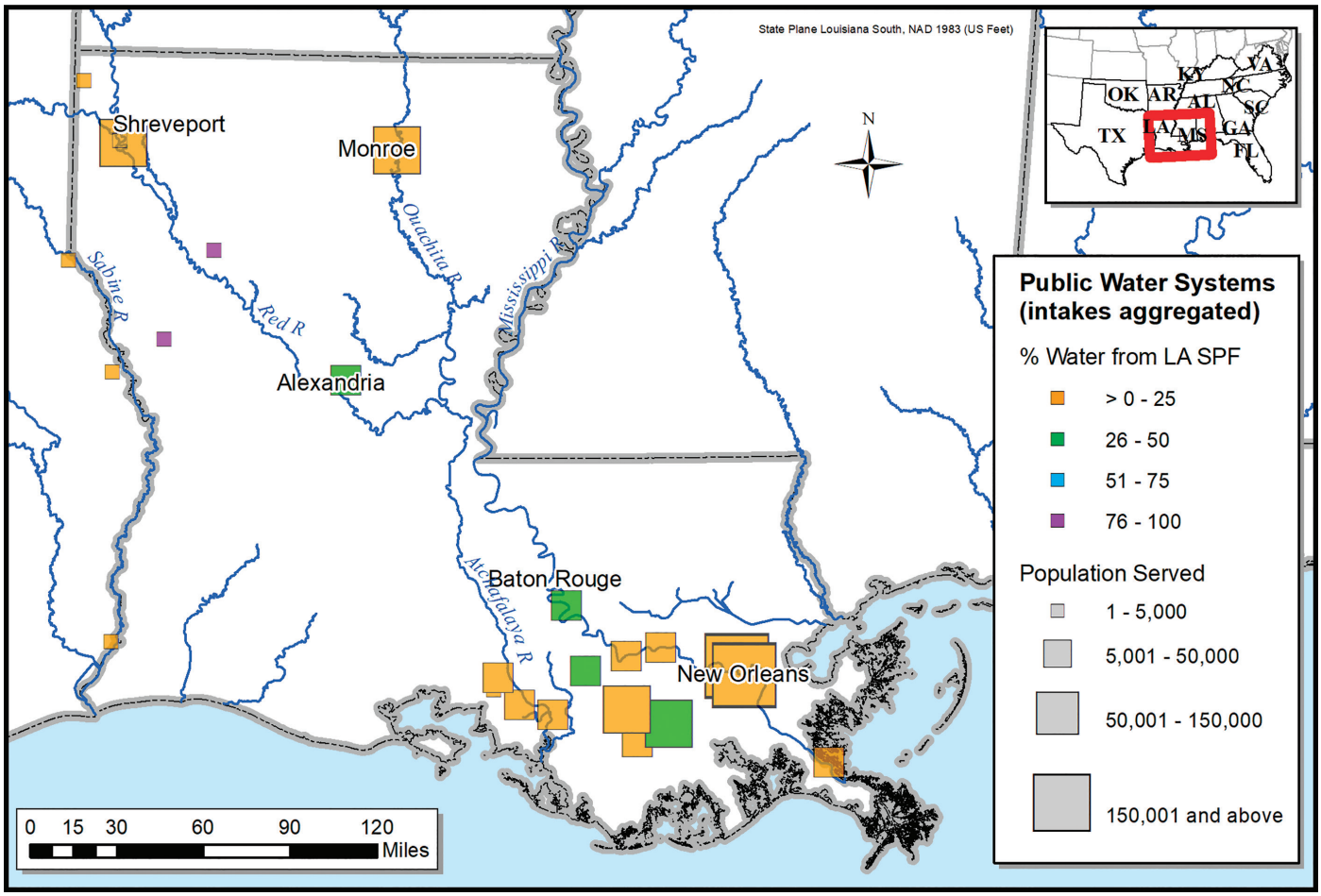


Figure A.LA.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Southeastern Louisiana Detail

Streams and Public Water System Intakes in Southeastern Louisiana Receiving Water from Louisiana State and Private Forests

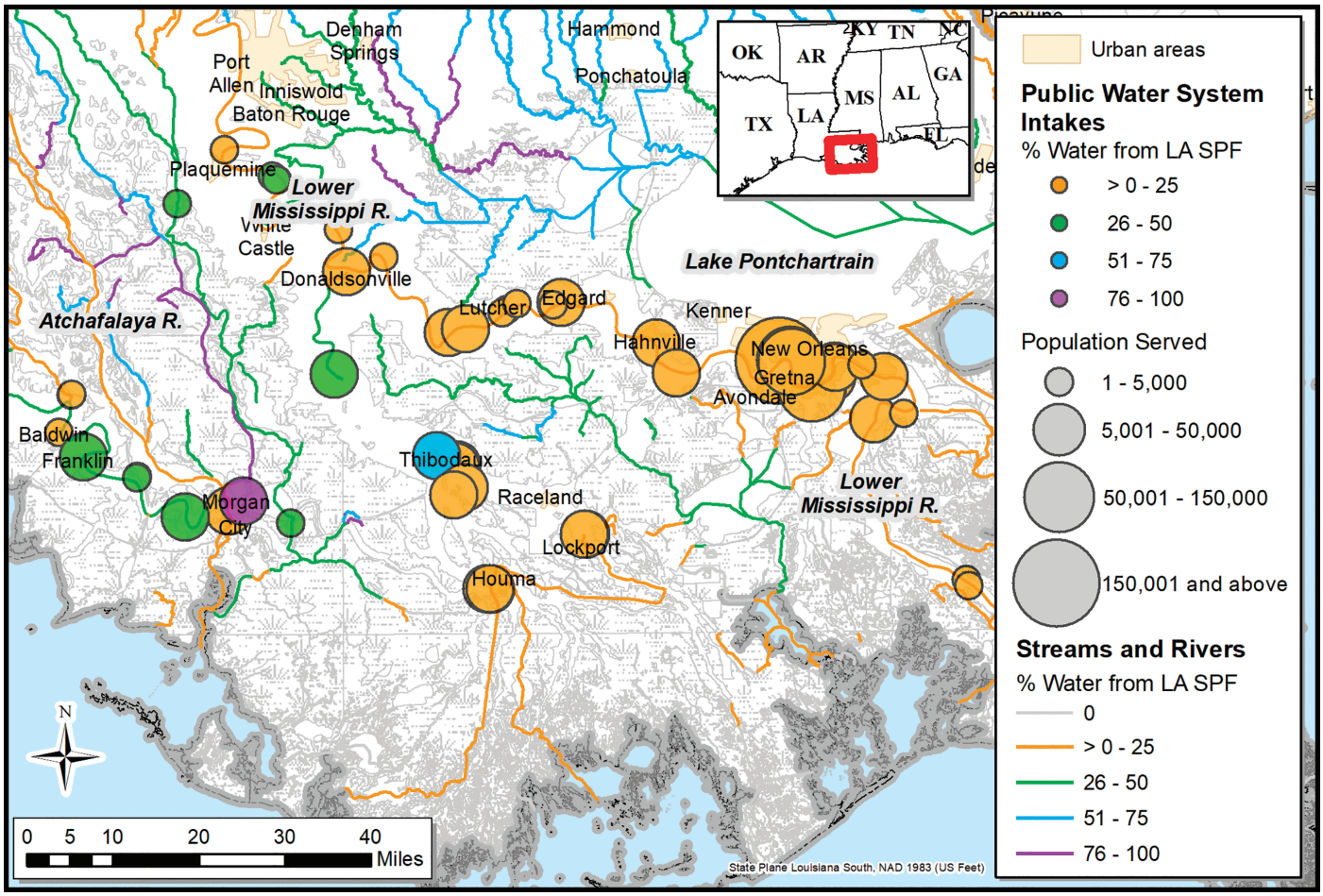


Figure A.LA.10—Local-scale detail showing percentage of water from Louisiana SPF for streams and surface drinking water intakes in southeastern Louisiana.

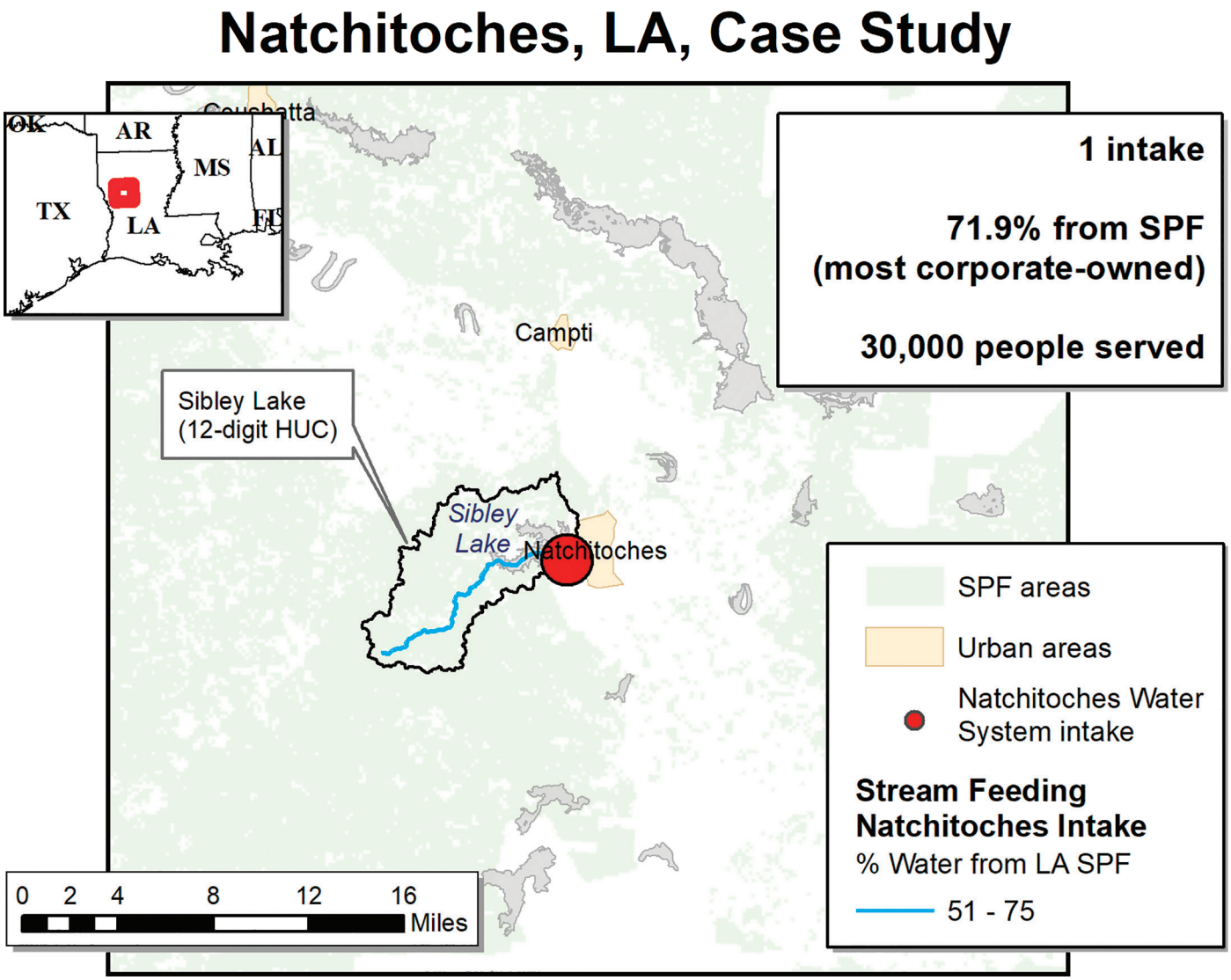


Figure A.LA.11—Case study of the Natchitoches Water System public water supply system, Natchitoches, LA, illustrating SPF water in the stream supplying the single surface drinking water intake. When this water reaches the intake, 71.9 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is corporate-owned.

STATE OF MISSISSIPPI

Summary

State and private forest (SPF) lands cover 57.4 percent of Mississippi (figs. A.MS.1 and A.MS.2; table A.MS.1). About 54.9 percent of all Mississippi surface water originates on SPF lands (fig. A.MS.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 62.8 percent of the SPF land area and 63.4 percent of surface water from SPF. Corporate-owned forests contribute 26.1 percent of surface water from SPF and account for 26.7 percent of land area of SPF. Average annual water yield in Mississippi is about 575 mm (fig. A.MS.4). Mississippi has a total of 23 surface drinking water intakes where at least some available water comes from SPF (fig. A.MS.5). About 7.2 percent of the total population of Mississippi is served by surface drinking water overall, and Mississippi SPF surface drinking water also serves about 7.2 percent of the State population, or 0.2 million people, to some degree. About 0.1 million people in Mississippi are getting more than half of their surface drinking water from SPF within the State (fig. A.MS.6). State and private forest lands in Mississippi also supply water to 51 surface drinking water intakes in other States (Alabama, Illinois, Kentucky, Louisiana, and Tennessee) (fig. A.MS.7), which collectively serve about 1.1 million people in 37 communities (fig. A.MS.8). Some public water systems in Mississippi utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.MS.9 by population served (symbol size) and percentage of water from SPF lands in Mississippi (symbol color). The Jackson detail map (fig. A.MS.10) adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.MS.11) of the City of Jackson public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Mississippi, where eight surface drinking water intakes receive about 67.2 percent of their water from SPF and serve about 0.2 million people.

Table A.MS.1—Land area by land cover and forest ownership type in Mississippi

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	81 414	20,117,466
Nonforest	46 704	11,540,799
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	7776	1,921,417
Tribal (public)	131	32,277
State (public)	3812	941,943
Local (public)	922	227,887
Corporate (private)	19 611	4,845,919
Family (private)	46 185	11,412,500
Other private	2977	735,523

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

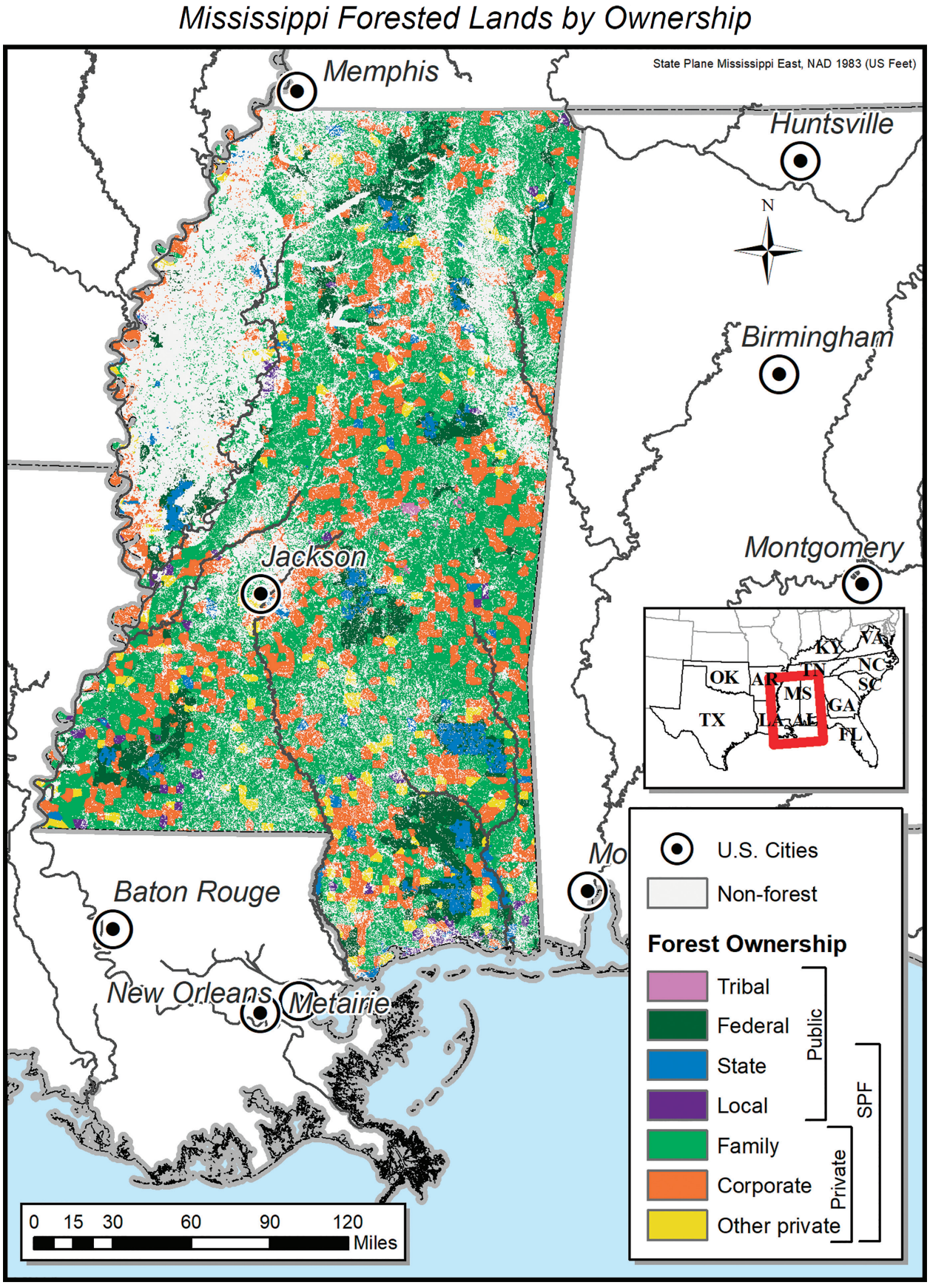


Figure A.MS.1—Mississippi nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

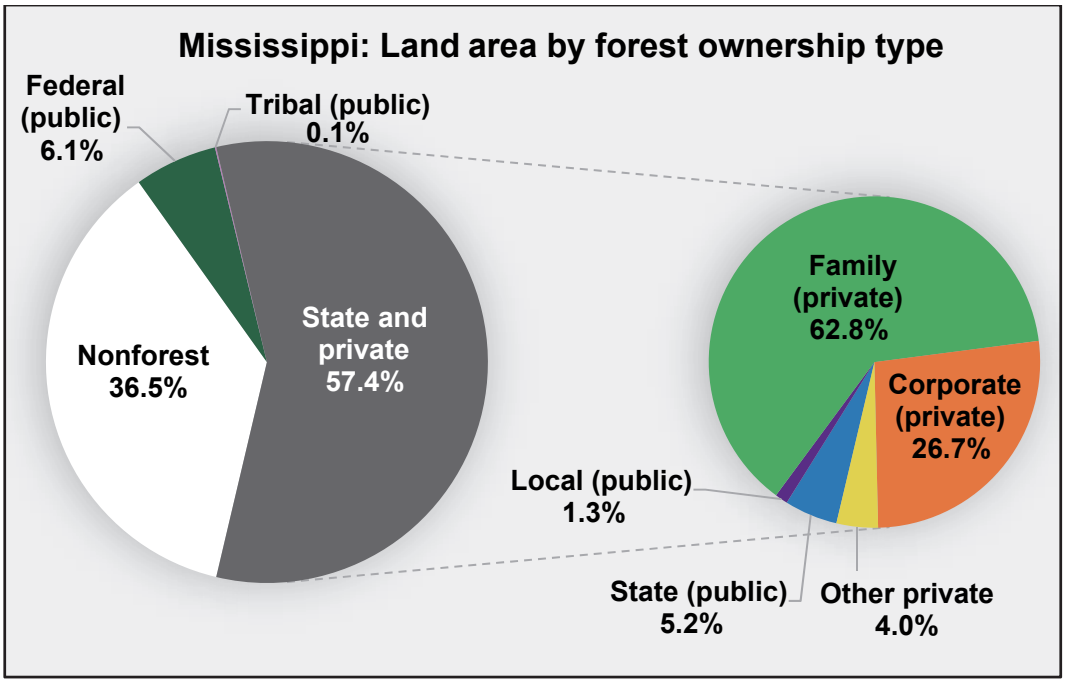


Figure A.MS.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

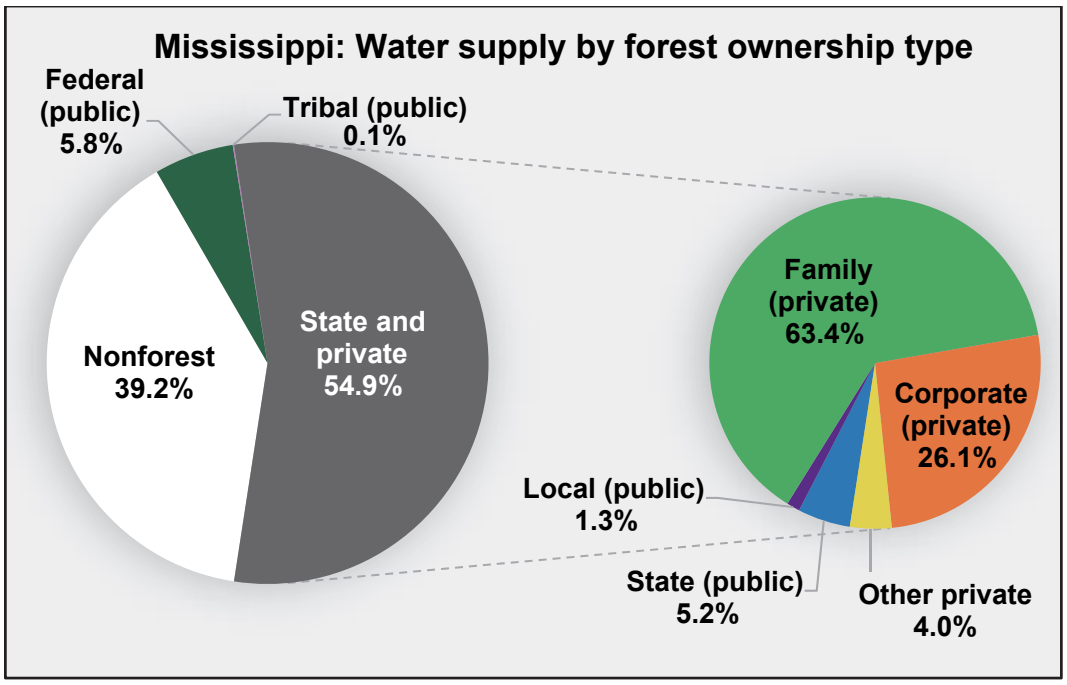


Figure A.MS.3—Percentage of Mississippi's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Mississippi

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

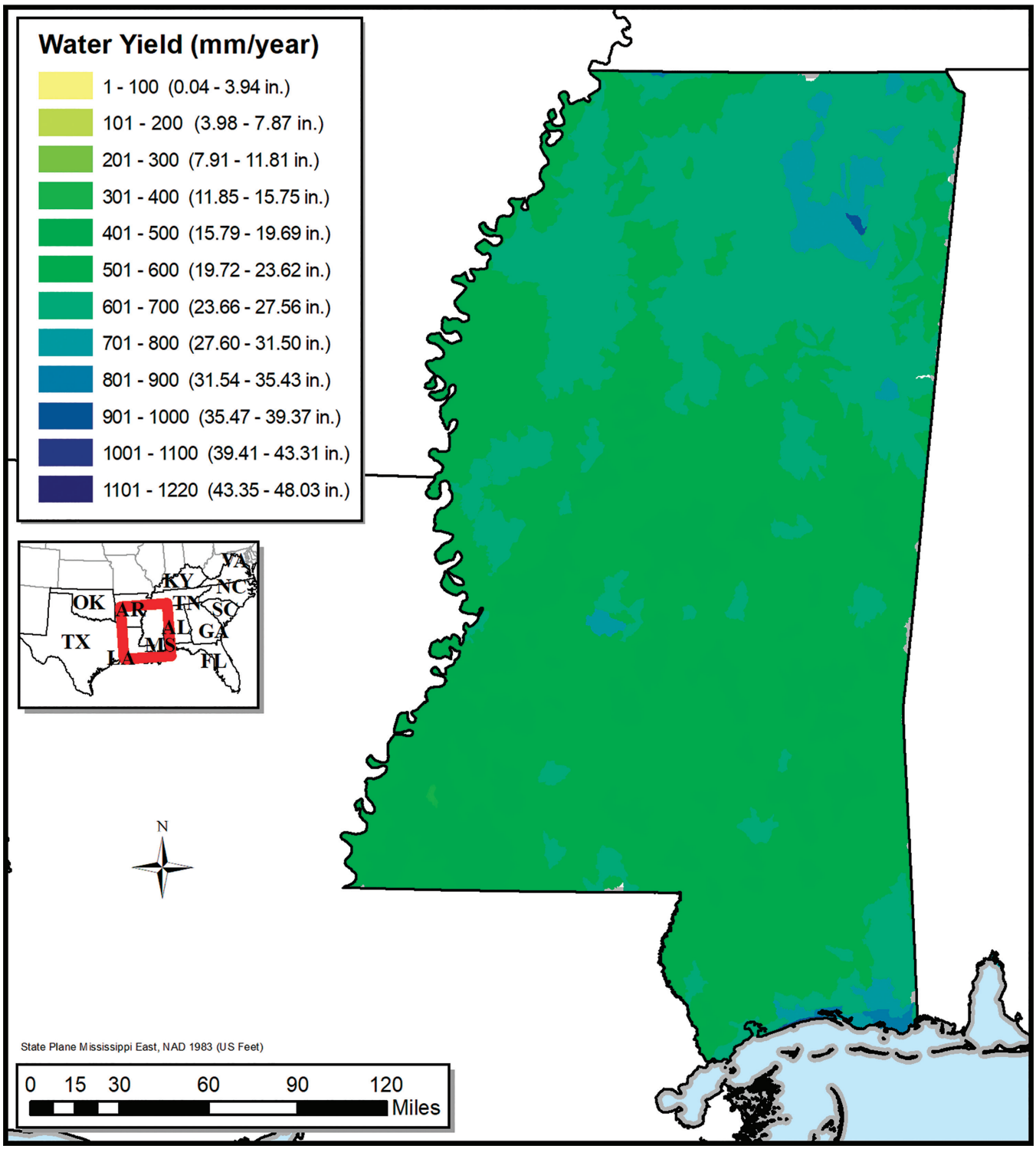


Figure A.MS.4—Estimated mean annual water yield by 12-digit hydrologic units in Mississippi, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Mississippi State and Private Forests

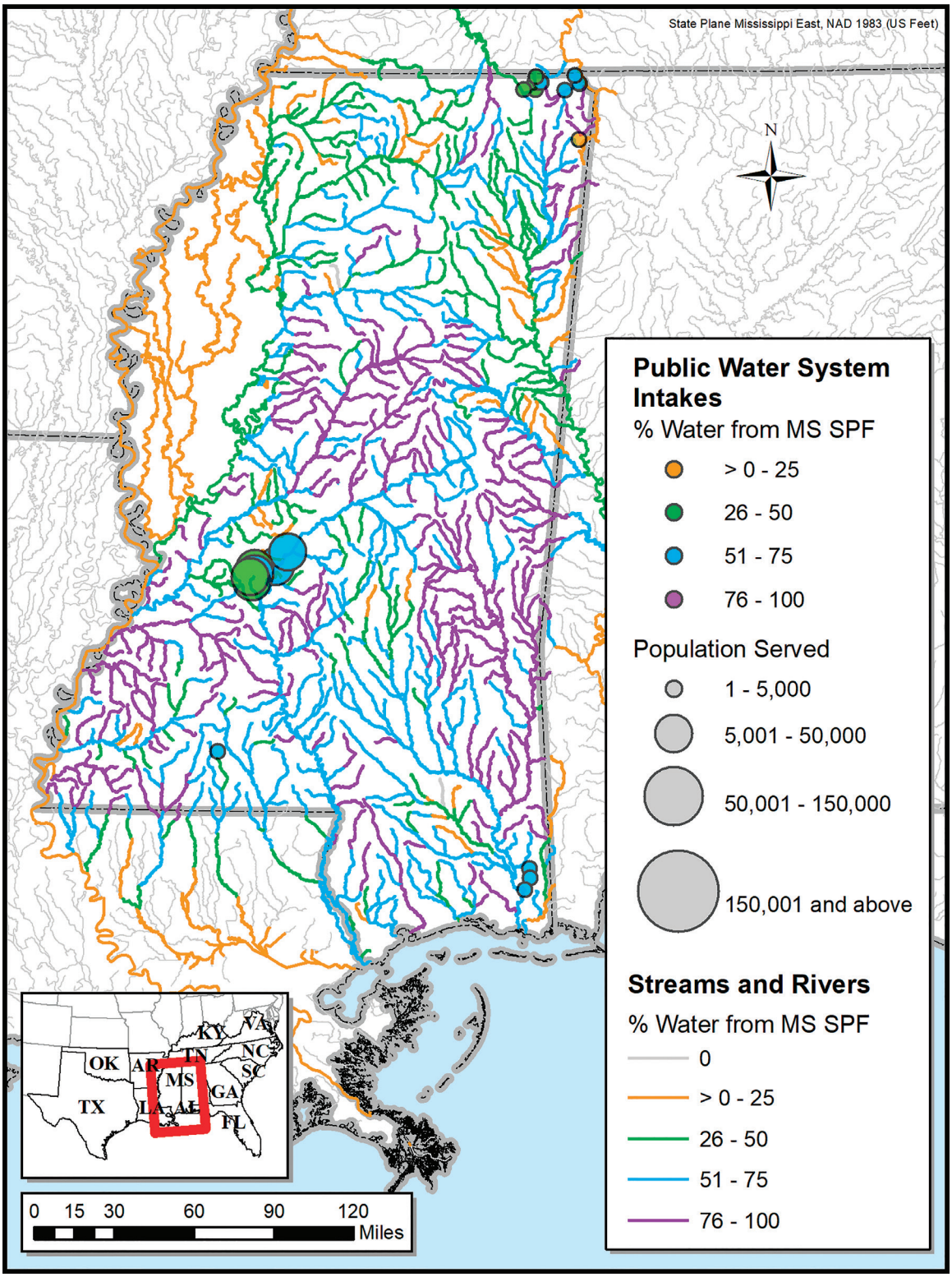


Figure A.MS.5—(A) Mississippi streams by percentage of Mississippi SPF water content, surface drinking water intakes within Mississippi by percentage of Mississippi SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 23 surface drinking water intakes within the State serve a population of 214,946 in six communities. Note: See figures A.MS.5 parts B and C on separate pages for streams and intakes only.

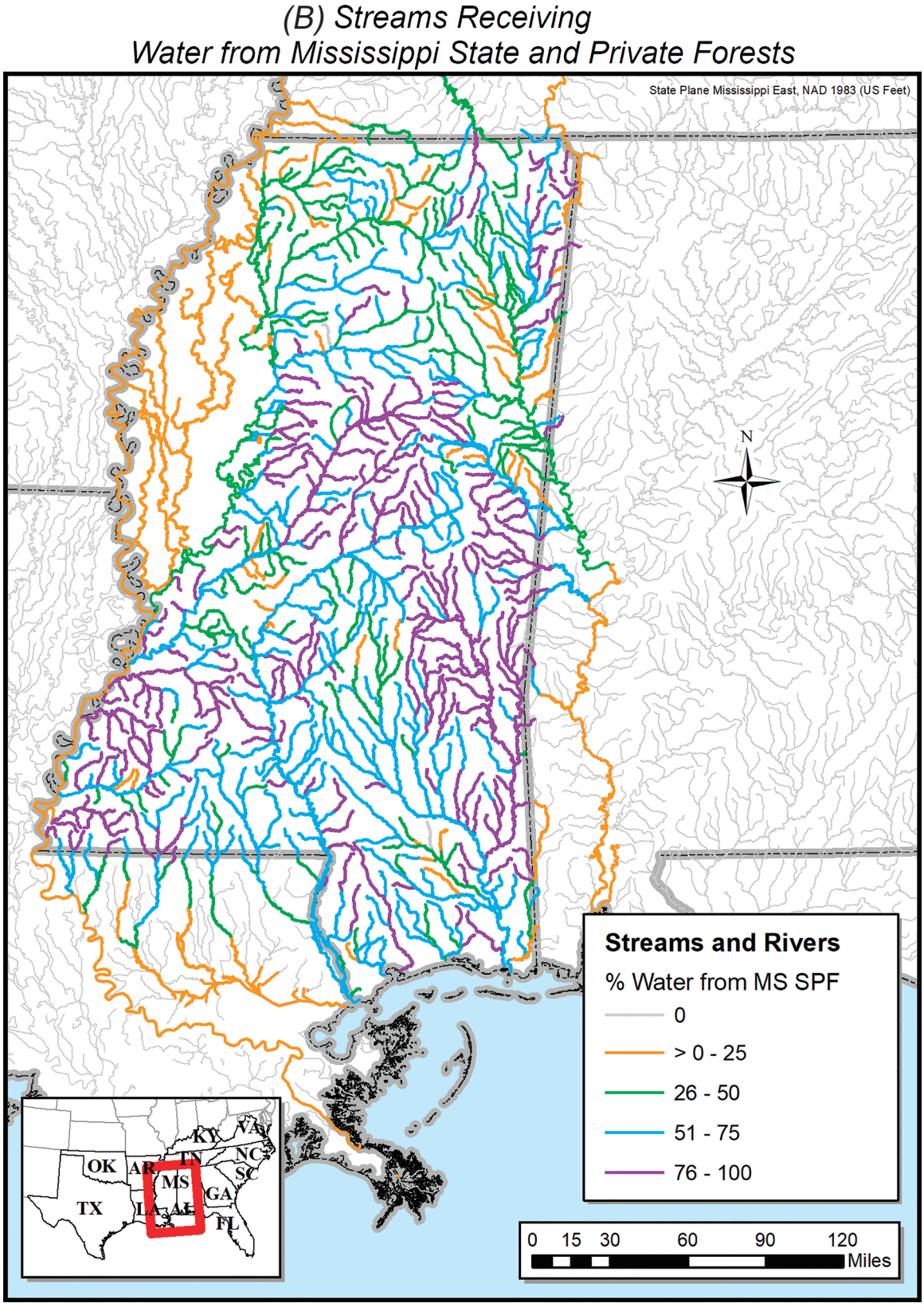


Figure A.MS.5—(B) Mississippi streams by percentage of Mississippi SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Mississippi State and Private Forests

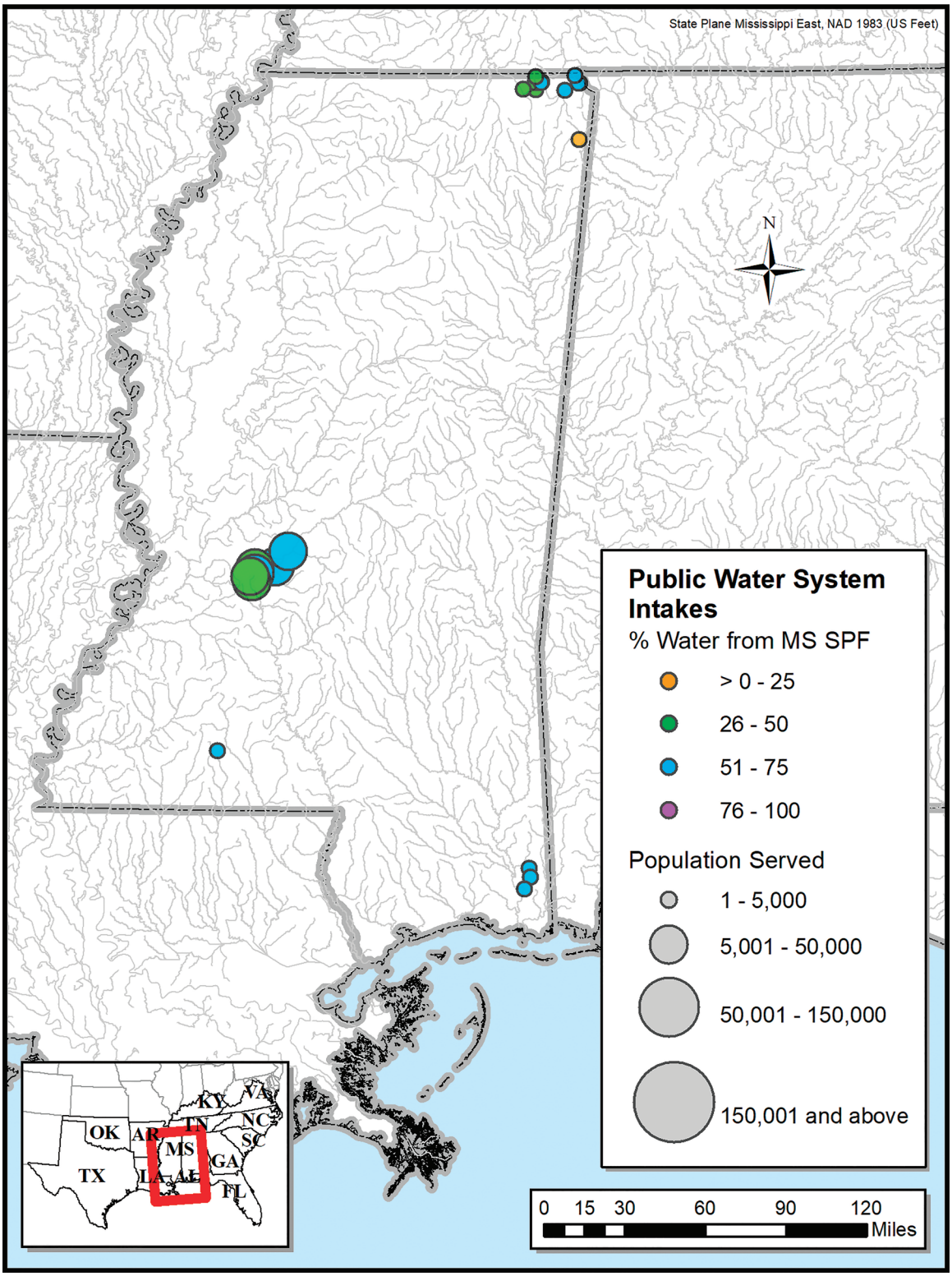


Figure A.MS.5—(C) Surface drinking water intakes within Mississippi by percentage of Mississippi SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 23 surface drinking water intakes within the State serve a population of 214,946 in six communities.

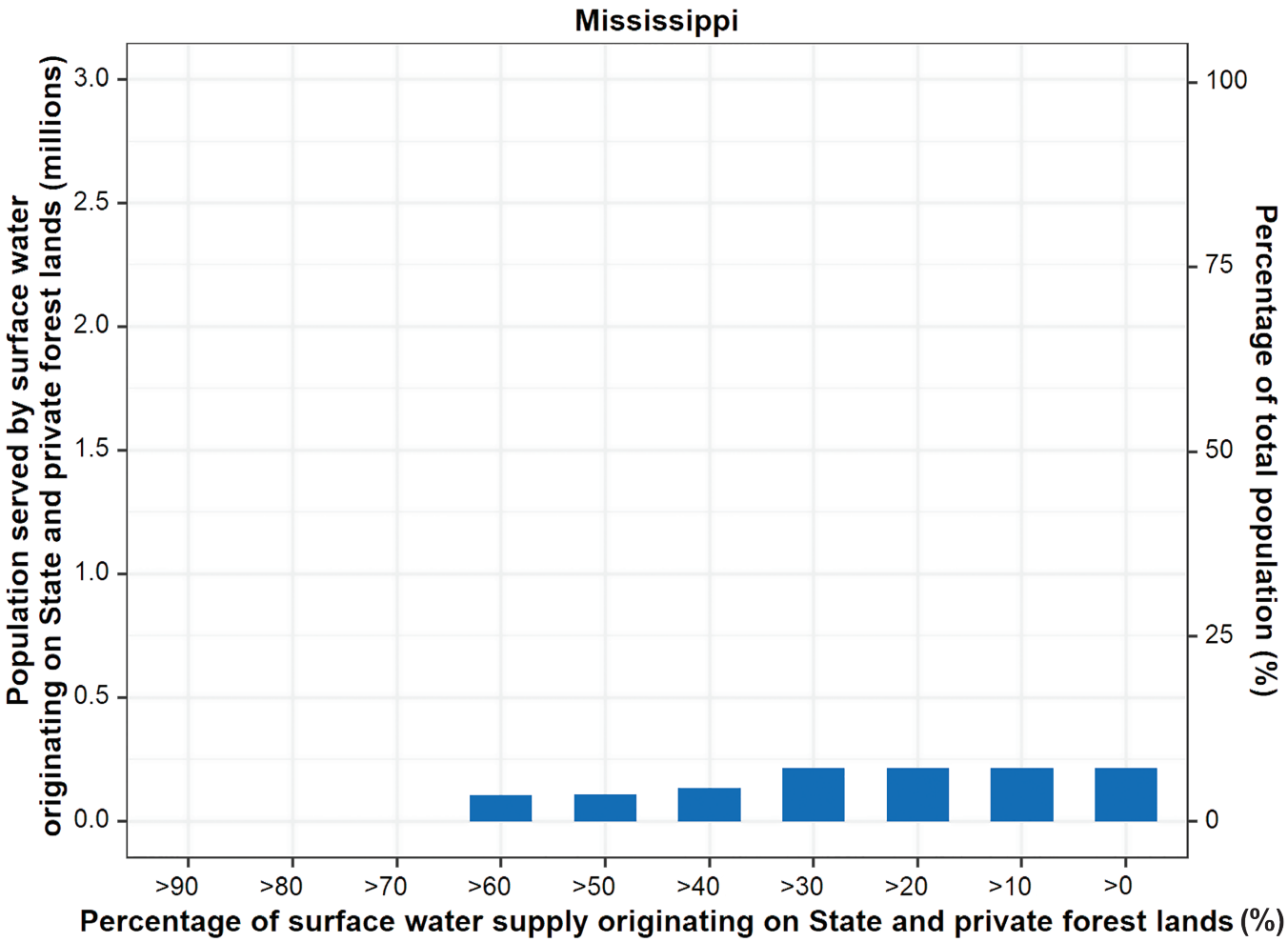


Figure A.MS.6—Cumulative frequency of population served according to percentage of water coming from Mississippi SPF lands.

Public Water System Intakes Outside of Mississippi Receiving Water from Mississippi State and Private Forests

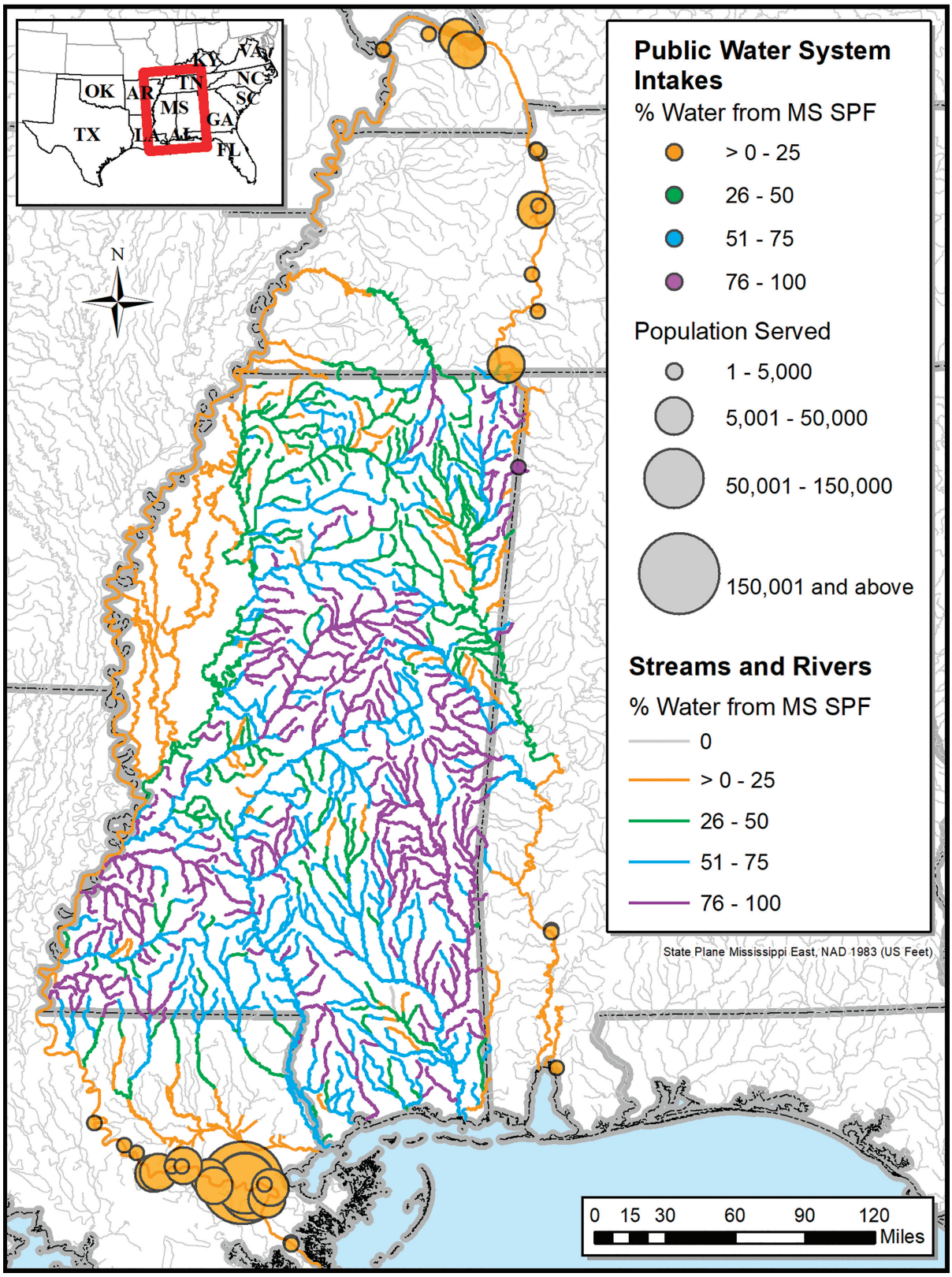


Figure A.MS.7—Mississippi streams by percentage of Mississippi SPF water content, surface drinking water intakes downstream of Mississippi by percentage of Mississippi SPF water content (symbol color), and population served by each of these external intakes (symbol color). A total of 51 surface drinking water intakes outside the State but carrying Mississippi SPF water serve a population of 1,057,304 in 37 communities.

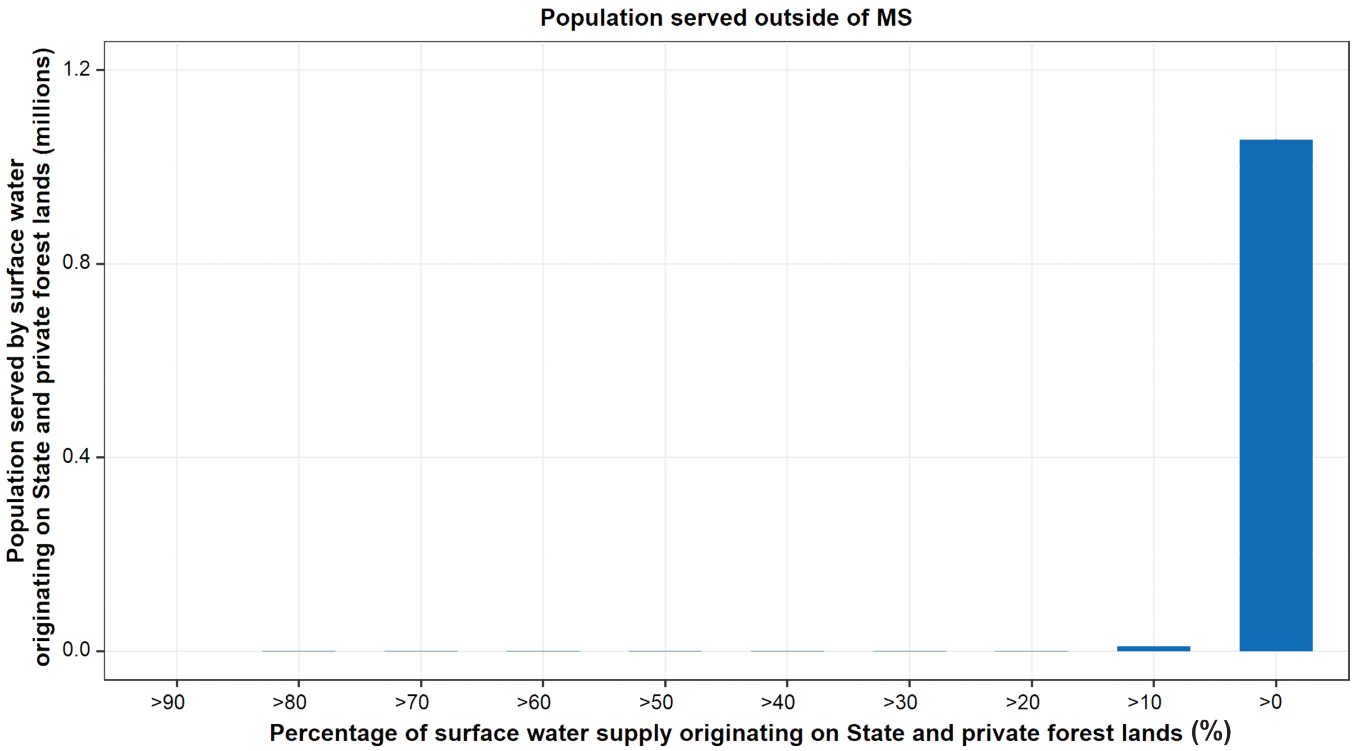


Figure A.MS.8—Cumulative frequency of non-Mississippi population served according to percentage of water coming from Mississippi SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol) Receiving Water from Mississippi State and Private Forests

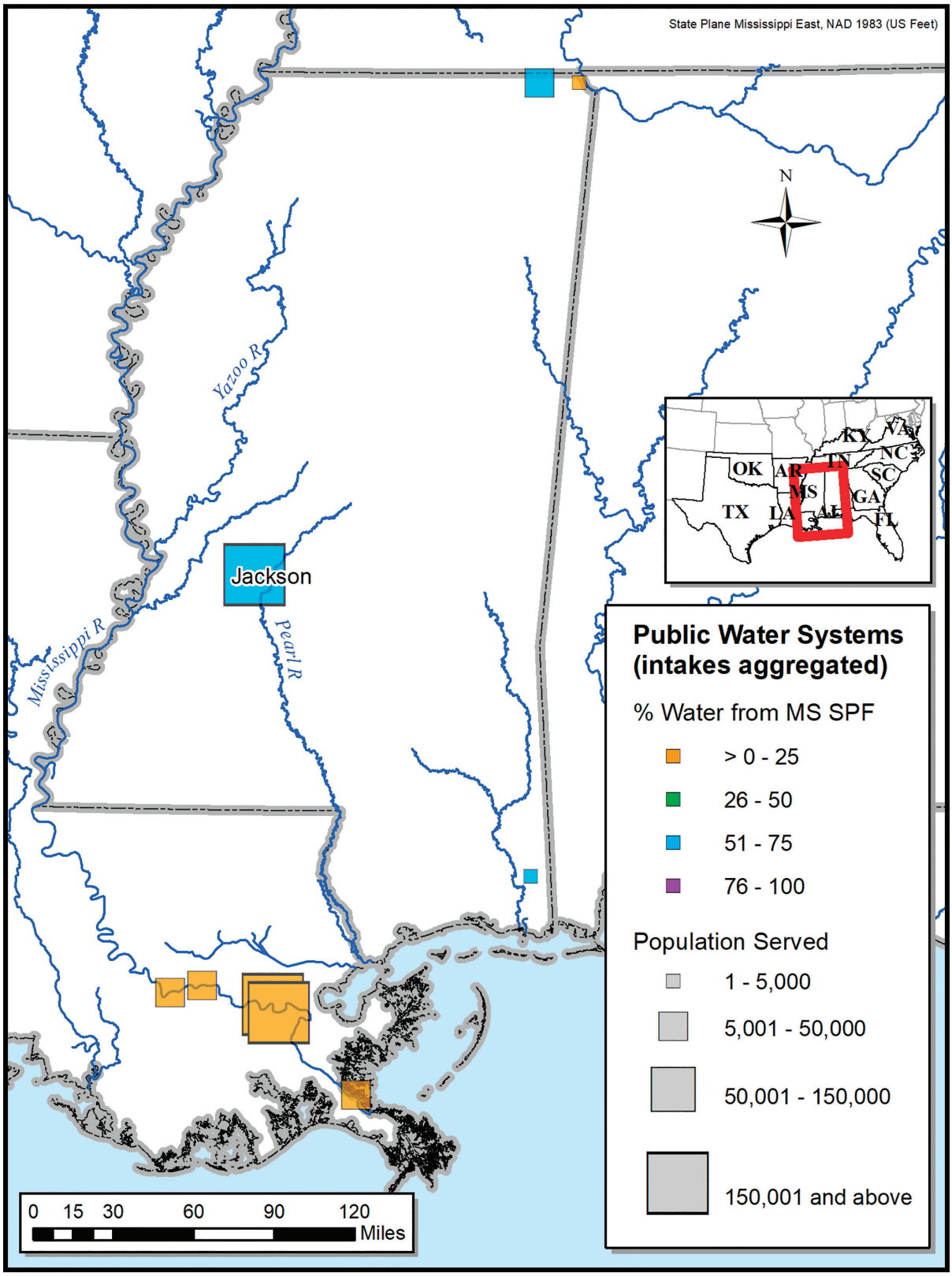


Figure A.MS.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Jackson Detail

Streams and Public Water System Intakes in the Jackson, MS, Area Receiving Water from Mississippi State and Private Forests

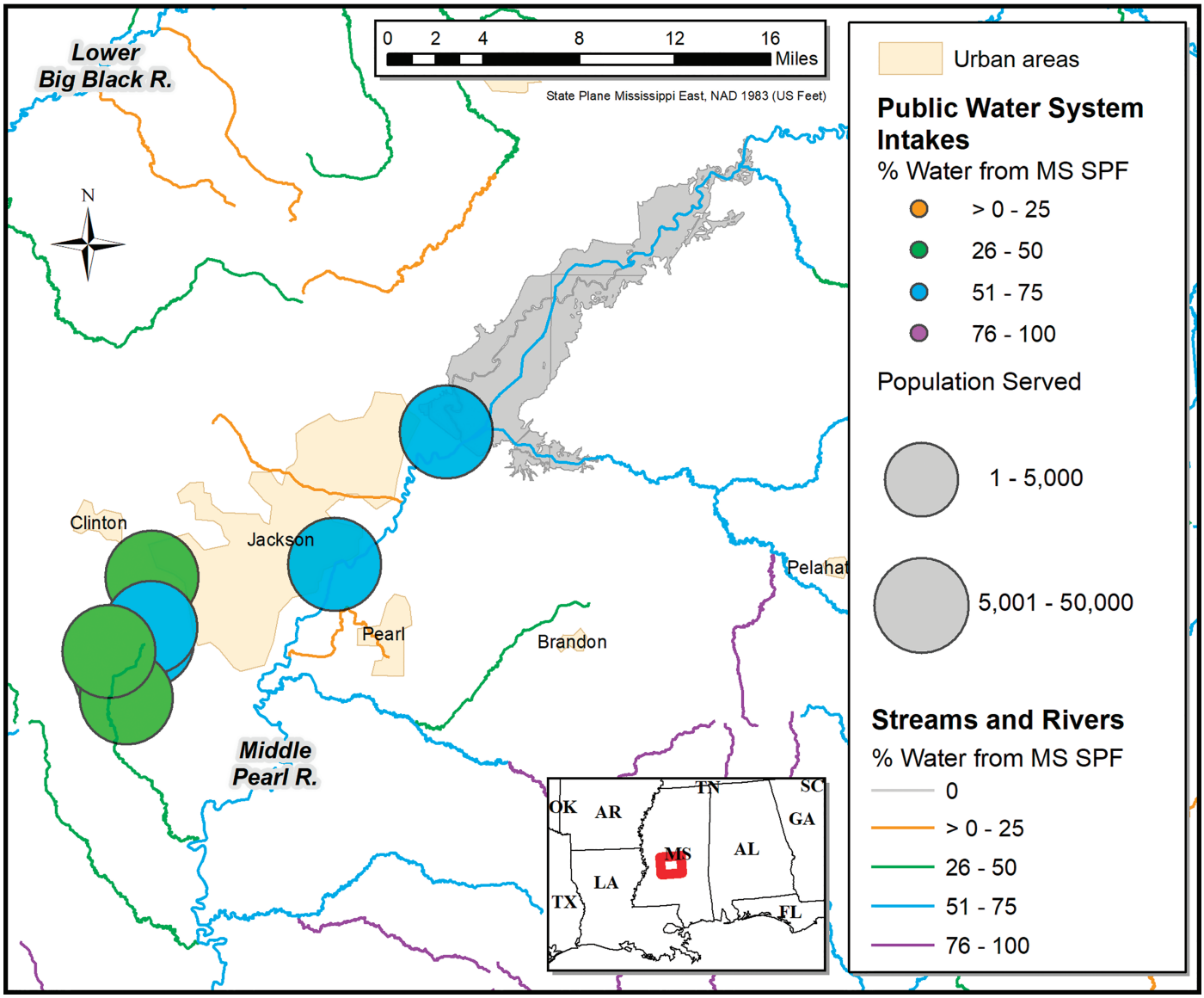


Figure A.MS.10—Local-scale detail showing percentage of water from Mississippi SPF for streams and surface drinking water intakes around Jackson, MS.

Jackson, MS, Case Study

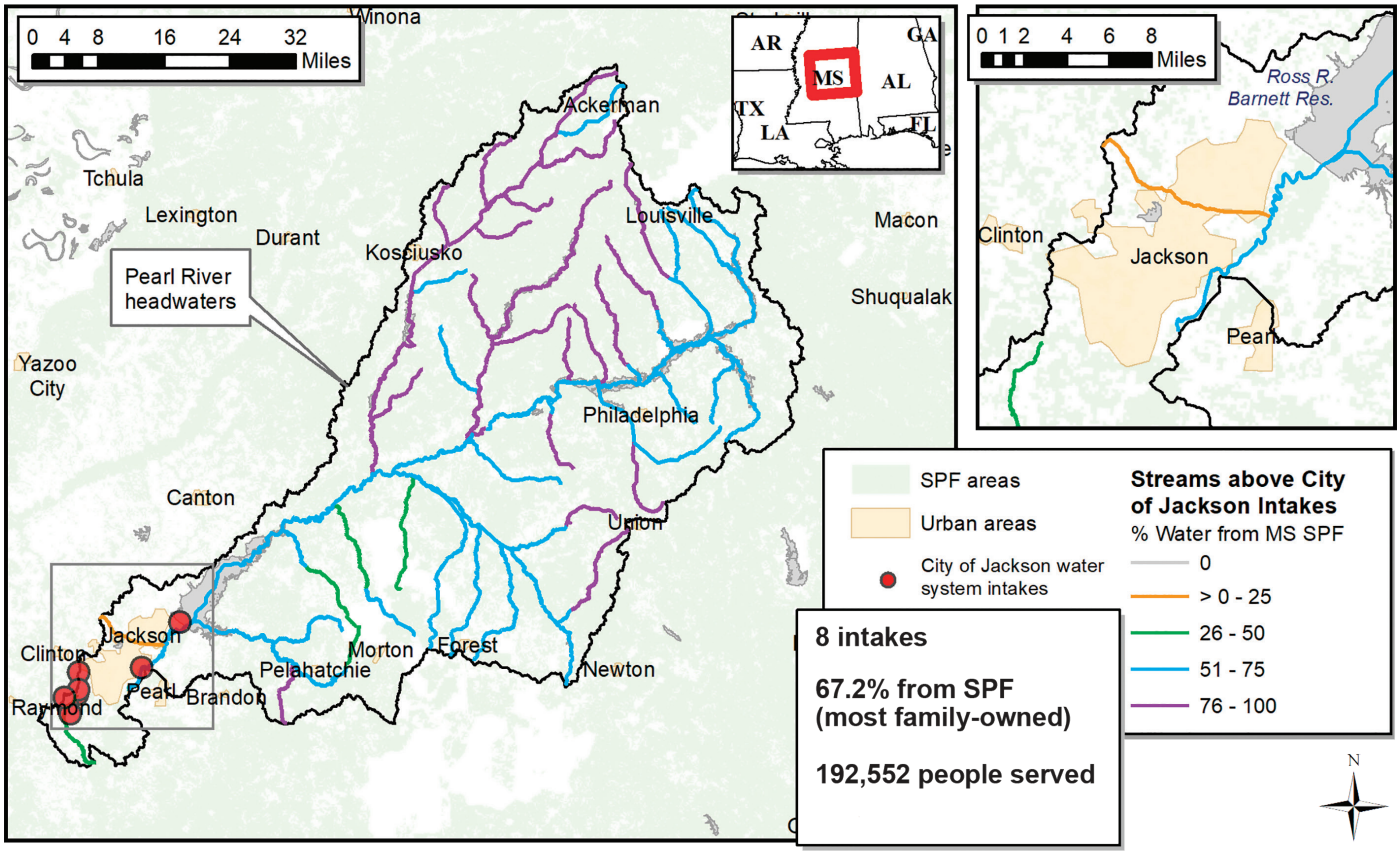


Figure A.MS.11—Case study of the City of Jackson public water supply system, Jackson, MS, illustrating SPF water in streams supplying the eight surface drinking water intakes. When this water reaches the intakes, 67.2 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF NORTH CAROLINA

Summary

State and private forest (SPF) lands cover about 49.4 percent of North Carolina (figs. A.NC.1 and A.NC.2; table A.NC.1). About 45.5 percent of all North Carolina surface water originates on SPF lands (fig. A.NC.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 62.9 percent of the land coverage and 62.3 percent of surface water from SPF. Corporate-owned forests contribute 27.2 percent of surface water from SPF and account for 27.0 percent of land coverage. Average annual water yield in North Carolina is about 400 mm, with greater annual water yield in the western part of the State (>800 mm) (fig. A.NC.4). North Carolina has a total of 484 surface drinking water intakes where at least some available water comes from SPF (fig. A.NC.5). About 56.9 percent of the total population of North Carolina is served by surface drinking water overall, and North Carolina SPF surface drinking water also serves about 56.9 percent of the State population, or 5.8 million people, to some degree. About 1.5 million people in North Carolina are getting more than half of their surface drinking water from SPF within the State (fig. A.NC.6). State and private forest lands in North Carolina also supply water to 296 surface drinking water intakes in other States (Alabama, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Ohio, South Carolina, Tennessee, Virginia, and West Virginia) (fig. A.NC.7), which collectively serve about 5.2 million people in 182 communities (fig. A.NC.8). Many public water systems in North Carolina utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.NC.9 by population served (symbol size) and percentage of water from SPF lands in North Carolina (symbol color). The detail maps of Charlotte, the Sandhills towns, the Triad area, and the Triangle area (figs. A.NC.10–A.NC.13) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.NC.14) of the City of Durham public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in North Carolina, where two surface drinking water intakes receive about 64.4 percent of their water from SPF and serve about 0.3 million people.

Table A.NC.1—Land area by land cover and forest ownership type in North Carolina

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	77 971	19,267,272
Nonforest	55 759	13,778,301
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	11 662	2,881,771
Tribal (public)	206	51,002
State (public)	4355	1,076,227
Local (public)	1083	267,601
Corporate (private)	17 843	4,409,061
Family (private)	41 570	10,272,255
Other private	1252	309,355

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

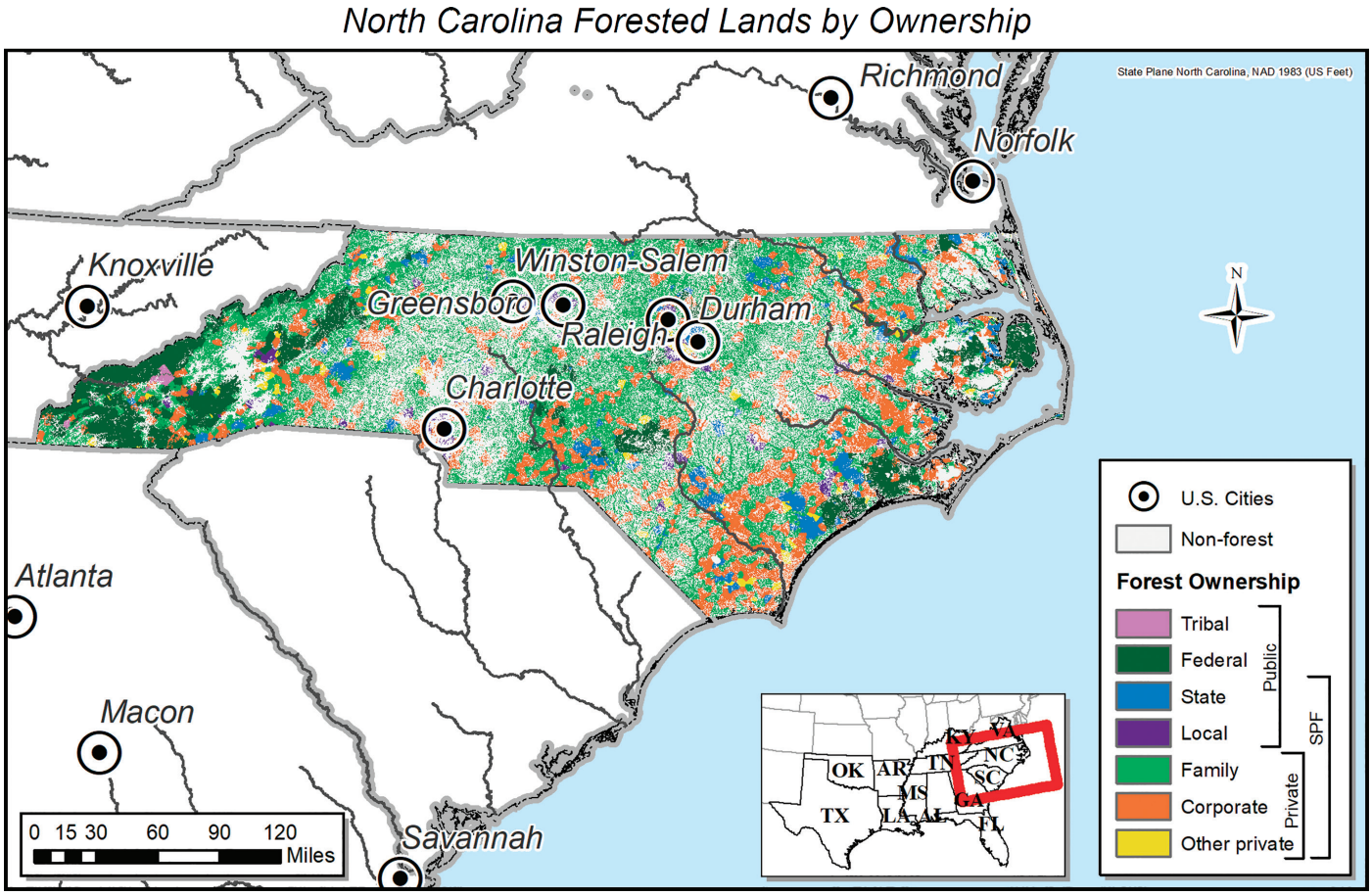


Figure A.NC.1—North Carolina nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

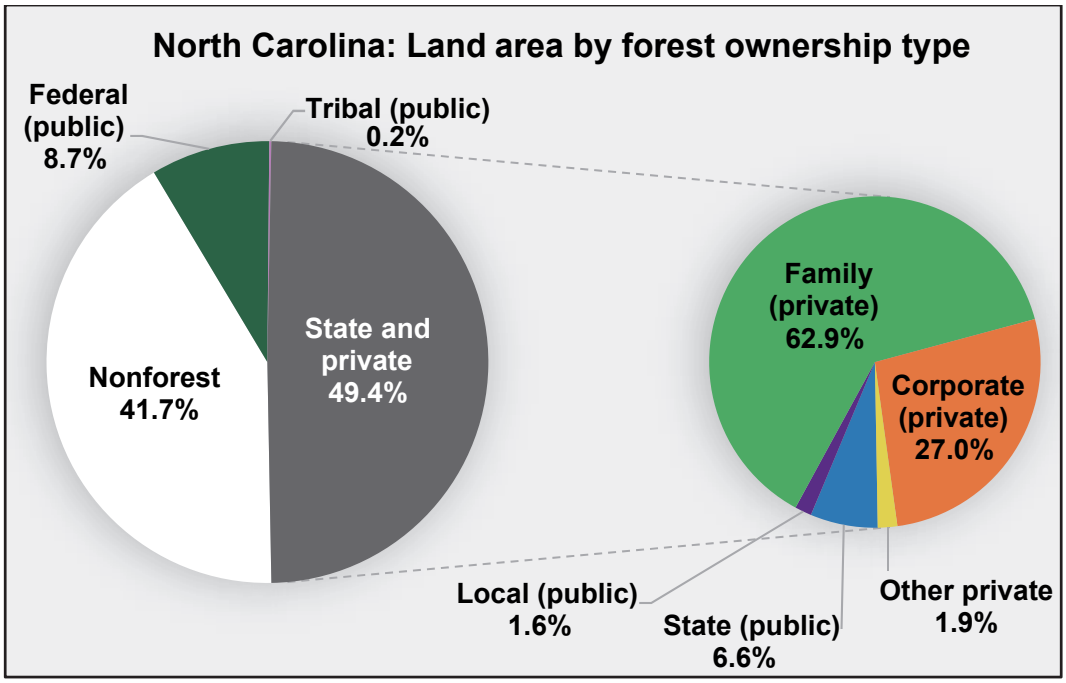


Figure A.NC.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

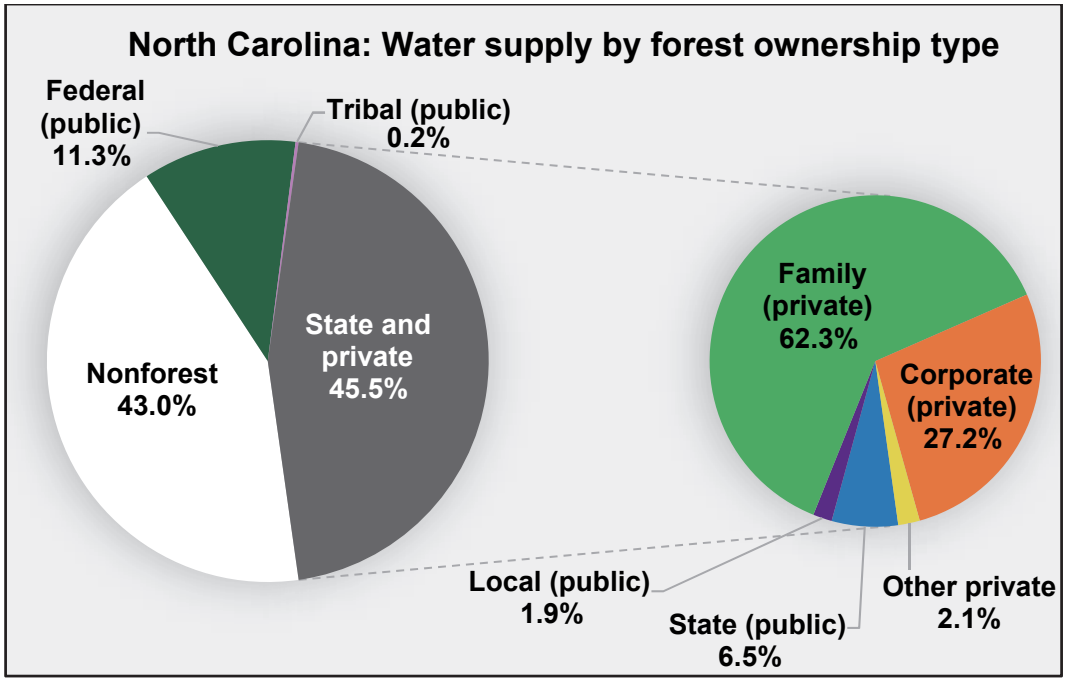


Figure A.NC.3—Percentage of North Carolina's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

North Carolina

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

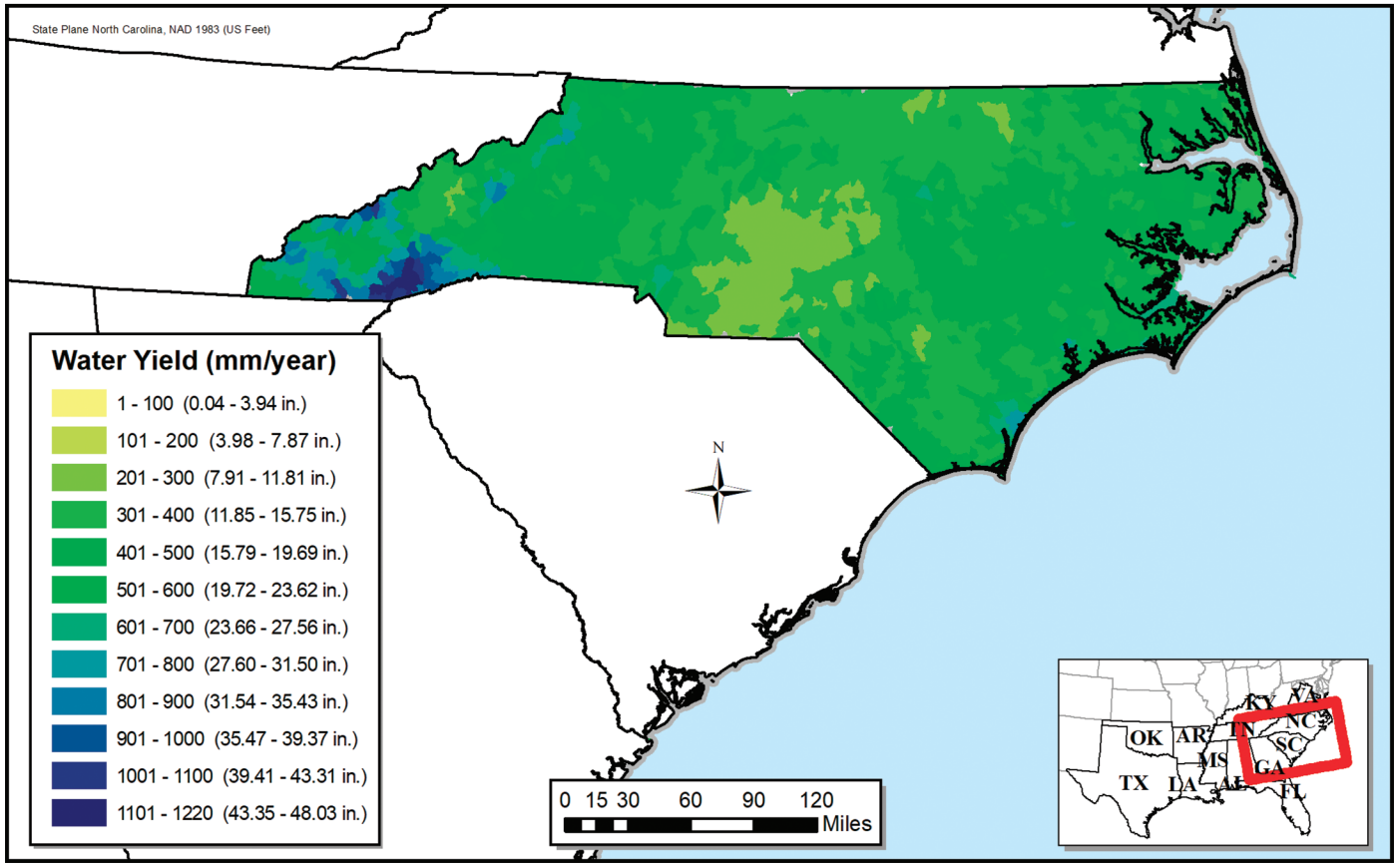


Figure A.NC.4—Estimated mean annual water yield by 12-digit hydrologic units in North Carolina, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from North Carolina State and Private Forests

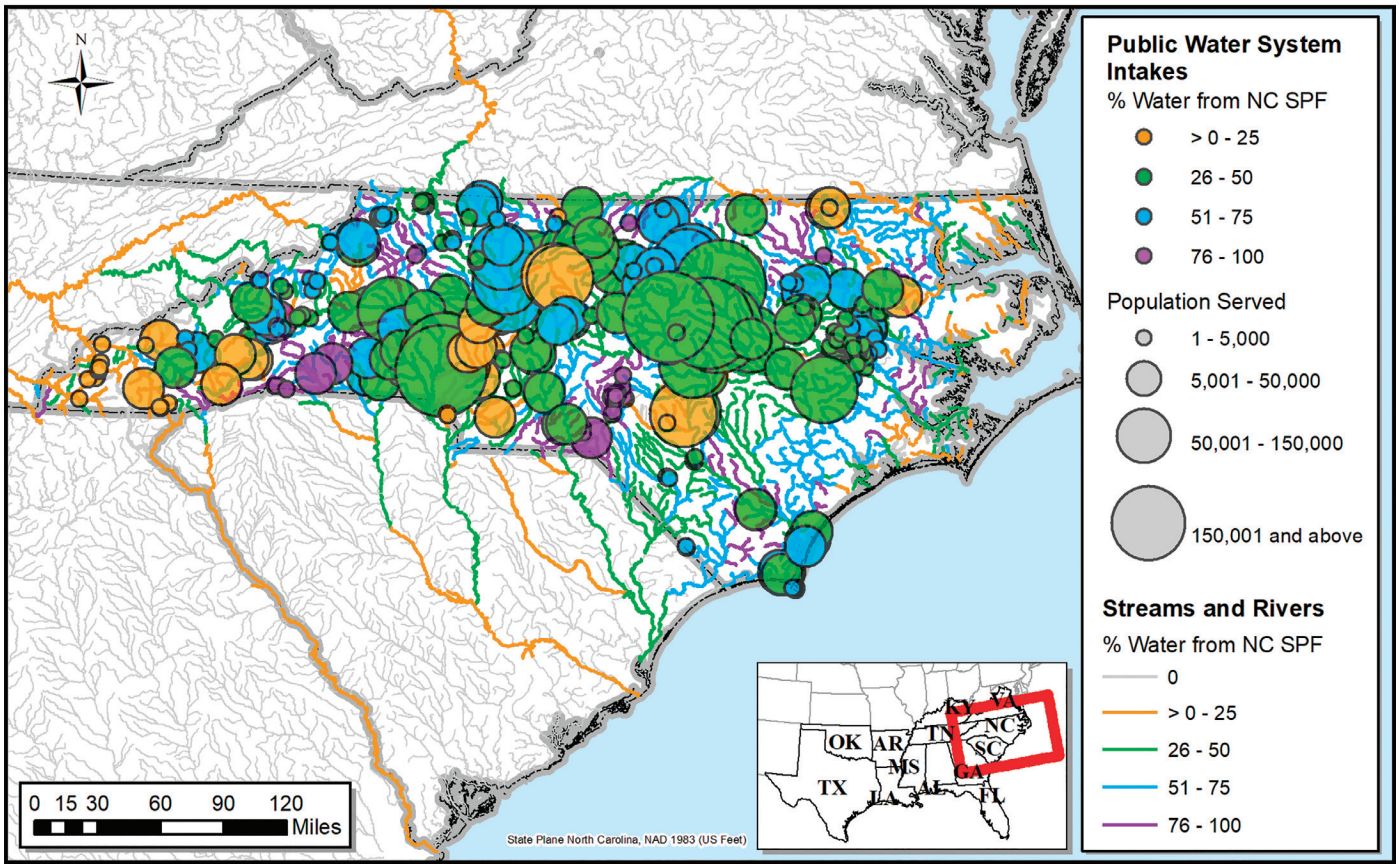


Figure A.NC.5—(A) North Carolina streams by percentage of North Carolina SPF water content, surface drinking water intakes within North Carolina by percentage of North Carolina SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 484 surface drinking water intakes within the State serve a population of 5,833,733 in 172 communities. Note: See figures A.NC.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from North Carolina State and Private Forests

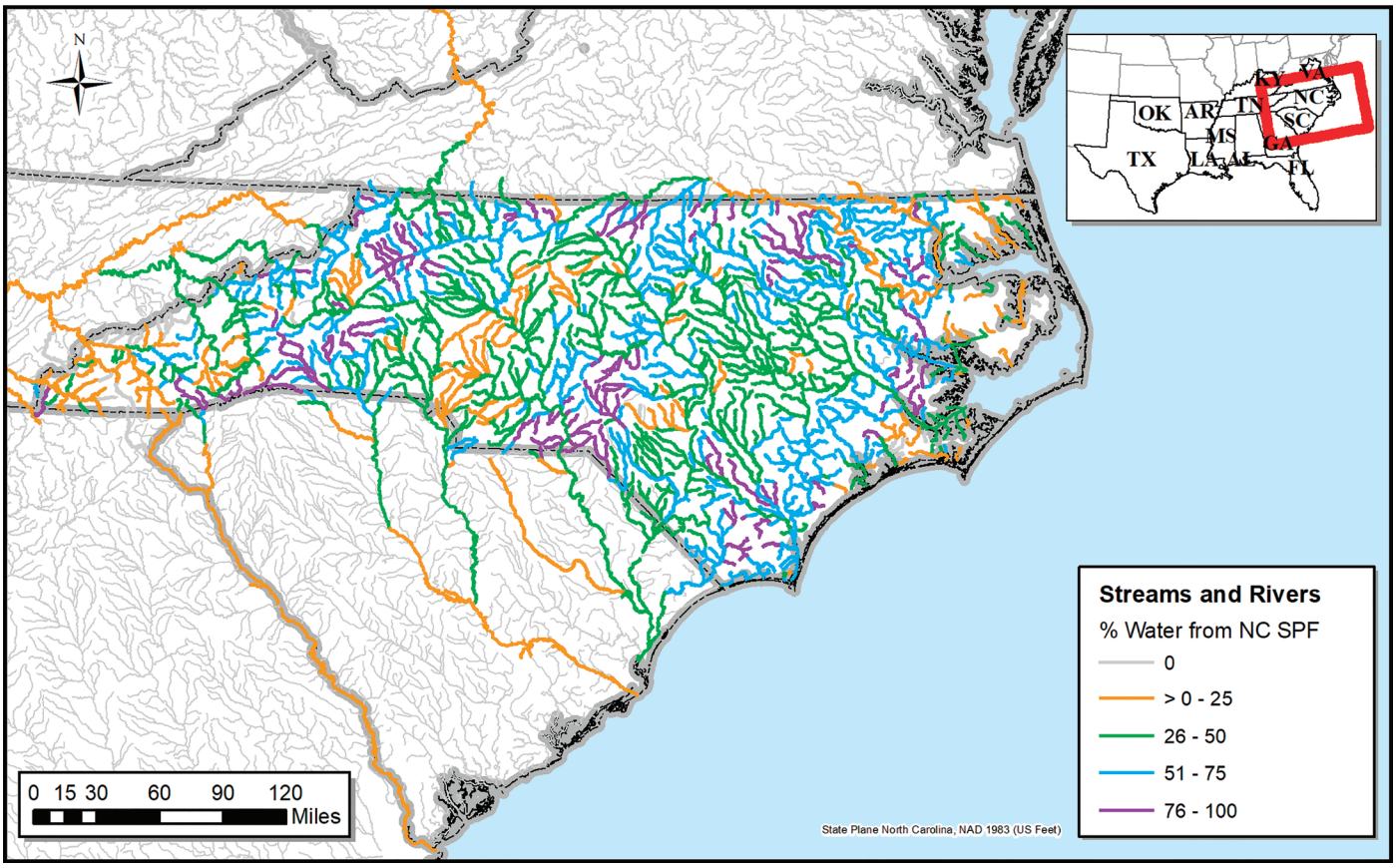


Figure A.NC.5—(B) North Carolina streams by percentage of North Carolina SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from North Carolina State and Private Forests

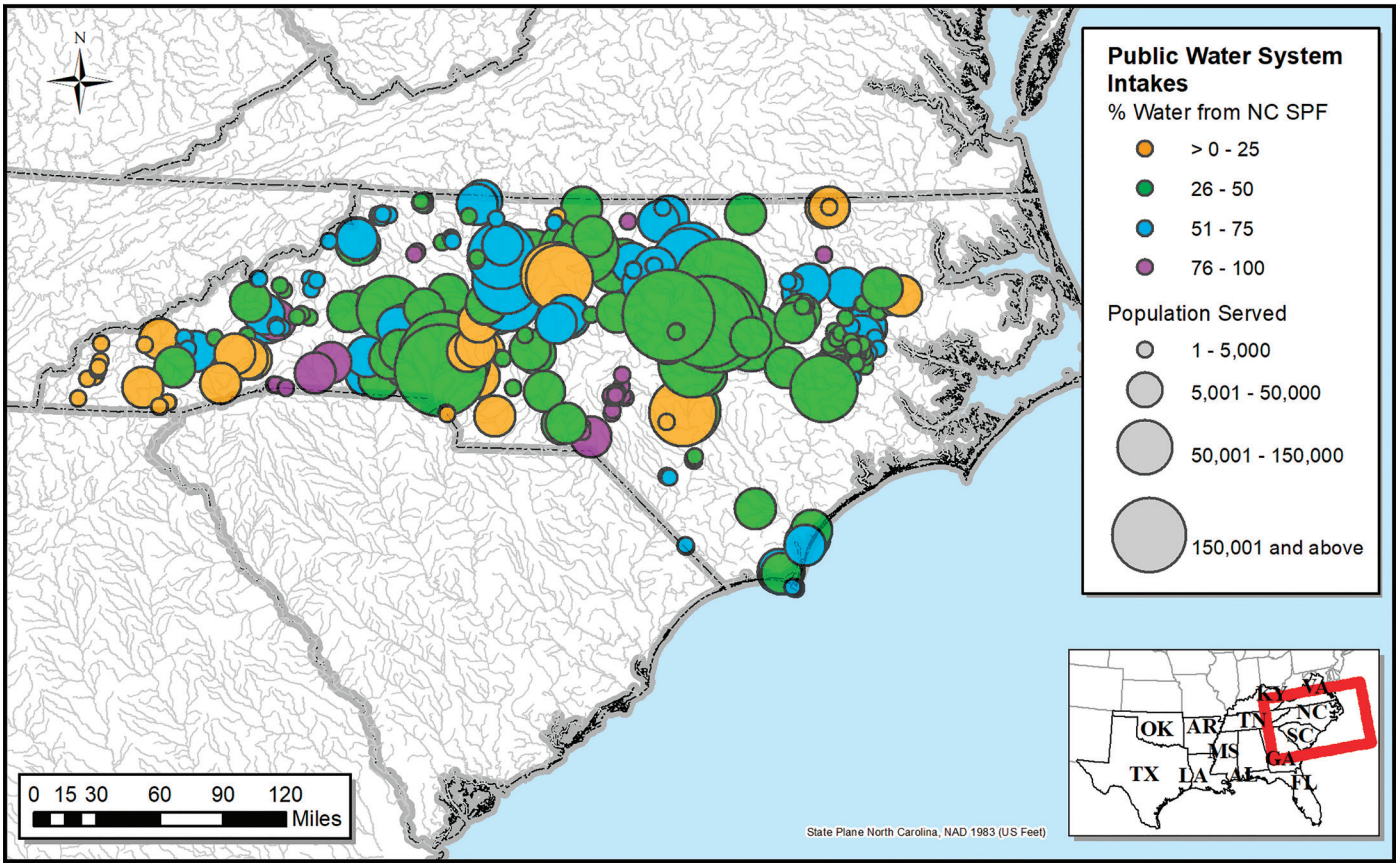


Figure A.NC.5—(C) Surface drinking water intakes within North Carolina by percentage of North Carolina SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 484 surface drinking water intakes within the State serve a population of 5,833,733 in 172 communities.

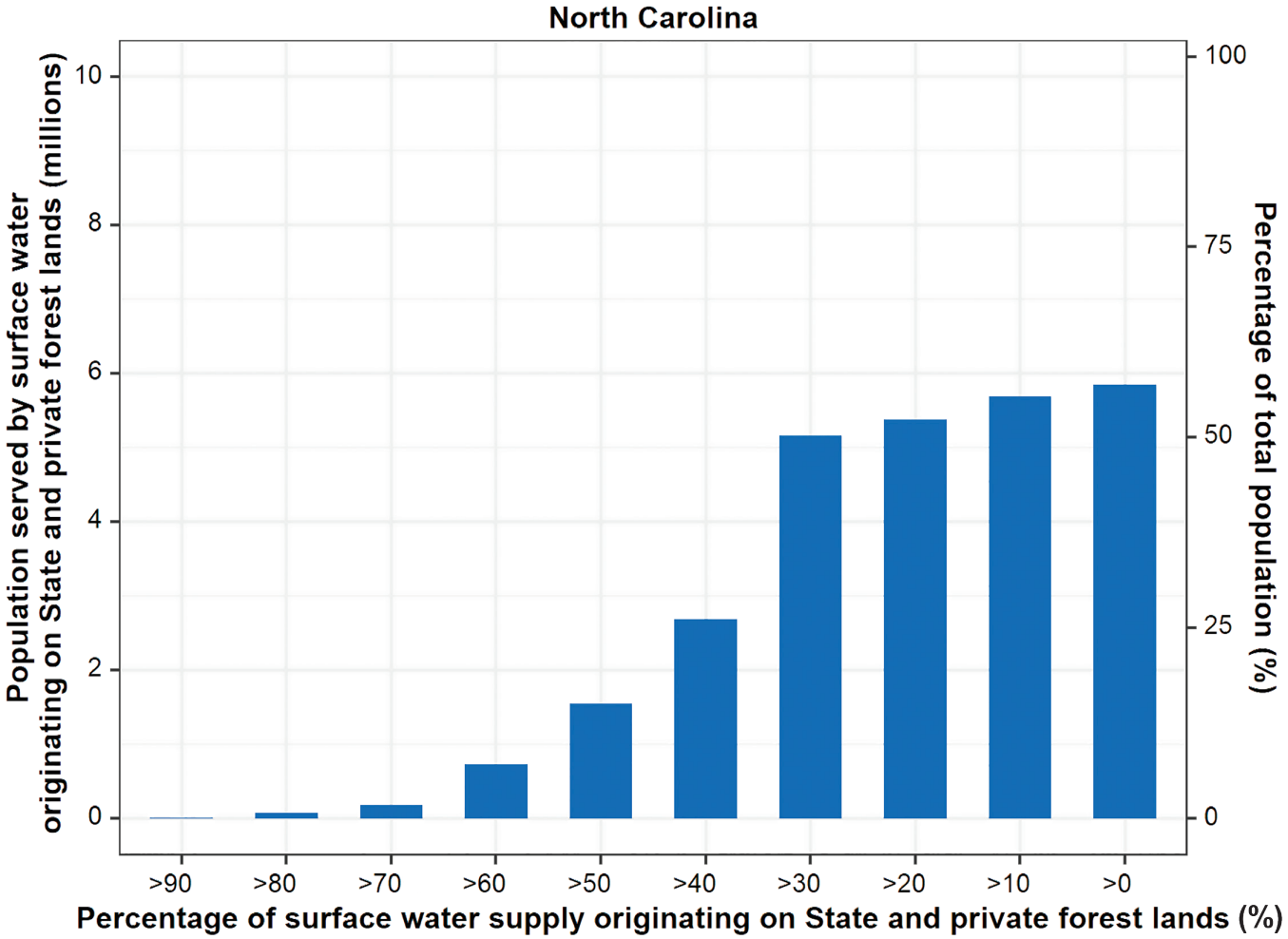


Figure A.NC.6—Cumulative frequency of population served according to percentage of water coming from North Carolina SPF lands.

Public Water System Intakes Outside of North Carolina Receiving Water from North Carolina State and Private Forests

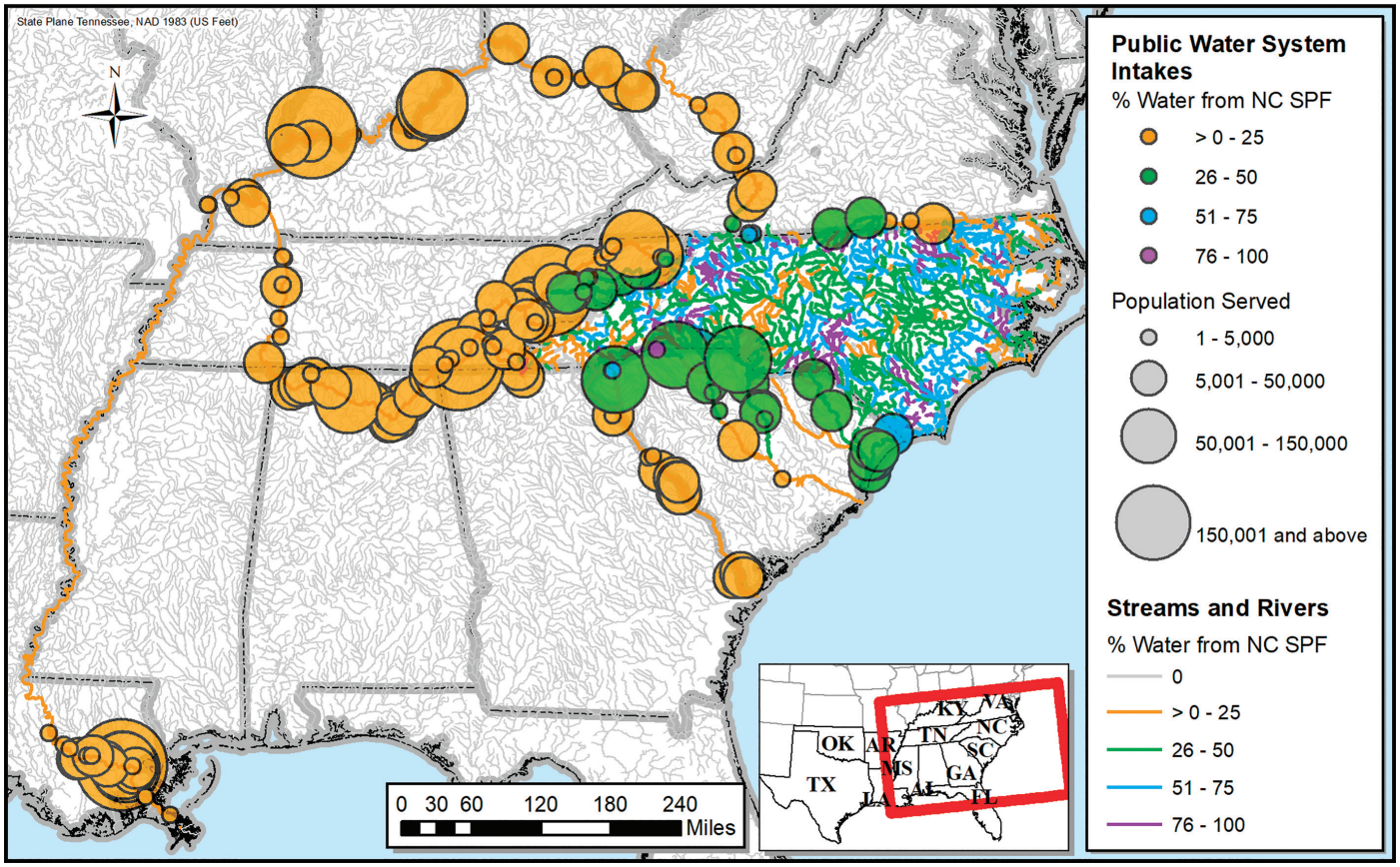


Figure A.NC.7—North Carolina streams by percentage of North Carolina SPF water content, surface drinking water intakes downstream of North Carolina by percentage of North Carolina SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 296 surface drinking water intakes outside the State but carrying North Carolina SPF water serve a population of 5,166,453 in 182 communities.

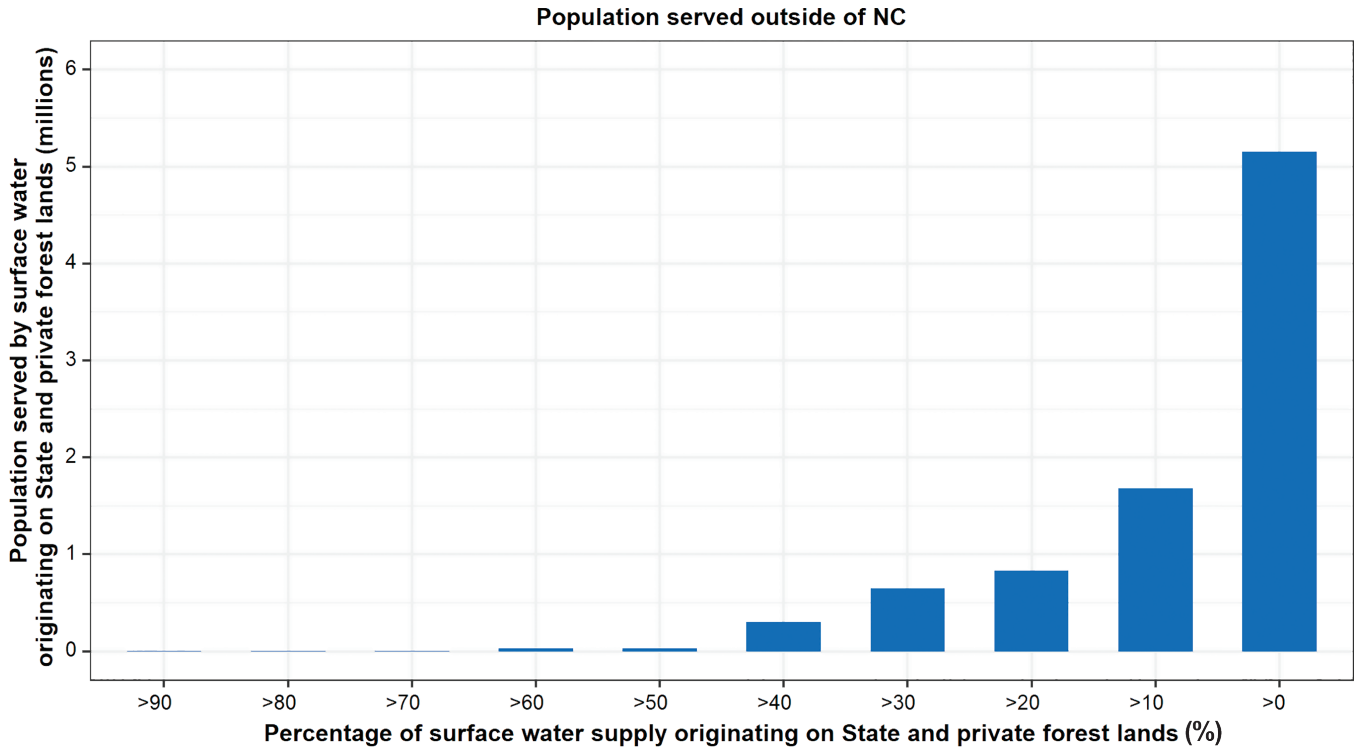


Figure A.NC.8—Cumulative frequency of non-North Carolina population served according to percentage of water coming from North Carolina SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from North Carolina State and Private Forests

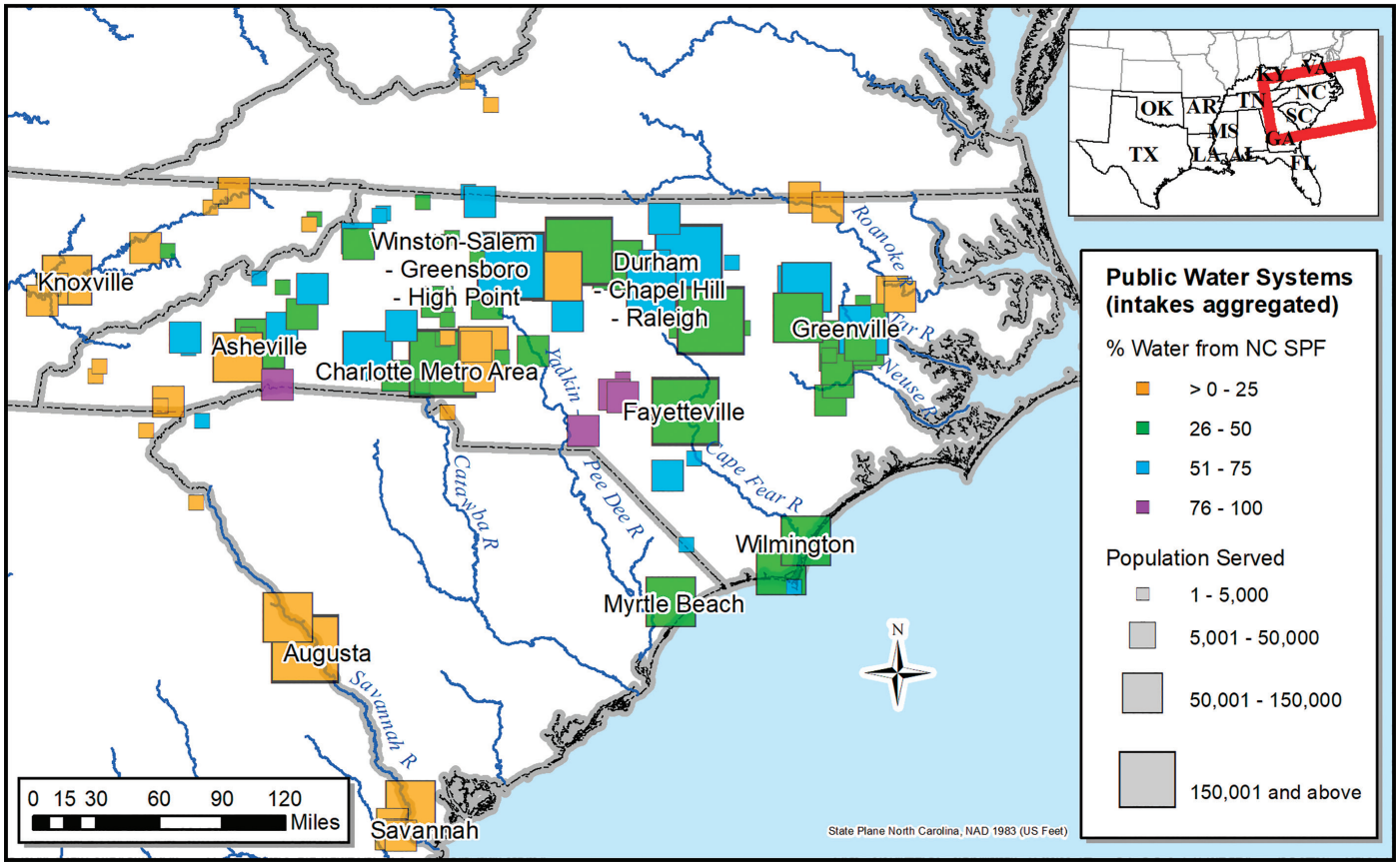


Figure A.NC.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Charlotte Detail

Streams and Public Water System Intakes of the Charlotte, NC, Area Receiving Water from North Carolina State and Private Forests

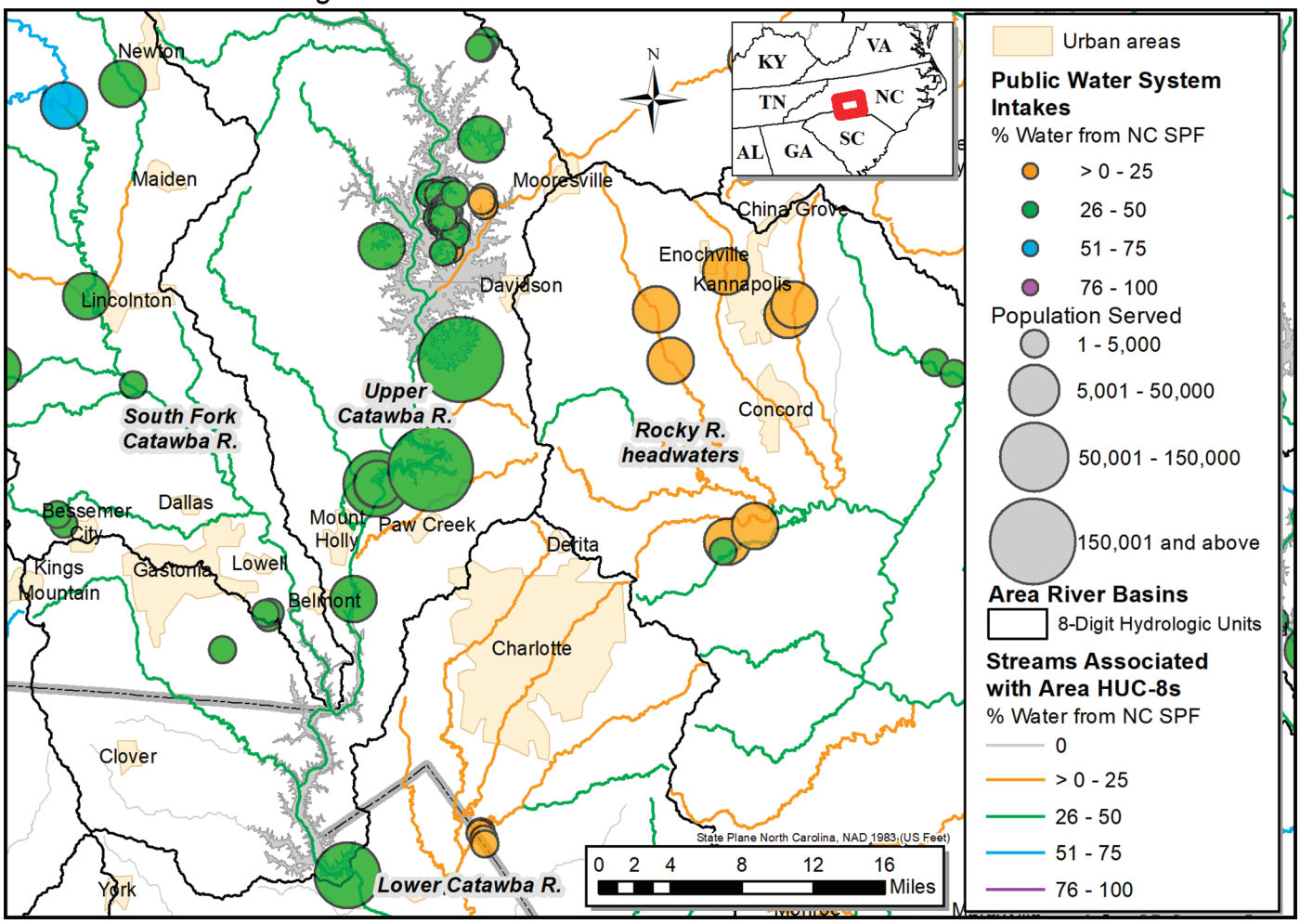


Figure A.NC.10—Local-scale detail showing percentage of water from North Carolina SPF for streams and surface drinking water intakes around Charlotte, NC.

Sandhills Detail

Streams and Public Water System Intakes of the Sandhills Area, NC, Receiving Water from North Carolina State and Private Forests

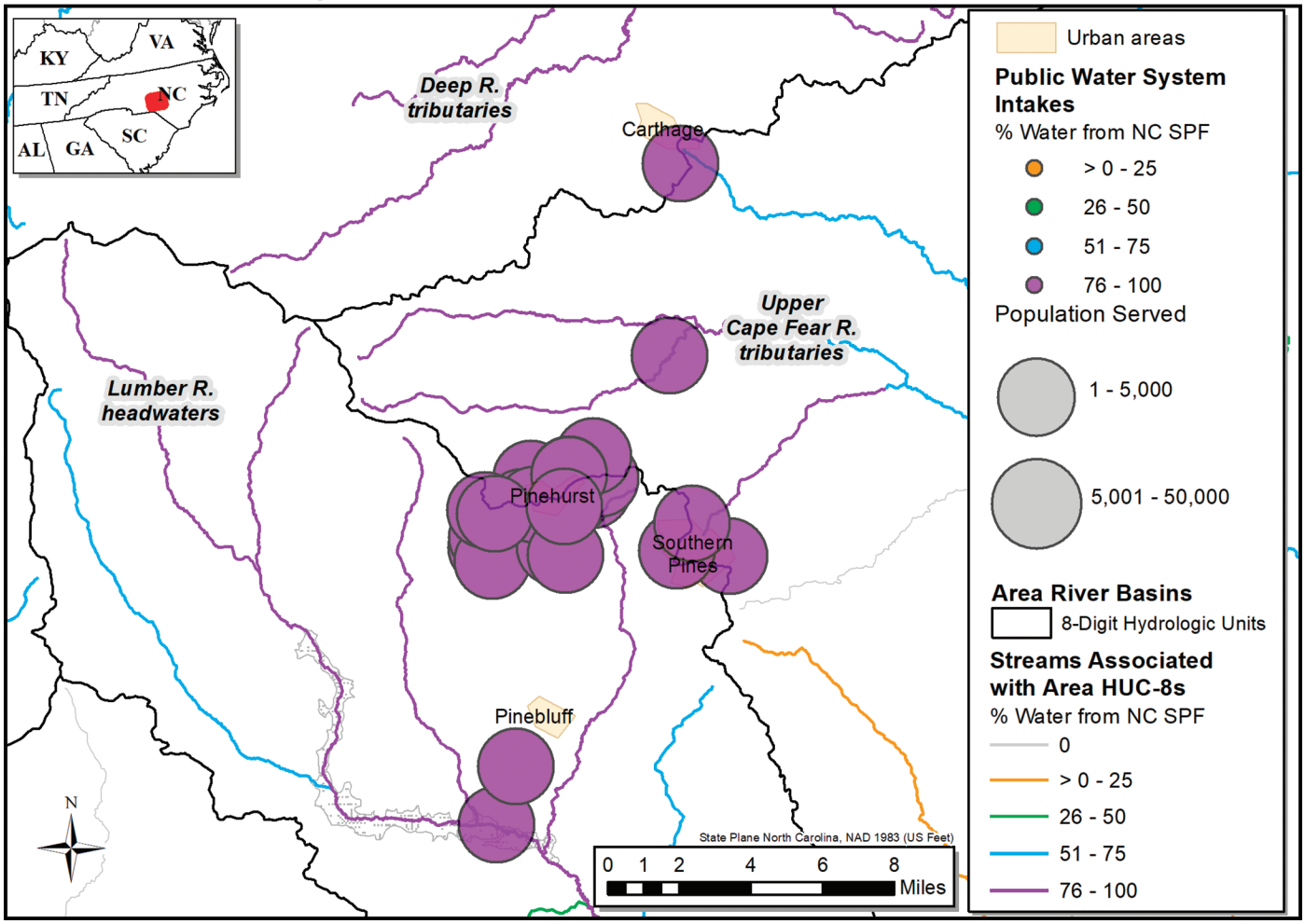


Figure A.NC.11—Local-scale detail showing percentage of water from North Carolina SPF for streams and surface drinking water intakes around Pinehurst and Southern Pines, NC.

Triad Area Detail

Streams and Public Water System Intakes of the Triad Area, NC, Receiving Water from North Carolina State and Private Forests

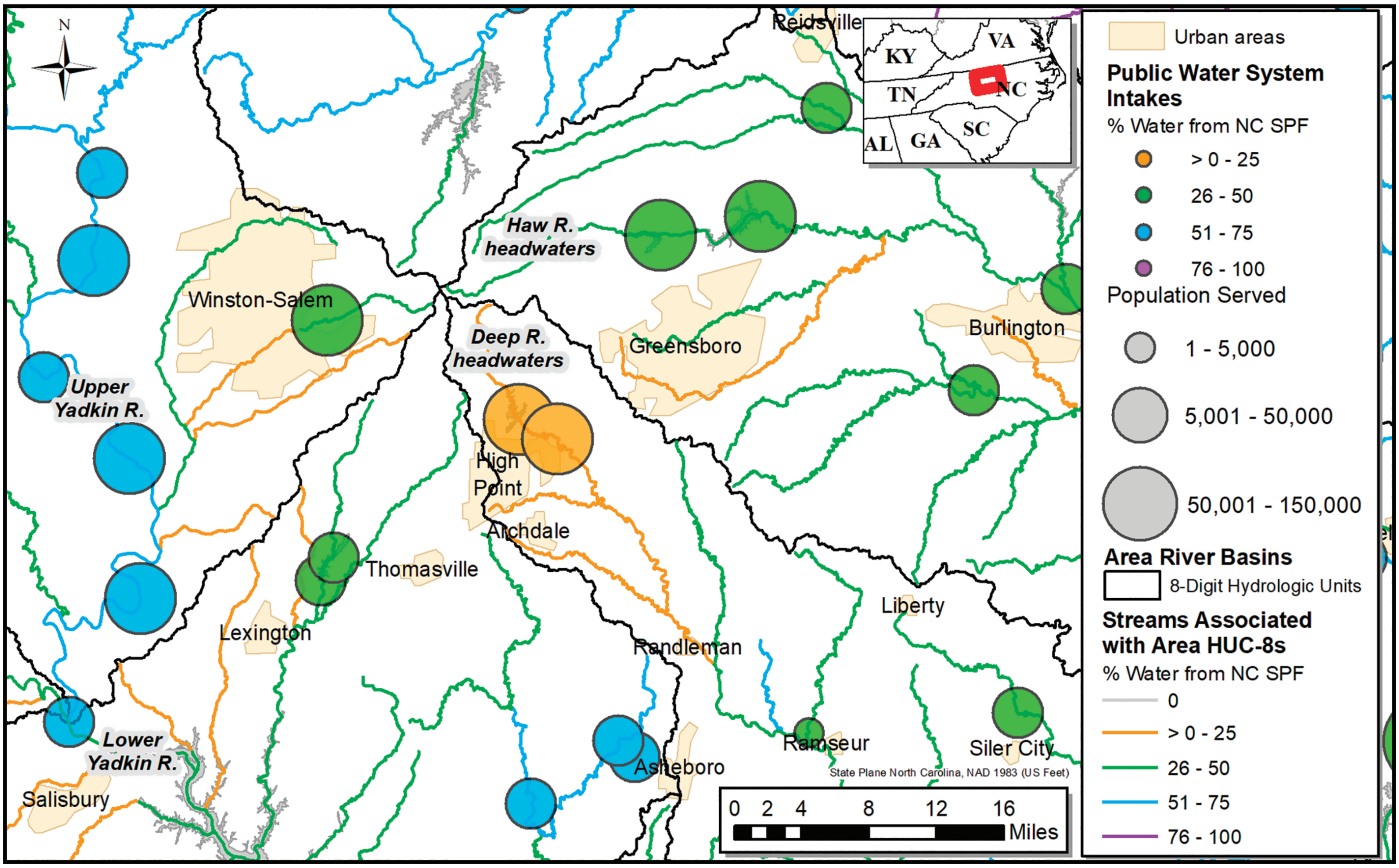


Figure A.NC.12—Local-scale detail showing percentage of water from North Carolina SPF for streams and surface drinking water intakes around Greensboro, Winston-Salem, and High Point, NC.

Triangle Area Detail

Streams and Public Water System Intakes of the Triangle Area, NC, Receiving Water from North Carolina State and Private Forests

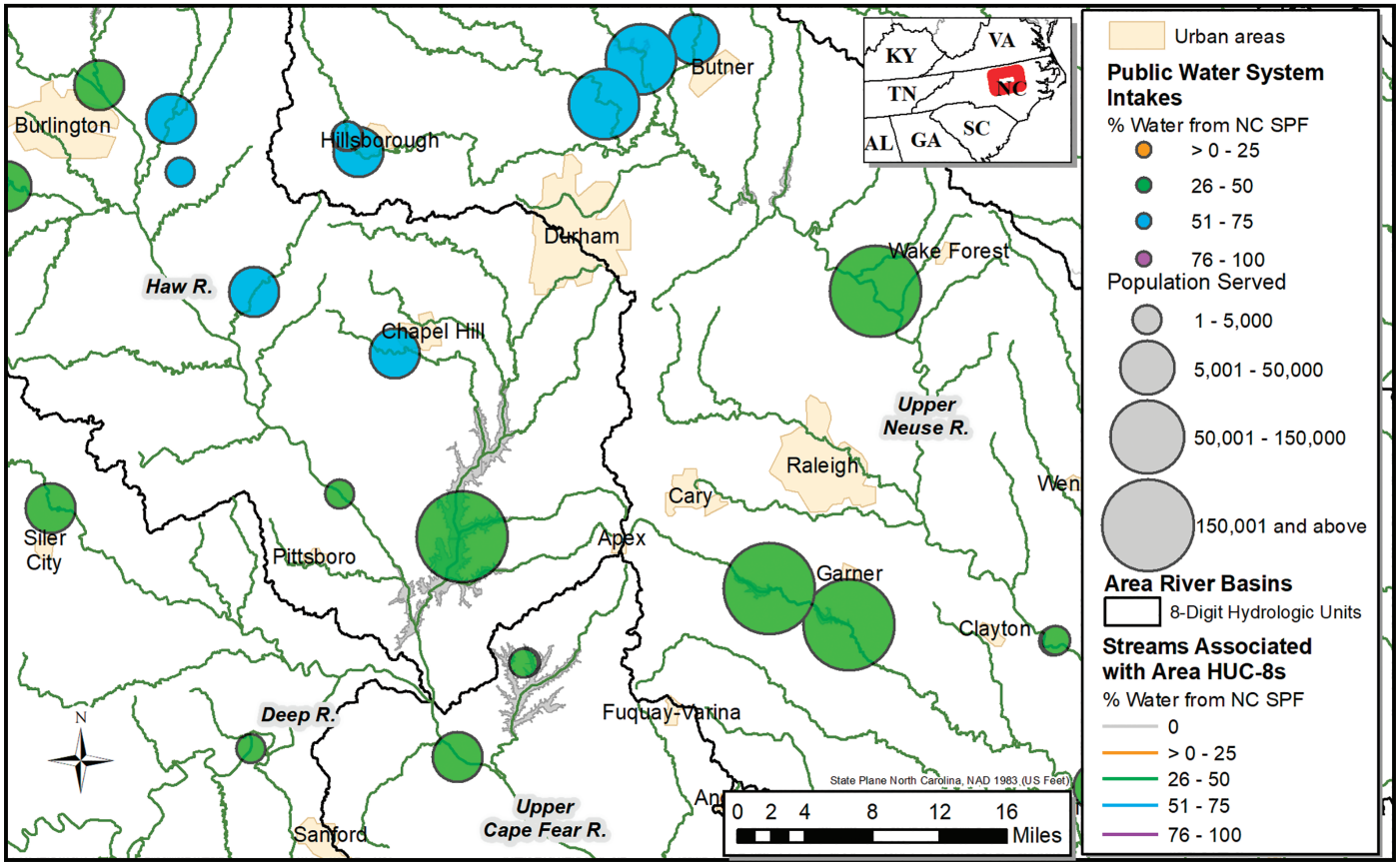


Figure A.NC.13—Local-scale detail showing percentage of water from North Carolina SPF for streams and surface drinking water intakes around Raleigh, Durham, and Chapel Hill, NC.

Durham, NC, Case Study

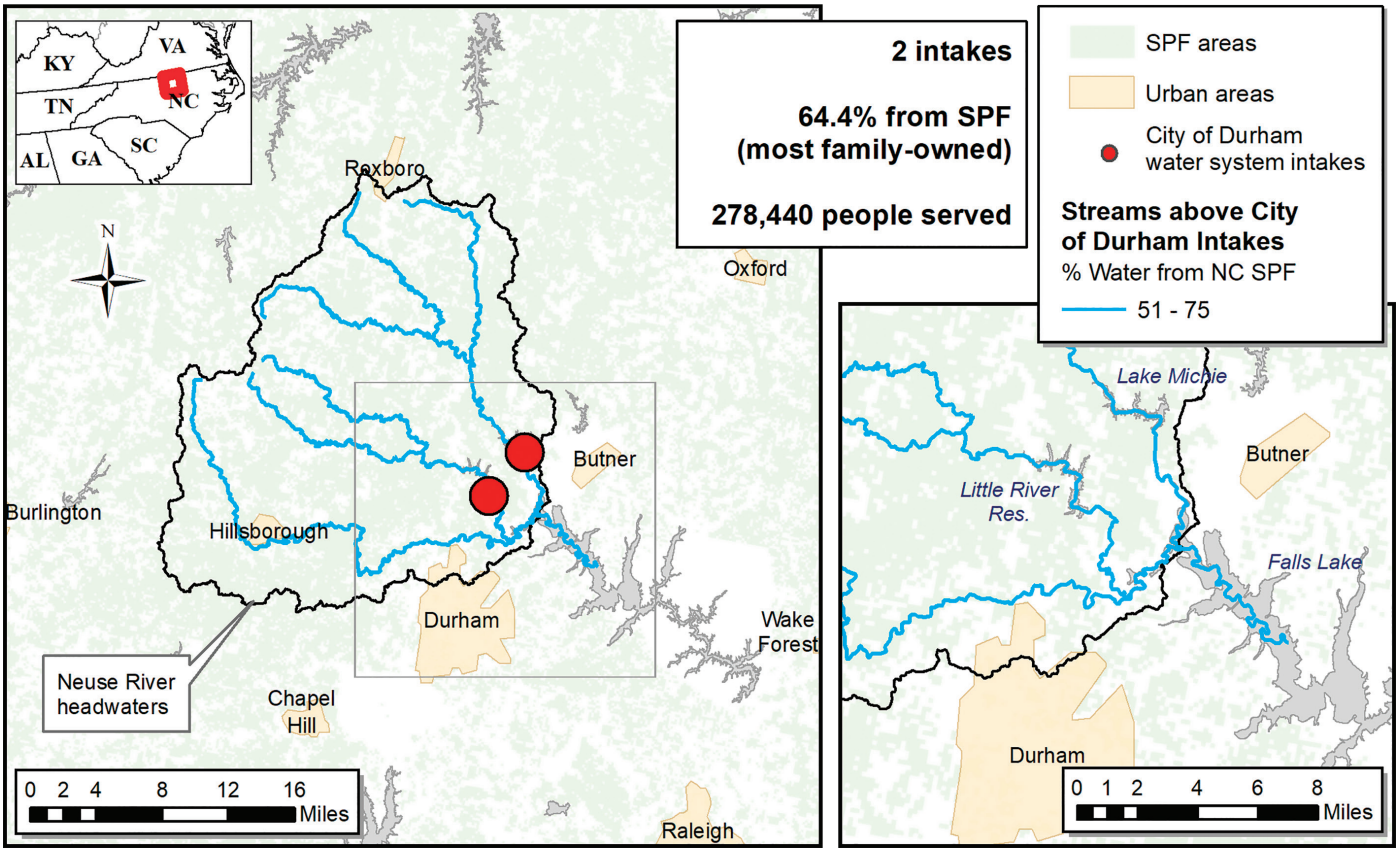


Figure A.NC.14—Case study of the City of Durham public water supply system, Durham, NC, illustrating SPF water in streams supplying the two surface drinking water intakes. When this water reaches the intakes, 64.4 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF OKLAHOMA

Summary

State and private forest (SPF) lands cover 22.8 percent of Oklahoma (figs. A.OK.1 and A.OK.2; table A.OK.1). About 31.1 percent of all Oklahoma surface water originates on SPF lands (fig. A.OK.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 68.2 percent of the SPF land area and 63.9 percent of surface water from SPF. Corporate-owned forests contribute 26.8 percent of surface water from SPF and account for 22.1 percent of land area of SPF. Average annual water yield in Oklahoma is about 223 mm, with much drier conditions in the west than in the east (fig. A.OK.4). Oklahoma has a total of 502 surface drinking water intakes where at least some available water comes from SPF (fig. A.OK.5). While about 63.8 percent of the total population of Oklahoma is served by surface drinking water overall, Oklahoma SPF surface drinking water serves about 56.1 percent of the State population, or 2.2 million people, to some degree. About 0.1 million people in Oklahoma are getting more than half of their surface drinking water from SPF within the State (fig. A.OK.6). State and private forest lands in OK also supply water to 108 surface drinking water intakes in other States (Arkansas, Kansas, Louisiana, Missouri, and Texas) (fig. A.OK.7), which collectively serve about 1.2 million people in 47 communities (fig. A.OK.8). Many public water systems in Oklahoma utilize more than one intake; these systems are shown (intakes aggregated) in figure A.OK.9 by population served (symbol size) and percentage of water from SPF lands in Oklahoma (symbol color). The Oklahoma City and Tulsa area detail maps (figs. A.OK.10 and A.OK.11) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.OK.12) of the Shawnee Municipal Authority public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Oklahoma, where a single surface drinking water intake receives about 57.9 percent of its water from SPF and serves about 30,000 people.

Table A.OK.1—Land area by land cover and forest ownership type in Oklahoma

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	49 552	12,244,769
Nonforest	138 082	34,120,716
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	4054	1,001,670
Tribal (public)	2754	680,610
State (public)	3026	747,672
Local (public)	415	102,618
Corporate (private)	9441	2,332,981
Family (private)	29 161	7,205,941
Other private	701	173,277

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

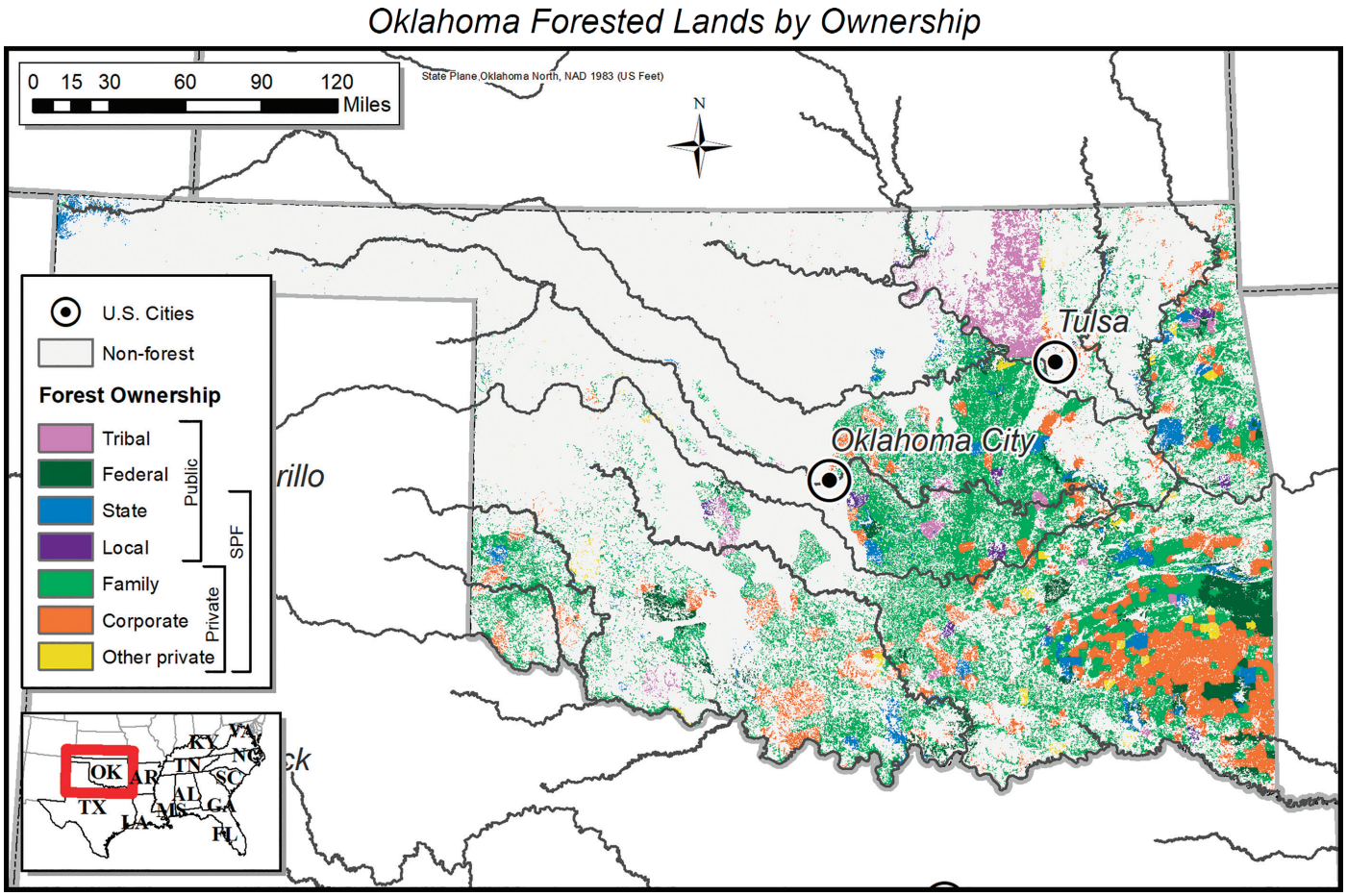


Figure A.OK.1—Oklahoma nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

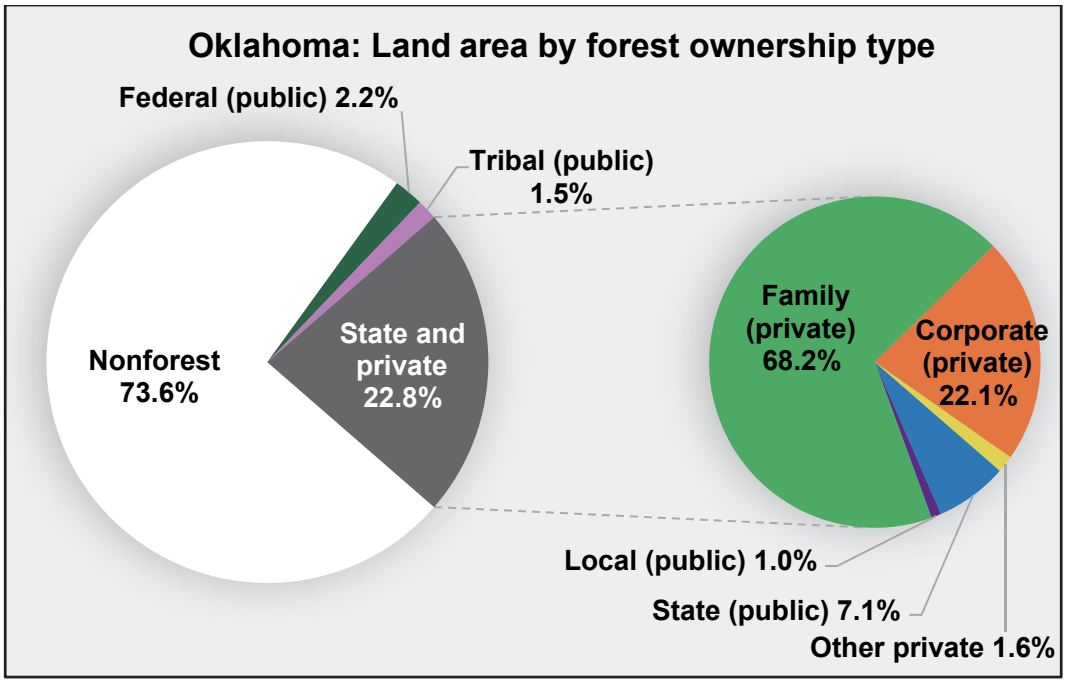


Figure A.OK.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

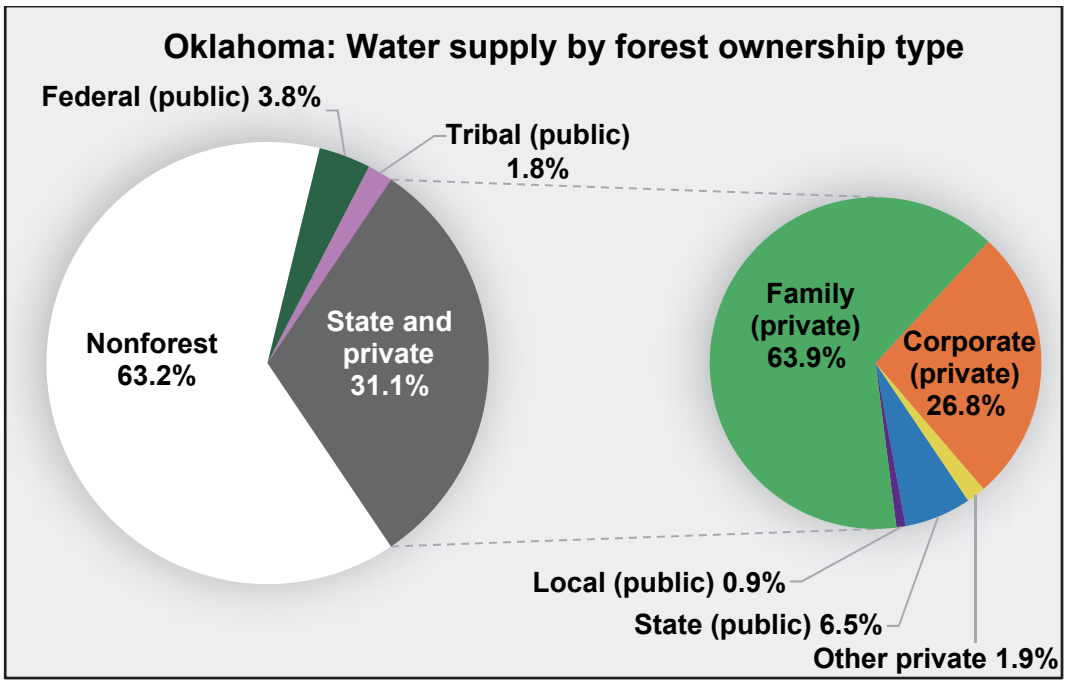


Figure A.OK.3—Percentage of Oklahoma's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Oklahoma

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

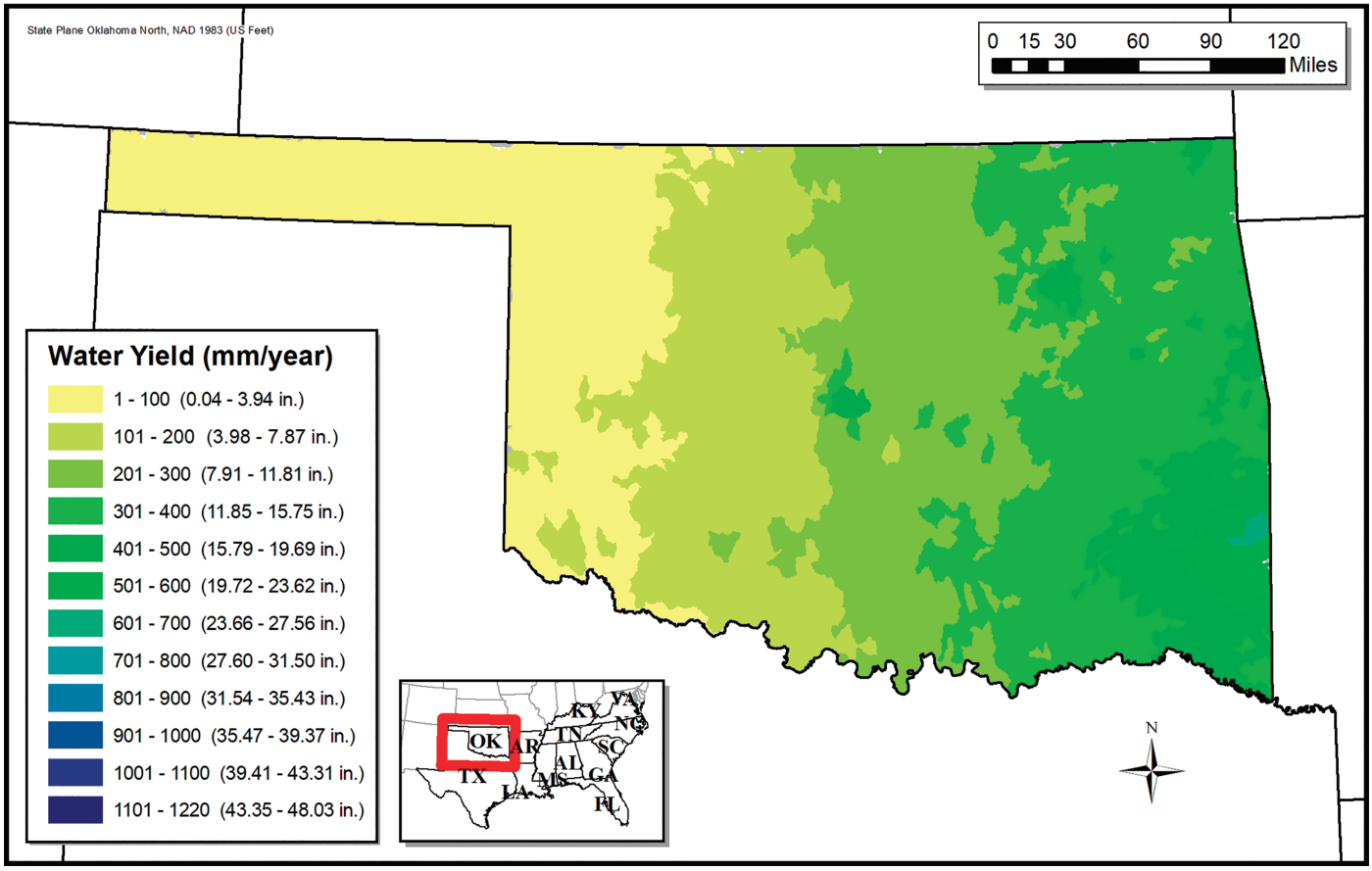


Figure A.OK.4—Estimated mean annual water yield by 12-digit hydrologic units in Oklahoma, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Oklahoma State and Private Forests

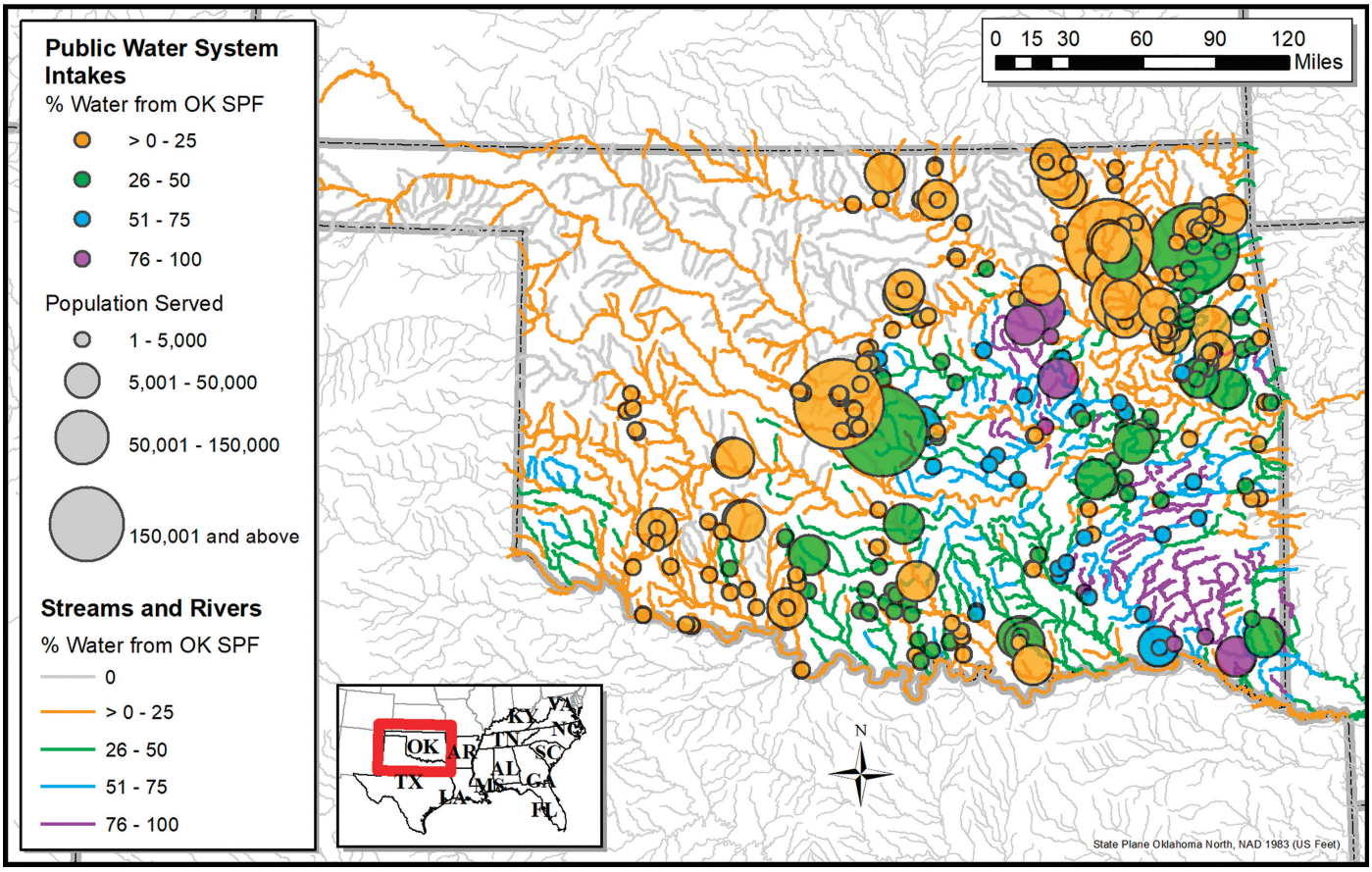


Figure A.OK.5—(A) Oklahoma streams by percentage of Oklahoma SPF water content, surface drinking water intakes within Oklahoma by percentage of Oklahoma SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 502 surface drinking water intakes within the State serve a population of 2,207,748 in 204 communities. Note: See figures A.OK.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Oklahoma State and Private Forests

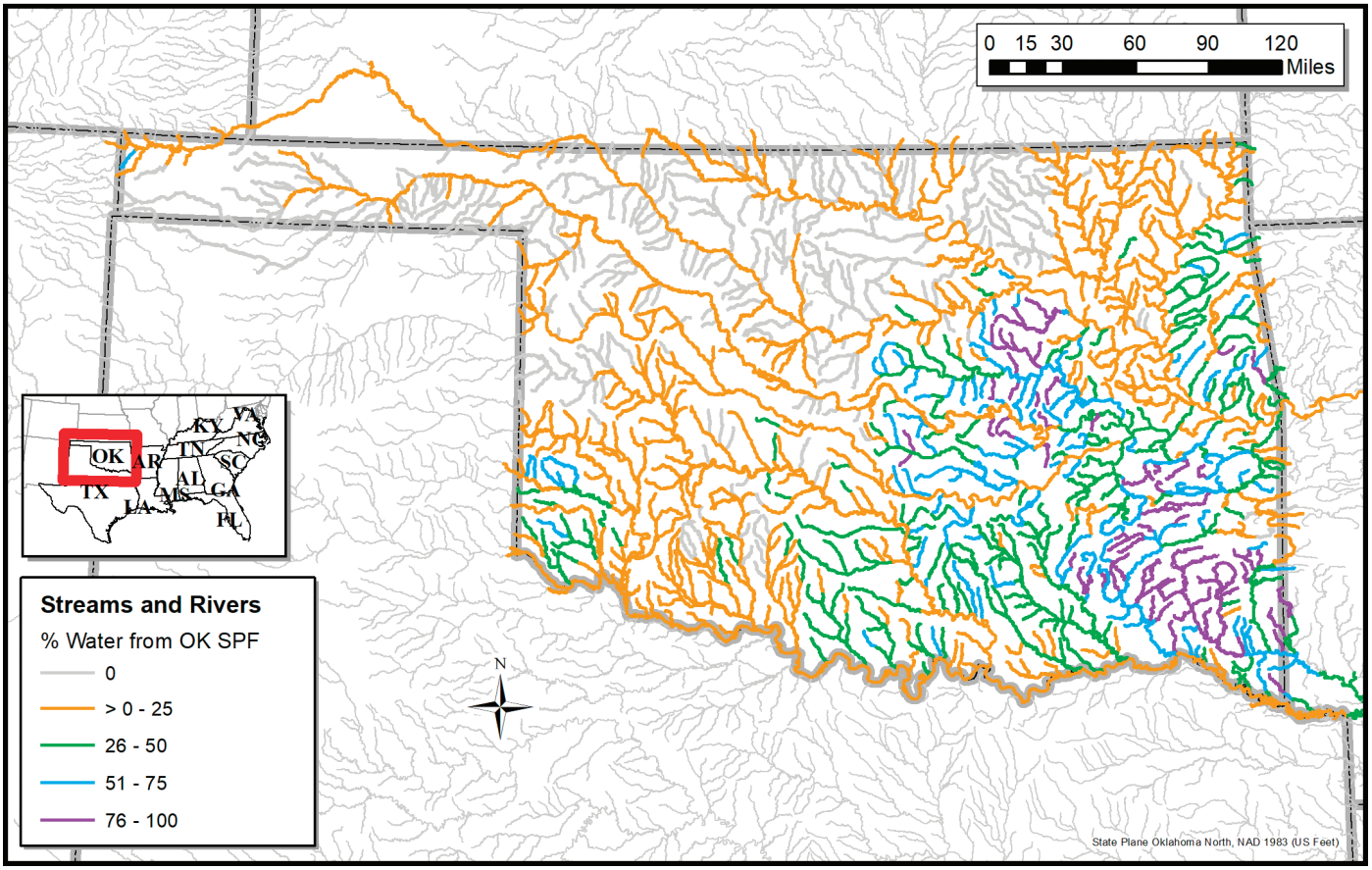


Figure A.OK.5—(B) Oklahoma streams by percentage of Oklahoma SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Oklahoma State and Private Forests

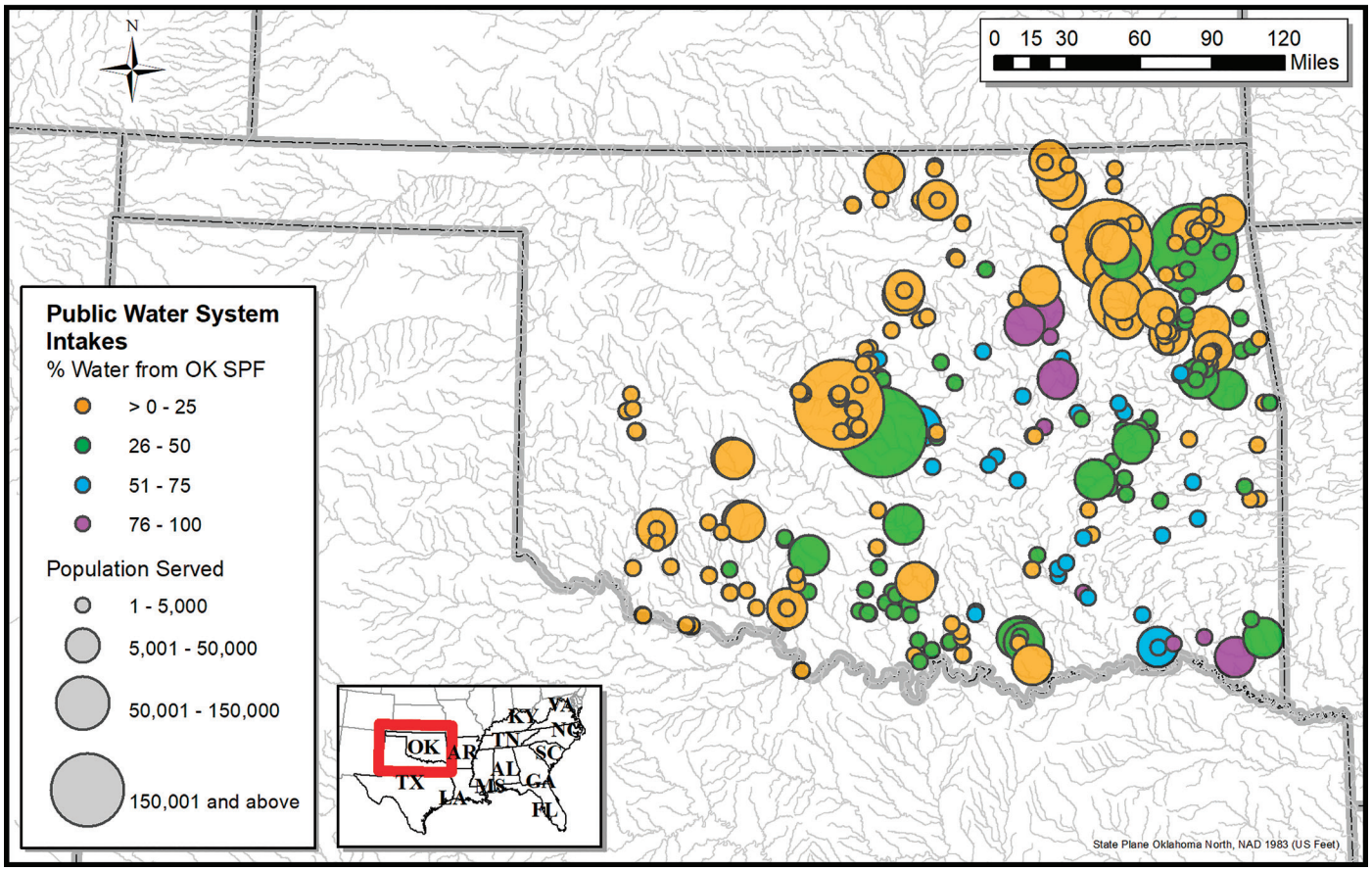


Figure A.OK.5—(C) Surface drinking water intakes within Oklahoma by percentage of Oklahoma SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 502 surface drinking water intakes within the State serve a population of 2,207,748 in 204 communities.

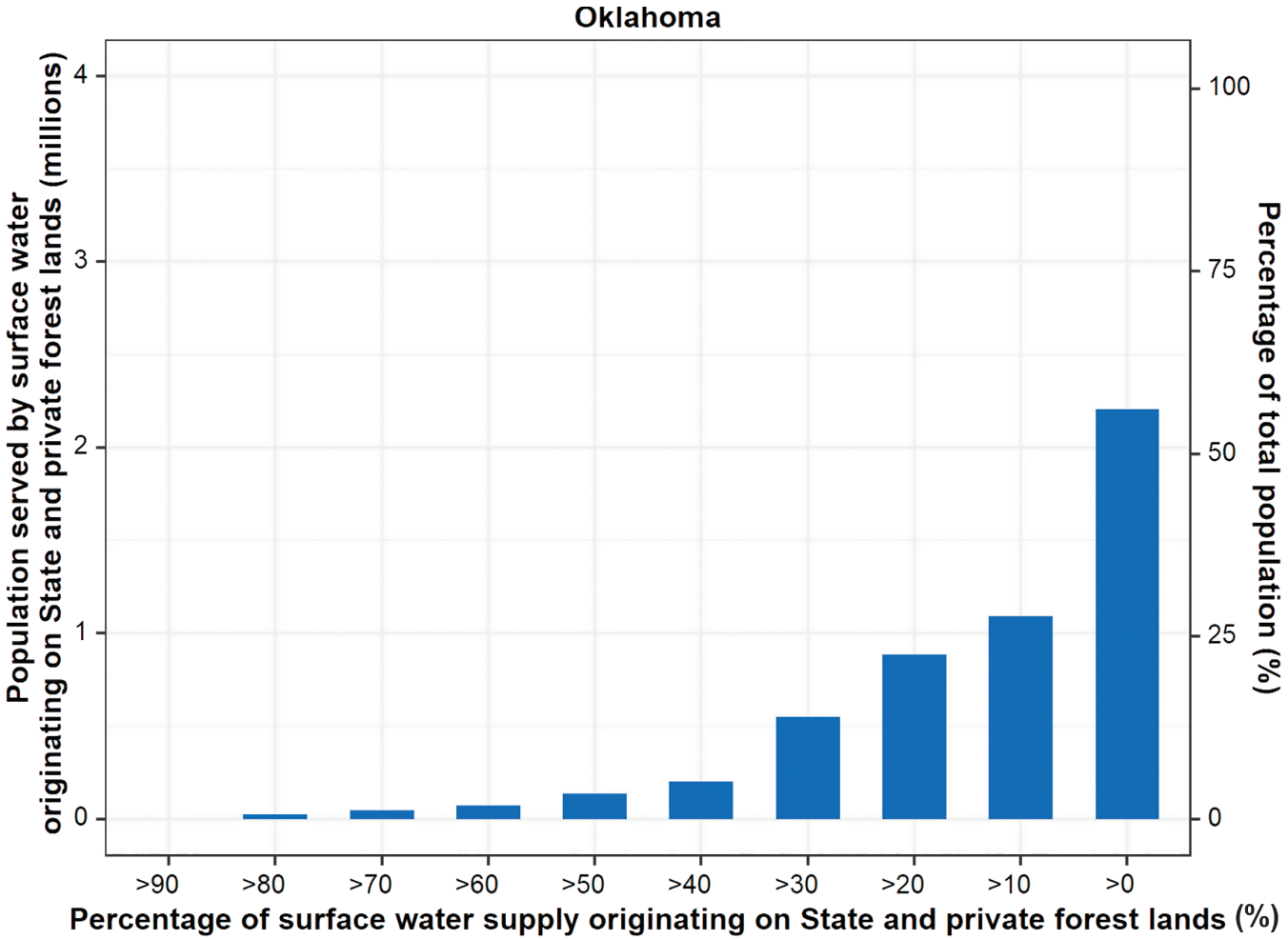


Figure A.OK.6—Cumulative frequency of population served according to percentage of water coming from Oklahoma SPF lands.

Public Water System Intakes Outside of Oklahoma Receiving Water from Oklahoma State and Private Forests

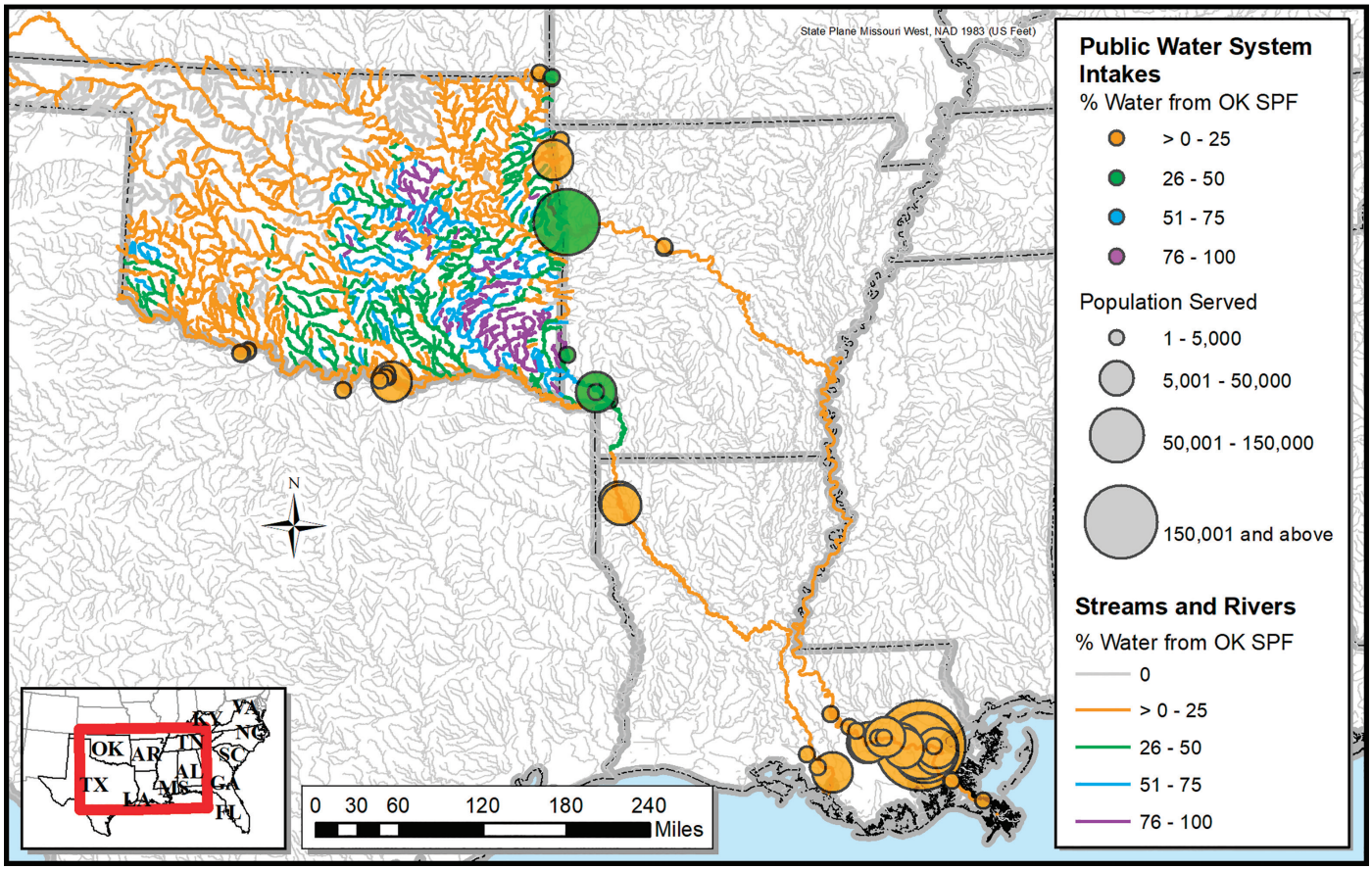


Figure A.OK.7—Oklahoma streams by percentage of Oklahoma SPF water content, surface drinking water intakes downstream of Oklahoma by percentage of Oklahoma SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 108 surface drinking water intakes outside the State but carrying Oklahoma SPF water serve a population of 1,200,547 in 47 communities.

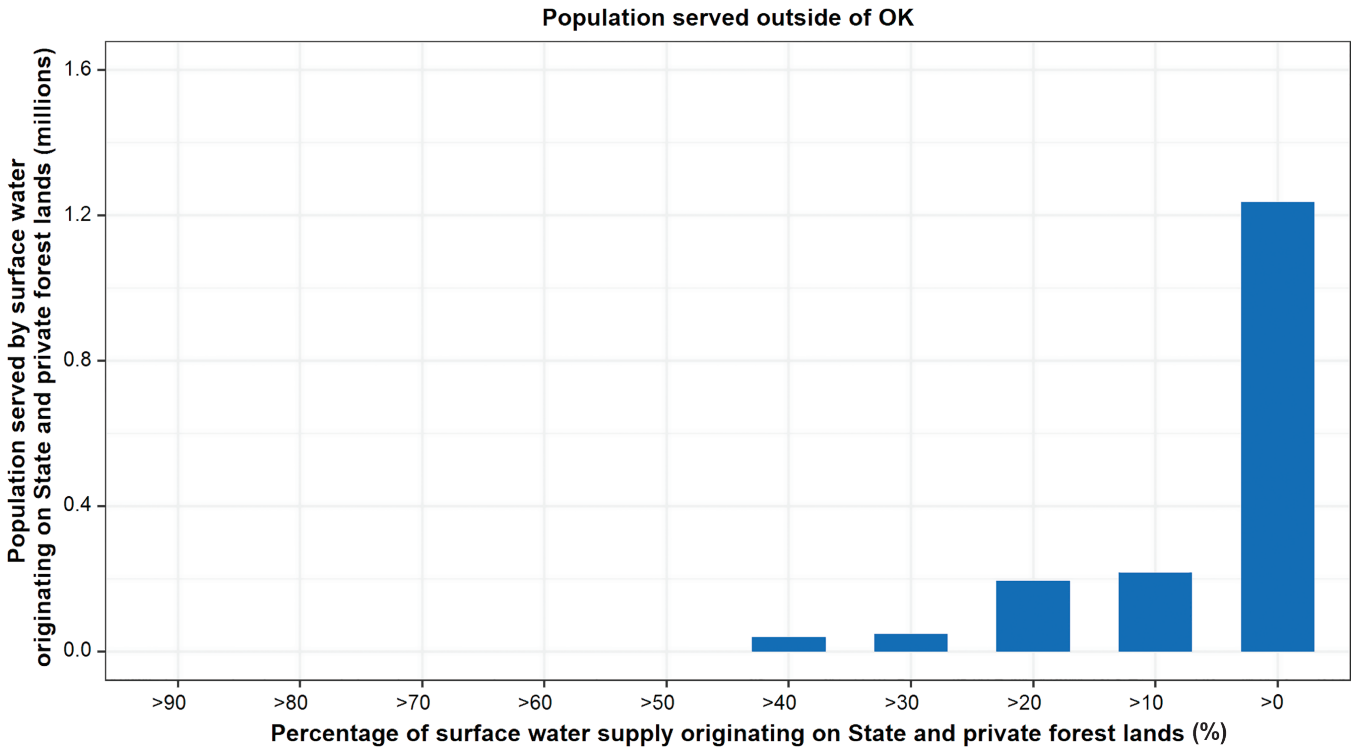


Figure A.OK.8—Cumulative frequency of non-Oklahoma population served according to percentage of water coming from Oklahoma SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Oklahoma State and Private Forests

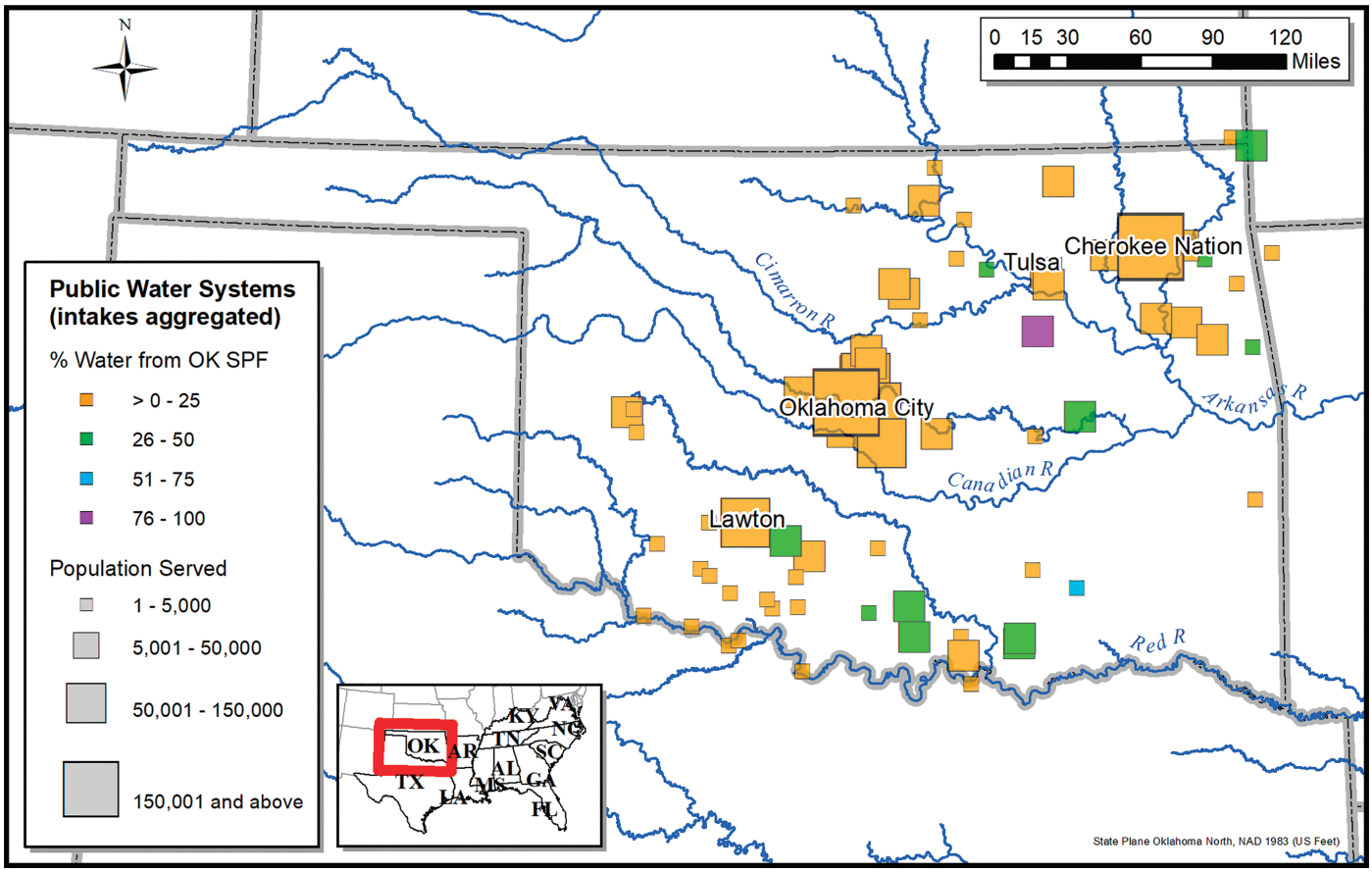


Figure A.OK.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Oklahoma City Detail

Streams and Public Water System Intakes in Oklahoma City, OK, Area Receiving Water from Oklahoma State and Private Forests

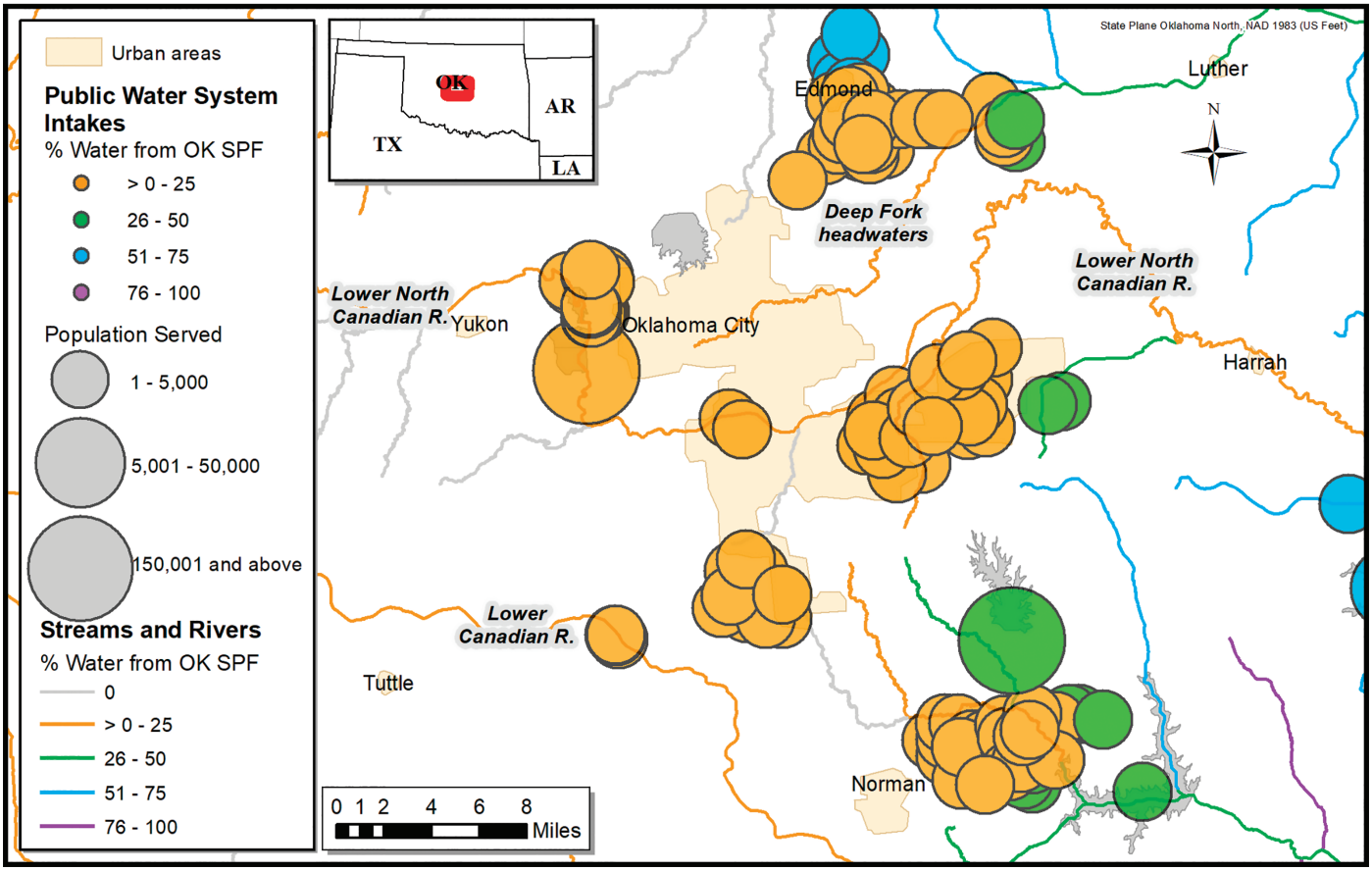


Figure A.OK.10—Local-scale detail showing percentage of water from Oklahoma SPF for streams and surface drinking water intakes around Oklahoma City, OK.

Tulsa Detail

Streams and Public Water System Intakes in Tulsa, OK, Area Receiving Water from Oklahoma State and Private Forests

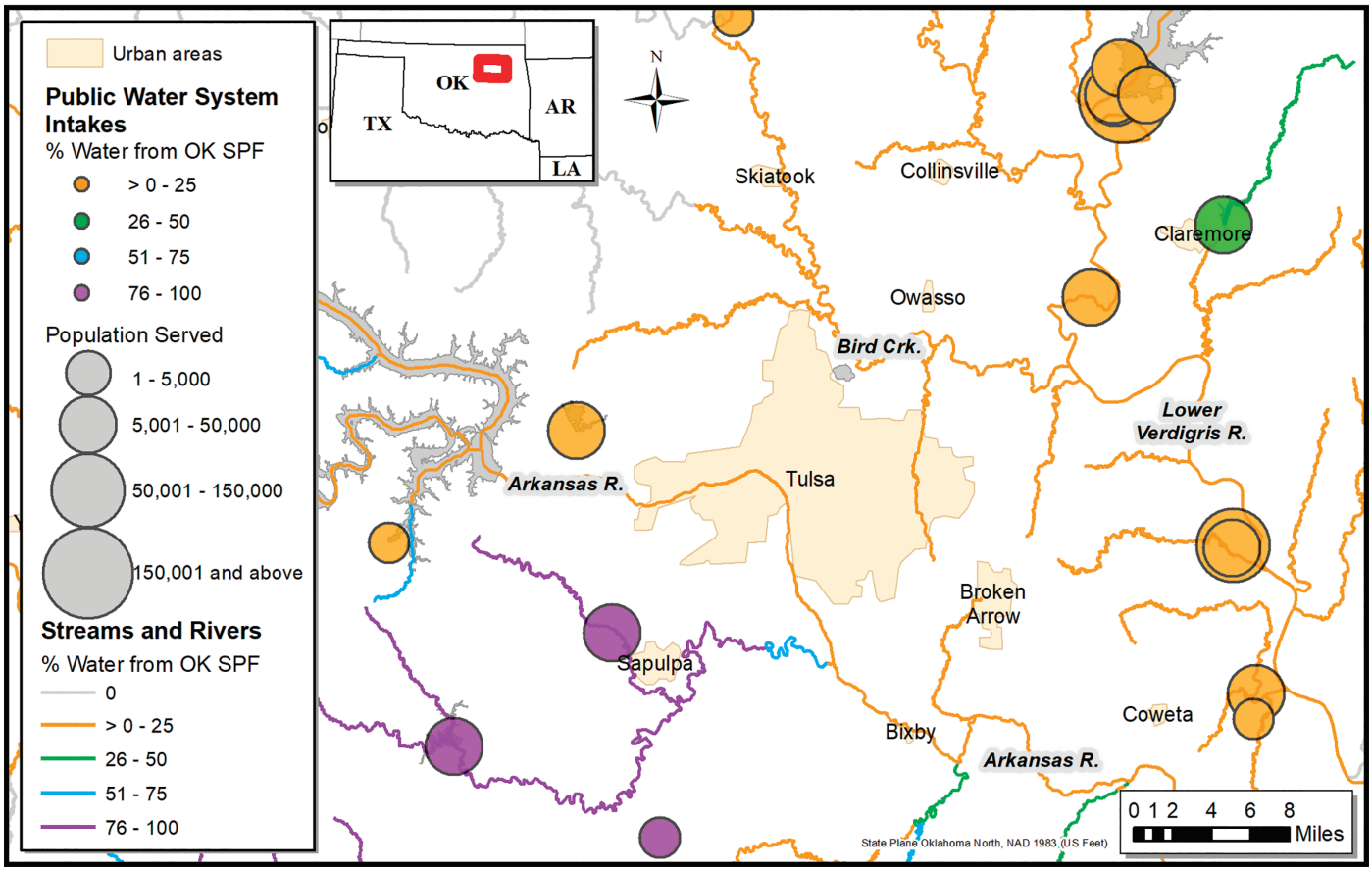


Figure A.OK.11—Local-scale detail showing percentage of water from Oklahoma SPF for streams and surface drinking water intakes around Tulsa, OK.

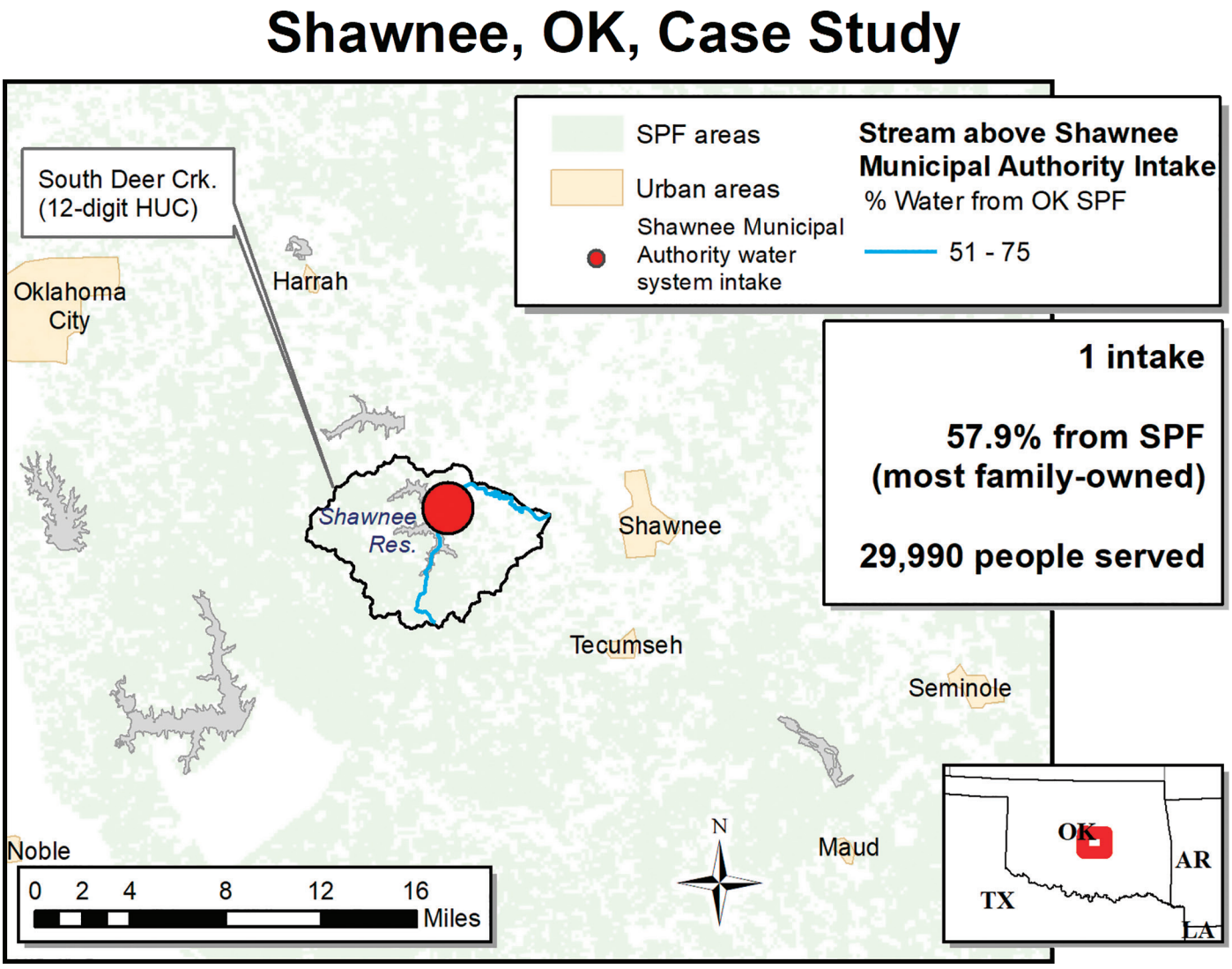


Figure A.OK.12—Case study of the Shawnee Municipal Authority public water supply system, Shawnee, OK, illustrating SPF water in streams supplying the single surface drinking water intake. When this water reaches the intake, 57.9 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF SOUTH CAROLINA

Summary

State and private forest (SPF) lands cover 57.8 percent of South Carolina (figs. A.SC.1 and A.SC.2; table A.SC.1). About 53.8 percent of all South Carolina surface water originates on SPF lands (fig. A.SC.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 58.3 percent of the SPF land area and 58.7 percent of surface water from SPF. Corporate-owned forests contribute 32.2 percent of surface water from SPF and account for 33.8 percent of land area of SPF. Average annual water yield in South Carolina is about 362 mm (fig. A.SC.4). South Carolina has a total of 205 surface drinking water intakes where at least some available water comes from SPF (fig. A.SC.5). About 45.1 percent of the total population of South Carolina is served by surface drinking water overall, and South Carolina SPF surface drinking water also serves about 45.1 percent of the State population, or 2.3 million people, to some degree. About 0.9 million people in South Carolina are getting more than half of their surface drinking water from SPF within the State (fig. A.SC.6). State and private forest lands in South Carolina also supply water to 42 surface drinking water intakes in other States (Georgia and North Carolina) (fig. A.SC.7), which collectively serve about 0.3 million people in 13 communities (fig. A.SC.8). Many public water systems in South Carolina utilize more than one intake; these systems are shown (intakes aggregated) in figure A.SC.9 by population served (symbol size) and percentage of water from SPF lands in South Carolina (symbol color). The Columbia-Lake Wateree area detail map (fig. A.SC.10) adds clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in an area where there is complex intersection between public water supply systems and population served. A case study (fig. A.SC.11) of the Greenville Water public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in South Carolina, where three surface drinking water intakes receive about 69.3 percent of their water from SPF (in headwaters of two different rivers) and serve about 0.3 million people.

Table A.SC.1—Land area by land cover and forest ownership type in South Carolina

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	54 031	13,351,632
Nonforest	29 243	7,226,136
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	5903	1,458,711
Tribal (public)	3	862
State (public)	2354	581,753
Local (public)	743	183,593
Corporate (private)	16 287	4,024,701
Family (private)	28 034	6,927,381
Other private	707	174,631

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

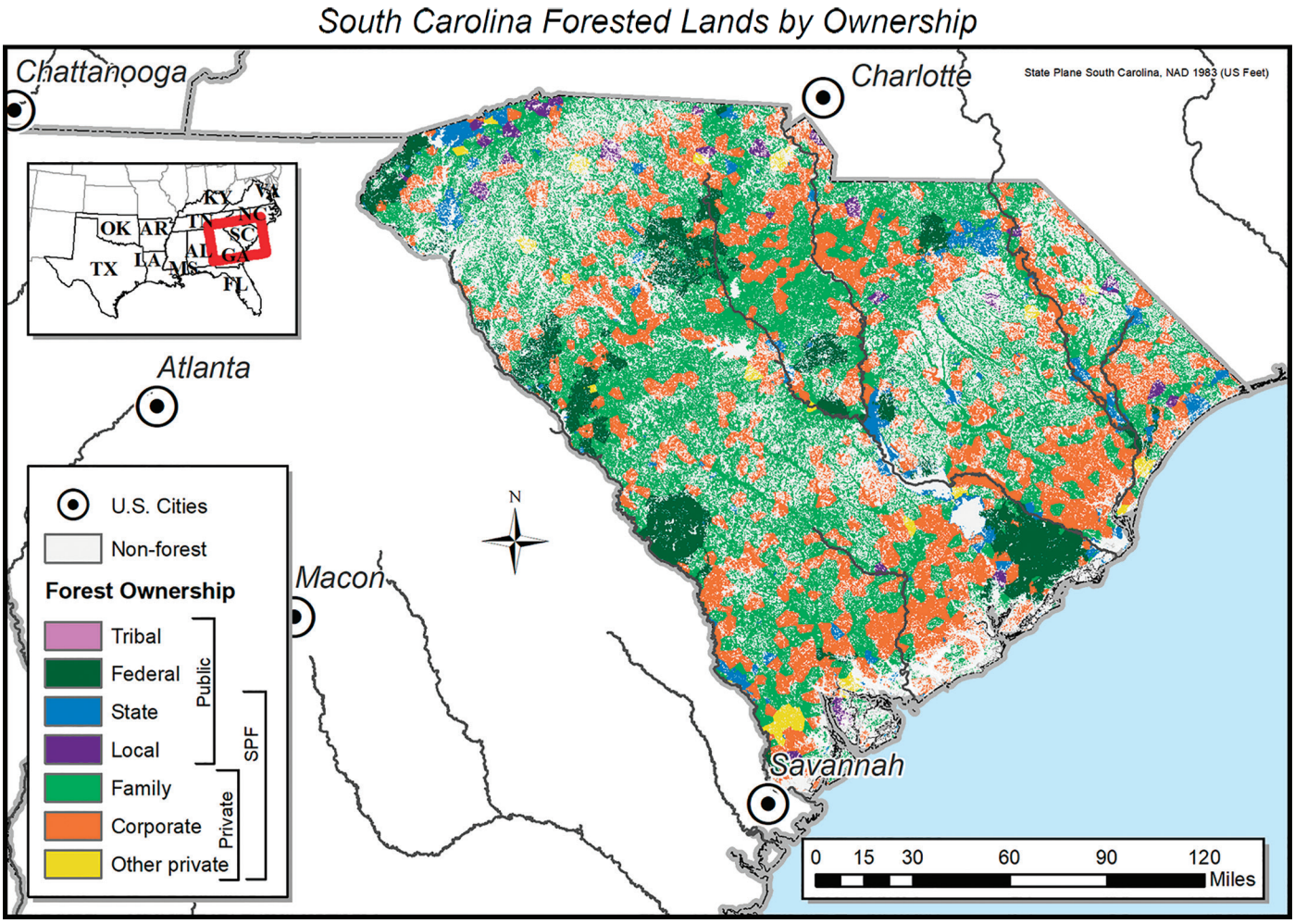


Figure A.SC.1—South Carolina nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

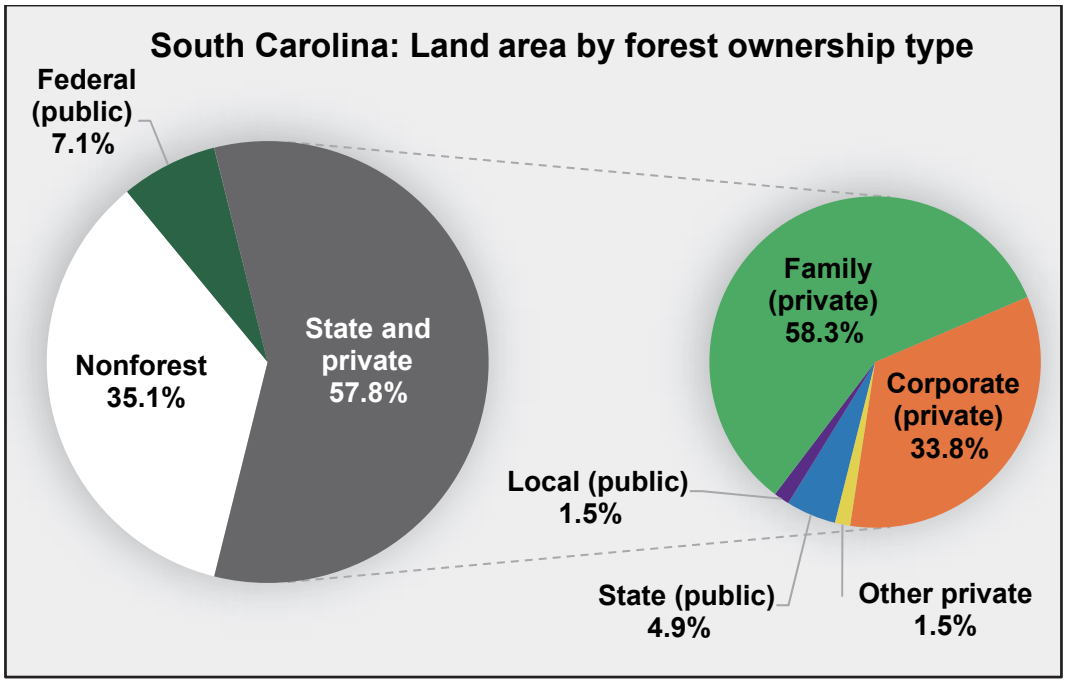


Figure A.SC.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

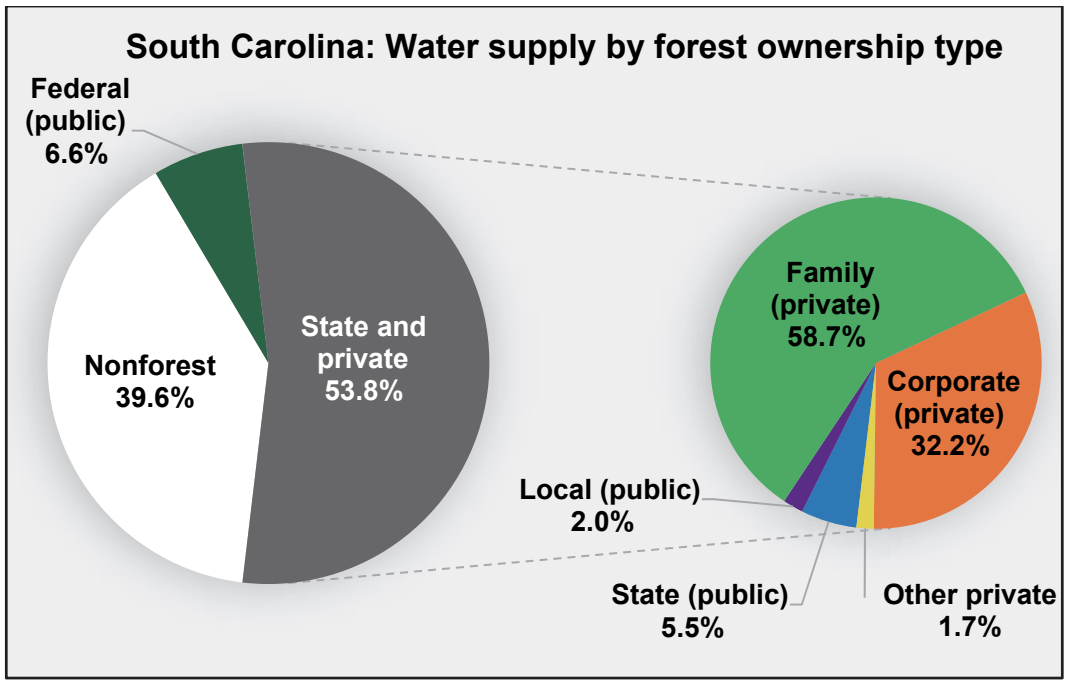


Figure A.SC.3—Percentage of South Carolina's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

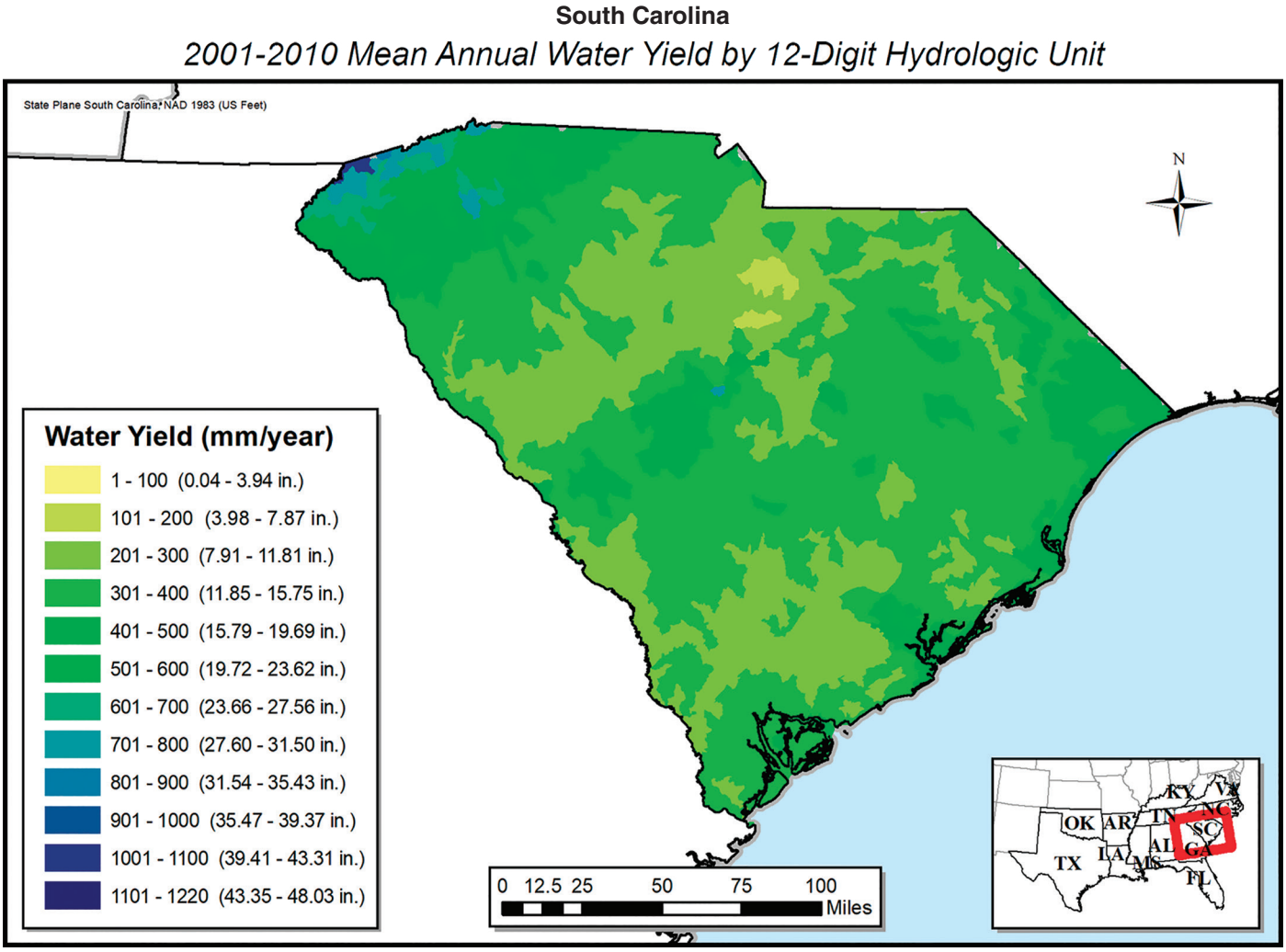


Figure A.SC.4—Estimated mean annual water yield by 12-digit hydrologic units in South Carolina, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from South Carolina State and Private Forests

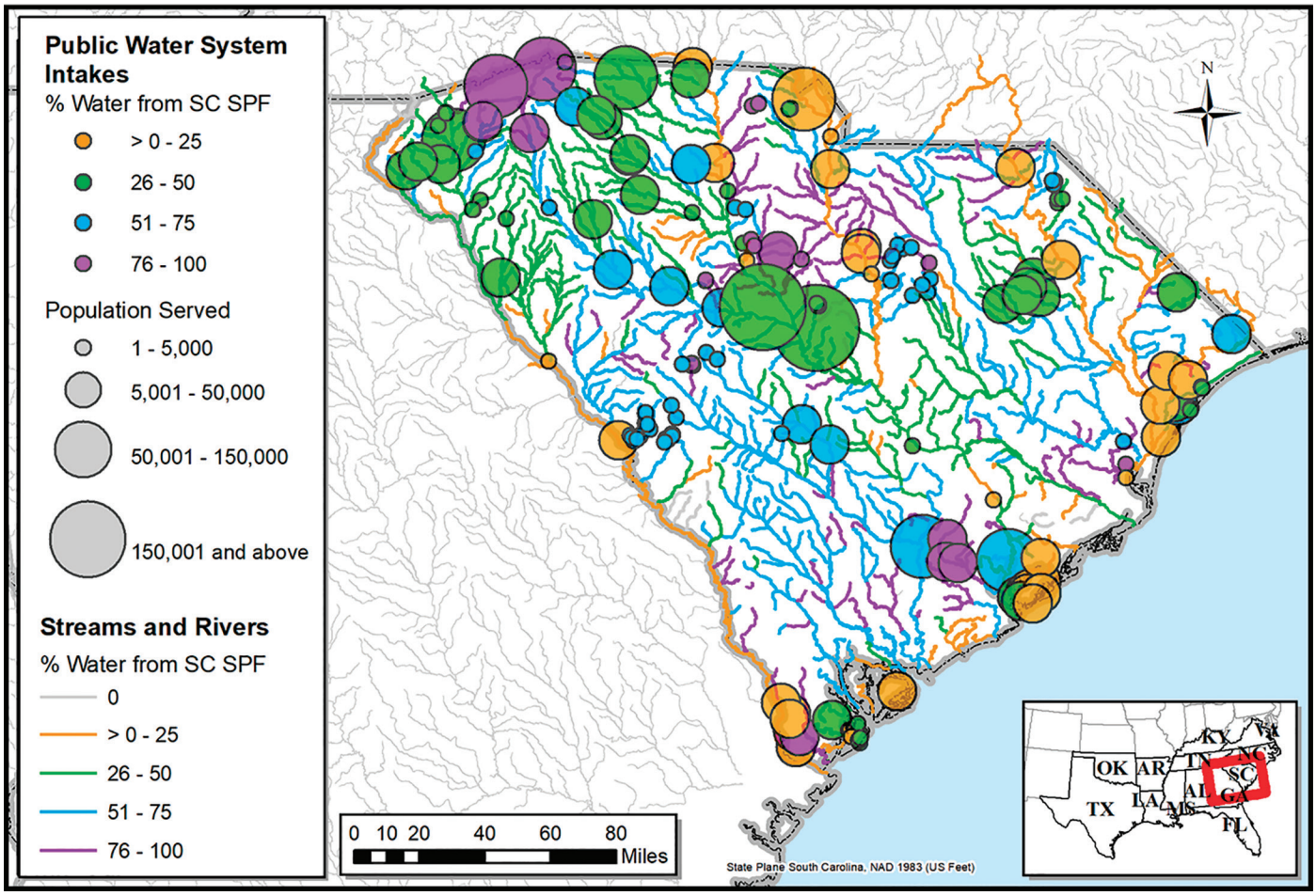


Figure A.SC.5—(A) South Carolina streams by percentage of South Carolina SPF water content, surface drinking water intakes within South Carolina by percentage of South Carolina SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 205 surface drinking water intakes within the State serve a population of 2,263,380 in 74 communities. Note: See figures A.SC.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from South Carolina State and Private Forests

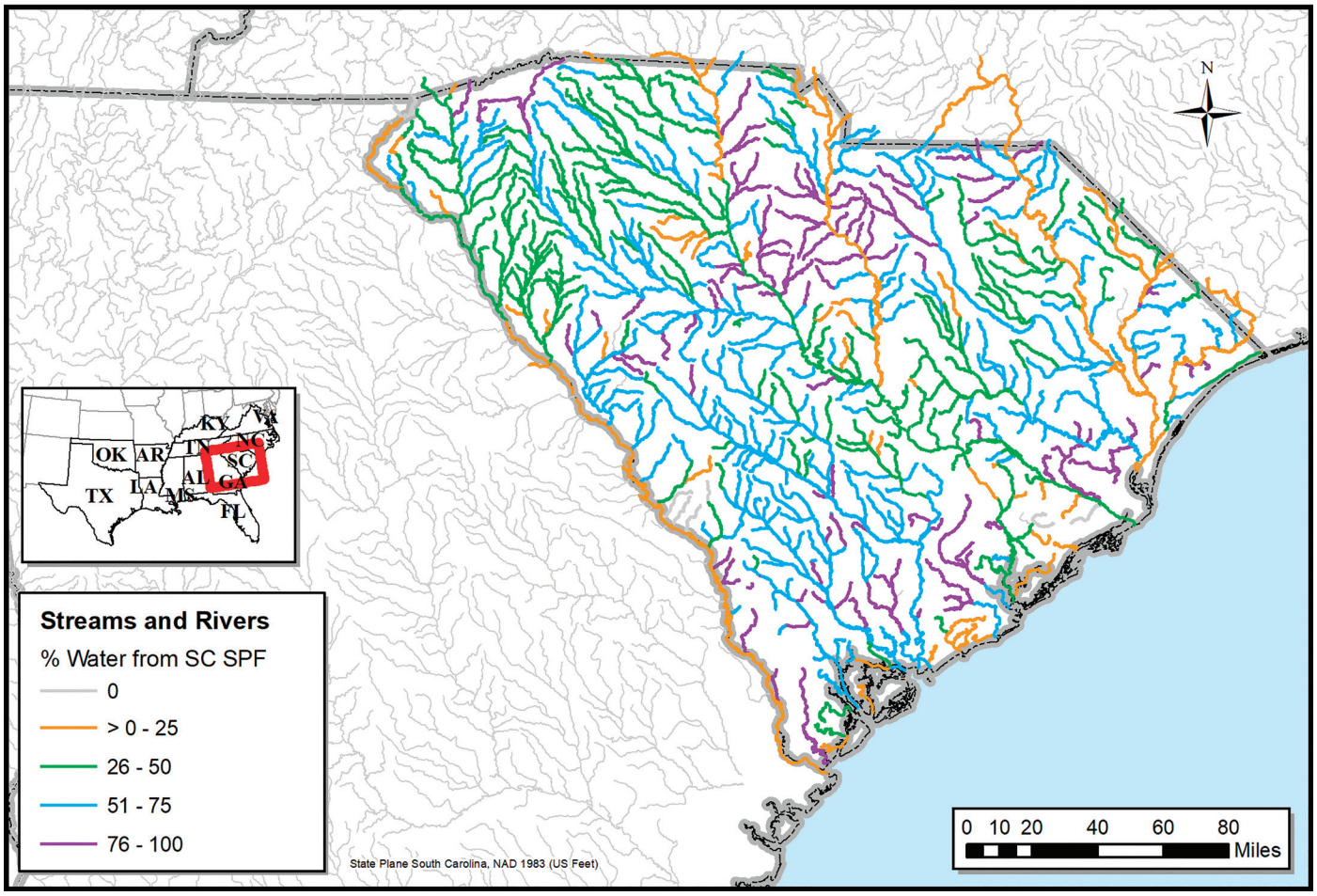


Figure A.SC.5—(B) South Carolina streams by percentage of South Carolina SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from South Carolina State and Private Forests

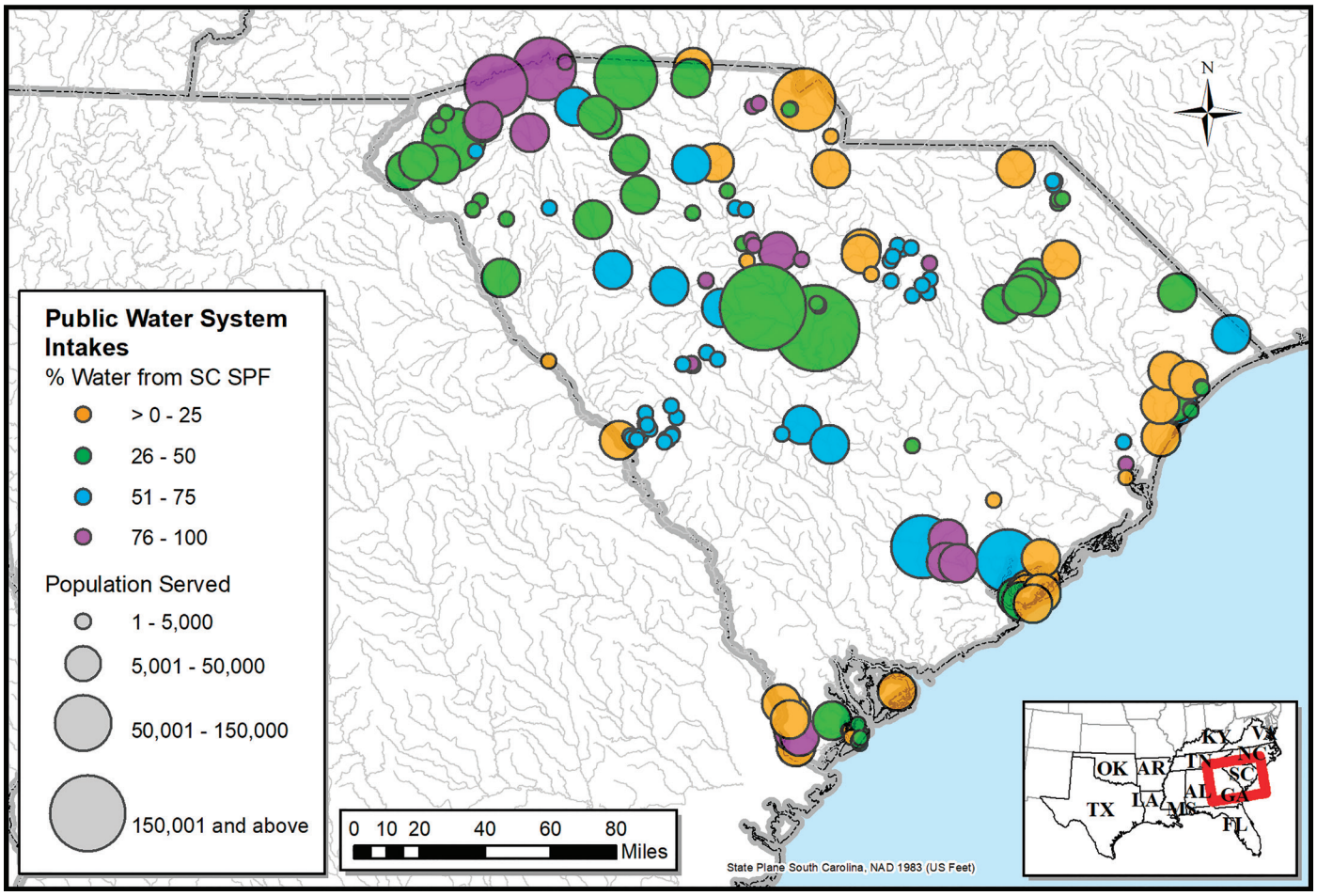


Figure A.SC.5—(C) Surface drinking water intakes within South Carolina by percentage of South Carolina SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 205 surface drinking water intakes within the State serve a population of 2,263,380 in 74 communities.

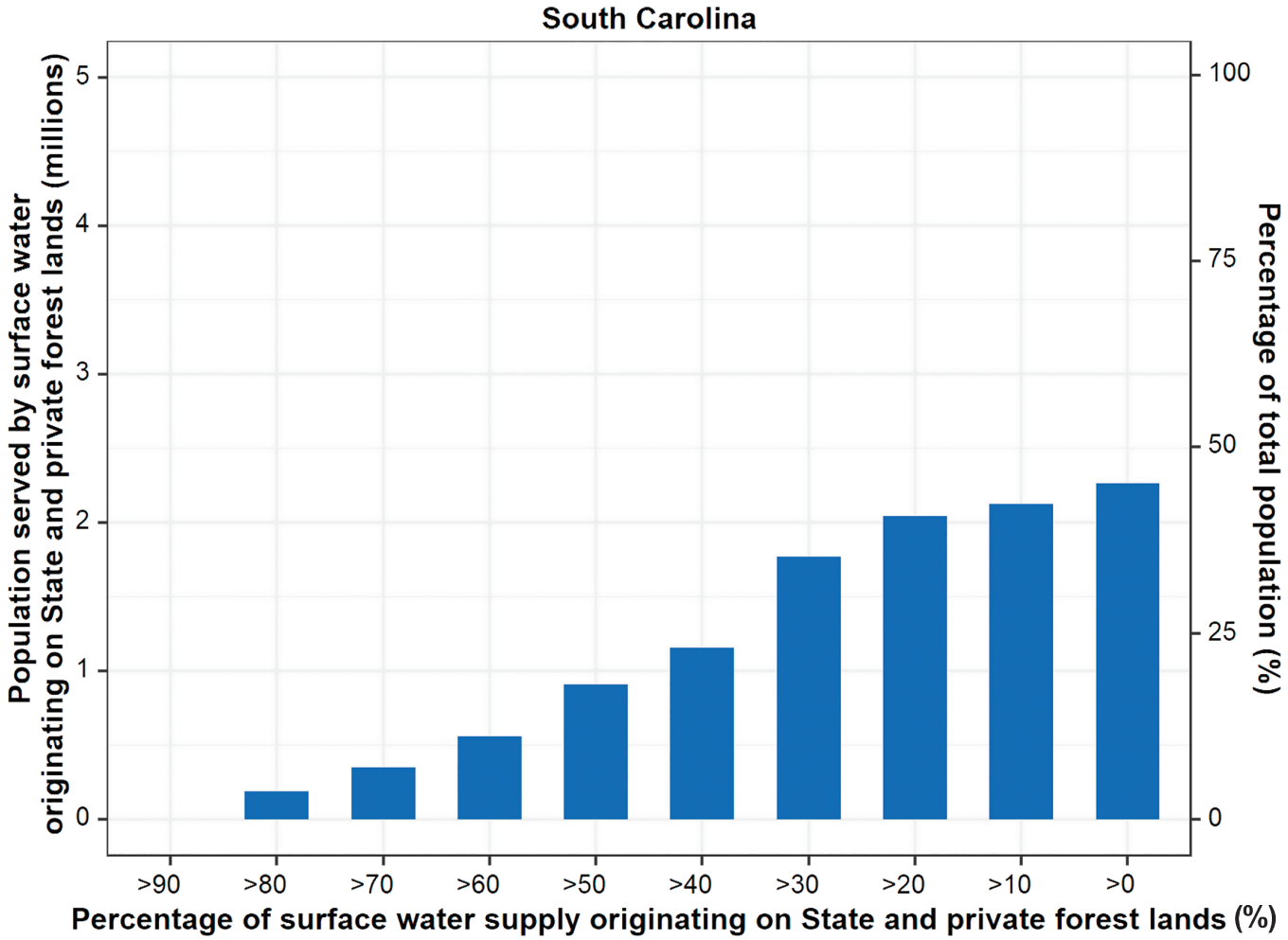


Figure A.SC.6—Cumulative frequency of population served according to percentage of water coming from South Carolina SPF lands.

Public Water System Intakes Outside of South Carolina Receiving Water from South Carolina State and Private Forests

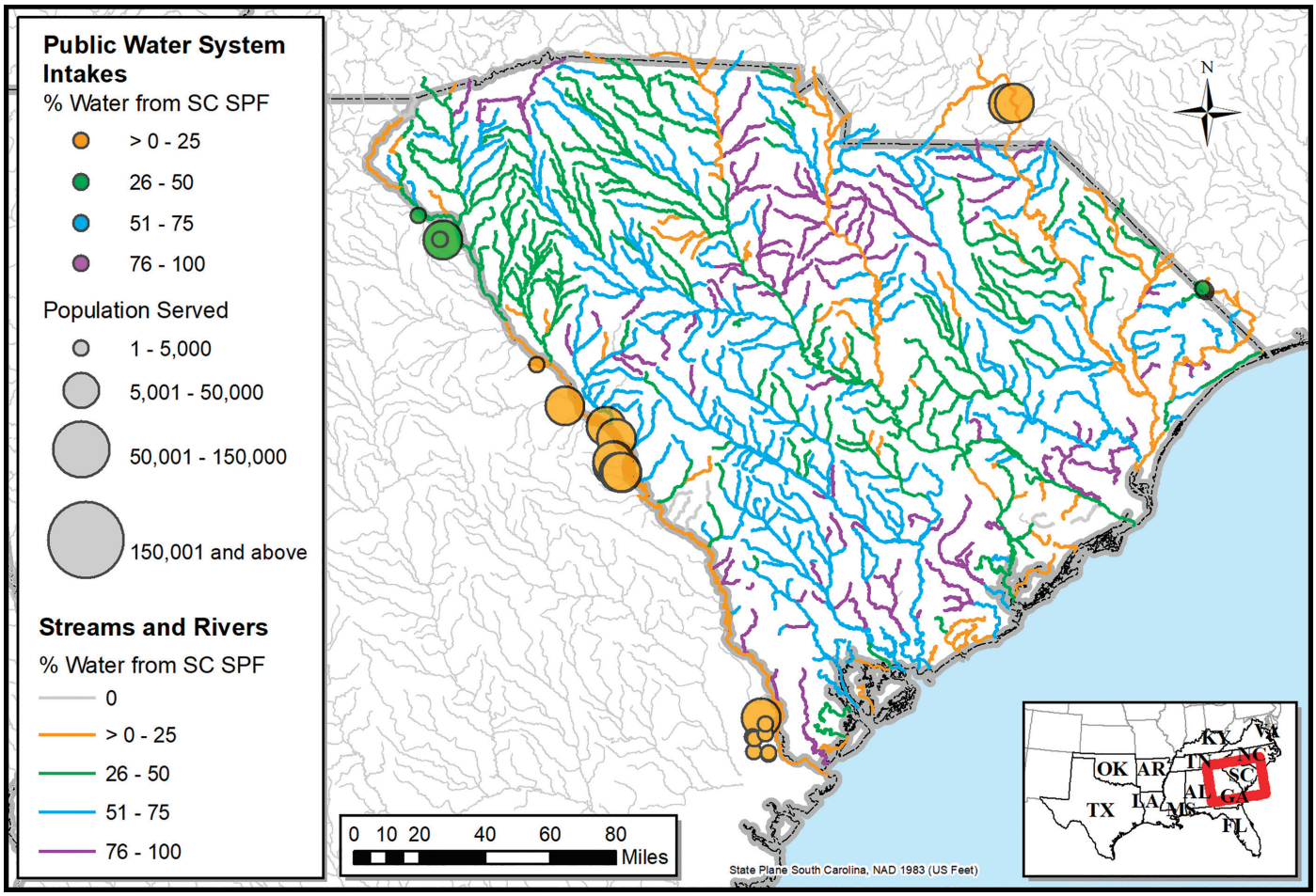


Figure A.SC.7—South Carolina streams by percentage of South Carolina SPF water content, surface drinking water intakes downstream of South Carolina by percentage of South Carolina SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 42 surface drinking water intakes outside the State but carrying South Carolina SPF water serve a population of 313,158 in 13 communities.

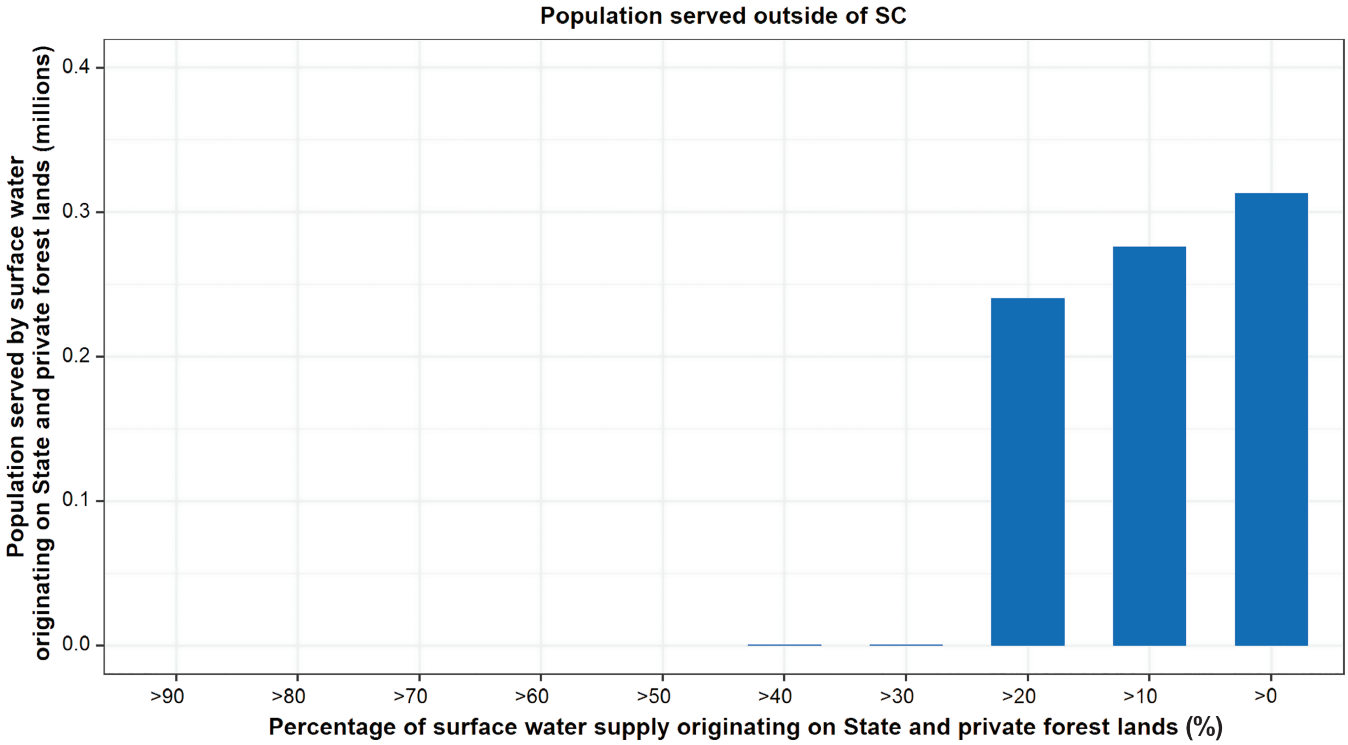


Figure A.SC.8—Cumulative frequency of non-South Carolina population served according to percentage of water coming from South Carolina SPF lands.

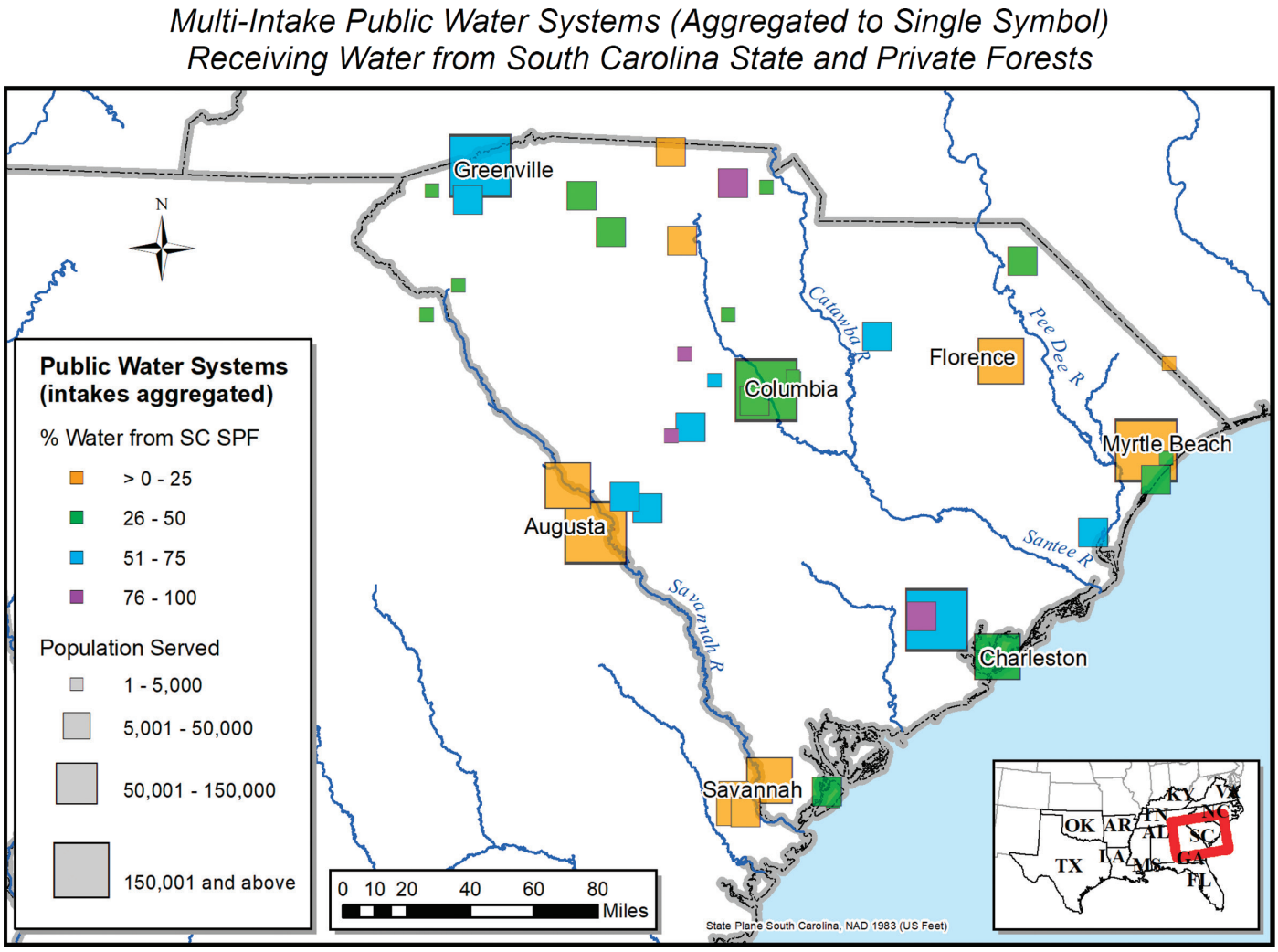


Figure A.SC.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Columbia-Lake Wateree Detail

Streams and Public Water System Intakes in Columbia-Lake Wateree, SC, Area Receiving Water from South Carolina State and Private Forests

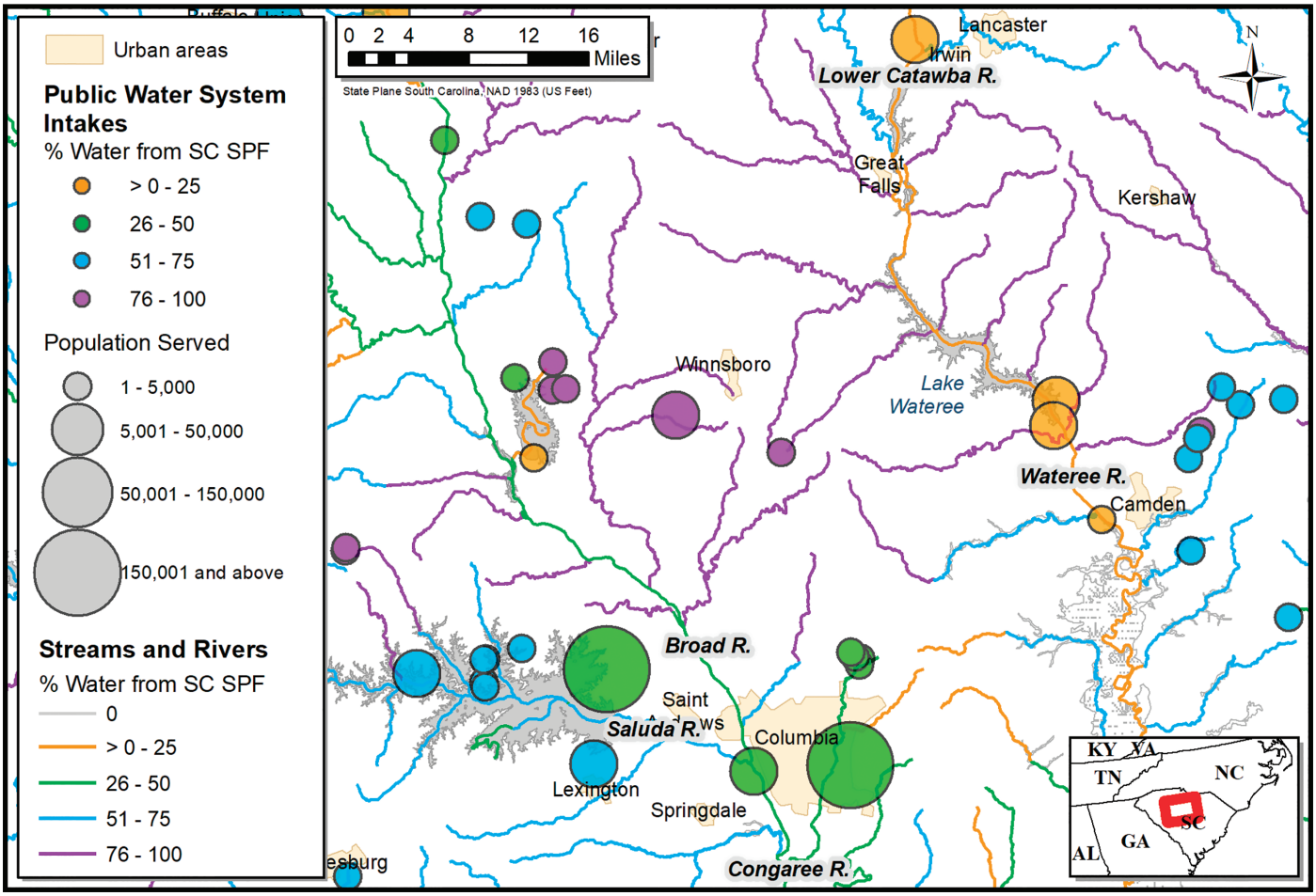


Figure A.SC.10—Local-scale detail showing percentage of water from South Carolina SPF for streams and surface drinking water intakes around Columbia, SC, and Lake Wateree.

Greenville, SC, Case Study

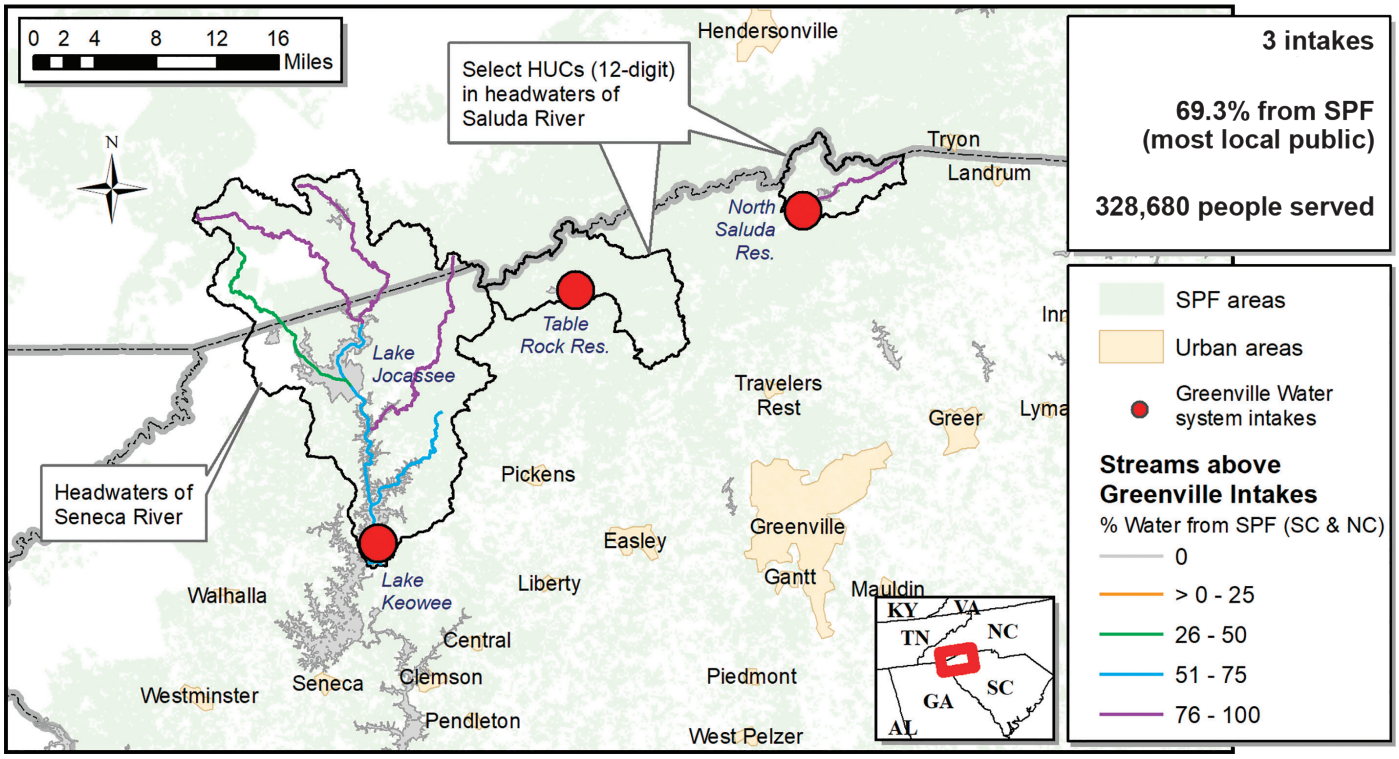


Figure A.SC.11—Case study of the Greenville Water public water supply system, Greenville, SC, illustrating SPF water in streams supplying the three surface drinking water intakes. When this water reaches the intakes, 69.3 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is local public.

STATE OF TENNESSEE

Summary

State and private forest (SPF) lands cover 45.3 percent of Tennessee (figs. A.TN.1 and A.TN.2; table A.TN.1). About 44.2 percent of all Tennessee surface water originates on SPF lands (fig. A.TN.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 71.1 percent of the SPF land area and 70.2 percent of surface water from SPF. Corporate-owned forests contribute 18.2 percent of surface water from SPF and account for 17.8 percent of land area of SPF. Average annual water yield in Tennessee is about 548 mm (fig. A.TN.4). Tennessee has a total of 346 surface drinking water intakes where at least some available water comes from SPF (fig. A.TN.5). About 70.0 percent of the total population of Tennessee is served by surface drinking water overall, and Tennessee SPF surface drinking water also serves about 70.0 percent of the State population, or 4.7 million people, to some degree. About 0.5 million people in Tennessee are getting more than half of their surface drinking water from SPF within the State (fig. A.TN.6). State and private forest lands in TN also supply water to 168 surface drinking water intakes in other States (Alabama, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, North Carolina, and Virginia) (fig. A.TN.7), which collectively serve about 2.5 million people in 111 communities (fig. A.TN.8). Many public water systems in Tennessee utilize more than one intake; these systems are shown (intakes aggregated) in figure A.TN.9 by population served (symbol size) and percentage of water from SPF lands in Tennessee (symbol color). The Chattanooga, Knoxville, and Nashville detail maps (figs. A.TN.10–A.TN.12) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.TN.13) of the Nashville Water Department public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Tennessee, where two surface drinking water intakes receive about 50.5 percent of their water from SPF and serve about 0.6 million people.

Table A.TN.1—Land area by land cover and forest ownership type in Tennessee

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	25 888	14,551,270
Nonforest	54 882	13,561,498
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	7303	1,804,510
Tribal (public)	0	0
State (public)	5069	1,252,497
Local (public)	404	99,937
Corporate (private)	9205	2,274,519
Family (private)	3697	9,067,993
Other private	210	51,814

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

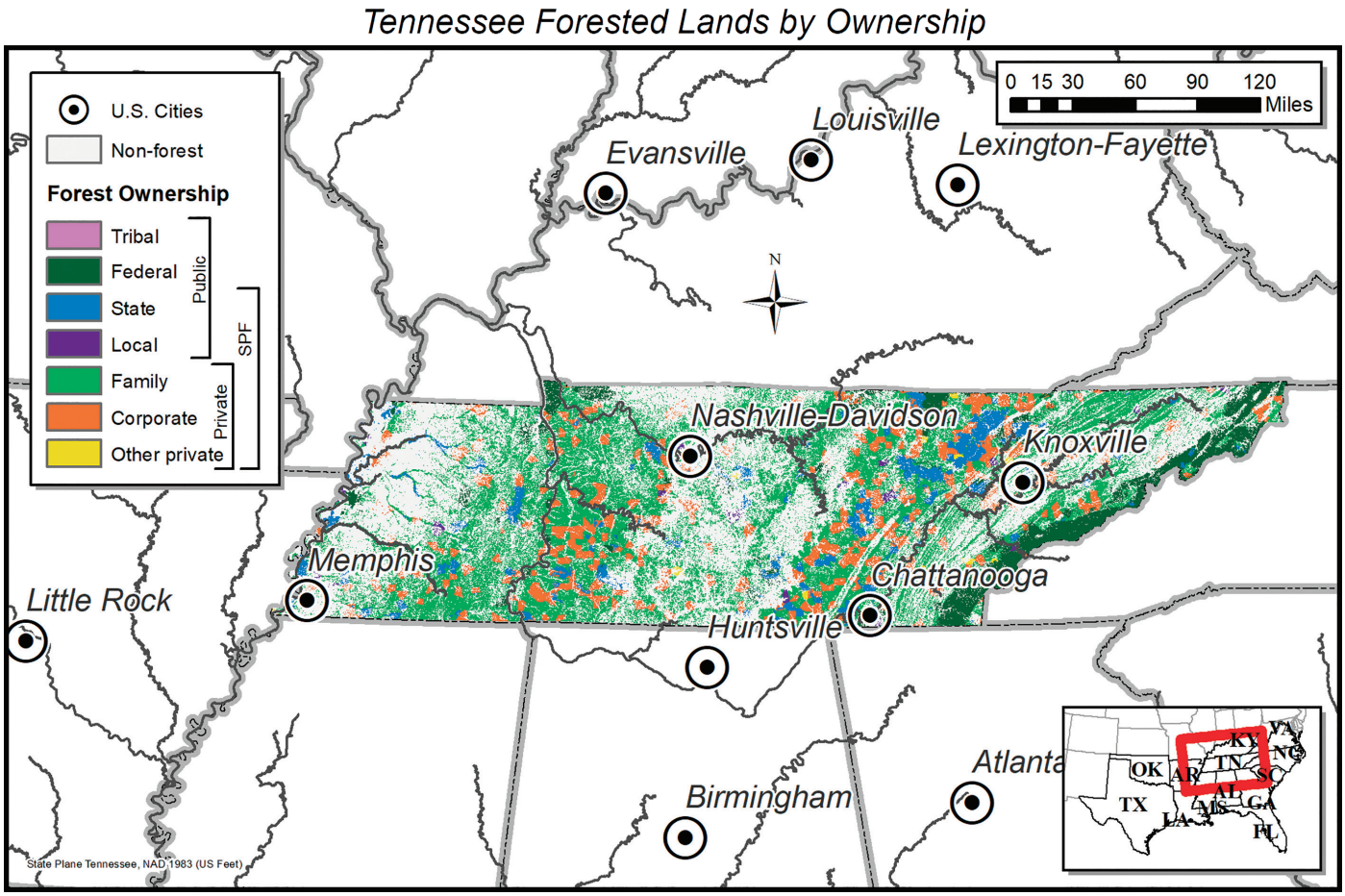


Figure A.TN.1—Tennessee nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

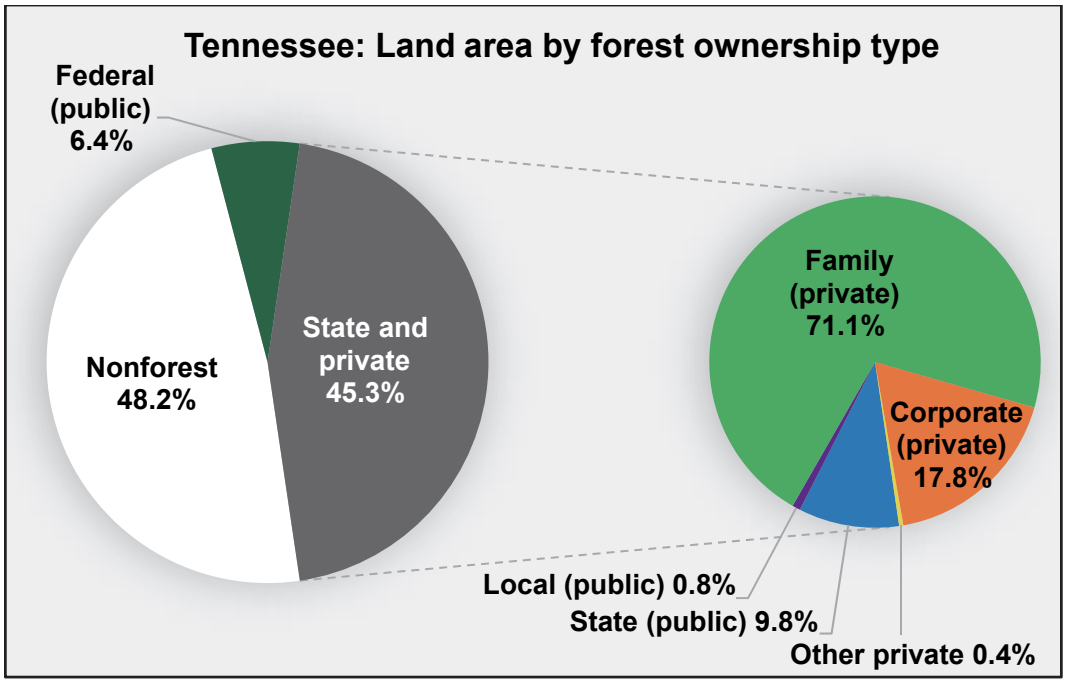


Figure A.TN.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

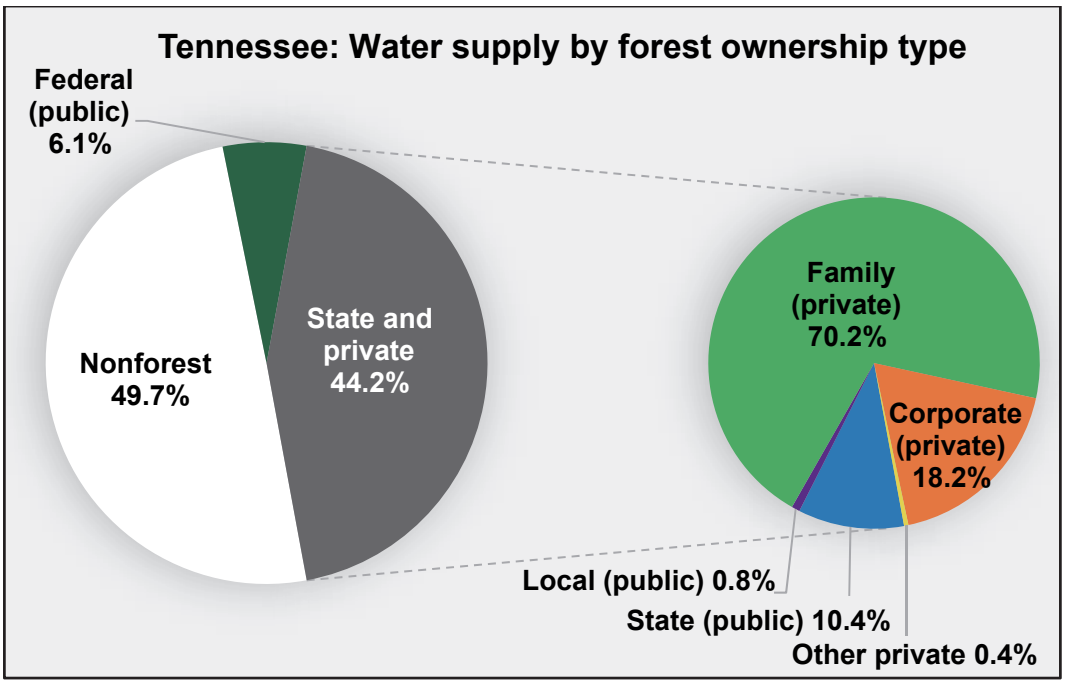


Figure A.TN.3—Percentage of Tennessee's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

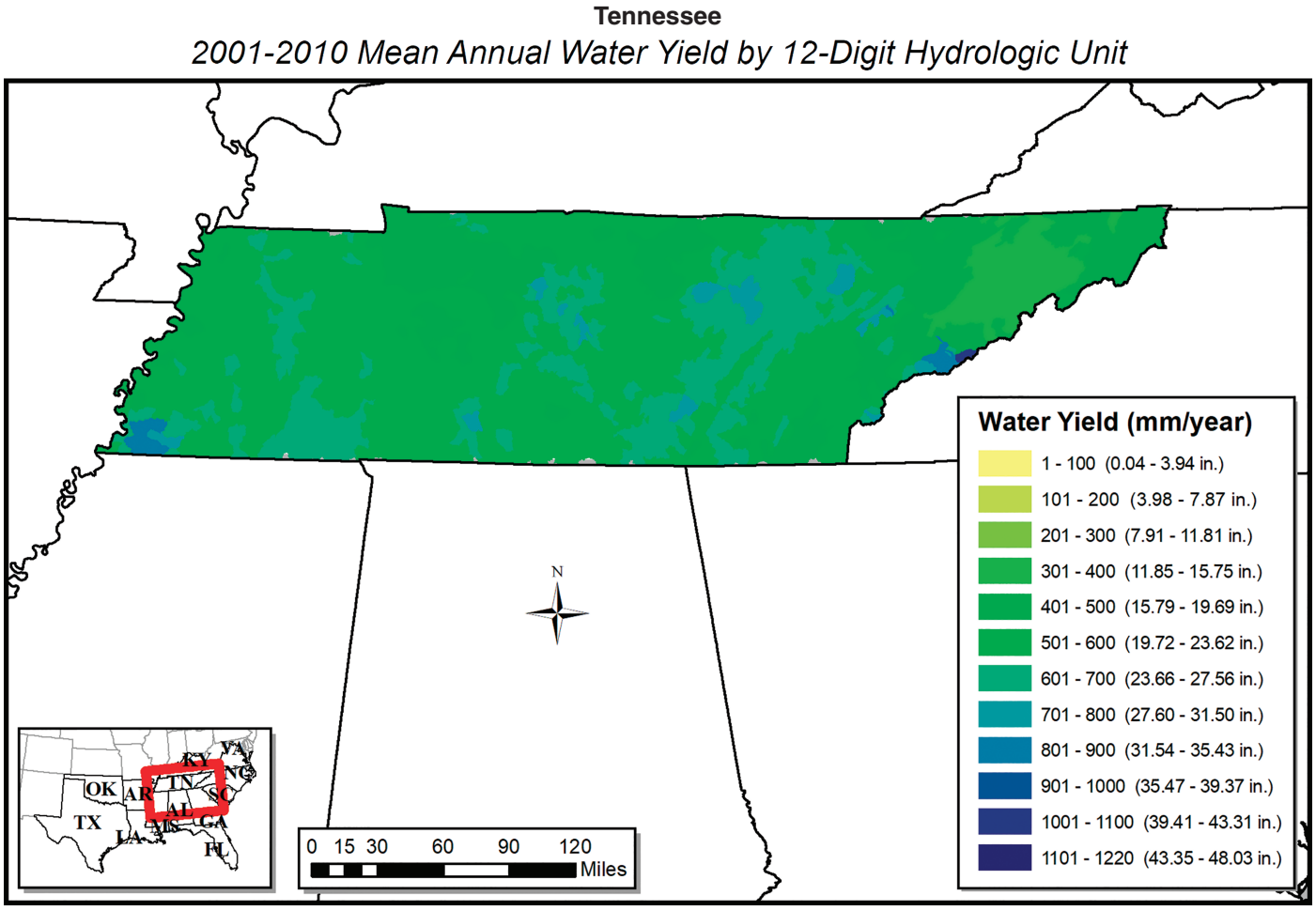


Figure A.TN.4—Estimated mean annual water yield by 12-digit hydrologic units in Tennessee, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Tennessee State and Private Forests

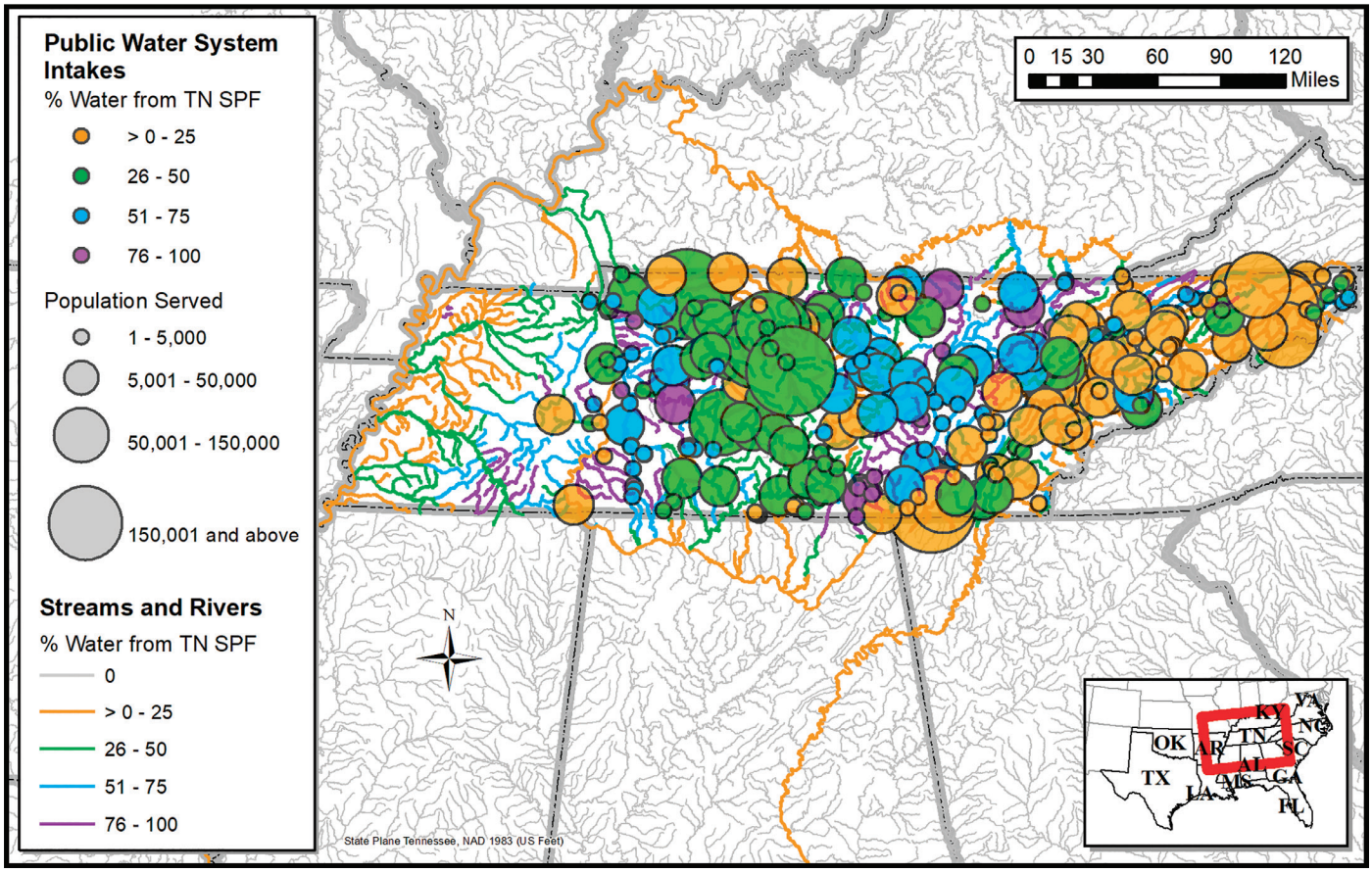


Figure A.TN.5—(A) Tennessee streams by percentage of Tennessee SPF water content, surface drinking water intakes within Tennessee by percentage of Tennessee SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 346 surface drinking water intakes within the State serve a population of 4,695,088 in 219 communities. Note: See figures A.TN.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Tennessee State and Private Forests

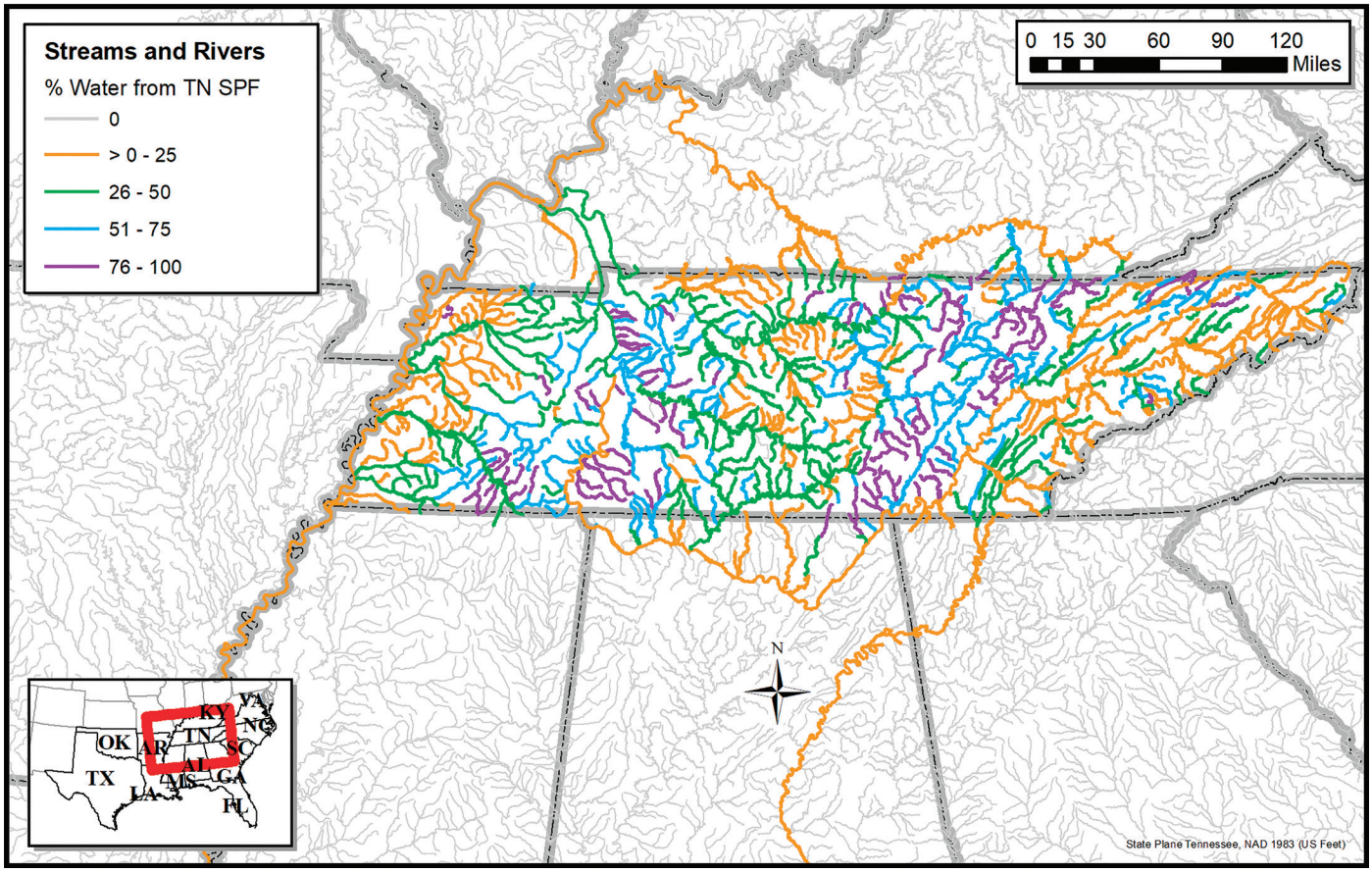


Figure A.TN.5—(B) Tennessee streams by percentage of Tennessee SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Tennessee State and Private Forests

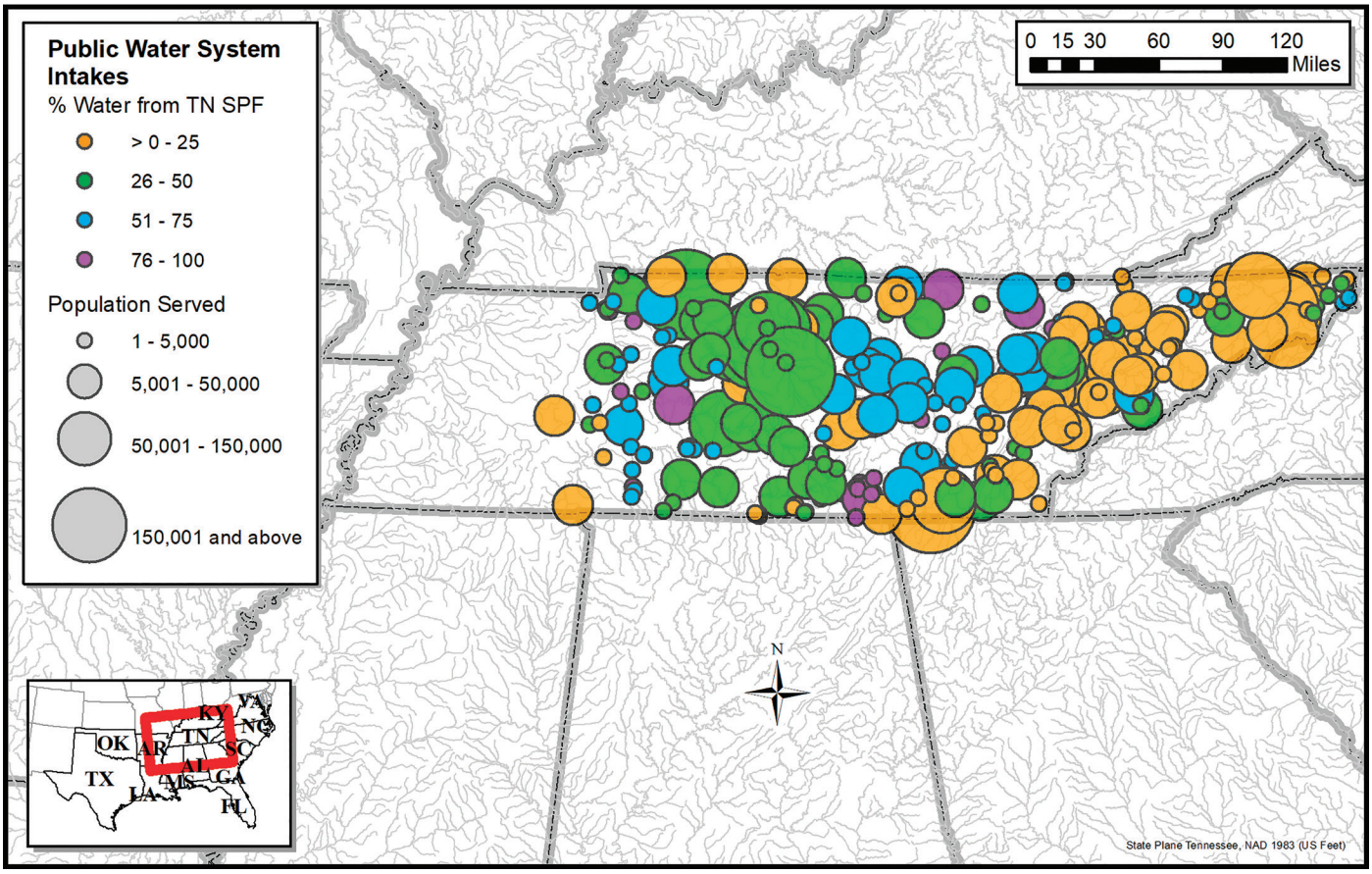


Figure A.TN.5—(C) Surface drinking water intakes within Tennessee by percentage of Tennessee SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 346 surface drinking water intakes within the State serve a population of 4,695,088 in 219 communities.

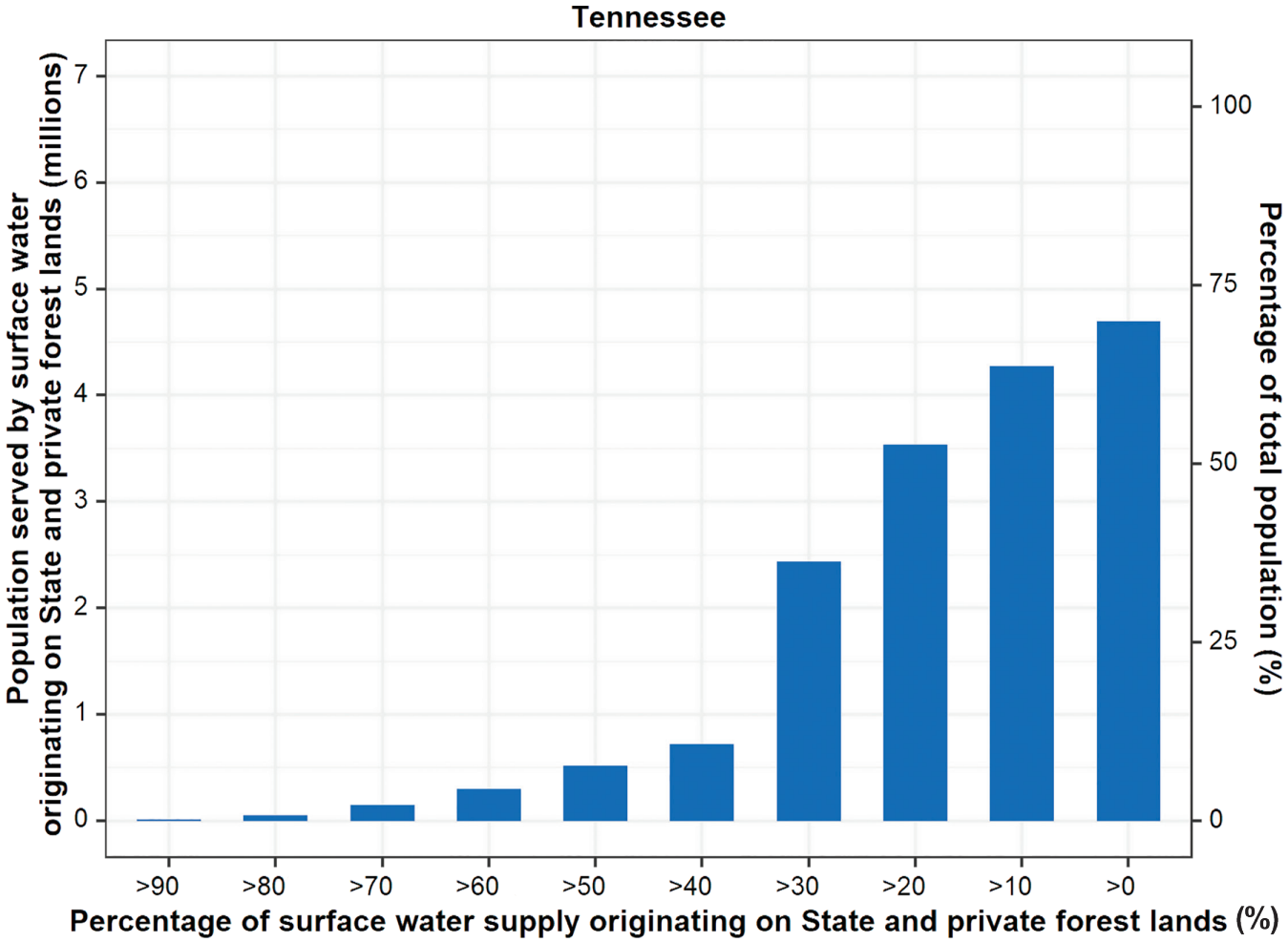


Figure A.TN.6—Cumulative frequency of population served according to percentage of water coming from Tennessee SPF lands.

Public Water System Intakes Outside of Tennessee Receiving Water from Tennessee State and Private Forests

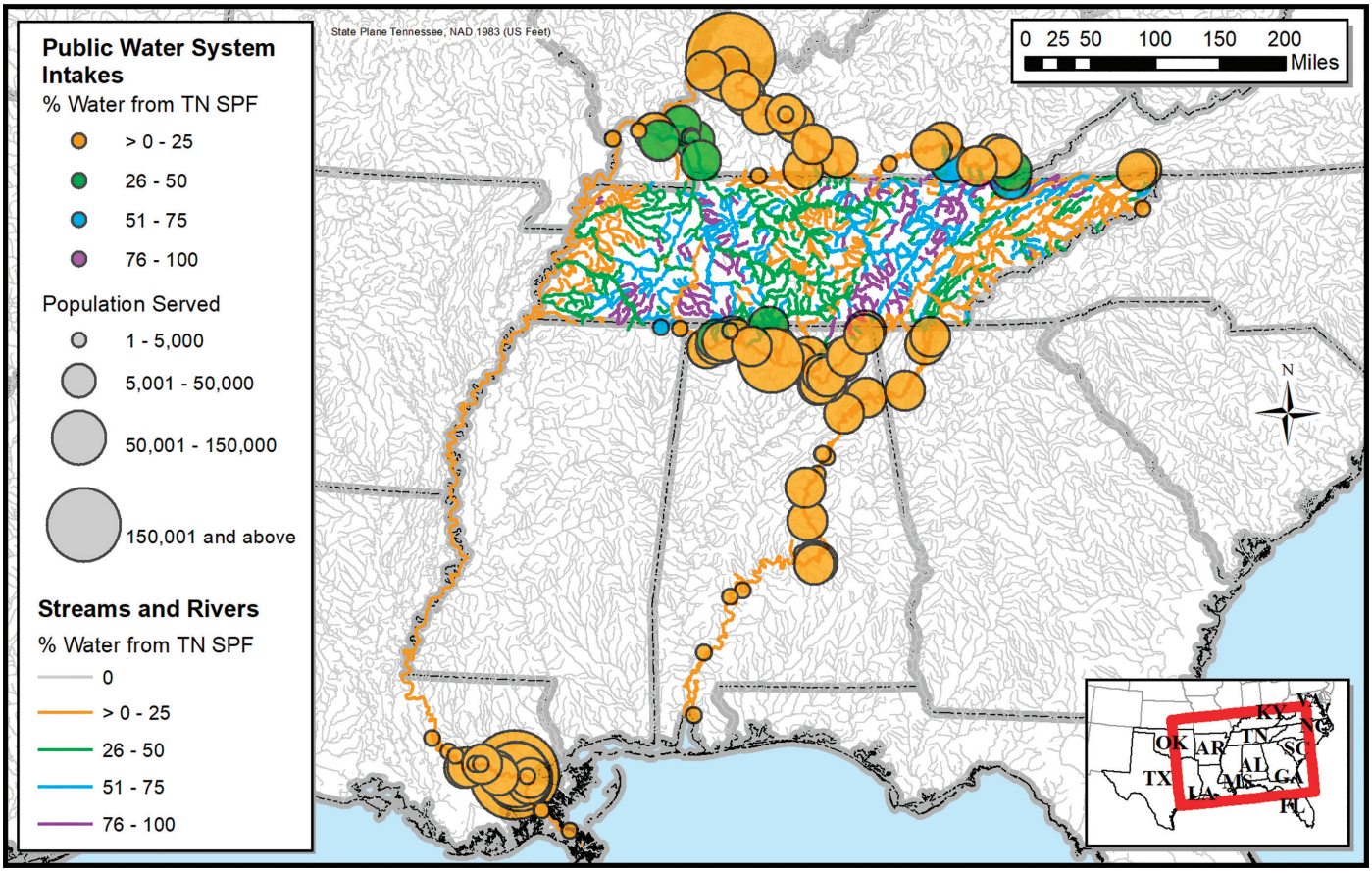


Figure A.TN.7—Tennessee streams by percentage of Tennessee SPF water content, surface drinking water intakes downstream of Tennessee by percentage of Tennessee SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 168 surface drinking water intakes outside the State but carrying Tennessee SPF water serve a population of 2,491,876 in 111 communities.

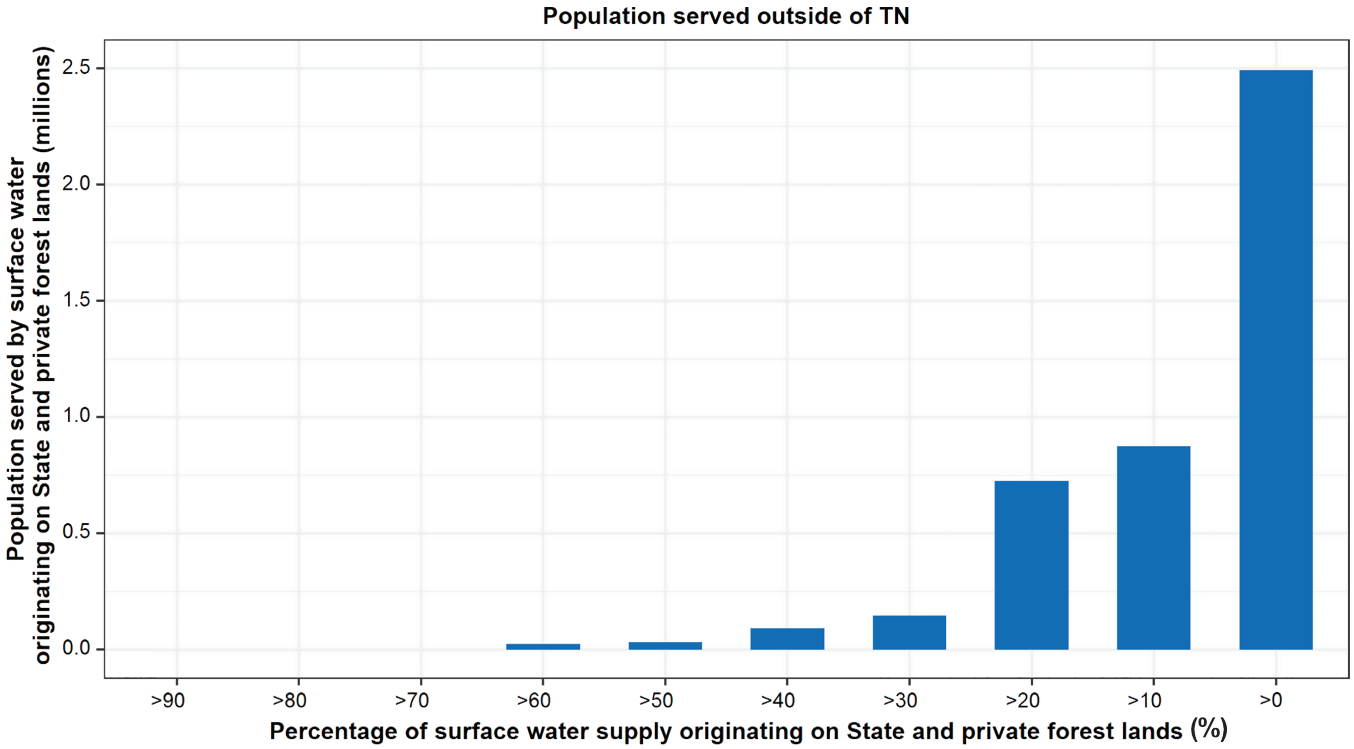


Figure A.TN.8—Cumulative frequency of non-Tennessee population served according to percentage of water coming from Tennessee SPF lands.

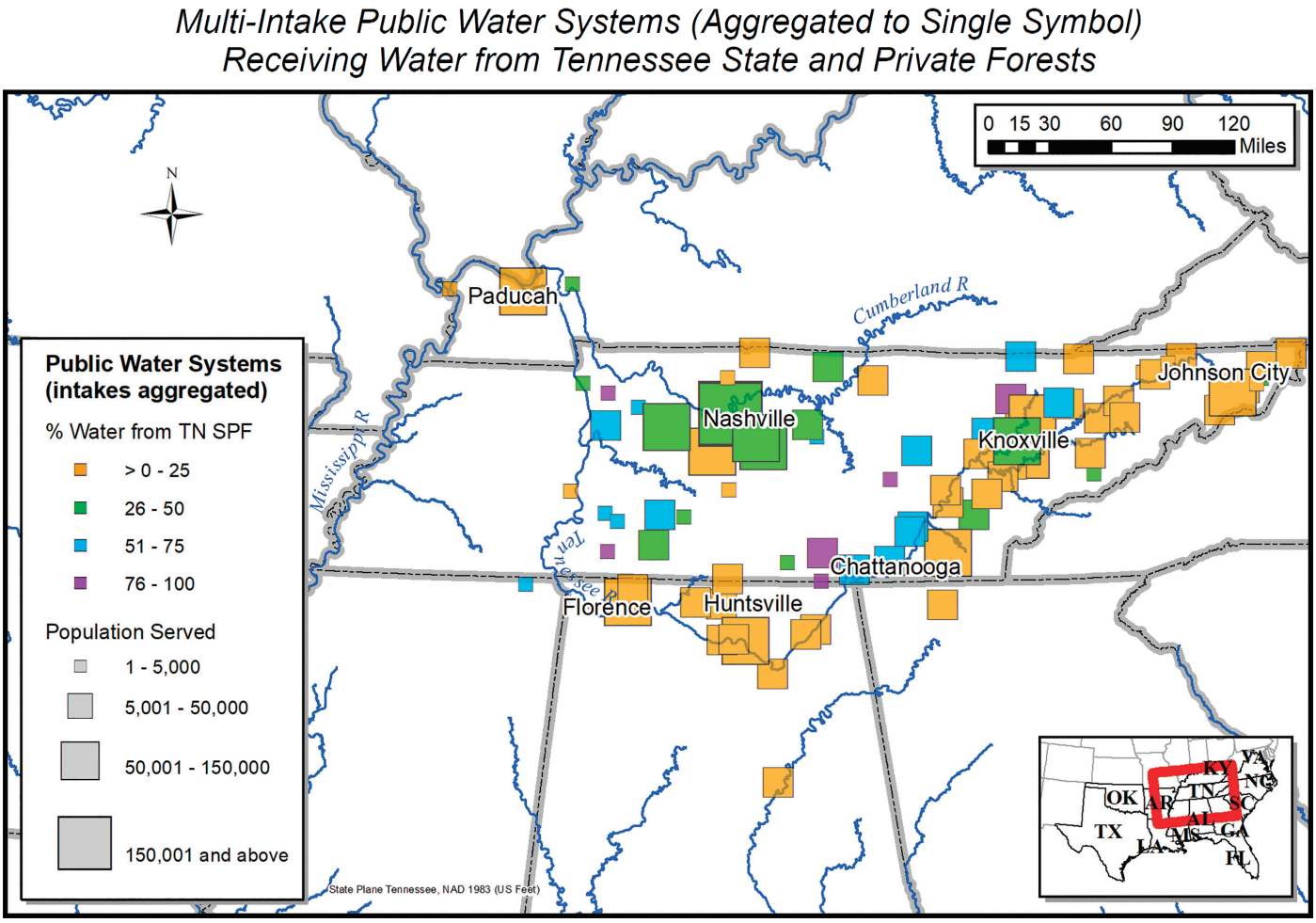


Figure A.TN.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Chattanooga Detail

Streams and Public Water System Intakes in Chattanooga, TN, Area Receiving Water from Tennessee State and Private Forests

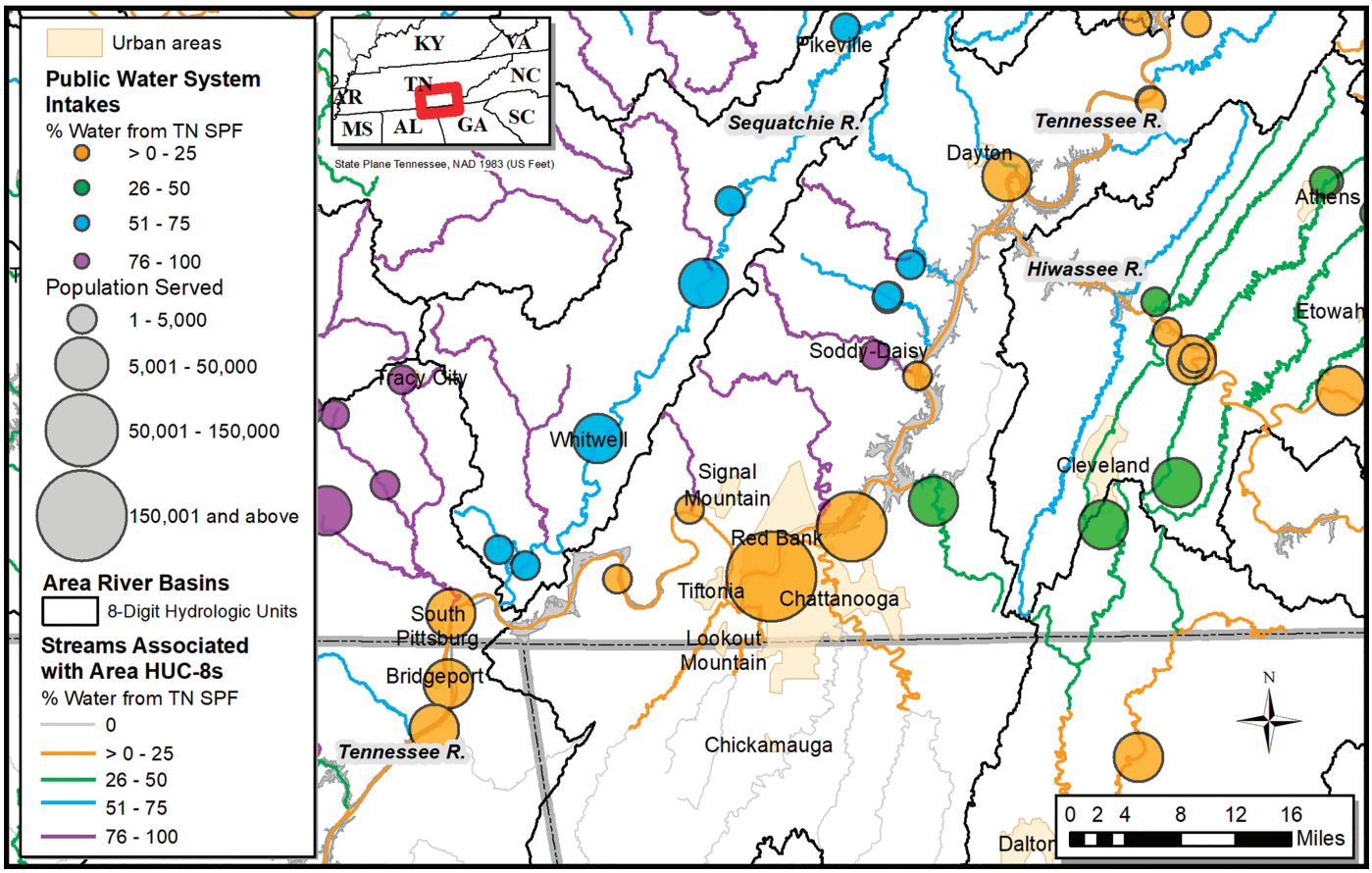


Figure A.TN.10—Local-scale detail showing percentage of water from Tennessee SPF for streams and surface drinking water intakes around Chattanooga, TN.

Knoxville Detail

Streams and Public Water System Intakes in Knoxville, TN, Area Receiving Water from Tennessee State and Private Forests

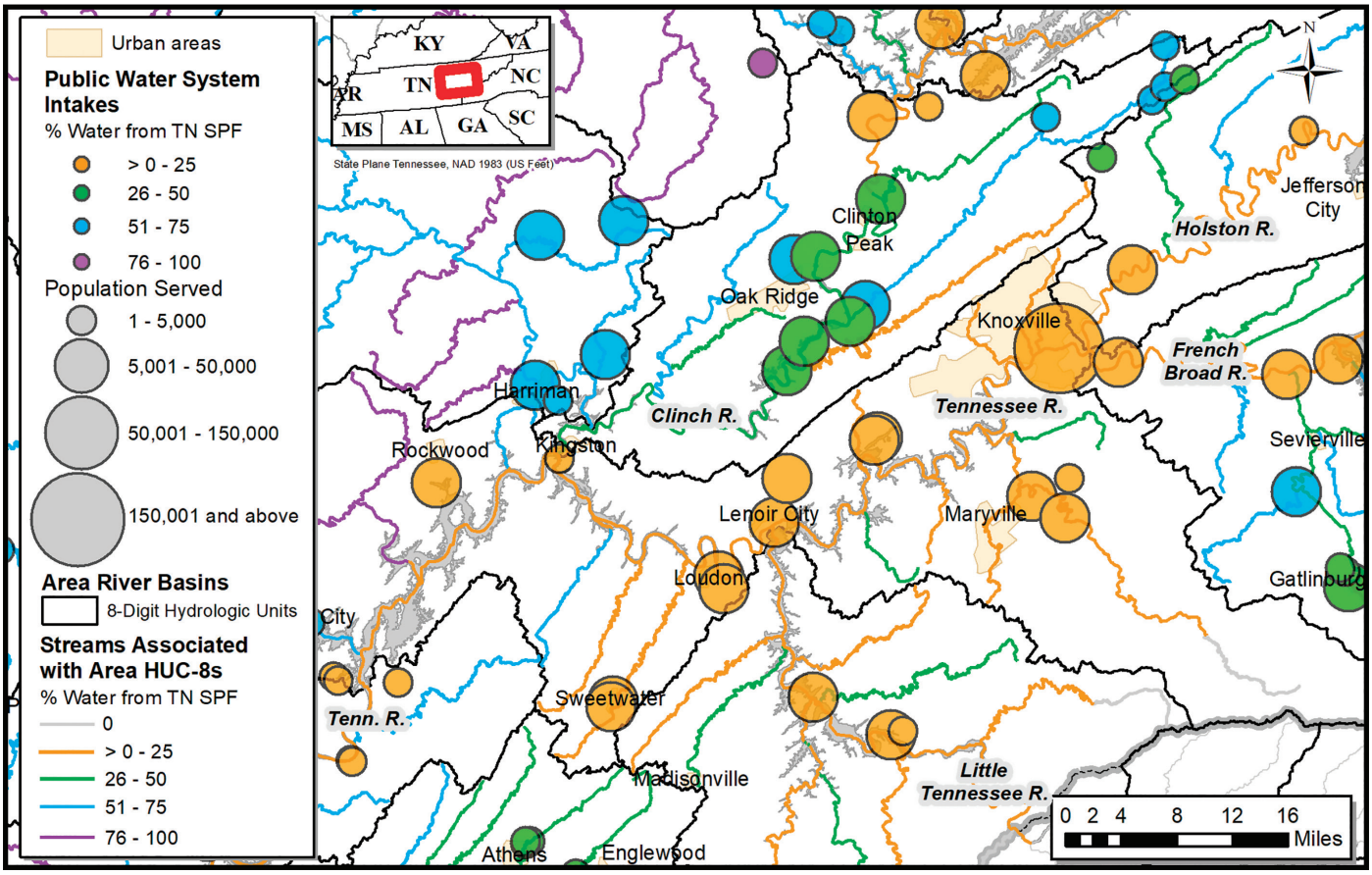


Figure A.TN.11—Local-scale detail showing percentage of water from Tennessee SPF for streams and surface drinking water intakes around Knoxville, TN.

Nashville Detail

Streams and Public Water System Intakes in Nashville, TN, Area Receiving Water from Tennessee State and Private Forests

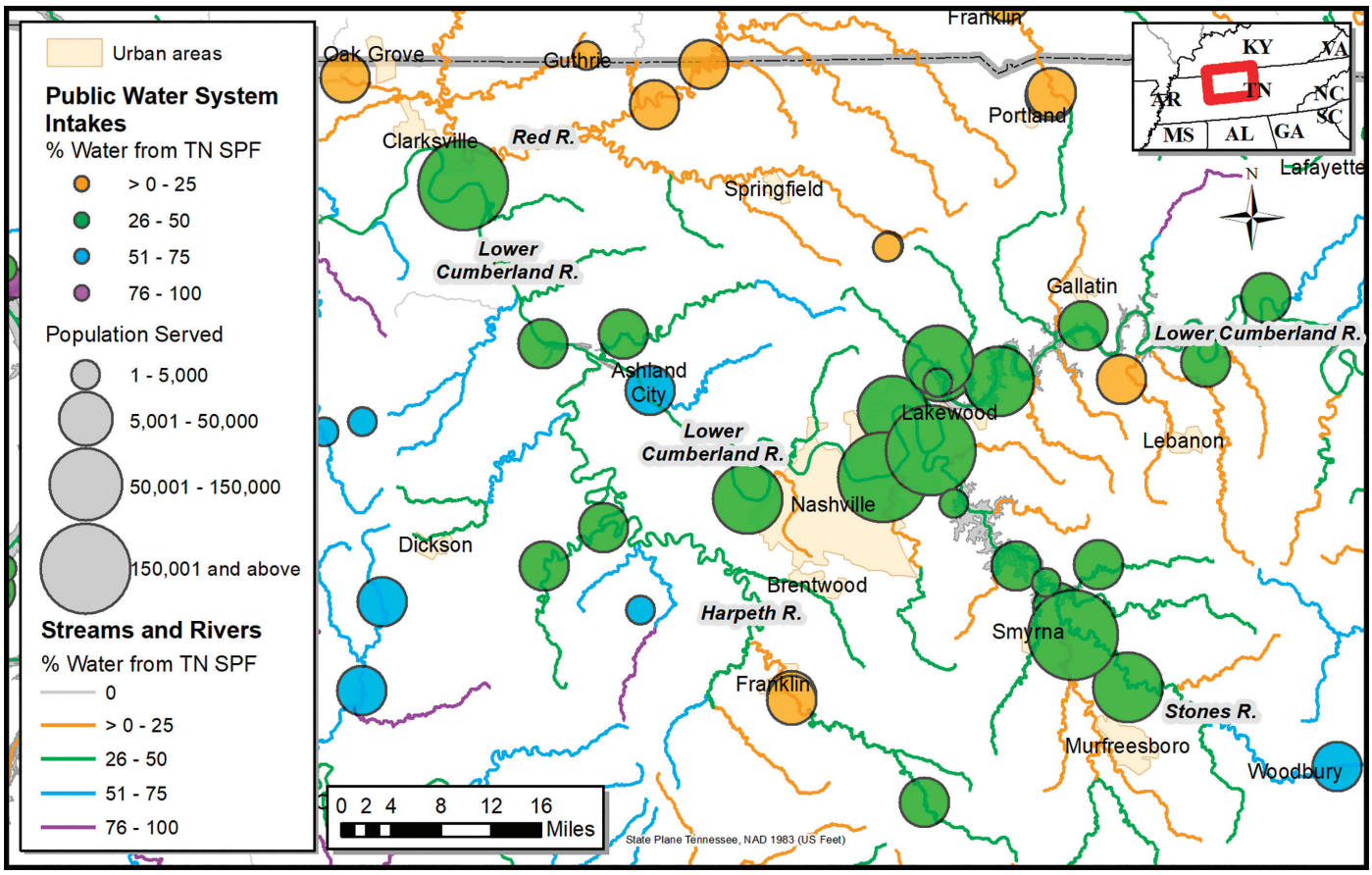


Figure A.TN.12—Local-scale detail showing percentage of water from Tennessee SPF for streams and surface drinking water intakes around Nashville, TN.

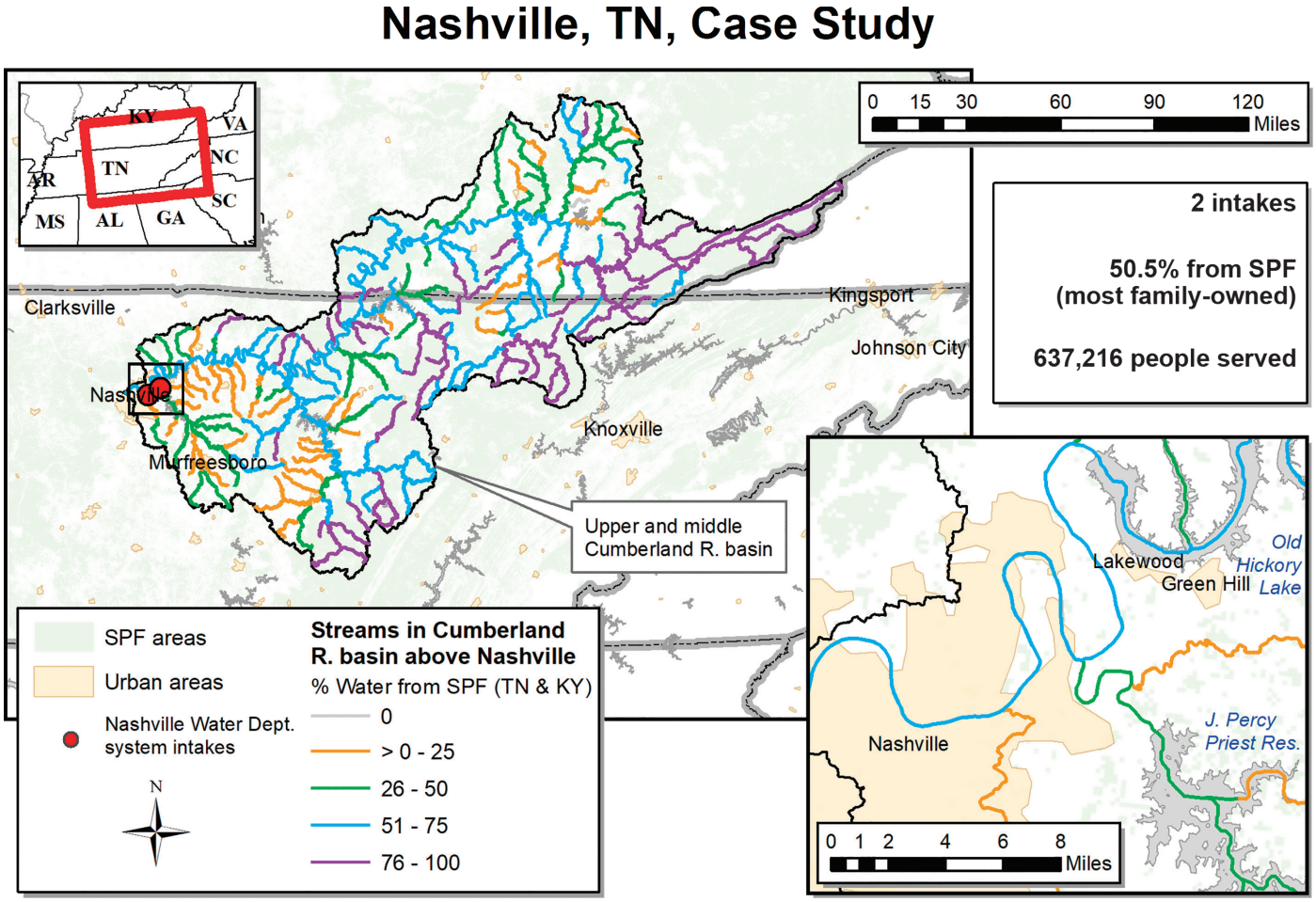


Figure A.TN.13—Case study of the Nashville Water Department public water supply system, Nashville, TN, illustrating SPF water in streams supplying the two surface drinking water intakes. When this water reaches the intakes, 50.5 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF TEXAS

Summary

State and private forest (SPF) lands cover 34.9 percent of Texas (figs. A.TX.1 and A.TX.2; table A.TX.1). About 36.5 percent of all Texas surface water originates on SPF lands (fig. A.TX.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 69.8 percent of the land area of SPF and 66.6 percent of surface water from SPF. Corporate-owned forests contribute 26.0 percent of surface water from SPF and account for 21.3 percent of land area of SPF. Average annual water yield in Texas is about 166 mm, with much drier conditions in the west than in the east (fig. A.TX.4). Texas has a total of 2,824 surface drinking water intakes where at least some available water comes from SPF (fig. A.TX.5). While about 61.8 percent of the total population of Texas is served by surface drinking water overall, Texas SPF surface drinking water serves about 59.0 percent of the State population, or 16.7 million people, to some degree. About 2.4 million people in Texas are getting more than half of their surface drinking water from SPF within the State (fig. A.TX.6). State and private forest lands in Texas also supply water to 149 surface drinking water intakes in other States (Arkansas, Louisiana, and Oklahoma) (fig. A.TX.7), which collectively serve about 1.6 million people in 61 communities (fig. A.TX.8). Many public water systems in Texas utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.TX.9 by population served (symbol size) and percentage of water from SPF lands in Texas (symbol color). The detail maps of northeastern Texas, San Antonio-Austin, Dallas-Fort Worth, and Houston (figs. A.TX.10–A.TX.13) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.TX.14) of the City of Austin Water & Wastewater public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Texas, where three surface drinking water intakes receive about 62.4 percent of their water from SPF and serve about 1.0 million people.

Table A.TX.1—Land area by land cover and forest ownership type in Texas

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	254 434	62,871,825
Nonforest	448 889	110,922,761
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	8803	2,175,362
Tribal (public)	246	60,676
State (public)	7935	1,960,752
Local (public)	2187	540,436
Corporate (private)	52 148	12,885,923
Family (private)	171 246	42,315,773
Other private	11 869	2,932,903

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

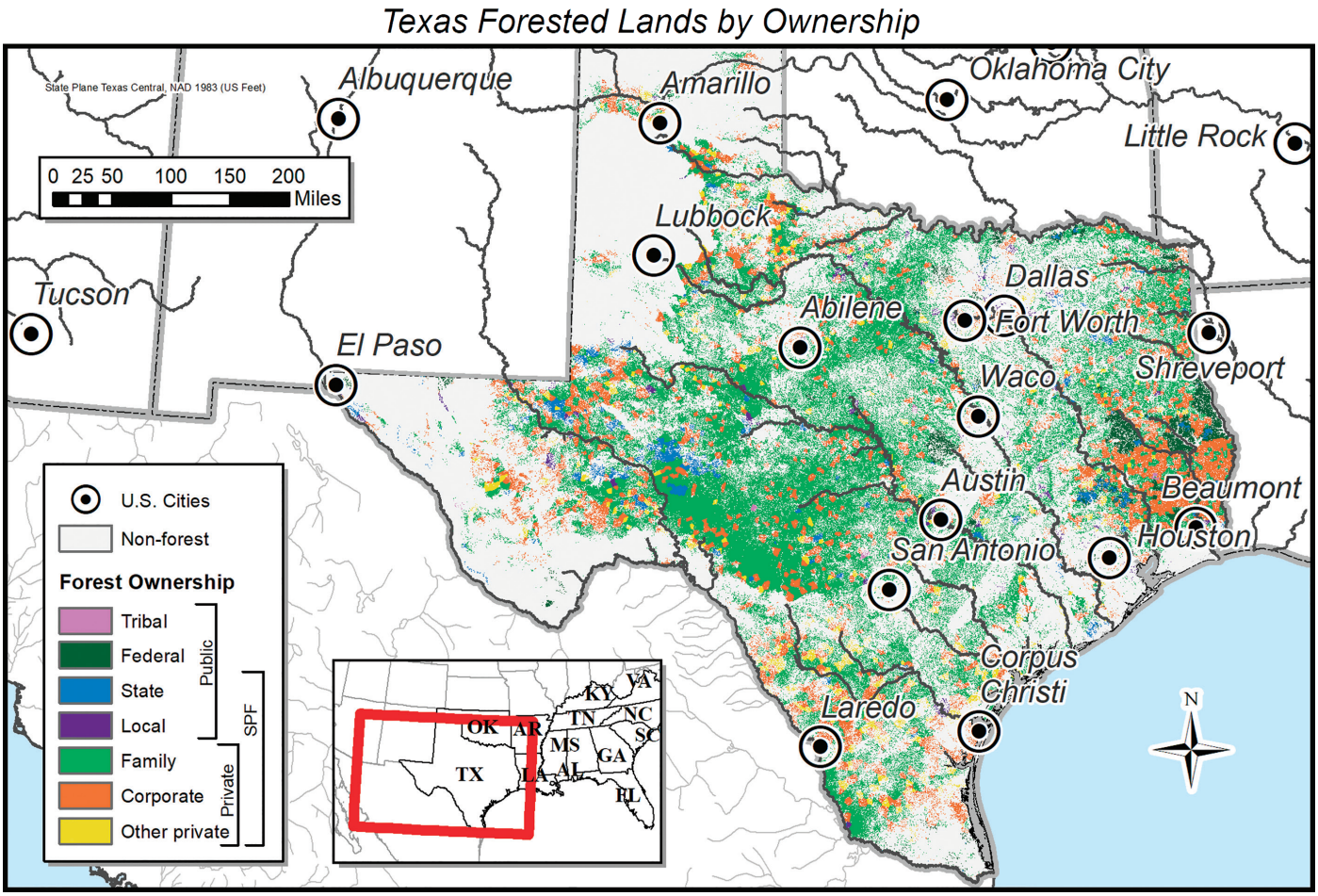


Figure A.TX.1—Texas's nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

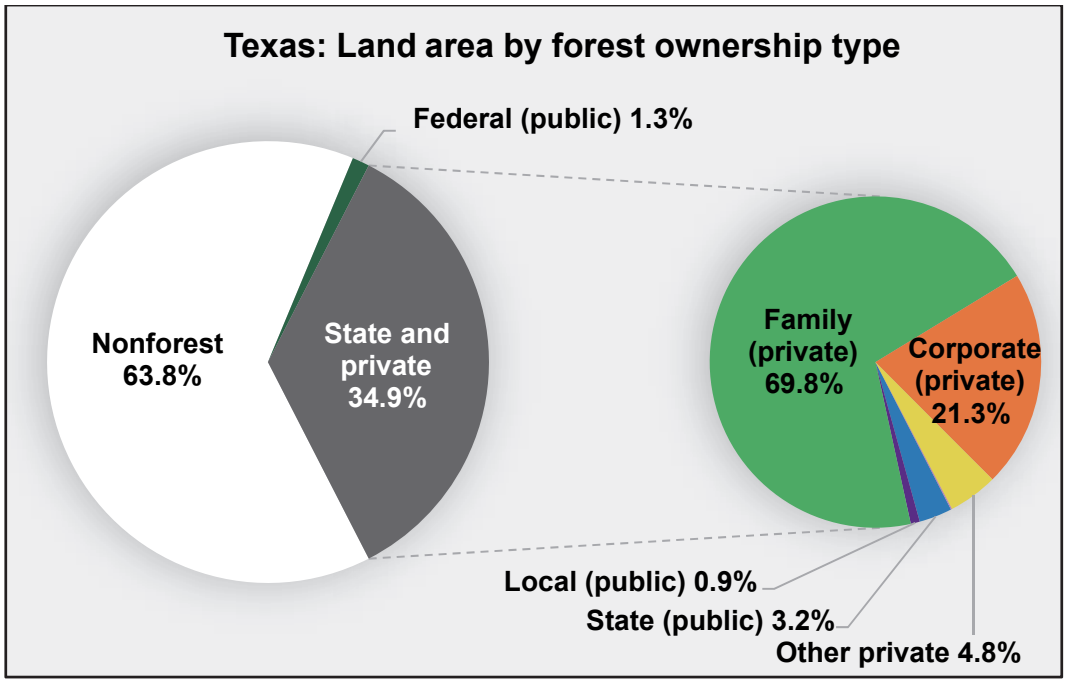


Figure A.TX.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

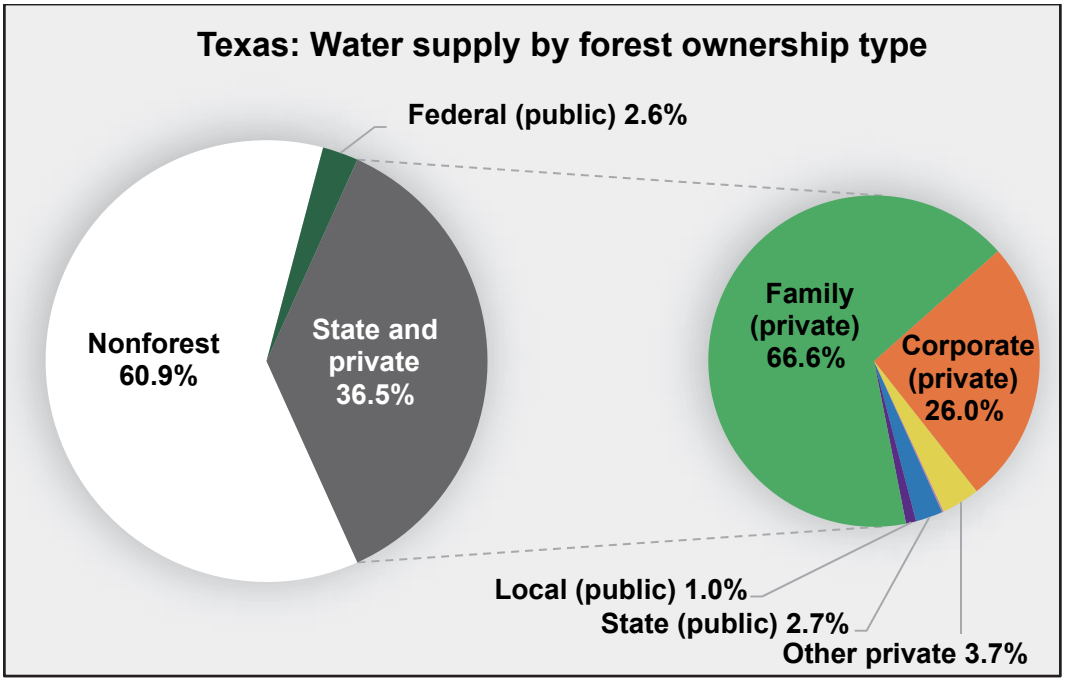


Figure A.TX.3—Percentage of Texas's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Texas

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

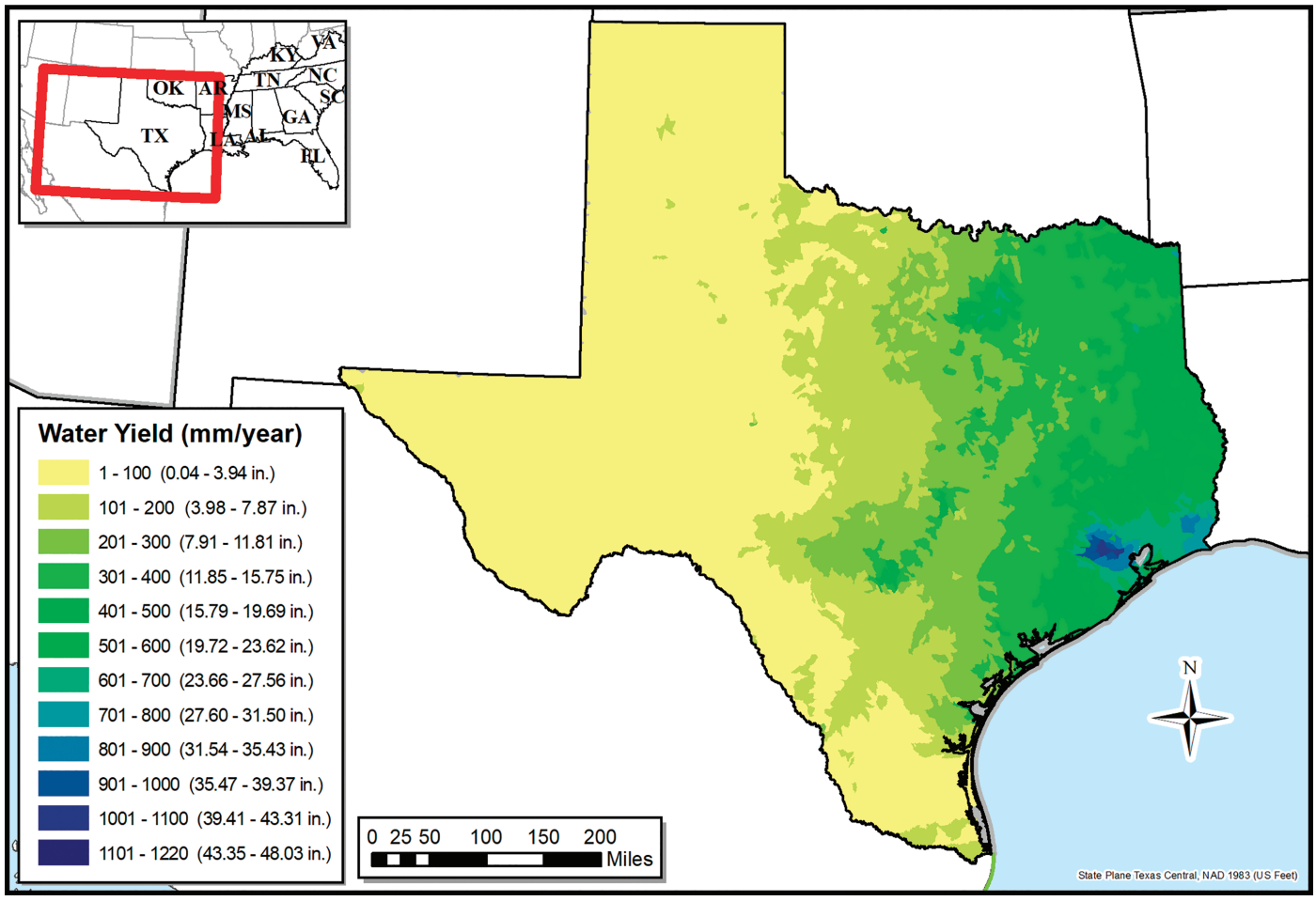


Figure A.TX.4—Estimated mean annual water yield by 12-digit hydrologic units in Texas, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Texas State and Private Forests

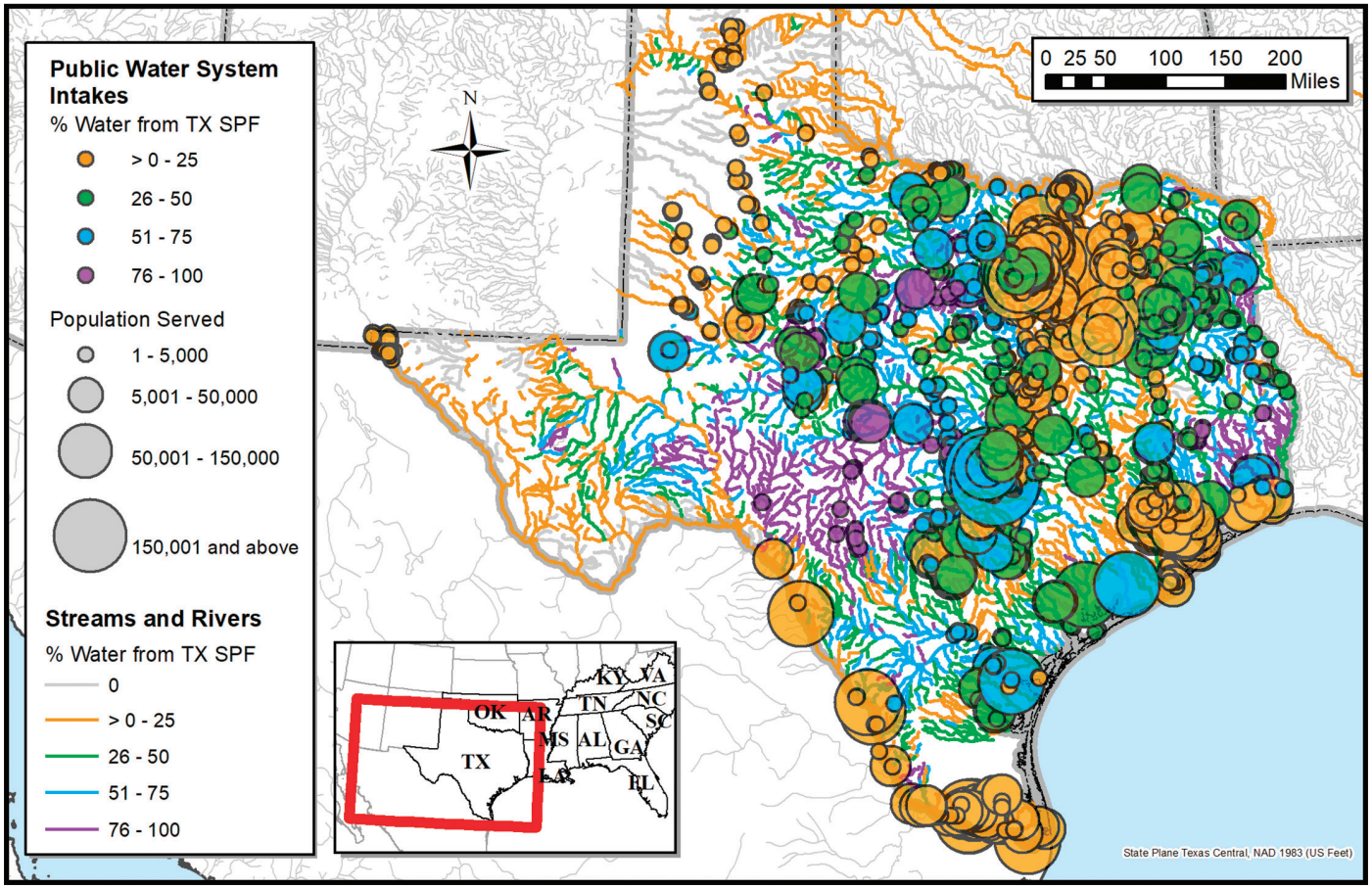


Figure A.TX.5—(A) Texas streams by percentage of Texas SPF water content, surface drinking water intakes within Texas by percentage of Texas SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 2,824 surface drinking water intakes within the State serve a population of 16,698,307 in 738 communities. Note: See figures A.TX.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Texas State and Private Forests

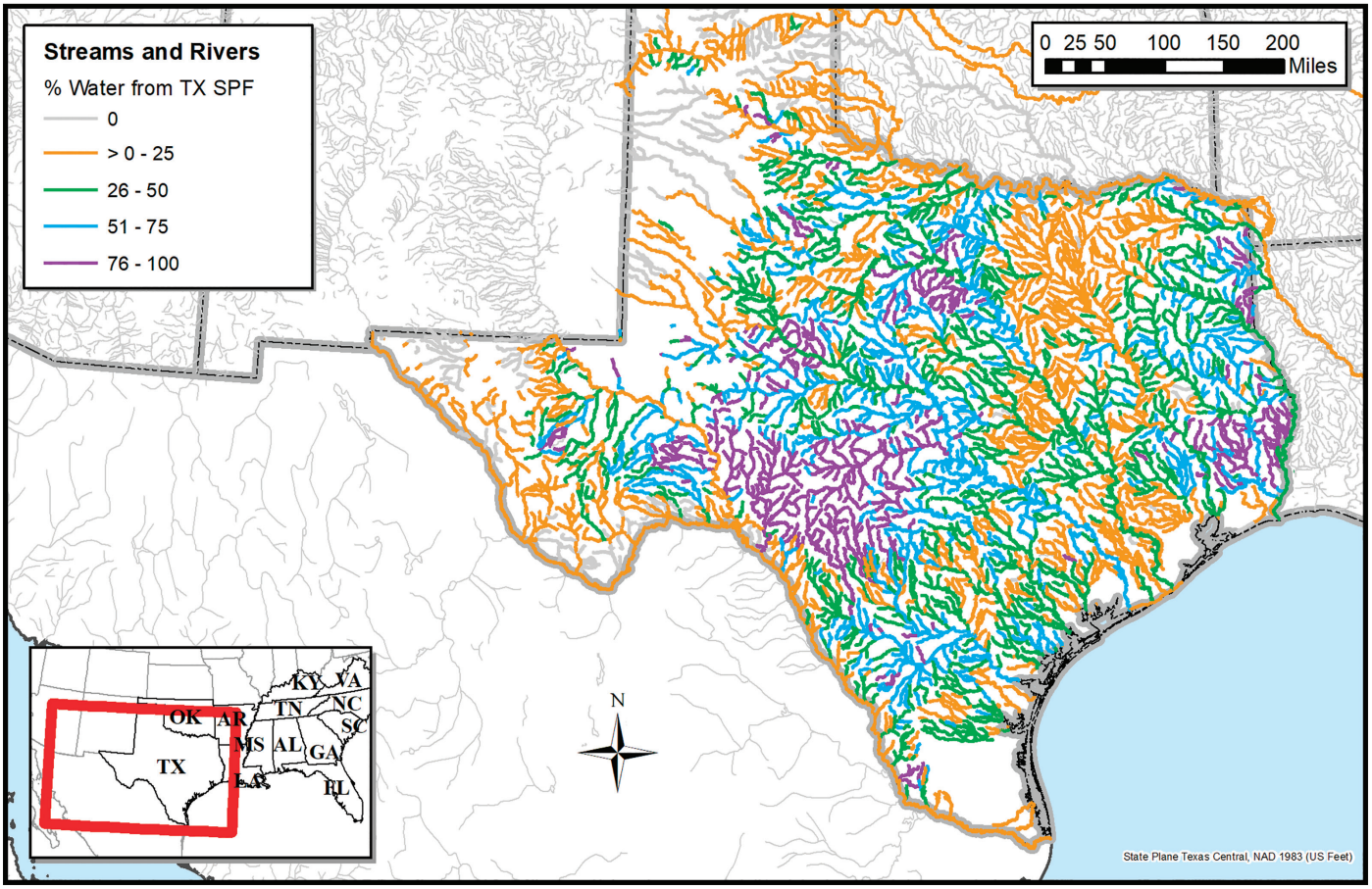


Figure A.TX.5—(B) Texas streams by percentage of Texas SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Texas State and Private Forests

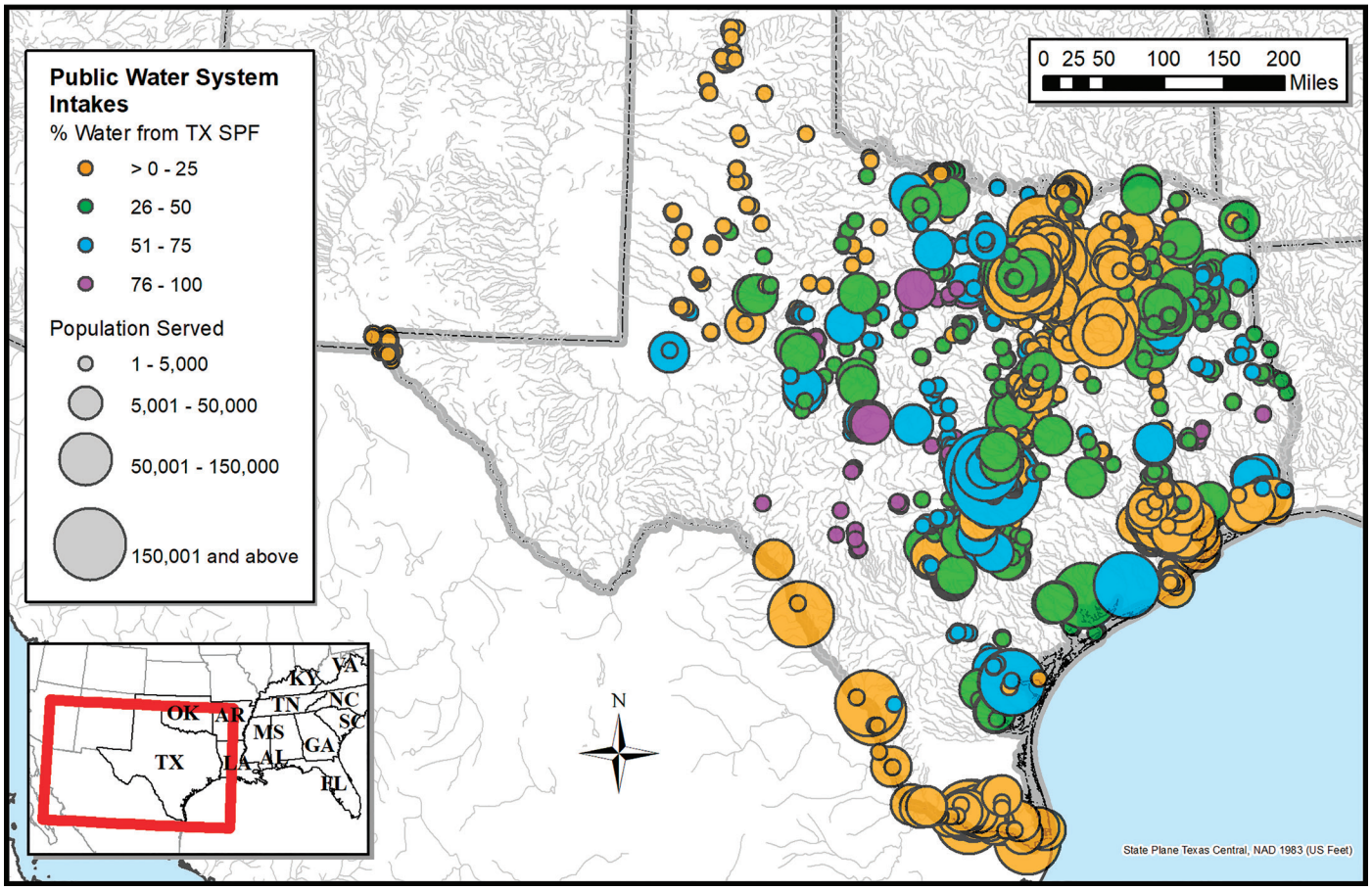


Figure A.TX.5—(C) Surface drinking water intakes within Texas by percentage of Texas SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 2,824 surface drinking water intakes within the State serve a population of 16,698,307 in 738 communities.

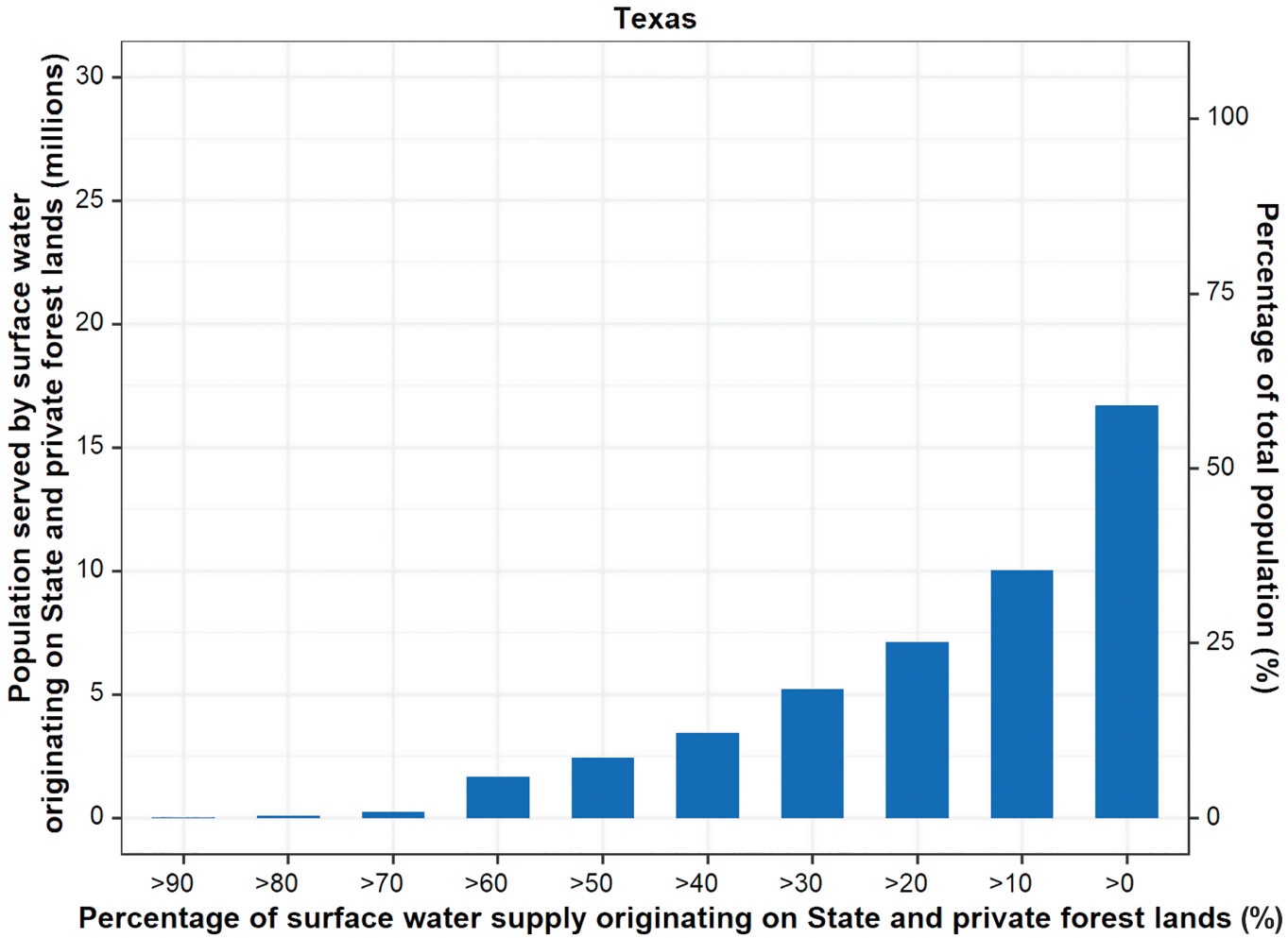


Figure A.TX.6—Cumulative frequency of population served according to percentage of water coming from Texas SPF lands.

Public Water System Intakes Outside of Texas Receiving Water from Texas State and Private Forests

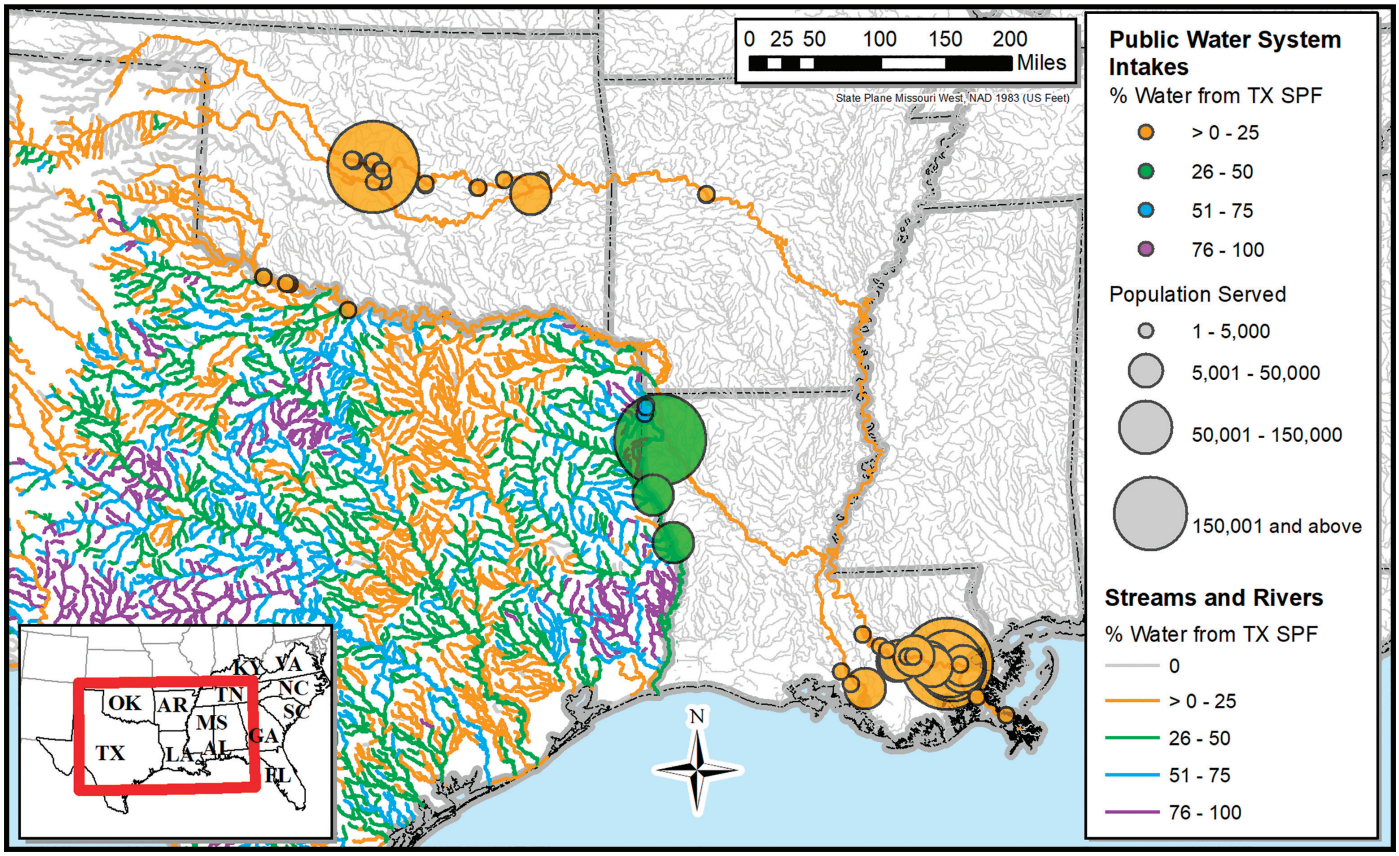


Figure A.TX.7—Texas streams by percentage of Texas SPF water content, surface drinking water intakes downstream of Texas by percentage of Texas SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 149 surface drinking water intakes outside the State but carrying Texas SPF water serve a population of 1,623,741 in 61 communities.

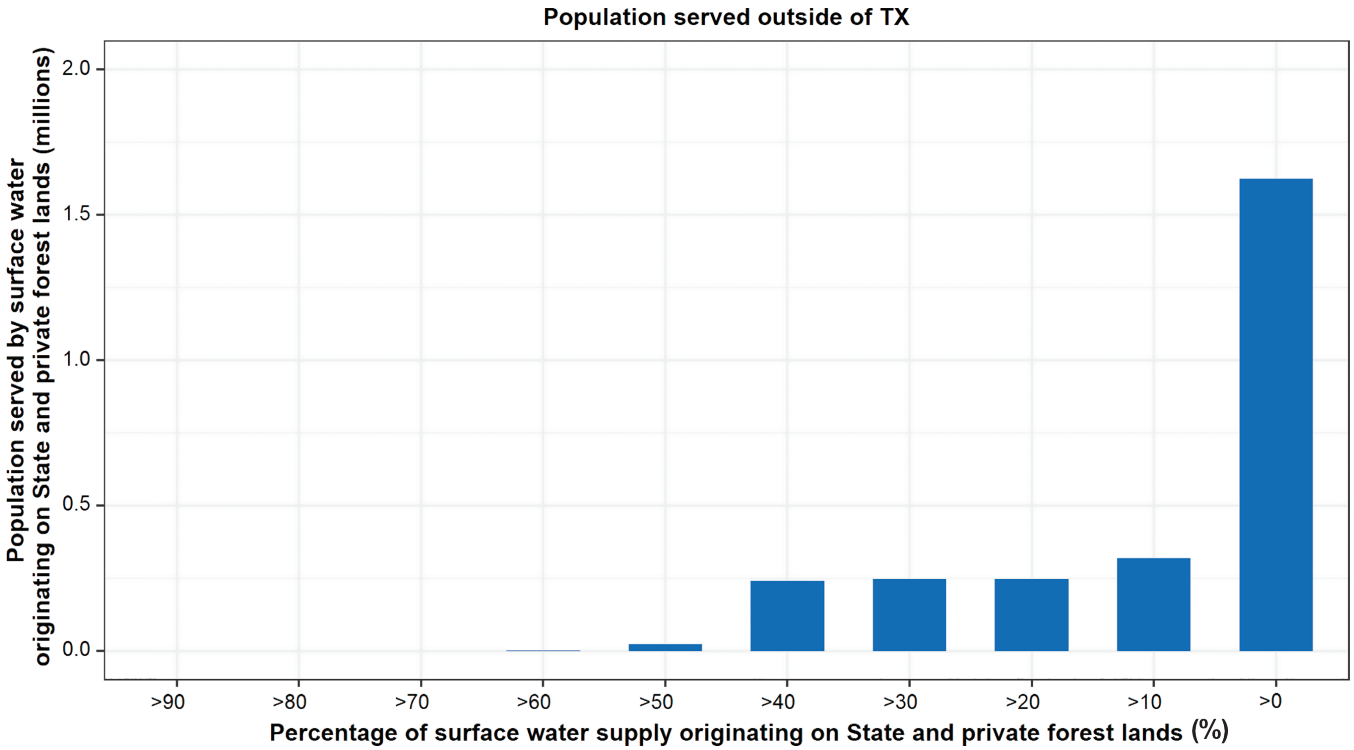


Figure A.TX.8—Cumulative frequency of non-Texas population served according to percentage of water coming from Texas SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Texas State and Private Forests

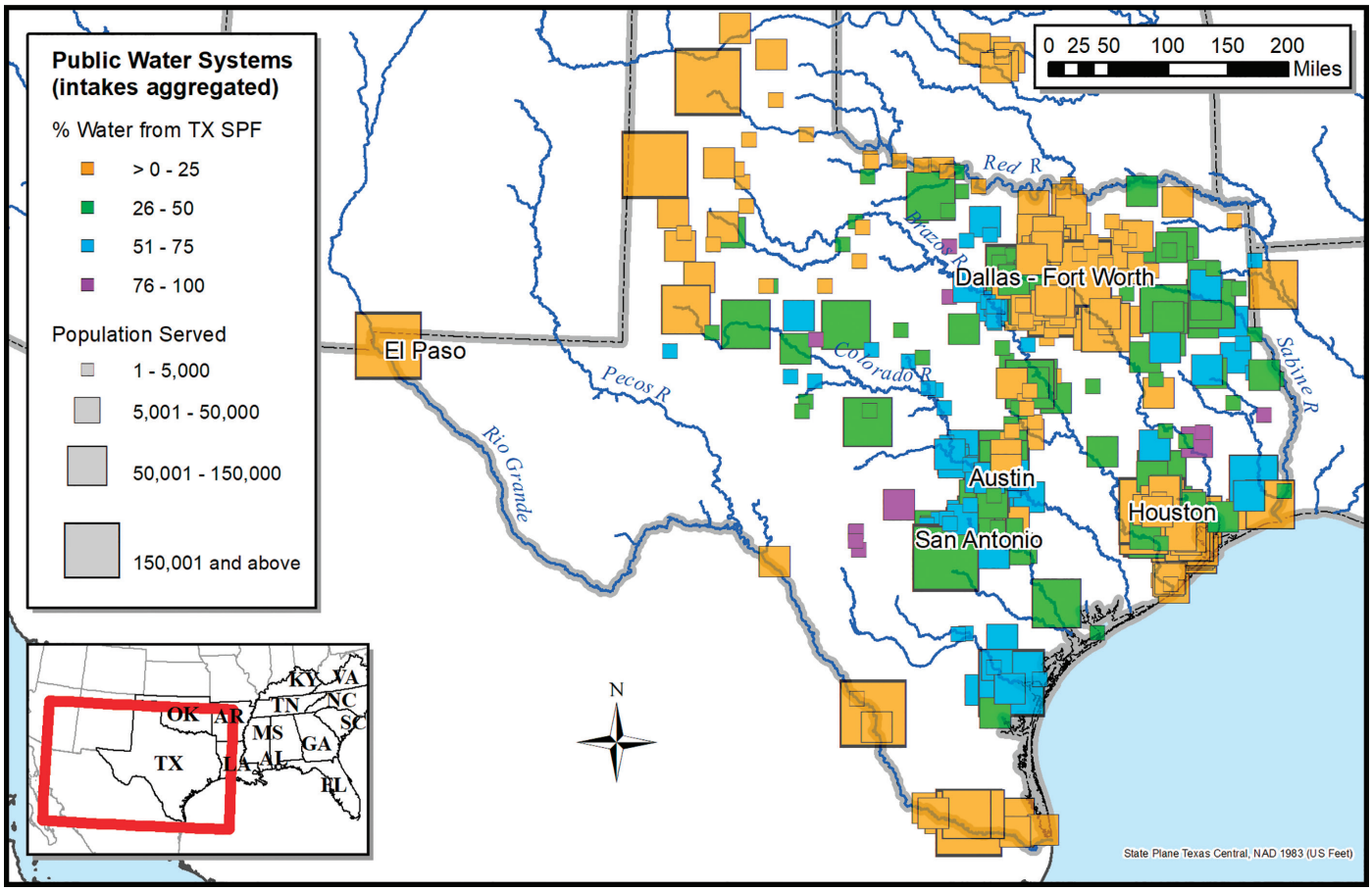


Figure A.TX.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Streams and Intrastate Public Water System Intakes in Northeastern Texas Receiving Water from Texas State and Private Forests

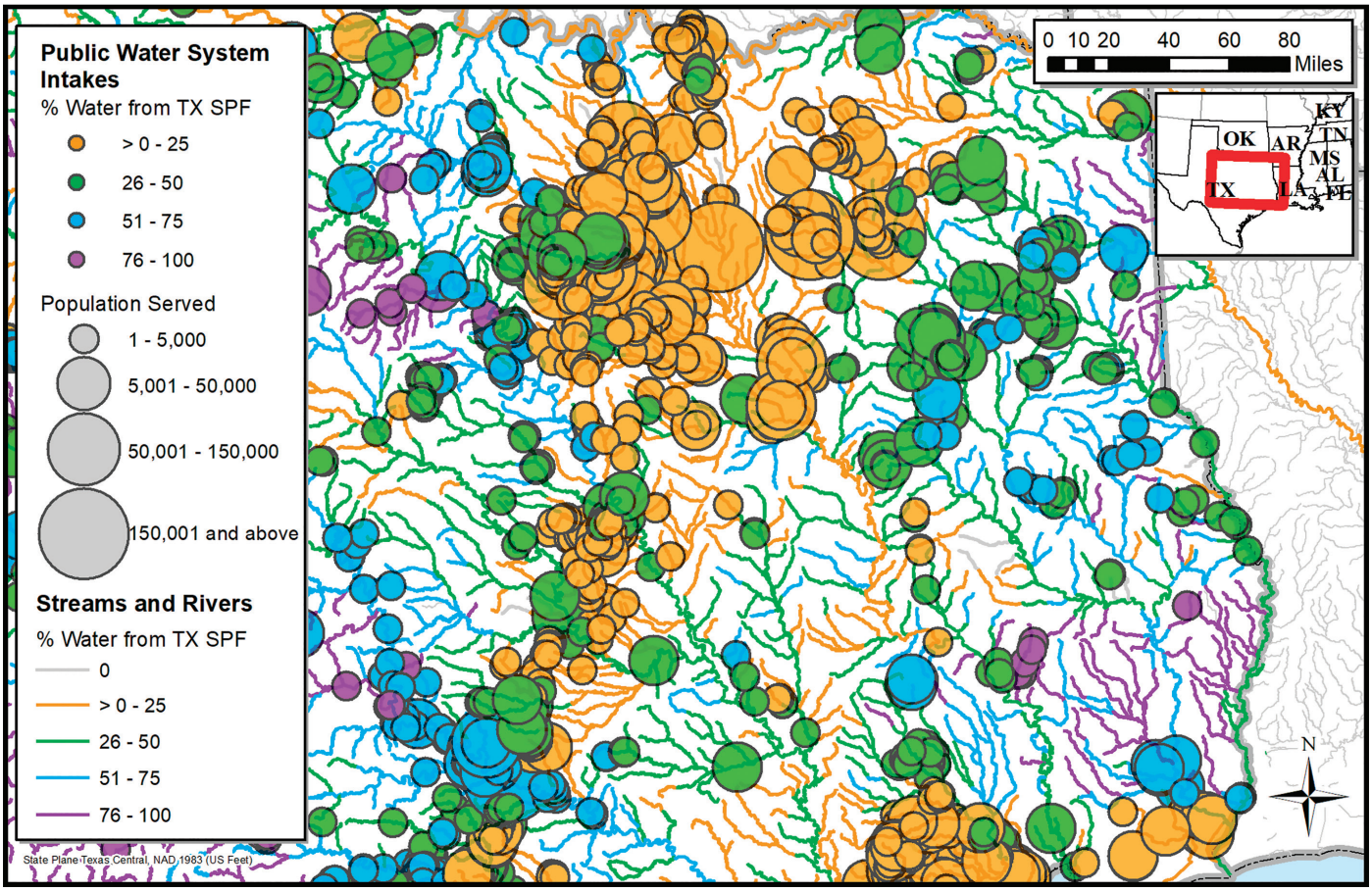


Figure A.TX.10—Local-scale detail showing percentage of water from Texas SPF for streams and surface drinking water intakes in northeastern Texas.

San Antonio-Austin Detail

Streams and Intrastate Public Water System Intakes in San Antonio-Austin Area Receiving Water from Texas State and Private Forests

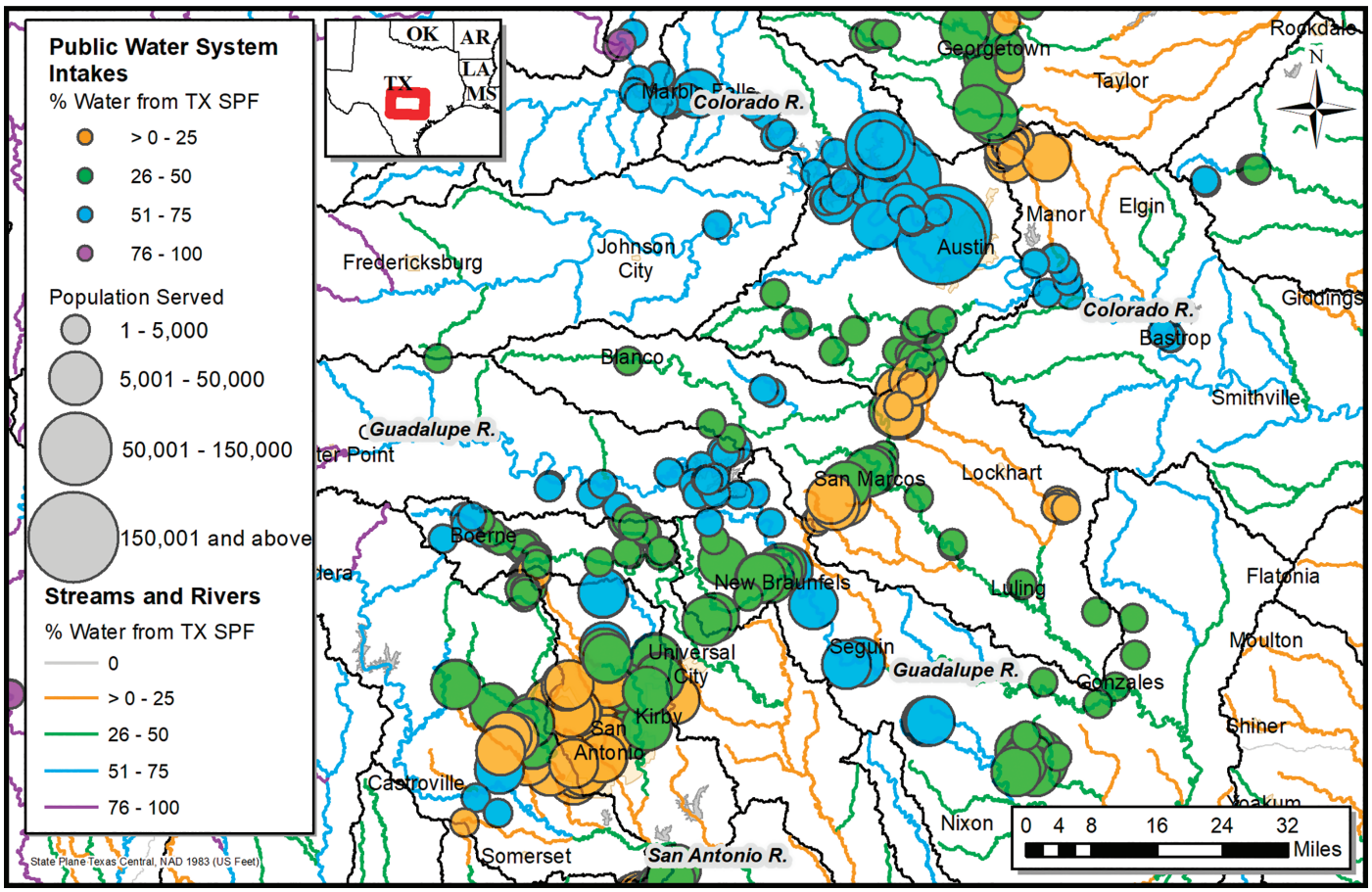


Figure A.TX.11—Local-scale detail showing percentage of water from Texas SPF for streams and surface drinking water intakes around San Antonio and Austin, TX.

Dallas-Ft. Worth Detail

Streams and Intrastate Public Water System Intakes in Dallas-Ft. Worth Area Receiving Water from Texas State and Private Forests

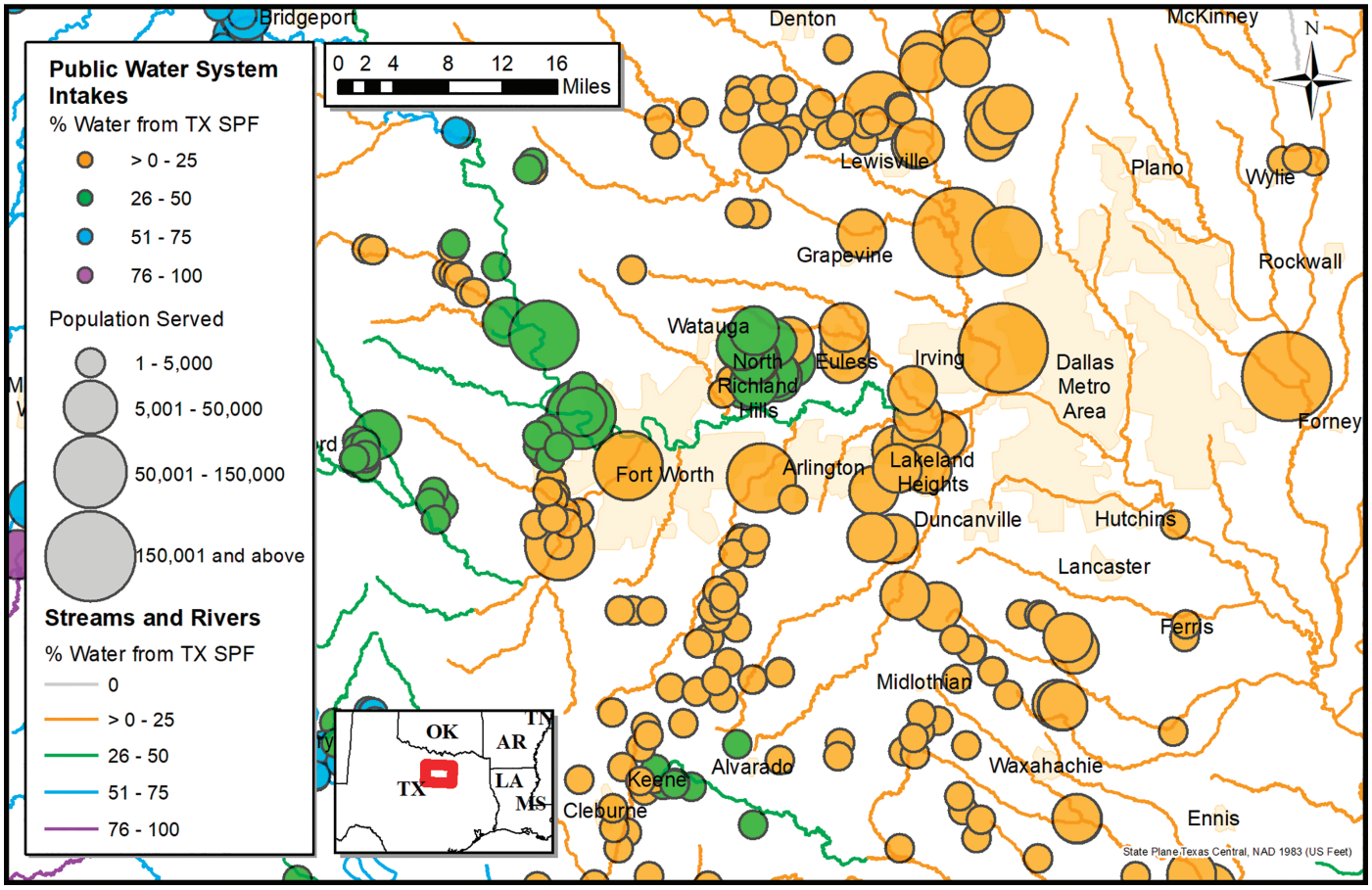


Figure A.TX.12—Local-scale detail showing percentage of water from Texas SPF for streams and surface drinking water intakes around Dallas-Fort Worth, TX.

Houston Detail

Streams and Intrastate Public Water System Intakes in Houston Area Receiving Water from Texas State and Private Forests

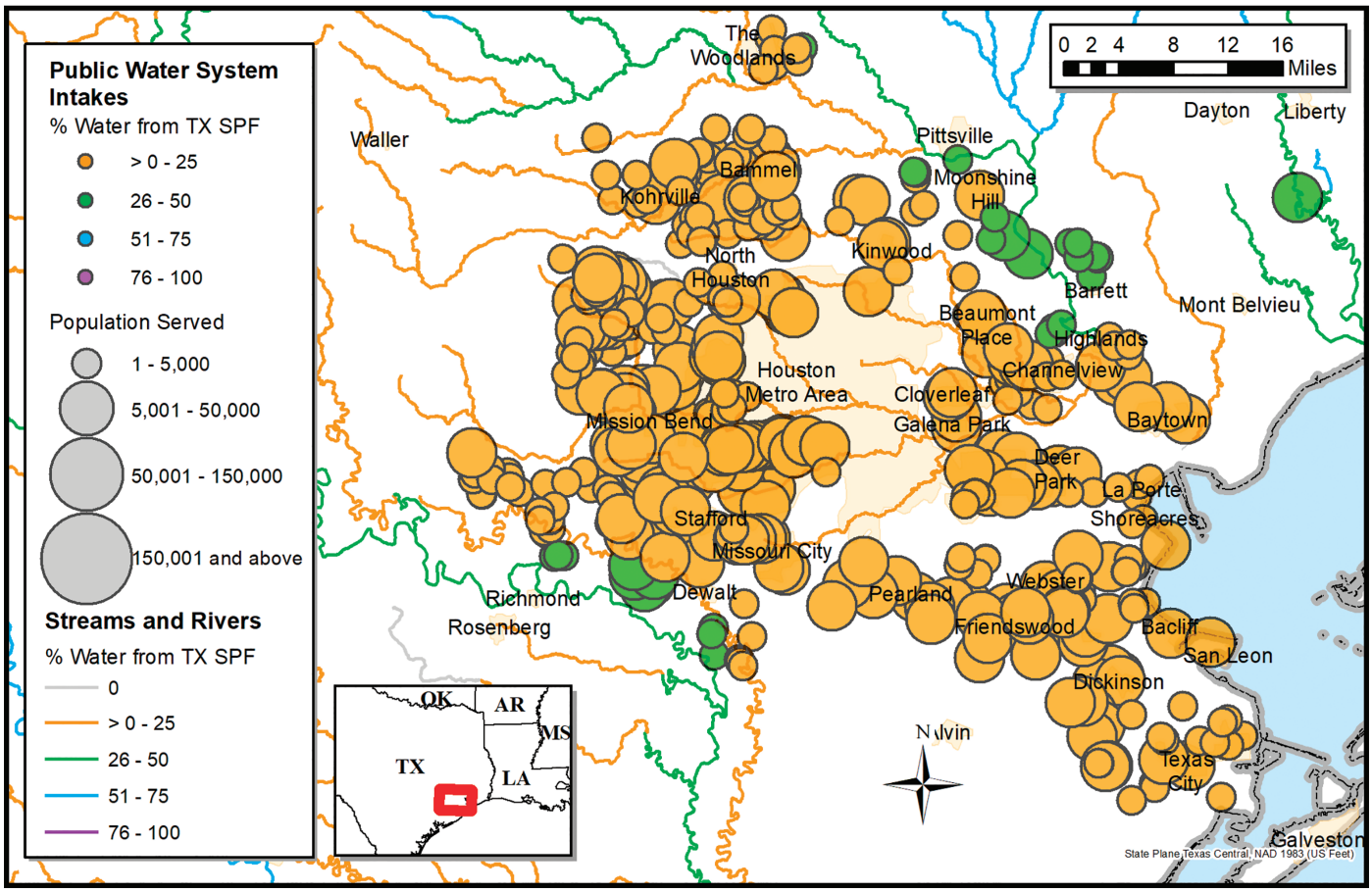


Figure A.TX.13—Local-scale detail showing percentage of water from Texas SPF for streams and surface drinking water intakes around Houston, TX.

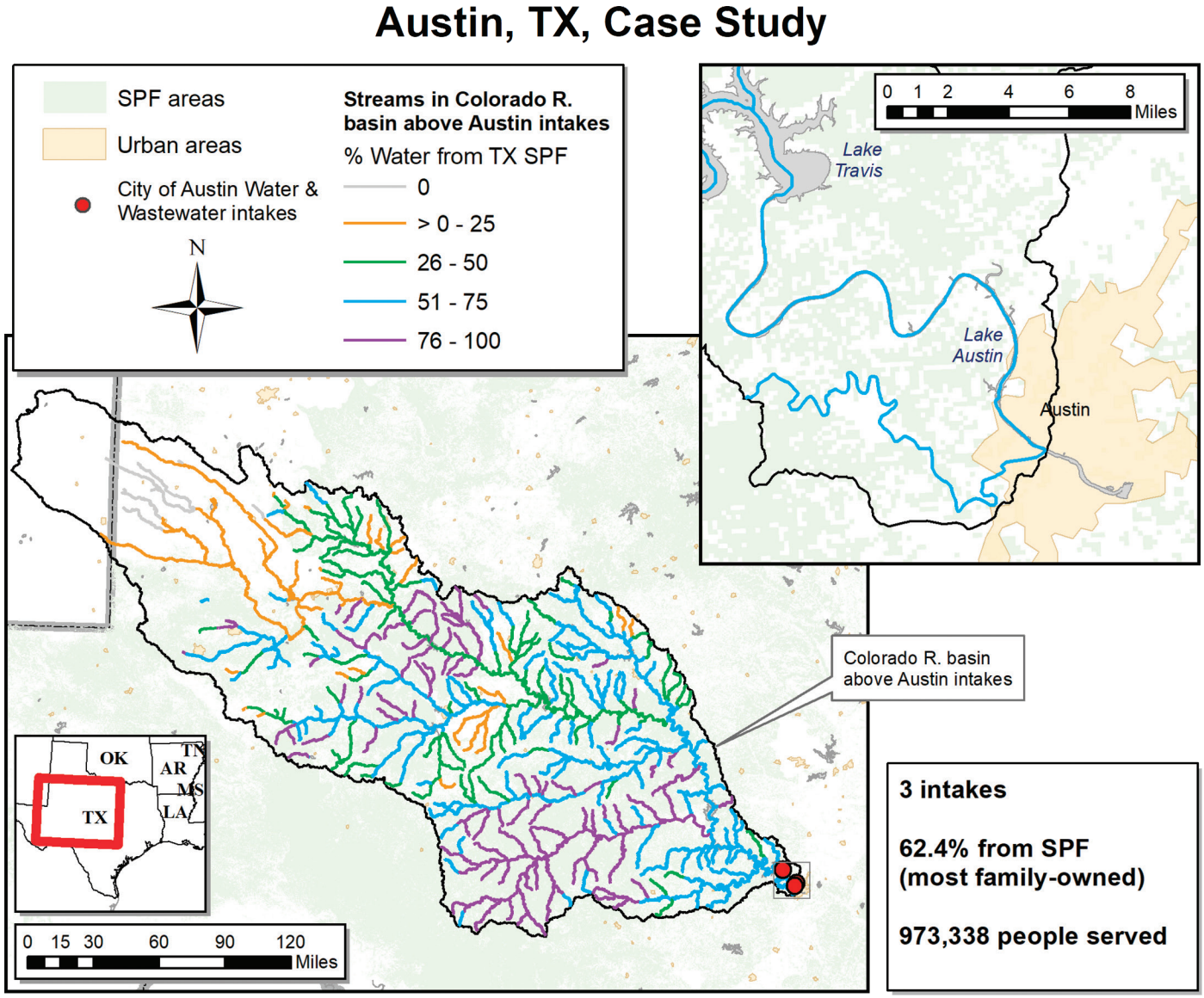


Figure A.TX.14—Case study of the City of Austin Water & Wastewater public water supply system, Austin, TX, illustrating SPF water in streams supplying the three surface drinking water intakes. When this water reaches the intakes, 62.4 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.

STATE OF VIRGINIA

Summary

State and private forest (SPF) lands cover about 49.6 percent of Virginia (figs. A.VA.1 and A.VA.2; table A.VA.1). About 47.4 percent of all Virginia surface water originates on SPF lands (fig. A.VA.3). The majority of SPF land area is in, and surface water is from, family-owned forests, accounting for about 68.6 percent of the land area of SPF and 68.3 percent of surface water from SPF. Corporate-owned forests contribute 23.7 percent of surface water from SPF and account for 23.6 percent of land area of SPF. Average annual water yield in Virginia is about 388 mm (fig. A.VA.4). Virginia has a total of 429 surface drinking water intakes where at least some available water comes from SPF (fig. A.VA.5). While about 51.5 percent of the total population of Virginia is served by surface drinking water overall, Virginia SPF surface drinking water serves about 50.1 percent of the State population, or 4.3 million people, to some degree. About 1.1 million people in Virginia are getting more than half of their surface drinking water from SPF within the State (fig. A.VA.6). State and private forest lands in Virginia also supply water to 300 surface drinking water intakes in other States (Alabama, Illinois, Indiana, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, and West Virginia) (fig. A.VA.7), which collectively serve about 5.9 million people in 196 communities (fig. A.VA.8). Many public water systems in Virginia utilize more than one surface drinking water intake; these systems are shown (intakes aggregated) in figure A.VA.9 by population served (symbol size) and percentage of water from SPF lands in Virginia (symbol color). The detail maps of northern, southeastern, and southwestern Virginia (figs. A.VA.10–A.VA.12) add clarity on the hydrology, surface drinking water intakes, water originating on SPF lands, and population centers in areas where there is complex intersection between public water supply systems and population served. A case study (fig. A.VA.13) of the City of Richmond public water supply system presents an example of the important role SPF lands play in providing water supply to a single community in Virginia, where a single surface drinking water intake receives about 49.2 percent of its water from SPF and serves about 0.2 million people.

Table A.VA.1—Land area by land cover and forest ownership type in Virginia

Land cover	**Land area** (km^2)	**Land area** (acres)
Forest	65 964	16,299,905
Nonforest	42 628	10,533,470
Forest ownership type[a]	**Land area** (km^2)	**Land area** (acres)
Federal (public)	12 109	2,992,211
Tribal (public)	0	0
State (public)	2269	560,567
Local (public)	1028	254,005
Corporate (private)	12 725	3,144,416
Family (private)	36 962	9,133,421
Other private	871	215,285

[a] State and private forest land comprises State, local, corporate, family, and other private (the last two also referred to together as nonindustrial private forest, or NIPF). Corporate ownership lands include forest land owned by forest industry as well as other corporate entities such as Timber Investment Management Organizations and Real Estate Investment Trusts (TIMOs and REITs, respectively).

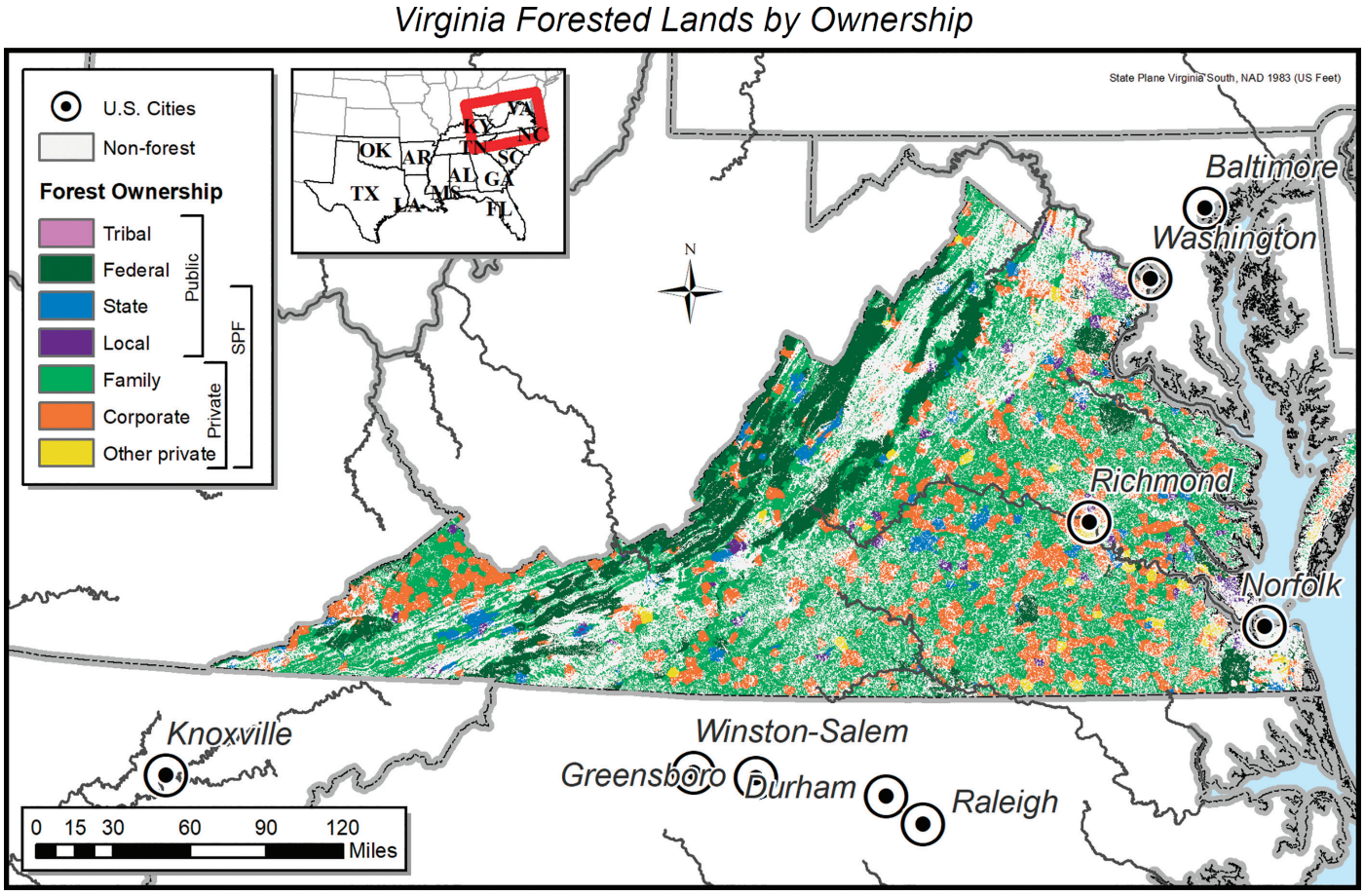


Figure A.VA.1—Virginia nonforest land and forest lands by ownership, ca. 2014. Forest ownership data source: raster dataset by Hewes and others (2017); see report for more discussion of data derivation and accuracy.

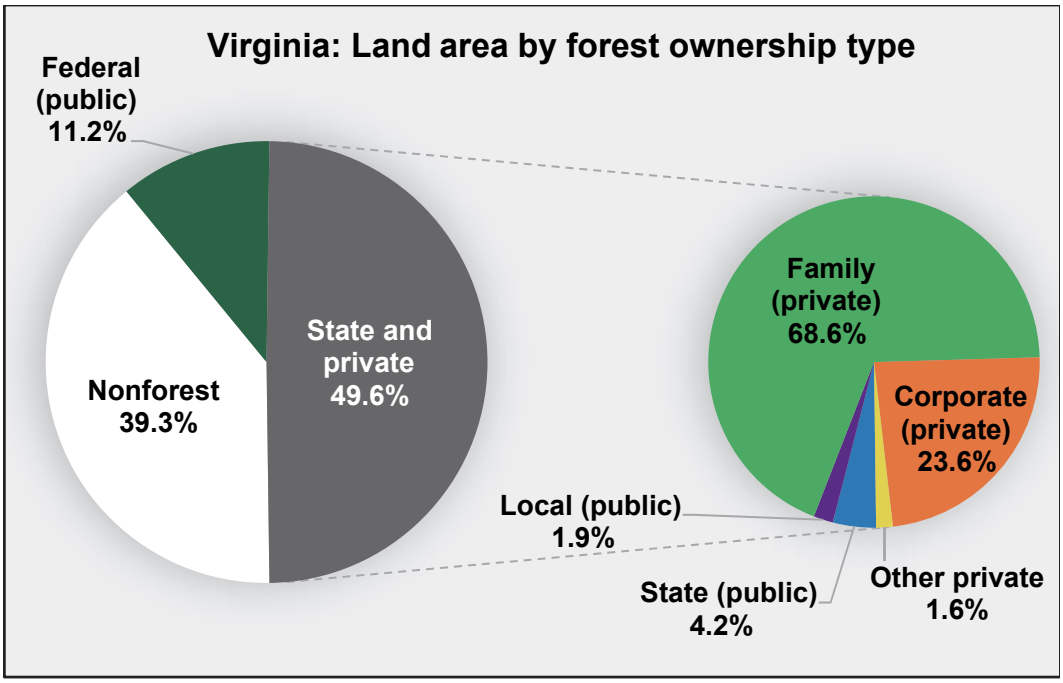


Figure A.VA.2—Land area percentages by forest ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

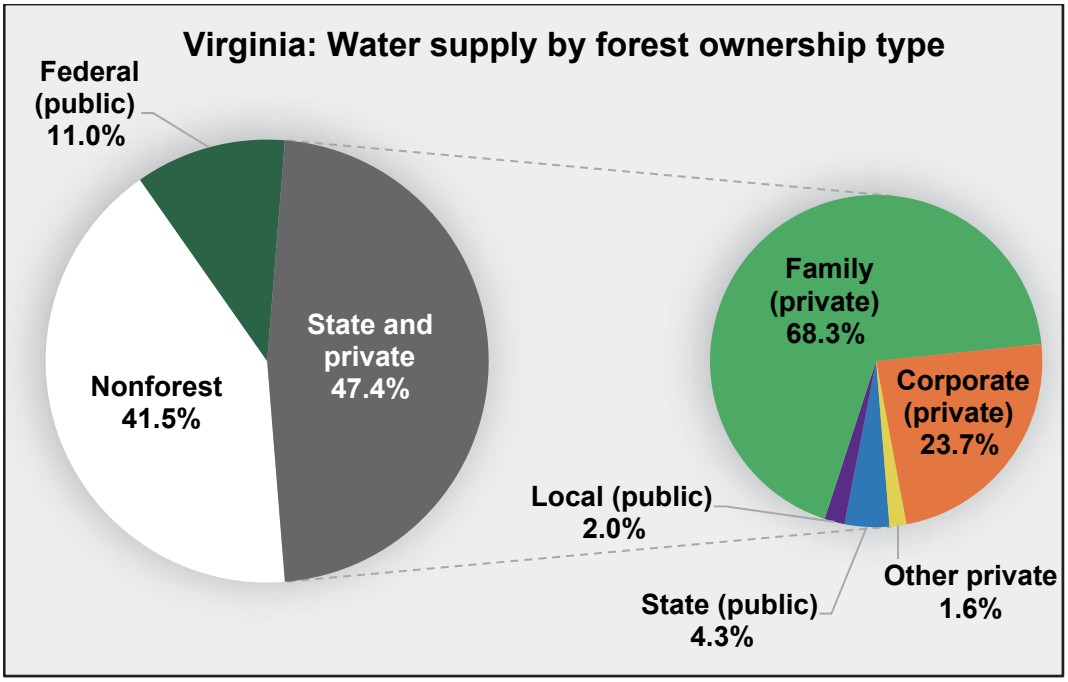


Figure A.VA.3—Percentage of Virginia's water supply deriving from nonforest lands and forest lands of different ownership, ca. 2014. In the smaller circle, percentages represent portion of SPF total for each ownership category. Note: Due to rounding, percentages may not total exactly 100.

Virginia

2001-2010 Mean Annual Water Yield by 12-Digit Hydrologic Unit

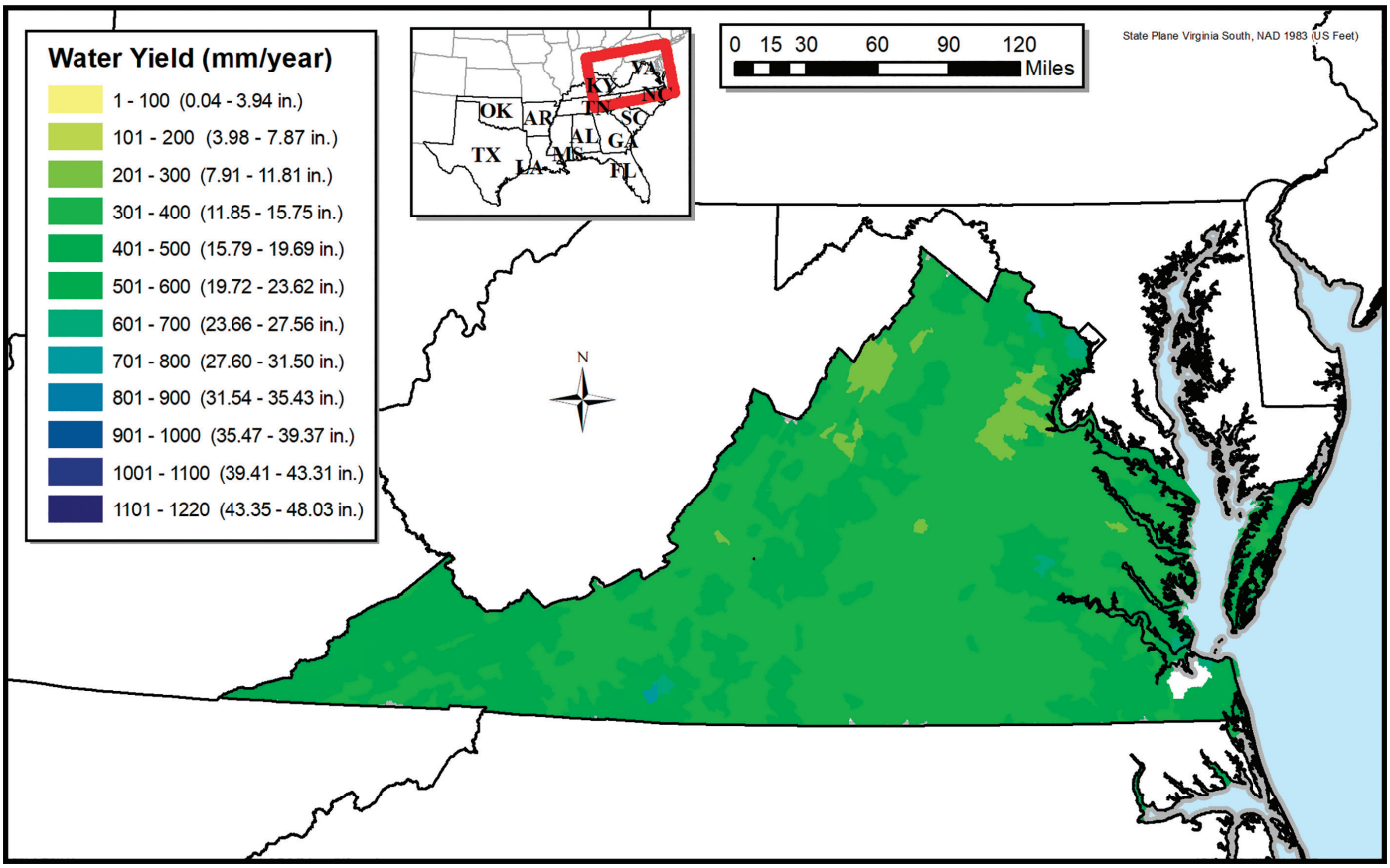


Figure A.VA.4—Estimated mean annual water yield by 12-digit hydrologic units in Virginia, 2001–2010. Hydrologic Unit Codes (HUC) use number of digits to represent watersheds of different scales. A 12-digit HUC (HUC12) represents a small local watershed. For explanation of water yield and how it is derived, see report.

(A) Streams and Intrastate Public Water System Intakes Receiving Water from Virginia State and Private Forests

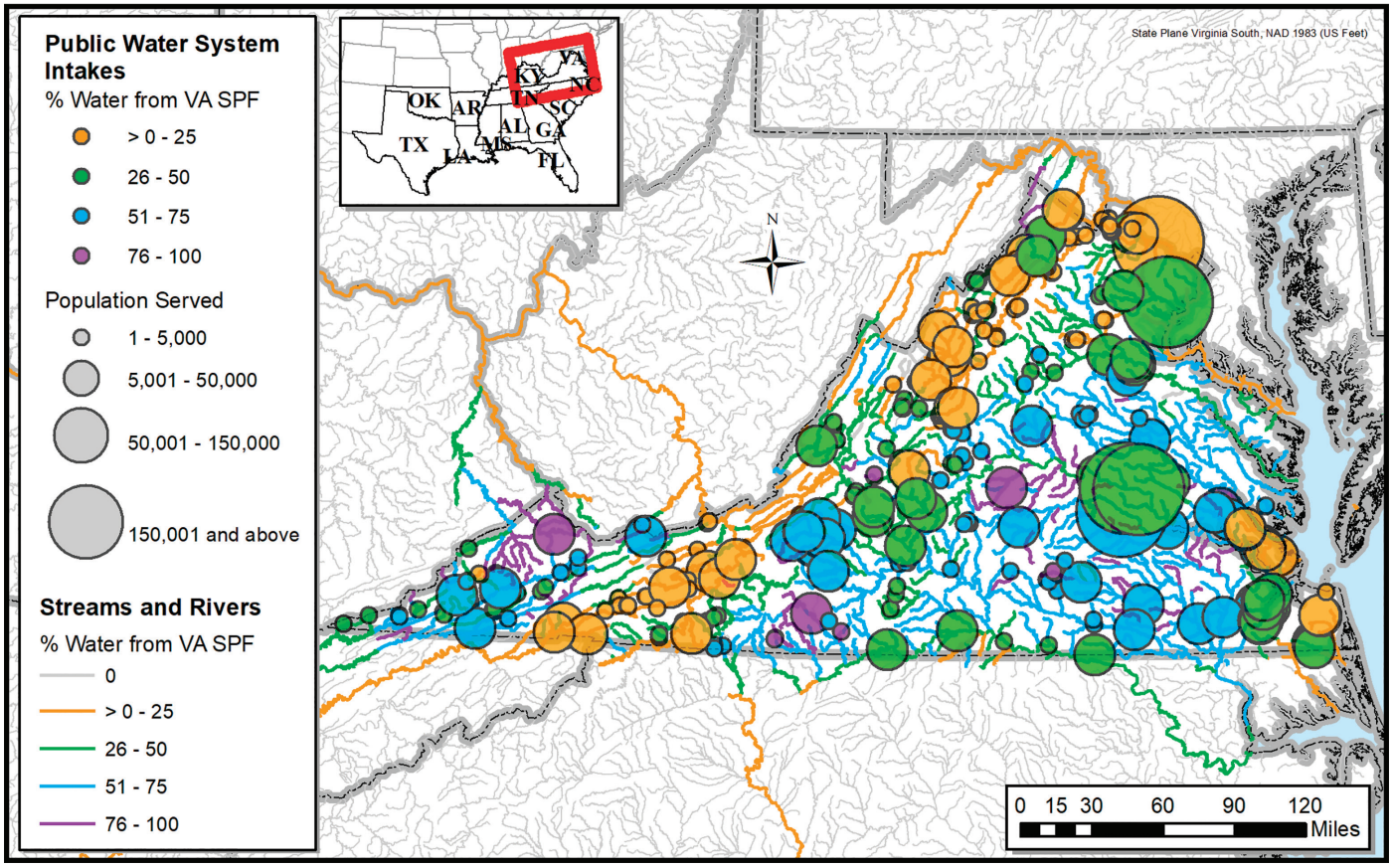


Figure A.VA.5—(A) Virginia streams by percentage of Virginia SPF water content, surface drinking water intakes within Virginia by percentage of Virginia SPF surface water available at intake (symbol color), and population served by each intake (symbol size). A total of 429 surface drinking water intakes within the State serve a population of 4,289,377 in 164 communities. Note: See figures A.VA.5 parts B and C on separate pages for streams and intakes only.

(B) Streams Receiving Water from Virginia State and Private Forests

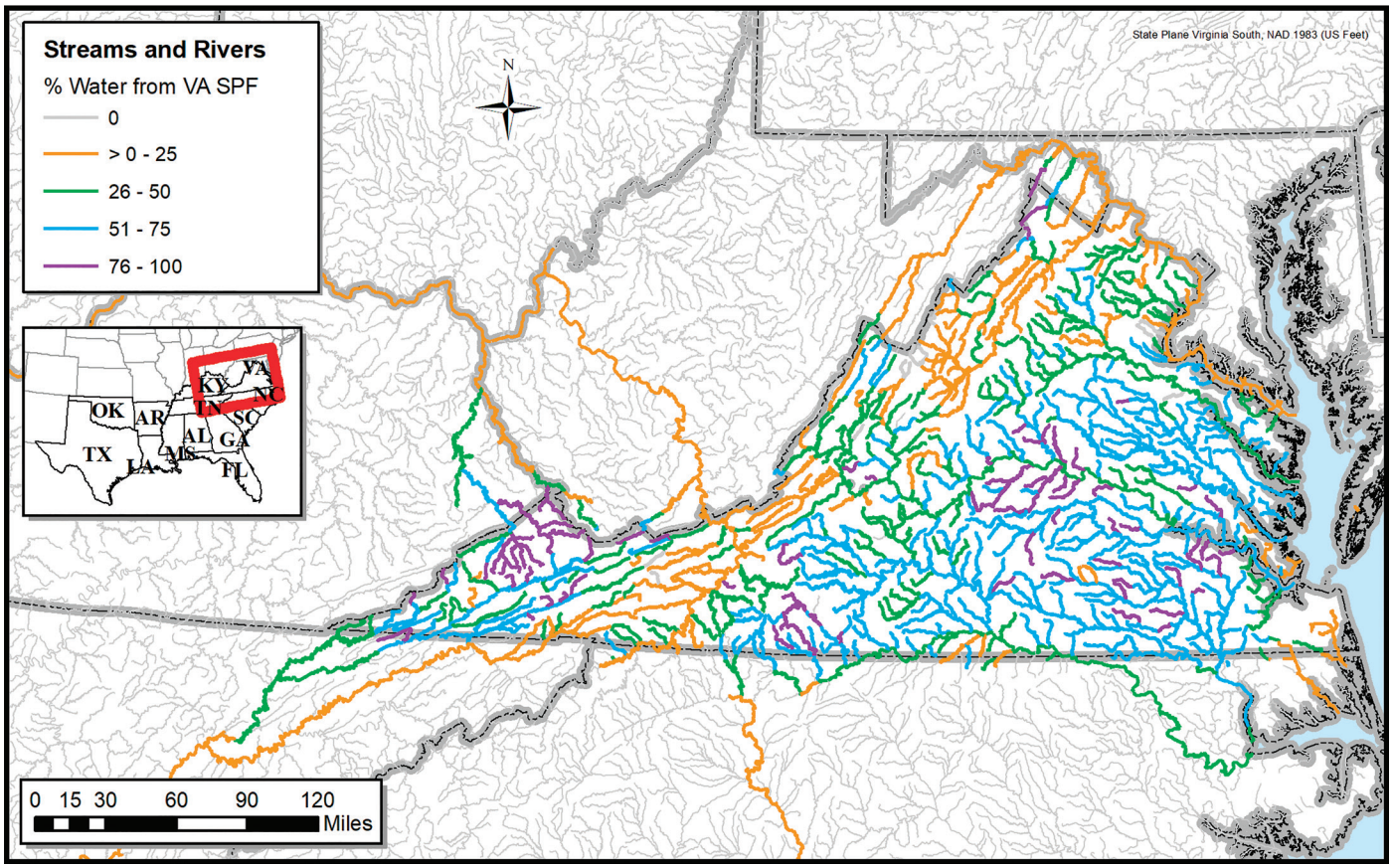


Figure A.VA.5—(B) Virginia streams by percentage of Virginia SPF water content.

(C) Intrastate Public Water System Intakes Receiving Water from Virginia State and Private Forests

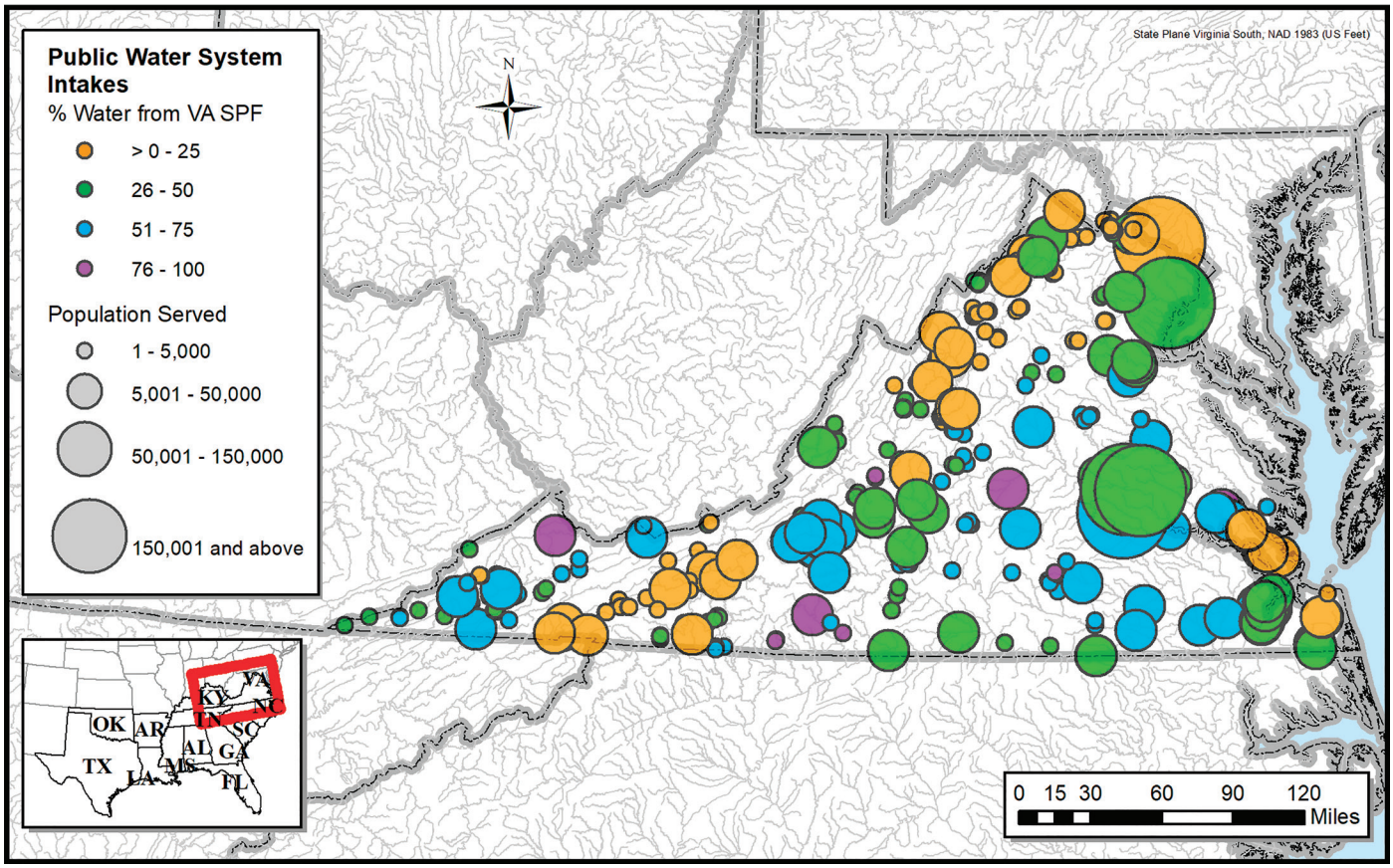


Figure A.VA.5—(C) Surface drinking water intakes within Virginia by percentage of Virginia SPF surface water available at intake (symbol color) and population served by each intake (symbol size). A total of 429 surface drinking water intakes within the State serve a population of 4,289,377 in 164 communities.

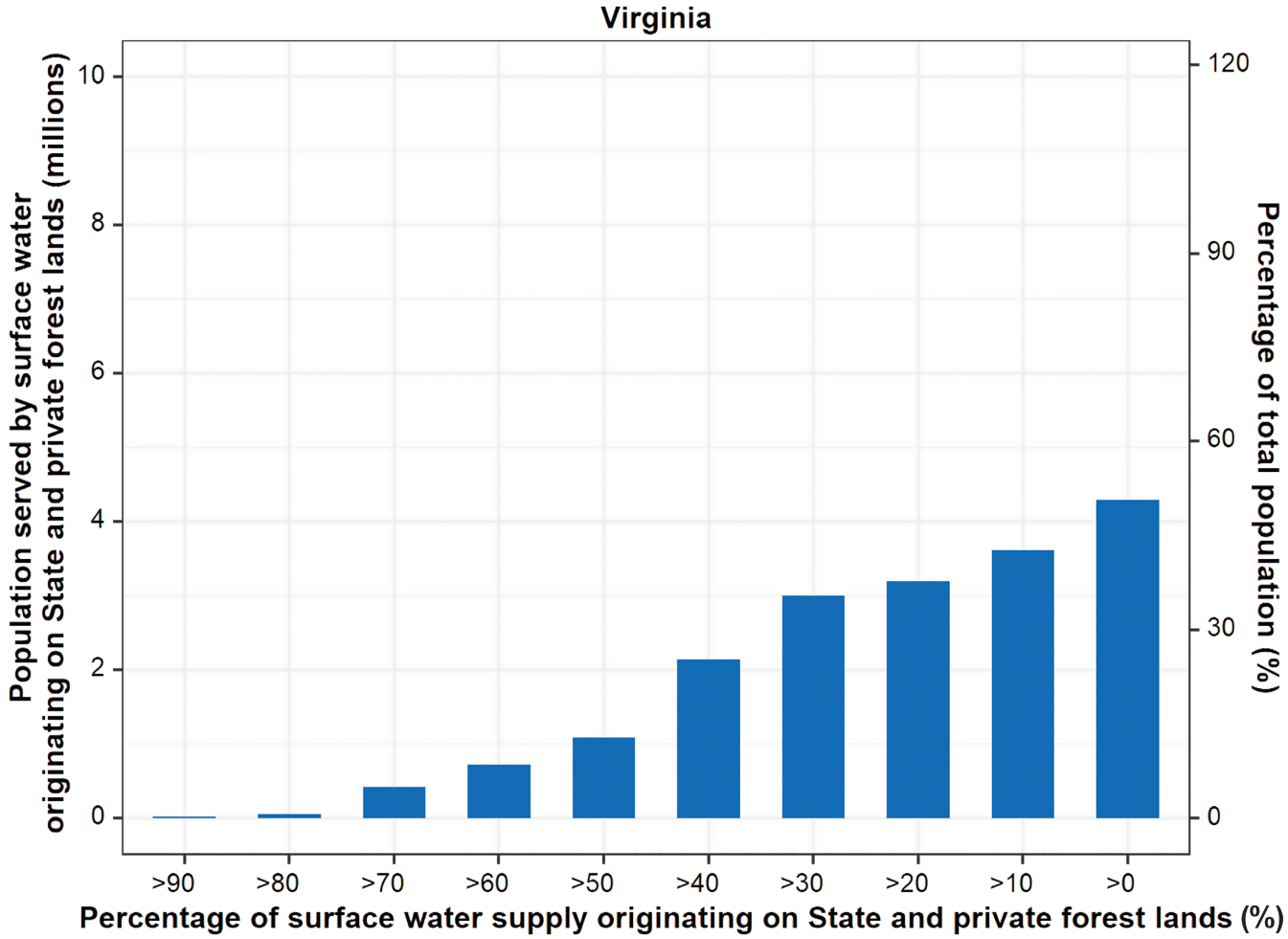


Figure A.VA.6—Cumulative frequency of population served according to percentage of water coming from Virginia SPF lands.

Public Water System Intakes Outside of Virginia Receiving Water from Virginia State and Private Forests

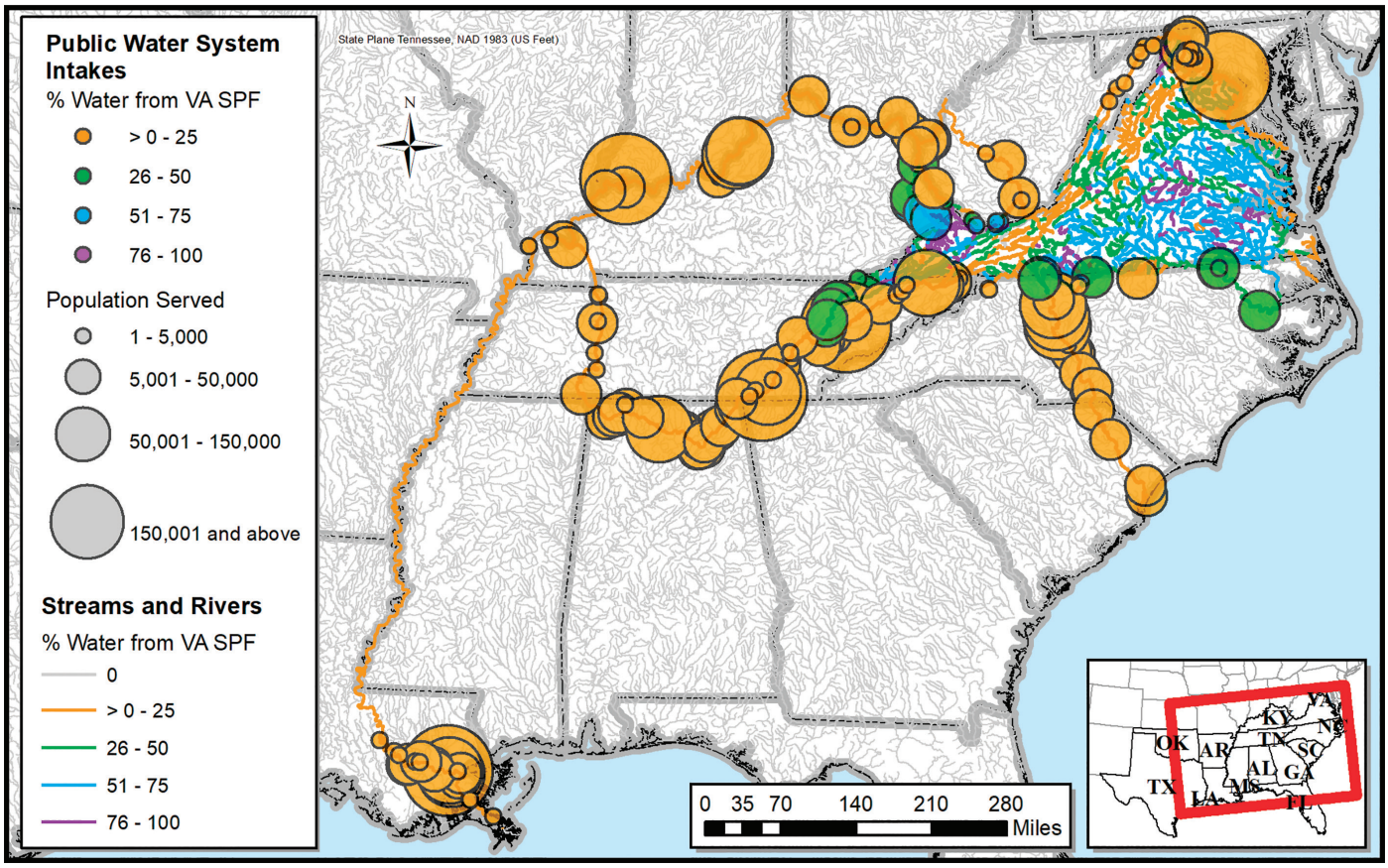


Figure A.VA.7—Virginia streams by percentage of Virginia SPF water content, surface drinking water intakes downstream of Virginia by percentage of Virginia SPF water content (symbol color), and population served by each of these external intakes (symbol size). A total of 300 surface drinking water intakes outside the State but carrying Virginia SPF water serve a population of 5,939,258 in 196 communities.

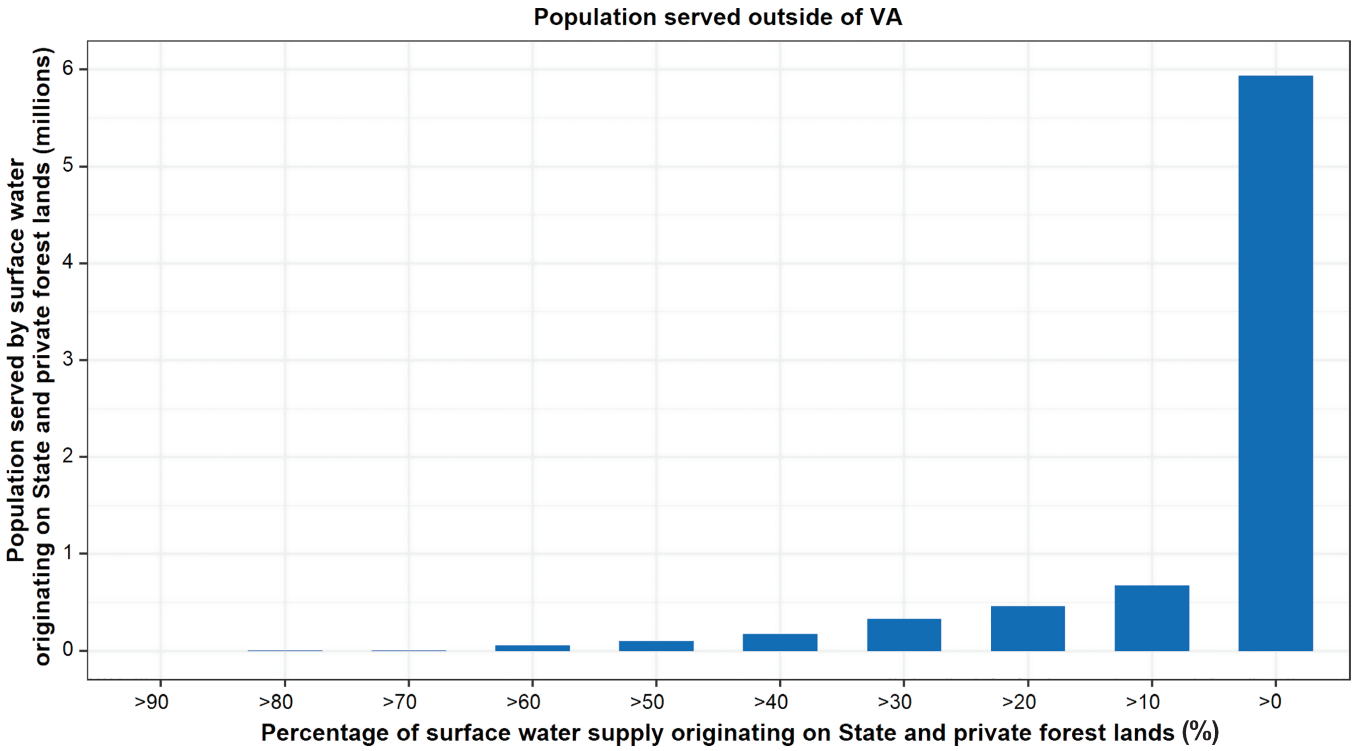


Figure A.VA.8—Cumulative frequency of non-Virginia population served according to percentage of water coming from Virginia SPF lands.

Multi-Intake Public Water Systems (Aggregated to Single Symbol)
Receiving Water from Virginia State and Private Forests

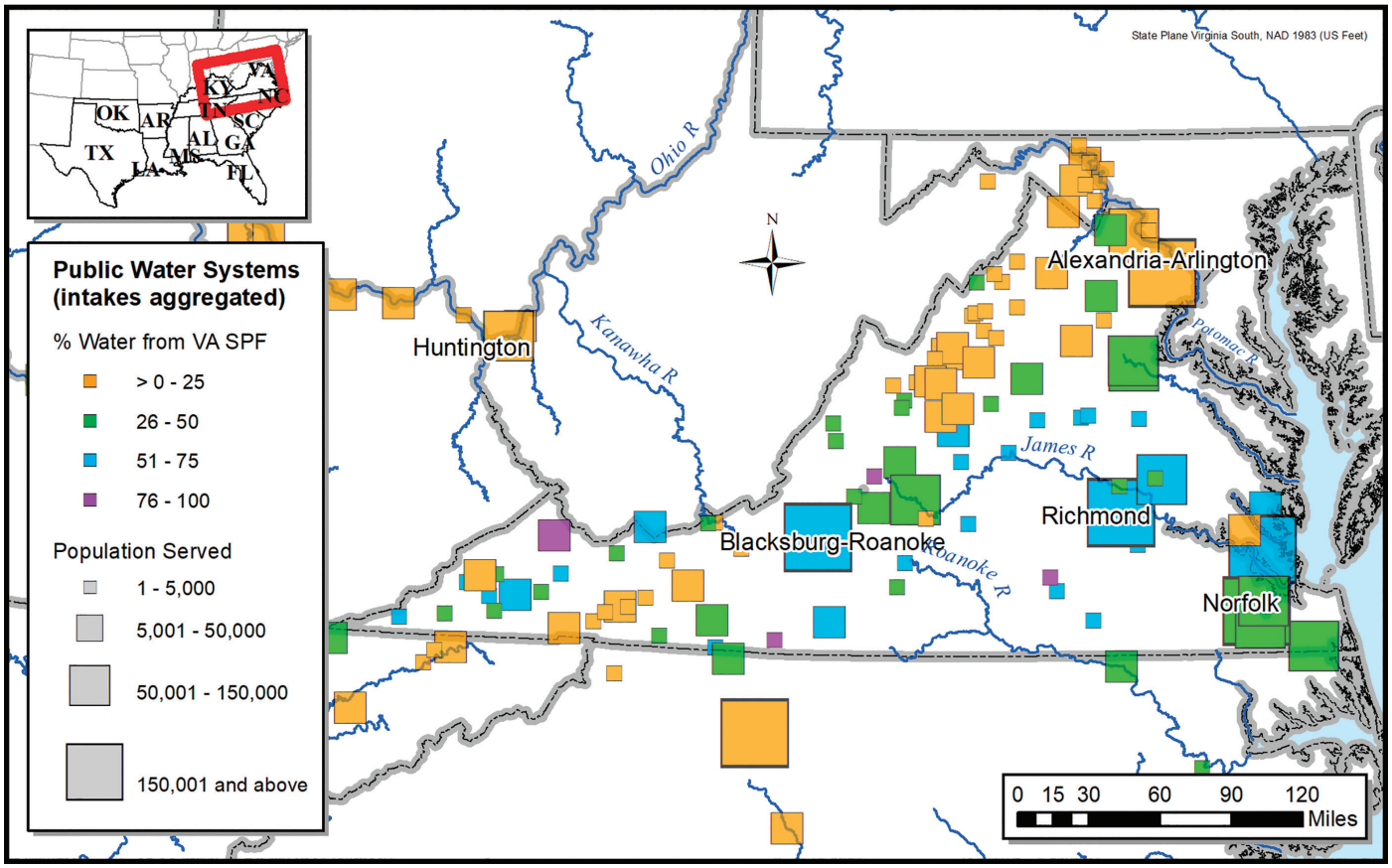


Figure A.VA.9—Multi-intake public water systems aggregated to single data point. Symbol color and size represent values for an entire municipal or corporate water supply system rather than values for individual surface drinking water intakes. Systems with no more than a single surface drinking water intake are not represented on this map.

Northern Virginia Detail

Streams and Intrastate Public Water System Intakes in Northeastern Virginia Receiving Water from Virginia State and Private Forests

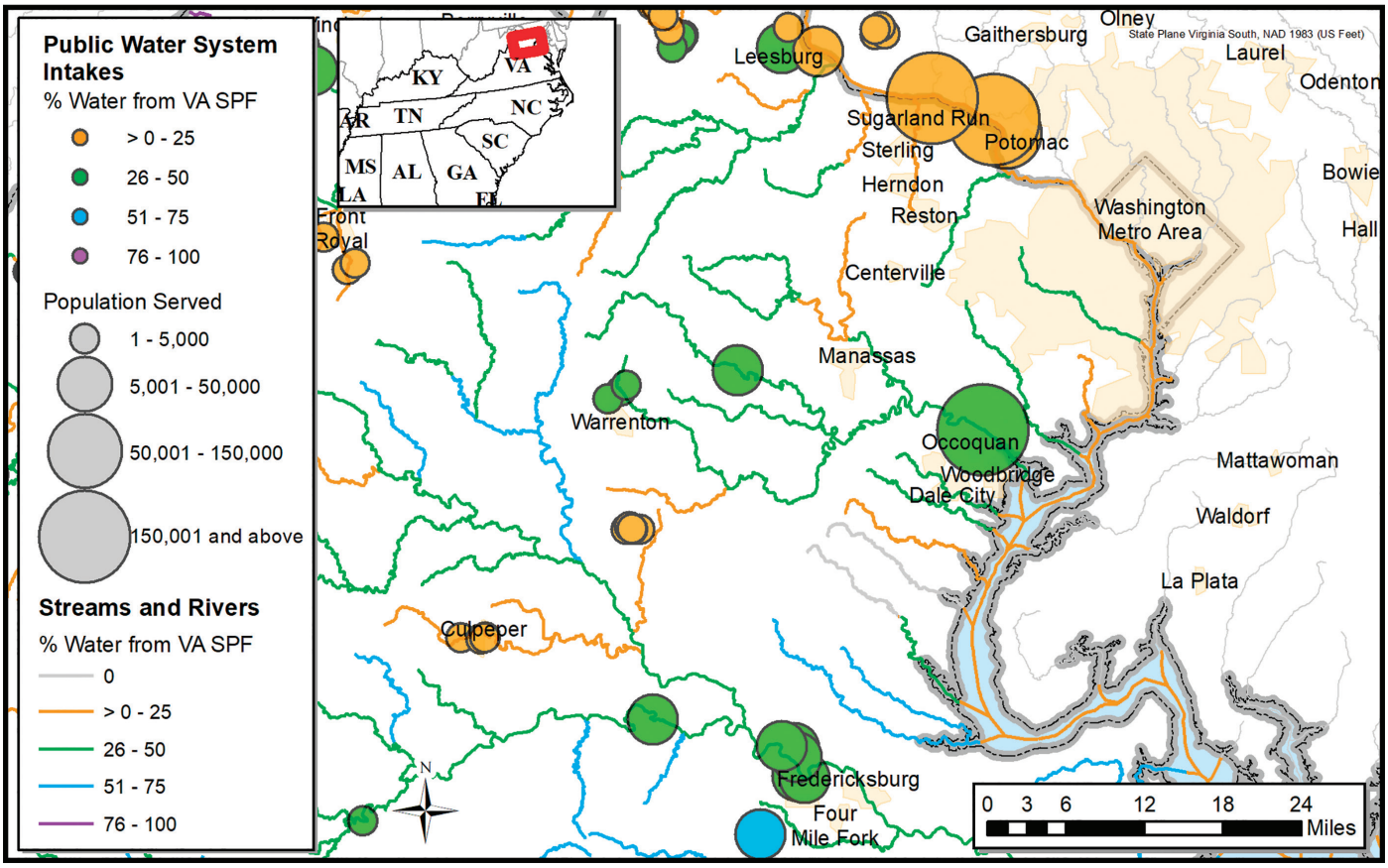


Figure A.VA.10—Local-scale detail showing percentage of water from Virginia SPF for streams and surface drinking water intakes in northern Virginia.

Southeastern Virginia Detail

Streams and Intrastate Public Water System Intakes in Southeastern Virginia Receiving Water from Virginia State and Private Forests

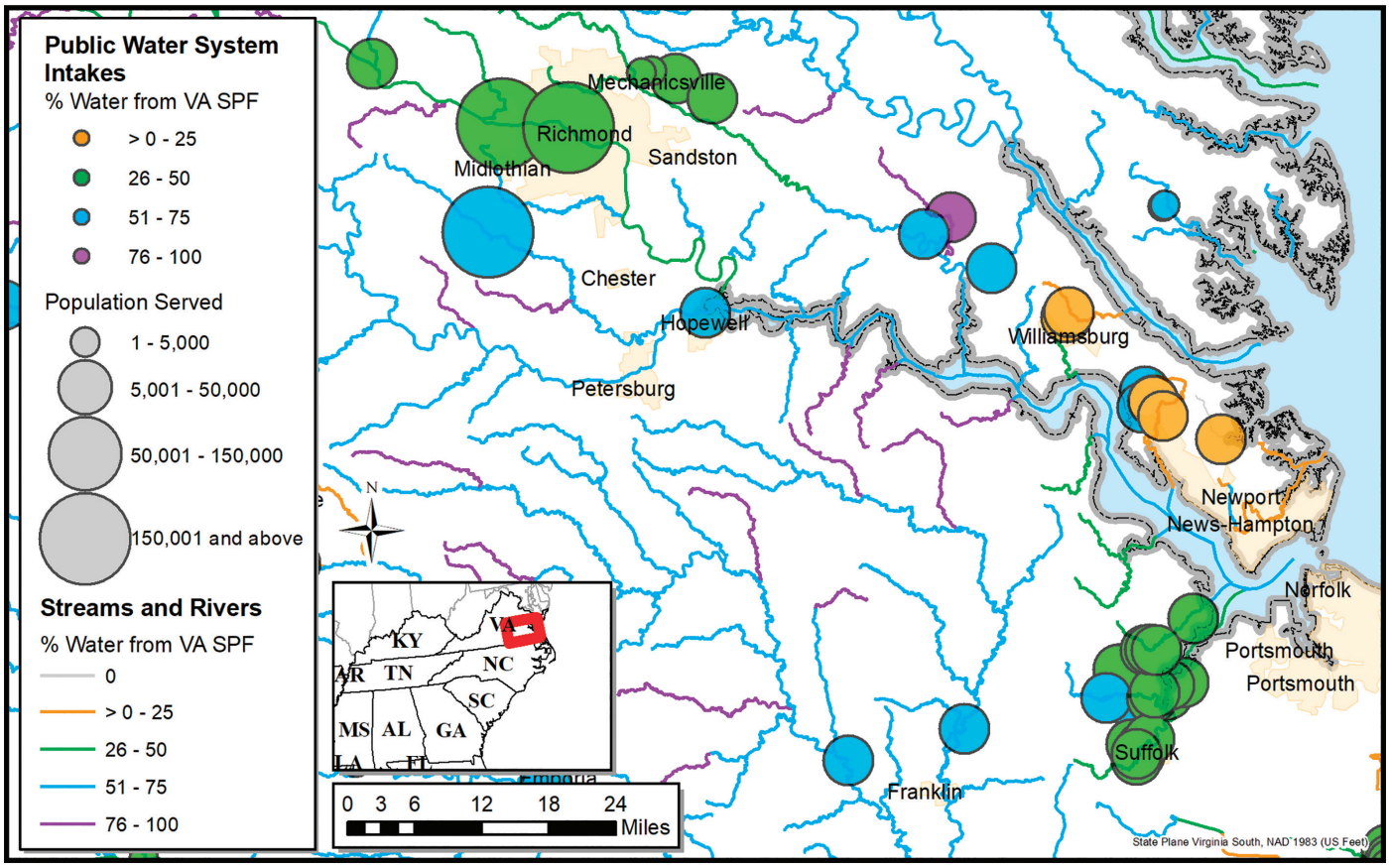


Figure A.VA.11—Local-scale detail showing percentage of water from Virginia SPF for streams and surface drinking water intakes in southeastern Virginia.

Southwestern Virginia Detail

Streams and Intrastate Public Water System Intakes in Southwestern Virginia Receiving Water from Virginia State and Private Forests

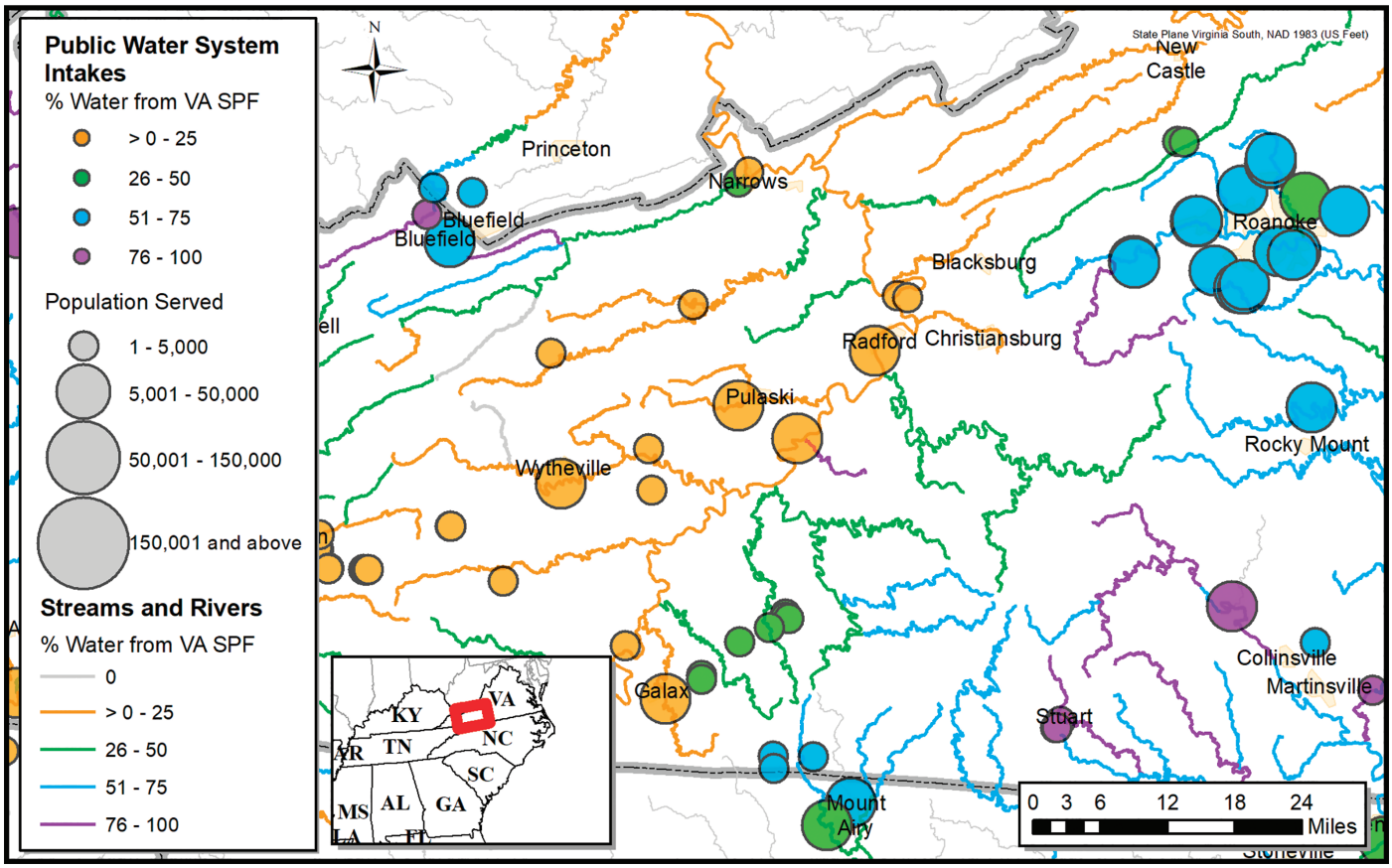


Figure A.VA.12—Local-scale detail showing percentage of water from Virginia SPF for streams and surface drinking water intakes in southwestern Virginia.

Richmond, VA, Case Study

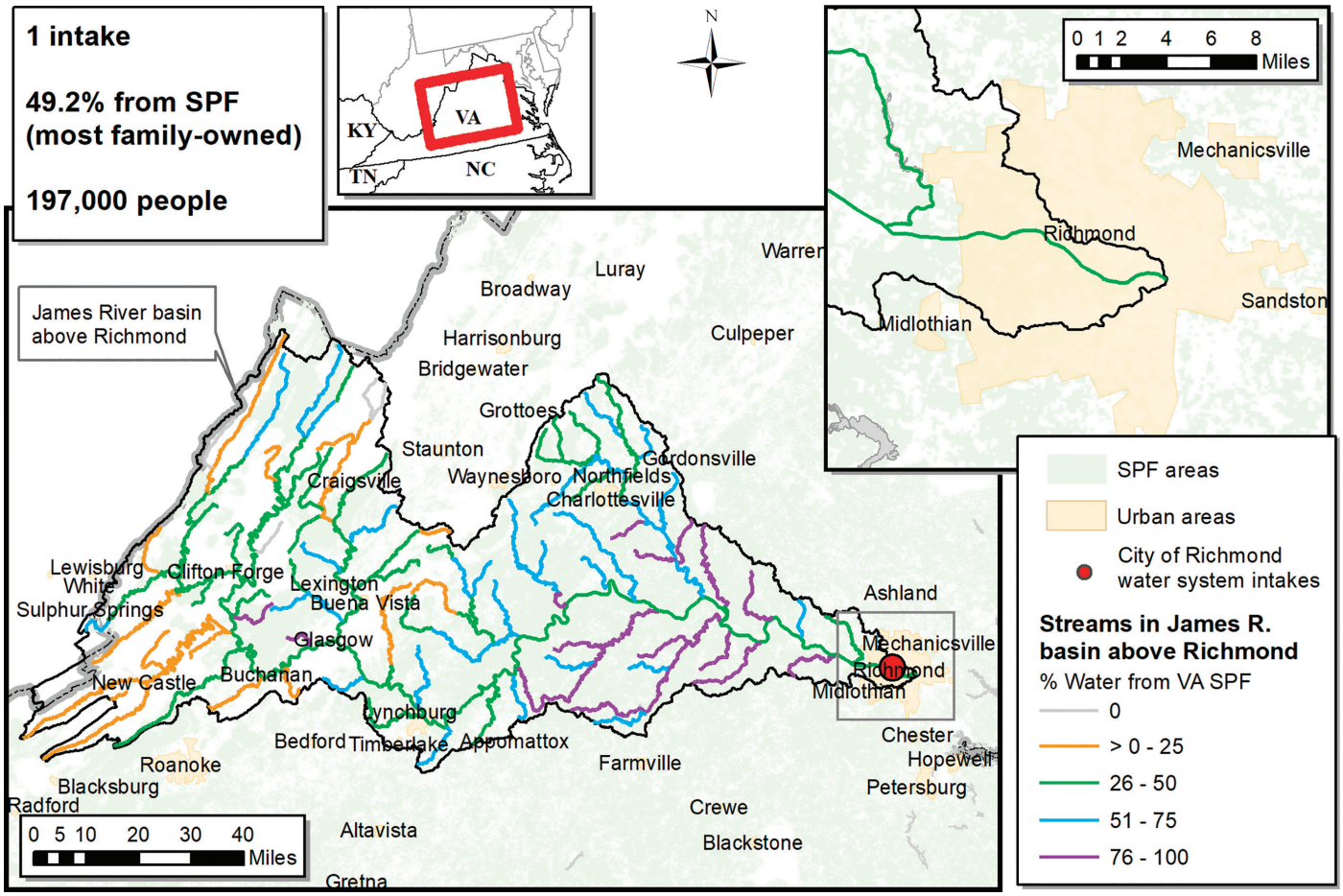


Figure A.VA.13—Case study of the City of Richmond public water supply system, Richmond, VA, illustrating SPF water in streams supplying the single surface drinking water intake. When this water reaches the intake, 49.2 percent of it comes from SPF lands. The largest ownership category in these specific SPF lands is family-owned.