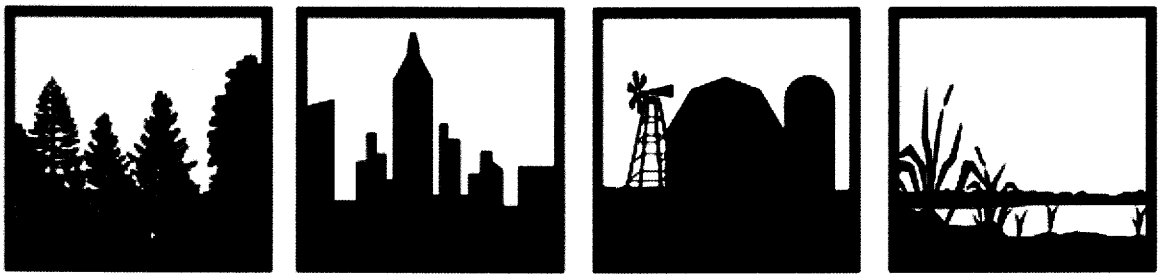

US - IALE

25th Annual Landscape Ecology Symposium
Is What Humans Do Natural?
Athens, GA | April 5-9, 2010

ABSTRACTS

affect ecosystem functions and local biodiversity. Knowledge about reed dynamics in freshwater wetlands of North America is still fragmentary. Our objectives were 1) to assess the invasion dynamics of reed; 2) to quantify the effects of reed on plant communities; and 3) to define the ecological niche of reed in order to project their potential distribution in a protected wetland. We monitored colonies of reed and characterized their habitat in a protected wetland situated in an agricultural landscape in Southern Quebec. Nine colonies where followed for three years and changes to their density were measured. The spread of the colonies and the impact on plant community composition was assessed using five transects. We then used habitat modelling to project the species potential distribution in the area. Results suggest that reed spreads faster in disturbed than in non-disturbed areas and that distance to water and roads are the main factors that influence the location of projected habitats. Results of this study will provide guidance for wetland and biodiversity management.
Keywords: biodiversity, invasion dynamics, Phragmites australis, potential distribution

50. A Multisensor Global Land Surface Phenology Earth Science Data Record
Authors: **DIDAN**, Kamel, The University of Arizona
Invited Symposium: A Land-surface Phenology: A View Through the Lens of Vegetation - Thursday, April 8: 10:40-11:00 - R
Abstract: One of the stated goals of NASA Making Earth Science Data Records for Use in Research Environments (MEaSUREs) program is the support of the Earth Science research community by providing reliable Earth Science Data Records (ESDR). These products are expected not only to be of high quality but should also combine data from multiple sources to form the long and coherent measurements required for studying climate change impact on the Earth system. Vegetation indices (VI), which capture the aggregate functioning of a canopy, are robust and widely used measurements for extracting phenology information and studying large-scale ecosystem processes. In this context, knowledge of phenologic variability and the environmental conditions controlling their activity are further prerequisite to inter-annual studies and predictive modeling of land surface responses to climate change. Satellite phenology encompasses the analysis of the timing and rates of vegetation growth, senescence, and dormancy at seasonal and interannual time scales. Changes in vegetation phenology depict an integrated response to change in environmental factors and provide valuable information to global change research. However, these studies are limited to using one sensor, owing to the inter-sensor continuity challenge. And with satellite missions lasting only few years, long term studies of vegetation change trends and phenology will have to bring together multiple satellite data sources. To that end, this MEASUREs' project aims at generating a seamless and consistent sensor independent ESDR quality record of land surface phenology by fusing measurements from different satellite missions and sensors. We're developing algorithms based on the homogeneous vegetation phenology cluster to be applied to AVHRR, MODIS, and VIIRS data records. This effort will generate, characterize, and deliver 30+ years of consistent daily measurements of land surface vegetation index and annual phenology parameters at a climate modeling grid resolution (0.05o, 5.6km).
Keywords: climate change, multisensor, phenology, remote sensing, Vegetation Index

51. Potential Land-use Changes with Woody Energy Crop Production in Wisconsin and Minnesota
Authors: **DONNER**, Deahn, Northern Research Station, US Forest Service; Ronald Zalesny Jr,

Northern Research Station
Offered Presentations: Agrarianism II - Wednesday, April 7: 10:40-11:00 - R
Abstract: Modular biomass power plant systems are currently being installed throughout Wisconsin and Minnesota. These systems require a constant source of material on a long-term sustainable basis within a small radius putting pressure on the surrounding forests. Using short rotation woody crops (SRWC; hybrid poplars) to supplement required biomass requirements could reduce this pressure, but there are concerns of the potential land cover changes that would result. We identified in a spatially-explicit manner potential core areas that have a high potential for land conversion to SRWCs given environmental and sociopolitical constraints. Our approach was to rank lands based on current land use (i.e., open land cover types), land ownership (private vs. public), suitability of soil for agriculture (marginal vs. prime), and economic thresholds. Because the decision to convert lands for SRWC production is an economic decision by most landowners, we incorporated soil rental rates established by the Farm Service Agency, and estimated return on corn yield by county to establish economic thresholds beyond which conversion to SRWC production is not probable. Next, we determined the range of variability (i.e., mean and variance) in key soil (e.g., available water holding capacity, bulk density, pH) and climate properties (e.g., growing degree days, temperature, precipitation) for the resulting land base. This variability was used to establish thresholds below which establishing SRWCs is not feasible given the currently available genotypes that have been field-tested from broad-scale deployment; thereby further refining the potential land base for initial land cover conversion. Within the core areas, we will begin to examine landscape and multi-agent drivers of change (e.g., small versus large property owners, distance to market) that can be coupled dynamically with the regional analysis to develop a more realistic estimate of the amount and locations of potential land conversion with increasing use of SRWCs for energy production.
Keywords: energy crops, land change, Minnesota, Populus, Wisconsin

52. Application of land change modeling for resolving urbanization - conservation conflicts on the edge of metropolis
Authors: **DORNING**, Monica, University of North Carolina at Charlotte; Douglas Shoemaker, University of North Carolina at Charlotte; Ross Meentemeyer, University of North Carolina at Charlotte
Offered Presentations: Disturbance I - Tuesday, April 6: 2:20-2:40 - F-G
Abstract: Increases in population growth and per capita land consumption continue to threaten the persistence of natural lands and create conflicts between demands for development and protection of valuable natural resources. To address this issue, we used land change modeling, informed by satellite imagery and conservation mapping, to predict conflicts in North Carolina's Southern Piedmont, a biologically diverse and productive region at the intersection of three rapidly expanding metropolises. We used logistic regression of socioeconomic and environmental factors driving urban expansion, along with historical trends in per capita land use and population projections, to develop a dynamic, stochastic model of land change through 2030. Using this modeling framework, we forecasted multiple land change scenarios following the historical trajectory and various conservation planning strategies that increase the cost of development in locations with higher conservation value. Our results indicate that if historic trends continue, over 30% of land developed between 2010 and 2030 will conflict with existing conservation priorities. Our model based on an alternative future that integrates conservation planning, indicates that it is possible to reduce future conflict by 75% without hindering demands