Preproposal

Midwest Watershed Management Geo-Spatial and Decision Support System

9/3/2002

Objectives/Purposes:

Locally-led watershed management forms the basis for continued economic development and environmental improvement in the United States. Success depends on an integrated approach that brings together scientific, education and training advances made across many individual disciplines and modified to fit the needs of the individuals and groups who must write, implement, evaluate, and adjust their watershed management plans. The purpose of our 5-year project is to:

- Improve the management of watersheds in Region 5 through the development, promotion and use of a web-based, user-friendly, geo-spatial watershed management data and decision support system (WMDDSS).
- Set the standard for other watershed management programs for the country.

The system will be:

- Web-based and user-friendly to capture the benefits of the information technology revolution occurring in this country.
- Geo-spatial to capitalize on the abilities of a geographic information system to meld disciplinary research, education, and training and focus it on real world problems.
- Populated with data and decision tools customized explicitly for watershed groups.
- Supported by comprehensive education and training programs.

Justification:

A multi-state WMDDSS will:

- Provide watershed groups with the necessary education, training and tools to write, implement, evaluate and adjust their watershed management efforts,
- Accelerate the realization of natural resource and environmental benefits.
- Decrease expertise-related bottlenecks encountered by watershed committees, thus allowing committees more time to make informed decisions.
- Facilitate the identification of cumulative impacts and trends and decrease emergency and homeland security response times.
- Facilitate the comparison of “What if” scenarios and visualizing impacts of proposed strategies or responses to public health, environment, and natural resource emergencies.
- Create the means to conduct performance-based assessments of implemented watershed plans.

- Reduce costs and duplication of information, education, data and tools.
- Reduce inconsistencies across states and facilitate the rapid deployment and use of science-based decision tools.
- Decrease GIS staff training and maintenance and purchases of GIS software.

Goals and Actions

Goals and actions are divided into three phases: Development and public access to a web-based watershed management data and decision support system (WMDDSS); decision support tools; and web-based, comprehensive data management system. Goals and activities under phase one satisfy the immediate needs of watershed groups, resource experts and watershed managers for access to available watershed information, educational materials, data and basic mapping tools for inventorying important economic and natural resources. Goals and actions in the remaining two phases contribute to the building of a comprehensive WMDDSS that includes specific tools, data, and education programs for Phase two and phase three overlap and interact throughout the project and result in the development of specific tools needed by watershed groups to achieve their stated economic, social, and environmental goals.

Phase 1 Goals and Actions

Development and public access to a web-based watershed management data and decision support system (WMDDSS)

1. Assess education and training needs of watershed groups, local and state government officials, Extension, and resource experts and develop a 5-year action plan.
    a. During year 1, the education workgroup will summarize the target audiences' resources and needs, summarize the education content and skills required by the target audiences, make available print and website resources via the portal, and conduct education and training programs via webcasts, workshops, and state watershed meetings.
    b. During year 1, the education workgroup will complete a 5-year outreach and training plan.

2. Construct a web-based portal for watershed groups and experts to visit and use.
    a. Specific categories including a GIS category will be developed and populated with available information, publications, tools, and data from participating states.
    b. Procedures will be developed for state educators to add state-specific and coordinated information, training, and education activities and programs to the watershed management portal.

3. Develop and make available a web-based, geo-spatial map engine and critical data layers of participating states.
    We know watershed groups request very similar maps to more fully understand their economic, social and natural resource bases, conduct inventories, and view and discuss special areas. Many of the core data layers are also used in decision tools already

developed and ones we may develop. Within a year, this data could be available for use by watershed groups, local and state officials, Extension and resource experts.

a. Access to the map engine will be available from the main watershed Internet site.
b. ESRI software will be used to display the Internet map engine.
c. Users will have access to key data layers identified in Table 1 plus an additional 6-12 data layers identified by watershed and EPA experts during the first year.
d. State data will be stored and accessible via a prototype distributed data management system. Project cooperators from the participating states and Region 5 EPA will establish the necessary protocol for sharing data throughout the project period. The lead state(s) will provide sufficient storage for data from the participating states and Region 5 EPA to minimize expected service interruptions regarding the prototype distributed data management system.
e. A watershed search tool, e-mail tool, and acreage calculation tool will be developed and made available for use in the map engine.

4. Update and maintain the map engine and data throughout the contract period.
    a. Each participating state will be responsible for updating and maintaining its data layers.
    b. The lead state(s) will be responsible for updating the Internet map engine and protocol for the distributed data management system.

Critical Data Layers for Watershed Management

GIS Data Layer
digital orthophoto quadrangles (state geological surveys and university cooperators)
NASS Cropland Data (or suitable land use coverage) http://www.nass.usda.gov/research/Cropland/SARS1a.htm
National Hydrography Dataset (http://nhd.usgs.gov/)
USGS Digital Elevation Model (DEM) data http://edc.usgs.gov/glis/hyper/guide/usgs_dem
Digitized soil surveys by county (http://www.ftw.nrcs.usda.gov/ssurgo.html)
Floodplain data (http://msc.fema.gov/MSC/statemap.htm)
10-digit and 12-digit watersheds and EPA 818 watersheds (New 10/12 digit designations being compiled by NRCS?)
Local, state, federal parks, lands, nature preserves, etc. (Generally state agencies)
Threatened and endangered species (State and federal)
Wetlands (http://www.nwi.fws.gov/)
Roads, highways, interstates (multiple locations, generally Census)
EPA data layers (to be determined during first year)

Phase 2 Goals and Actions

Development and access to decision support tools in the WMDDSS.

5. Identify existing and critically needed decision support tools.
    a. Watershed experts from participating states and EPA will form a group and meet during year 1 to review existing and needed decision tools for improving watershed management.
    b. The group will identify a subset of critically needed tools applicable to the participating states.
    c. The group will develop a request for proposals. Two tools will be funded beginning in year 2 for two years, two in year 3 for two years, and 2 in year 4 for two years.
    d. The group will establish the protocol for integrating the decision tools into the existing GIS infrastructure.

6. Conduct a competitive grant competition in years 2, 3 and 4 to identify and fund the development of 6 decision tools.
    a. The approved decision tools must come from the list of critically needed decision tools.
    b. The entities awarded the contracts will follow the protocol outlined in the RFP to ensure each tool's use by watershed groups, state and local governments, Extension and natural resource experts.
    c. Each project will run two years with quarterly updates.

7. Maintenance of Decision Support tools.
    a. The lead state(s) will maintain the developed decision tools upon completion of the individual grants.
    b. The lead state(s) will update the decision tools as new mapping software become available.

Phase 3 Goals and Actions

Web-based, comprehensive data management system for WMDDSS.

8. Update and add new state-wide data sets as they become available from agencies and other sources.
    a. As existing core data is updated, each participating state will make available the updated data following established protocol.
    b. New data layers identified by participating states as critical and broadly available across the region will be added by participating states. It is expected that 2 to 4 updated and new data sets will be added yearly.
    c. The lead state(s) will set the standards for the addition of updated and new data to ensure the consistency and use of data across the region.

9. Develop an Internet-based system for adding site-specific field data.
    a. In year 2, cooperators from participating states will form a group, meet and develop an approach for adding data field data to WMDDSS.
    b. The group will develop the protocol for entering data from GPS units.
    c. Programmers from the lead state(s) of this project will write and test the interface for adding data in year two.
    d. The data entry enhancement will be added to WMDDSS in year 3 for use by participating states.
    e. The lead state(s) will be responsible for updating the data entry enhancement to work with new GIS software.