



Project Status Report

Upper Mississippi River System
Long Term Resource Monitoring Program
National Biological Service

The Spatial Query Tool: Analyzing Long Term Resource Monitoring Program Data Using Geospatial Technology

Why it is needed

Long Term Resource Monitoring Program (LTRMP) staff collect fisheries, water quality, vegetation, invertebrate, and other biological and physical long-term resource trend data on the Upper Mississippi River System (UMRS). These data are then stored in a database management system. Spatial data such as land cover/use, bathymetry, water control infrastructure, ecologically sensitive areas, human use facilities and areas, water elevations, and other information are also collected and maintained. The need for scientists and river managers to view and analyze resource trend data in conjunction with other spatial data has resulted in the development of a geographic information system (GIS) application that integrates these data and provides the capability to spatially subset resource trend data.

Vegetation, land use, hydrology, and geomorphic characteristics vary significantly over the UMRS study area. When integrated with monitoring data, spatial databases will assist scientists in determining ecological status and trends and help explain causal relationships. Because of the sheer magnitude of this effort, automated tools are required to support such analyses.

What it is

Using GIS tools, an easy-to-use graphical application has been developed to spatially query the Long Term Resource Monitoring Program biological database and to display the selected data in conjunction with other spatial data for viewing, plotting, and analysis. One of the important features of the Spatial Query Tool is the ability to define an area spatially, then extract the existing LTRMP data for that area. Selected information can be exported in a format compatible with a statistical analysis program such as SAS.



Wisconsin Department of Natural Resources LTRMP Pool 8 Field Station biologist monitoring fish on an electrofishing boat

The Spatial Query Tool features a graphical user interface and requires only basic knowledge of GIS concepts. Proper use of the component database requires familiarity with the contents and field definitions.

The application allows the user to select a study pool, a base map, and resource component, zoom to the area of interest, then create a spatial subset of sampling sites by graphically defining a bounding box or polygon. Base maps of land cover, aquatic areas, or control structures can be displayed. The user can query the database from selected fields of interest and apply this query to the spatial subset of the sampling sites. The selected sampling sites displayed over the selected base data can be plotted or the information from the database can be used in other computer programs.

Current applications

A user-friendly interactive application to link resource component trend data with spatial data did not exist prior to this initiative. The Spatial Query Tool was developed on a UNIX computer platform to take advantage of the advanced GIS functionality and tools available in that environment. The application is currently being used by EMTC and field station component specialists.

What's next

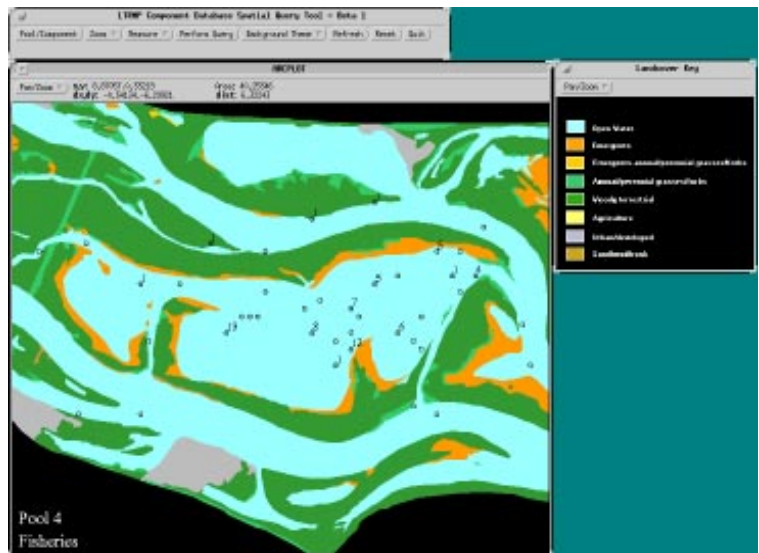
Once the UNIX version has been fully tested, the Spatial Query Tool will be adapted to run on a personal computer. This local access capability will allow expanded use of the application by resource managers at the field office level.

For further information, contact

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Menu screen to build and submit a query on the component database for fisheries in Pool 4



Display of a spatial subset of fisheries locations in Pool 4 resulting from the database query

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