Using NASA Resources to Inform Climate and Land Use Adaptation in two LCCs

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Abstract

Designation of US Department of Interior Landscape Conservation Cooperatives (LCCs) emphasizes the important threat that climate and land use change pose to biological resources in national parks and other federal lands. Developing strategies for management and adaptation in the coming century requires improvements in our ability to forecast biological responses under future scenarios, assess spatial variation in the vulnerabilities of biological resources, and design multi-scale management strategies based on vulnerability and management feasibility.

This project will focus on portions of the Great Northern and Appalachian LCCs, both of which support critical biological resources and have already undergone climatic warming. Within the climate adaptation framework of Glick et al. 2011, we will integrate models from the Terrestrial Observation and Prediction System (TOPS) and the SERGoM land use change model to hindcast (2001-2010) and forecast (2010-2100) responses of habitat types to 36 future scenarios.

Objectives

1. Hindcast and forecast future climate and land use scenarios.
2. Assess the vulnerability of ecological processes and key habitat types.
3. Evaluate management options.
4. Design and Implement management adaptation strategies.
5. Facilitate decision support.

Approach

Hindcasting (1980-2010) and Forecasting (2010-2100)
Land use - Downscaled Climate
Ecological Exposures
Vulnerability Assessment

Study Areas

Great Northern LCC
Appalachian LCC

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Current Status

The project is the first year of the four-year funding period.

Year 1: Refine study approach; engage key collaborators; compile data sets; validate models

Year 2: Do ecological hindcasts and forecasts; model habitat types; assess vulnerability in GNLCC with cooperators.

Year 3: Do management evaluation and implementation in GNLCC; assess vulnerability in APLCC with cooperators.

Year 4: Do management evaluation and Implementation in APLCC; technology and data transfer; final reporting.