Topic/Title: Lake Geodatabase for Invasive Plant Monitoring and Management
Organization: King County Noxious Weed Control Program
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Personnel to be involved:

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Data available:

There are two main sets of data: (1) King County GIS data on lakes and (2) King County noxious weed program data on weed locations. The additional potential sources of data are listed in Appendix A.

Project Description:

King County is developing a citizen science monitoring program[1] called the Lake Weed Watchers where trained volunteers will be asked to monitor lakes for invasive plant species and report their findings online through a web interface and eventually through mobile devices. The purpose of the program is to assist with early detection and rapid response of priority invasive plants on lakes and to educate and engage the public on the topics of lake stewardship and invasive species. To visualize citizen reporting with spatial content, there is a need for a lake geodatabase to organize, manage, and display existing information from various sources (Appendix A) including lakes and their characteristics, surrounding features, historical data on native and non-native plant species found in the lake, any management activities being performed on the lake weeds, and any lake organizations involved with the lake[2].

The first priority in the proposed student project is to compile a King County lake GIS layer (or geodatabase) that can be used for weed watcher reporting[3]. Data cleaning will be required[4]. After correcting and filling in missing data, basic lake characteristics should be added[5]. The basic requirement should not take longer than half the quarter since much of the data is available from King County GIS.

The second priority, since this lake geodatabase is meant to be used in invasive species monitoring, is to compile a table for each lake of non-native and native aquatic plants that have been known to occur on the lake and directly connect it to the lake layer. A connection should be made (join/relate table or building a relationship class) in this geodatabase, along with the lake feature class. In addition to the plant species list, existing weed surveys (point-based information) should be incorporated into the same geodatabase.

Expected benefits to organization:

1. Have a complete lake geodatabase for use in invasive plant surveys and public outreach and education.
2. Be able to visualize existing web reporting data through GIS
3. Generate maps to display and summarize weed survey and control information.

Expected benefits to students:

1. Design a geodatabase model for aquatic invasive species control and practice geodatabase deployment.
2. Connect multiple data sources (tables and existing GIS layers) into one geodatabase, set up the topology and relationship classes.

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[1] On the project's web page they will also be able to view the noxious weed program's data and other historical invasive plant data for the lake (and ideally track the invasive plant management activities that occur on that lake). The ultimate expectation for this project has listed in **Appendix B**.

[2] Much of the data needed for online map already exists in some form, so the main work of the project will be to collect the various pieces of data and to combine or relate them in a way that will be useful for the volunteer weed watchers as well as the noxious weed program staff and other public agencies.

[3] Weed reporting website link: http://green.kingcounty.gov/weedwatcher/default.aspx

[4] Existing data compiled from lake stewardship program database (see Appendix A for the link) already exist, so the main work will be to add the large lakes and to check for and complete any missing data.

[5] These characteristics include associated streams (inlets and outlets), boat launches, lake size and depth, bathymetry if available, and fish species present. All types of data coming from sources other than King County will need to be incorporated into the lake GIS layer.

Appendix A GIS data, existing reports, and website data

☐ King County Lake Stewardship Information: http://your.kingcounty.gov/dnrp/wlr/water-resources/small-lakes/data/default.aspx
The tabular data represented on this website will be provided to the students.

☐ King County GIS Portal: http://www5.kingcounty.gov/gisdataportal/
Data that is available here includes: noxious weed locations, waterbodies, streams, parks, park facilities (including boat launches)

☐ Metadata for King County GIS data: http://www5.kingcounty.gov/sdc/Metadata.aspx

☐ All Washington lakes -- topo maps: http://www.washingtonlakes.com/TopoMaps.aspx

☐ King County Lake Bathymetric Map (Partial Lakes)
http://your.kingcounty.gov/dnrp/library/archive-documents/wlr/waterres/smlakes/maps/KC_bath_maps.pdf

☐ WA Dept of Ecology aquatic plant survey data (the data can be viewed online or downloaded as an Access database): http://www.ecy.wa.gov/programs/eap/lakes/aquaticplants/index.html &
http://www.ecy.wa.gov/apps/watersheds/aquaticplants/searchresults.asp?searchterm=king

☐ Weed locations in King County (Noxious Weeds Survey Data):
http://www5.kingcounty.gov/sdc/Metadata.aspx?Layer=noxious_weed (more detailed GIS data and Access database data will also be made available through the noxious weed program)

☐ Lake characteristics table (file provided through King County of lake features desired)

☐ List of priority aquatic invasive plant species for the project (provided by King County)

☐ Weed survey report form/table (file provided through King County)

Appendix B

The ultimate expectation for this project, if there is time, would be develop a way to actively link the lake geodatabase with the noxious weed program database and the weed watcher online reports so that it will be updated as the program staff and volunteers add weed locations and management activities. This part of the project is expected to be preliminary and advisory since the interface with the weed watcher application needs to be built in-house, but it could be useful to see how it could be done.