



Spatial Information & Data Support

Background

- Geospatial data and analysis will be critical across all teams.
- Each of the research teams will require detailed maps of the study areas in order to plan and execute field visits, to inform the public and other stakeholders about the study sites, and to understand processes at the site-scale, and to upscale results to the forest scale in order to evaluate the broader impacts of treatments.
- Because spatial variability of vegetation and terrain features greatly influences forest health, wildlife habitat, water cycling, and fire behavior over a range of scales, we plan to extract the topography and vegetation information from numerous available existing and remotely sensed geodatasets augmented with field measures acquired using GPS, leaf area meters, and laser rangefinders.

Objectives

- *Provide spatial data and detailed study area maps for teams to plan an execute field visits and inform the public;*
- *Provide site-scale image processing and spatial analysis to support process understanding;*
- *Upscale results to the forest scale to understand the broader impacts of treatments.*

Methods

- We will acquire high resolution remote sensing images (e.g. IKONOS) and LiDAR data to map in detail the vegetation and topography of the sites, the change of the crown closure, leaf area index, and other vegetation parameters before and after the treatments.
- We plan to conduct extensive field measurements for georeferencing multiple spatial data sources, and providing ground-true data for accuracy assessment.
- We will work closely with other science teams in their sampling design to ensure that we have the appropriate spatial data for analysis.
- These data will improve our understanding of the spatial relationships between canopy and forest characteristics and changes in habitat, fire, and hydrologic responses (e.g. soil moisture and thus stream response).
- We also plan on scaling up these relationships from the catchment to the forest level using coarser resolution remotely sensed imagery (e.g. Landsat TM) and topography (e.g. NextMap Radar product at 5m spatial resolution).
- *Specific team-related methods include:*
- Fire and forest ecosystem health parameters will be derived from object-based remote sensing classification methods on high resolution images as well as LiDAR data analysis. Landsat TM data together with MODIS data will be used to upscale the results from the individual firesheds to a broader regional level.
- Landscape ecology approaches will be applied to calculate meaningful ecological pattern indices for the wildlife study.
- The water team will develop a hydrological model augmented with extensive field measurements and spatial data to upscale the site measurements to the forest scale.
- We will also develop a webGIS for interaction between stakeholders and the science team.

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Team Integration & Support

- Support for all teams is critical, and will be accomplished in the following ways:
- The *wildlife* team will require detailed spatially referenced biotic and abiotic data that can be associated with their field location of animals. Such information will be used to develop multivariate models of animal habitat and movement.
- The *fire and forest ecosystem health* team will require tree mortality, tree canopy cover, average tree height, crown bulk density, and height to live crown base. Those attributes will be derived from LiDAR and high resolution images such as IKONOS.
- The *water quantity and quality* team will also need fine-scale information about canopy and vegetation indices to upscale their point measurements to the fireshed scale.
- The *public participation* team will use geospatial data as part of the SNAMP Internet-GIS web discussion board, and to produce maps and other information for interacting with stakeholders.
- Field data, spatial data, and other project data will be made available to team members via the Internet, using an existing digital library modified to accept and serve data and metadata from this project.
- Our goal is to have share data within the team as soon as it is available on our computers (i.e., both raw and processed data). We will make processed data available outside the team in as timely a manner as possible, following basic QC.

Investigators

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