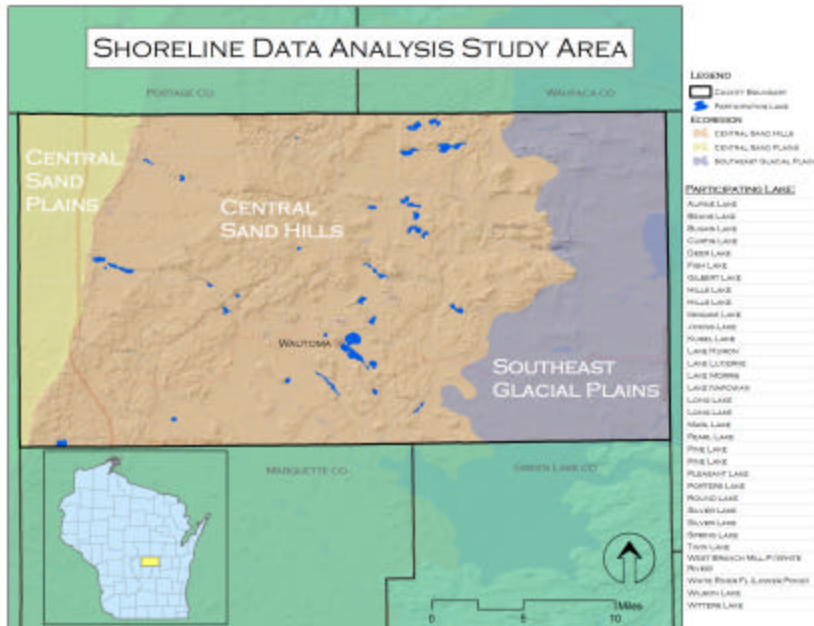


Shoreline Data Analysis Grant Project Scope/Description

Description of Project Area

Waushara County is a small rural county with a full time population of about 25,000. Between 1980 and 2000, Waushara County grew by more than 20% with most of the population increase being located upon the lakes and streams. There has been more non-resident growth in the county rather than resident growth, particularly on our lakes, and this non-resident population offers a whole additional set of challenges, such as difficulty in communicating with absentee owners, unfamiliarity with local regulations because they do not live here, higher rates of property transfers, etc.

This population increase has resulted in a greater need for the facilitation, technical assistance and education, including information on the lakes and streams. Waushara County has three distinct eco-regions that lie within the county borders. The Southeast Glacial Plains eco-region landscape is made up of glacial materials deposited during the Wisconsin Ice Age. The Central Sand Hills eco-region contains what was once Glacial Lake Wisconsin. The area is characterized by a mixture of farmland, woodlots, wetlands, small kettle lakes, and cold water streams, all on sandy soils. The Central Sand Plains eco-region is found in the western area of the county and occurs on a flat, sandy lake plain, and supports agriculture, forestry, recreation, and wildlife management. The ecological landscape formed in and around what was once Glacial Lake Wisconsin, which contained glacial meltwater extending over 1.1 million acres at its highest stage.



Description of problem to be addressed by project

The Shoreline Information System for Waushara County, funded by a Lake Planning Grant, offers a means to plan for and manage the unique opportunities and special characteristics that surround the Waushara County lakes. The area where land and water meets provides critical habitat for aquatic and terrestrial biota and can either be a source of water quality problems and can improve the water quality of runoff from the nearby landscape. During the summer of 2010, the Waushara County Land Conservation Department (LCD) conducted a shoreline inventory for 32 inland lakes. The inventory documented the current conditions of the shoreland for these lakes and identified areas that may warrant intervention using Global Positioning Systems (GPS) technology. Intervention may be in the form of education and/or technical assistance to landowners of the affected areas. The inventory consisted of a modified version of the EPA's shoreland assessment tool that was used in the National Lakes Assessment. LCD staff described the depth and composition of the vegetative buffer, slope, seawalls, rip rap, boat landings, boat houses, docks, erosion, direct drainage, and buildings within 75 feet of the shoreline.

The LCD intends to use this information, once in a suitable spatial format, to augment anticipated lake protection and land conservation efforts for the lakes within the phase 1 study. The development of a spatial shoreline information system will provide unique opportunities to identify and protect properties that maintain healthy fish and wildlife habitats, maintain high water quality, and have exceptional scenic quality. Analysis will also determine areas where threats might include water runoff and pollution from anthropogenic sources. Local residents, the Waushara County Watershed and Lake Council, and the LCD staff, including decision makers, currently do not have access to shoreline information in a comprehensive format to make well informed lake and land management decisions.

In an effort to take a proactive approach, Waushara County sees a need for the development of a Geographic Information Systems (GIS) database of shoreline features, along with spatially referenced, high resolution photography, for plan development and implementation.

In Waushara County, approximately 70 miles of shoreline has been inventoried for 32 lakes by LCD staff. County staff collected shoreline attributes specifically for the establishment of baseline conditions of critical habitat, aquatic and terrestrial biota, erosion, and physical structures. This data provides critical information about the potential threats and opportunities for lake planning, thus providing a backbone for a variety of applications and uses, from resource monitoring, planning, protection, and policy formation. Though still useful, this information is maintained in hard copy maps and paper format making it difficult to interpret and nearly impossible to analyze and update. To enhance the efficiency, converting inventories into a GIS database will help staff and citizens move forward with plans and management strategies.

Lake groups in Waushara County are at various levels of activity in their lake management planning. This project will guide the lake groups to refine their

strategies to preserve, protect, and enhance significant portions of the shorelines for the benefit of present and future generations. The move to GIS will enable the process of data capture, maintenance, analysis, and sharing more efficient and accurate.

This continued effort will further aid lake groups and individual property owners to better manage and educate lake property owners in decision making related to their lake management plan. The effort also included inventorying and analysis of lake management plans.

Description of project goals and objectives

The ultimate purpose of this project is to provide long term benefits to the community by protecting and improving water quality and habitat in and near Waushara County lakes. This will be accomplished by developing a comprehensive spatial database of land resources, detailed shoreline information, and high resolution photographs for 32 lakes. Waushara County staff and citizens will utilize the GIS database for making land use and management decisions. As an example, the Zoning staff will use apply this information in their update and adoption of the recently amended NR115 Administrative Code. The database is also expected to yield many associated products, like maps, text descriptions, and summary statistics for each lake in the study.

Our efforts will lead us to develop this information, once in a suitable spatial format, to augment anticipated lake protection and land conservation efforts for the lakes within the study. These efforts include:

- Develop a suitable spatial shoreline data base
- Identify priority areas where threats might include runoff, sediment delivery and pollution from anthropogenic sources.
- Develop a digital photography inventory of the shoreline, which will be integrated into a GIS for map display and analysis that prioritizes sediment delivery sites from the shoreland inventory developed during Phase 1 .
- Document the current state of land uses such as, structures and vegetative cover within close proximity of the shoreline for future improvement and/or mitigation of NR 115.
- Enhance the capacity of LCD staff in using the mapping tools and software to visualize, analyze, and update shoreline inventory database for planning and land management decision making.
- Utilize the Shoreline Information System as a template for future lake and watershed planning efforts throughout the region.

Expected outcomes:

- Design a geodatabase to store riparian land uses for presentation to lake groups.
- Develop a baseline database of photographs for 32 lakes in Waushara County.

Description of methods and materials

1) Develop GIS data for shoreline attributes

The existing shoreline inventory will be electronically documented by the consultant using GIS and a shoreline database. The location of shoreline attributes were captured using a Garmin GPS receiver by Z&LCD staff during the summer of 2010. Information about the shoreline was recorded on paper forms as well as the associated GPS waypoint number. The GPS points as hardcopy forms will serve as a framework to compile and maintain a detailed inventory of shoreline characteristics for this project. GIS topology tools will be incorporated by the consultant to ensure shoreline database geometry be consistent with Waushara County data. The inventory will include:

Within 35 feet of Ordinary High Water Mark:

- Vegetation
- Human Influence
- Erosion
- Slope

Within 75 feet of Ordinary High Water Mark:

- Buildings
- Land use

2) Shoreline inventory summary

The results of the shoreline inventory will be summarized both in text and map form. The text will describe the methods used to create the data and the criteria applied to appraise shoreline characteristics. The associated maps will identify potential sources of pollution and protection areas. New and existing data will be made available to the public, lake groups, and external agencies through a web mapping application.

3) GPS enabled digital camera and photo inventory training

A one-day hands-on training session will be conducted with county staff on the use of a GPS enabled digital camera. The shoreland inventory will be accompanied by a photo inventory with the aid of a GPS enabled digital camera system. The camera system will consist of powerful digital photography of the entire shoreline, from the water looking landward, which will be integrated into a GIS for map display and analysis. The purpose of collecting geo-tagged images is to document the current state of buildings, foliage, docks, beaches, and development within close proximity of the shoreline. In addition, such images provide citizen groups with a historic, geospatial record for the implementation, tracking, and improvements to their lake shorelines. The images may also assist the county in the enforcement of shoreland regulations and in future investigations of environmental and/or property disputes.

Photographs will be taken during at regular intervals at a specific distance from the OHWM to ensure overlap and complete coverage of the shoreline. An attached GPS unit will document the precise location of each photograph (within 1-5 meters). A digital compass module will provide the direction in which each image was taken. The photographs will be made available for use with ArcGIS, Google Earth, and the County's web mapping application for public use.

Description of project products or deliverables

Maps identifying properties that may need protection for nps control
Determine areas where threats might include runoff, sediment deliver and pollution from anthropogenic sources .

Description of data to be collected, if applicable

- A review of the shoreline inventory evaluation identifying areas that may warrant intervention using GPS technology. Intervention may be in the form of education and/or technical assistance to landowners of the affected shoreline areas.
- A pictorial inventory of the shoreline within the study area that will be tied to the county GIS system.

Description of existing and proposed partnerships

The LCD has current relationships with twenty two Lake District/Associations through the Waushara County Watershed Lakes Council. We assist the council with control of aquatic invasive species , grant acquisition assistance and facilitation, educational programming, technical assistance, and cost sharing.

We also work with area schools and service groups on projects to provide education on the value of our surface water resources and the near shore area's value for habitat, pollution control and aesthetic beauty.

Discussion of role of project in planning and/or management of lake

The initiatives described above will directly support state and local efforts to protect and enhance shoreline activities as prescribed in NR-115. Assimilating the data described in this project scope into the County GIS will help us track development trends, determine impacts of exotic species, and tie land use practices to water quality. This will enable data access to be more easily accessible to lake groups, staff, partners and lake property owners.

Performance standards compliance checking in lake drainage basins will also allow Waushara County to better target our efforts. This type of planning effort is highly encouraged by the WDNR Bureau of Watershed Management.

Waushara County has been successful in applying for and receiving several multi-county Regional AIS grants since 2006. The data gathered from the AIS grant as well as from this grant will be integrated with the county comprehensive land use plan and will be included in the County Lake Management Strategy.

Timetable for implementation of key activities

All activities will take place during the grant period

Plan for sharing project results

The data and final report will be made available on CD, via email, or hard copy to partner agencies, local governments and the public and will be made available on our website.

Other information in support of the project not described above

Waushara County currently has three staff involved in the enforcement of our Manure Storage Ordinance. The manure storage ordinance has been updated & codified to include the four animal waste prohibitions described in NR151 Agricultural Performance Standards.