

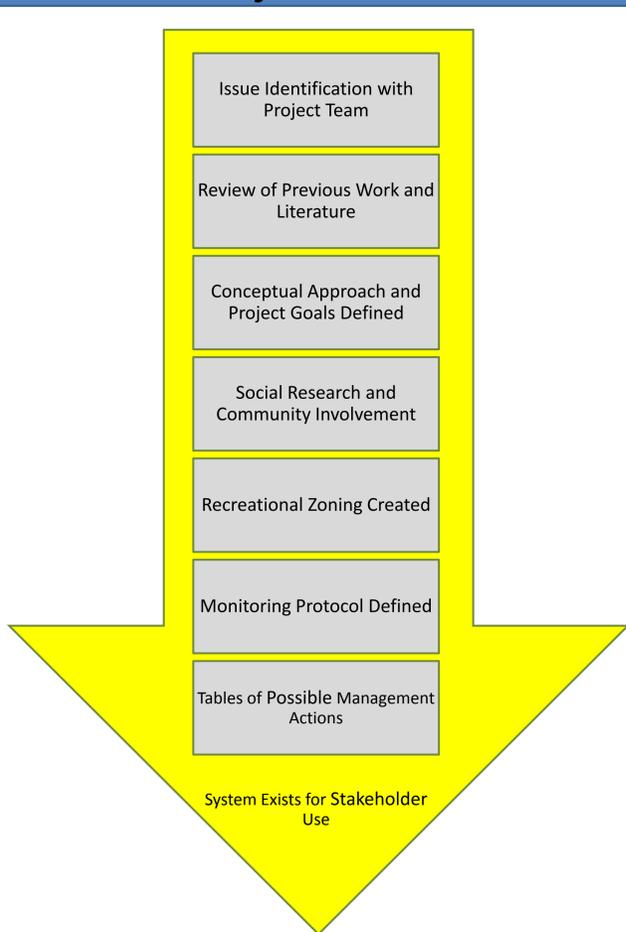
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Introduction

There are no comprehensive management systems to deal with recreation on a multi-jurisdictional natural resource such as lakes. This poses a problem for the small town patchwork present with most lakes in New England. The New Hampshire Lakes are a crucial part of the state's economy. It has been estimated that the recreational uses and availability of drinking water alone are worth around \$1.1 billion to \$1.5 billion annually to the state of NH (Shapiro et. al 2003). Unfortunately, the use of the lakes is resulting in loving these places to death. To address this, the project will provide subsection classification through town governments and stakeholder input.

Objectives



Methods

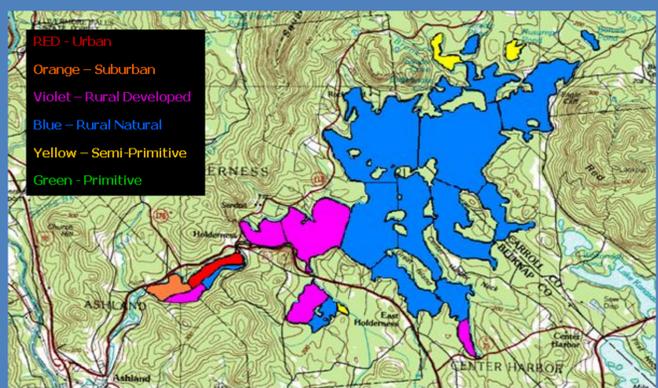
Using a case study approach, we will conduct our research on the Squam Lakes in New Hampshire. This lake is surrounded by five towns: Ashland, Holderness, Sandwich, Moultonborough, and Center Harbor. A natural resource spanning several political boundaries is very common throughout the Eastern United States.

Through a hybrid recreation management framework we hope to provide informative and accurate details for each subsection of the lake while using state of the art methods of community involvement. Influential management frameworks to this project include:

- Water Recreation Opportunity Spectrum
- Limits of Acceptable Change
- Community-Based Natural Resource Management

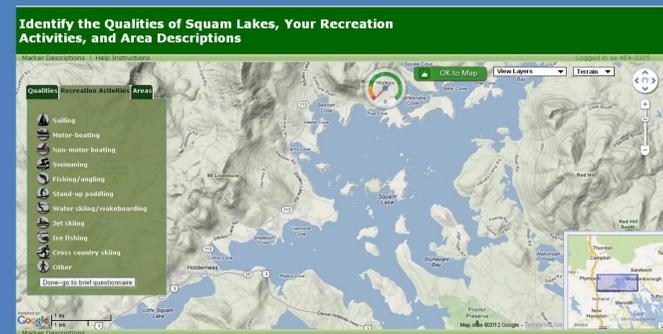


Our classification system is used in the Water Recreation Opportunity Spectrum. Each classification corresponds to management action recommendations. The purpose of this framework is to manage areas of the lake for the appropriate recreational uses. Monitoring of recreational impact will show whether management methods are effective.



PPGIS

In an effort to keep the community involved with decisions we have coordinated with Greg Brown from the University of Queensland to involve Public Participation Geographical Information Systems (PPGIS) in our data collection aspect of our management framework.

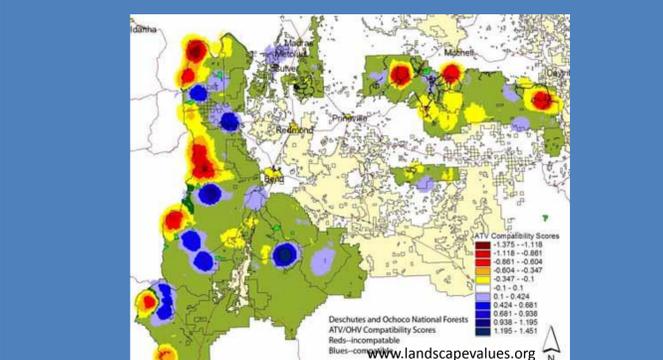


This mapping technique allows stakeholders to drag and drop markers, such as recreational activities to specific Spatial Data Points (Above)



Other markers available include Qualities (Above Left) and Presence of Development (Above Right) Qualities include some perceptions (Crowding) as well as markers that denote areas of concern (Invasive species and wildlife habitats). Presence of Development is taken from the WROS

Outcome- Below is a depiction of recreation compatibility created from PPGIS survey data.



Conclusions

With the data provided by PPGIS we can visually represent hotspots to managers and characterize lake or natural resource subsections. This will guide management decisions with subsections of the lake rather than town boundaries.

Additional benefits of the project include:

- Identification of physical areas perceived to be at risk and issues of concern
- Identification of recreational activities present in each zone
- Facilitation of examination of many research questions (data!)
 - Descriptive and hot-spot mapping
 - Spatial analyses
 - Co-occurrence mapping
 - Other statistical analyses

Along with the useful information of this framework, involving stakeholders in a management plan can have many benefits such as stewardship and place attachment.

References

Shapiro, Lisa, Heidi Kroll. "Estimates of Select Economic Values of New Hampshire Lakes, Rivers, Streams and Ponds." *New Hampshire Lakes Association*. 2003 Jun.

Carroll, Josh. "The Water Recreation Opportunity Spectrum and Water Quality in the Squam Lakes Region of New Hampshire." *University of New Hampshire*. 2009

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