Title: Geospatial Tools for Ecosystem Services

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Abstract: Northeastern lakes provide valuable ecosystem services that benefit residents and visitors and are increasingly important for provisioning of recreational opportunities and amenities. Concurrently, population growth threatens lakes by, for instance, increasing nutrient loads. To examine these issues, we are developing geospatial tools that help explore the association between lake condition and the provisioning of ecosystem services. We are also developing a database from the USEPA's National Lake Survey, the New England Lakes and Ponds Survey, the USGS SPARROW model, precipitation data from the PRISM Climate Group, census data, as well as many other datasets. In this poster, we describe how we are combining many tools (e.g., ArcGIS server, Oracle, SAS and R) in an online application that facilitates mapping and analysis of lake ecosystem services that are sensitive to variations in predicted nitrogen and phosphorus loading. These efforts will provide managers and researchers a better understanding of links between management decisions affecting nutrient fluxes and selected ecosystem services; support other novel research questions such as examining the link between ecological condition and human health; and provide the means for others to replicate our results and adapt our approaches and analyses in novel ways. \

Keywords: ArcGIS Server; R; Oracle; SAS; New England Lakes and Ponds Survey; National Lakes Assessment, Database Development; reproducible research

Purpose of research: This research is a proof of concept that focuses on integrating software to provide ecosystems services tools, data, and research results. This integration of software allows u to provide online access to data, GIS, and analysis. When completed the database and associated tools will allow our partners to include ecosystem services, supported by state of the art technologies and rich environmental data, in their management decisions.