

WETLANDS PLANNING FOR THE STATE OF GEORGIA: A WATERSHED DEMONSTRATION PROJECT

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INTRODUCTION

Among the projects funded by the U.S. Environmental Protection Agency's State Wetland Planning Grant Program, Watershed Demonstration Projects provide the opportunity to protect water resources through the planning process where the planning unit is not necessarily a political unit. Counties in the state of Georgia, as elsewhere, are often bounded by streams. When the planning unit is the county, or groups of counties as with the Regional Development Centers in Georgia, it may be difficult to bring together in any single plan all land-uses that may impact water quality in a stream that forms the boundary between planning units. This project demonstrates the construction of a database for land use planning for the watersheds of two reservoirs in Georgia.

BACKGROUND

The Freshwater Wetlands and Heritage Inventory Program in the Game and Fish Division of the Georgia Department of Natural Resources (DNR) has been funded through the EPA program to conduct a Watershed Demonstration Project. It is hoped that by demonstrating the development of a database for the watersheds of Lake George and Lake Blackshear containing information useful in the planning process, this project will encourage local planning agencies to develop similar databases for watersheds within their jurisdictions. Furthermore, it is hoped that agencies with adjacent jurisdictions will work cooperatively to develop plans that deal with watersheds in their entirety.

The databases for the two project watersheds are being developed to provide useful guidance as to what information is needed and how to go about compiling and processing it. In addition to the typical natural resource database themes of geology, soils, hydrography, landcover, elevation, and transportation, specialized thematic layers for wetlands and sensitive species can be added. In developing these databases, a digital image processing and geographic information system (GIS) is used. This suite

of thematic, geo-referenced information will be developed to provide the basis for demonstrating methods of incorporating landcover and other resource information into land-use plans.

This same suite of resource information will be used by one of the project cooperators, the Clean Lakes Program project within the DNR Environmental Protection Division. Selection of the two watersheds was based on the immediate needs of this project. In this regard, the project will also demonstrate the cooperation of various agencies in gathering and using natural resource data in water quality and wetland protection efforts.

Part of the outreach element of the DNR project is the presentation at scheduled workshops of the watershed-based approach. The outreach element is coordinated by the Department of Community Affairs (DCA), that state agency which provides assistance to local planning agencies.

Table 1. Elements of the Database for the Watershed Demonstration Project.

	Data Type	Source *	Scale	Status
Landcover	raster	GDNR	1:24,000	processed
Wetlands	vector	USFWS	1:24,000	ready for digitizing
Geology	vector	GDNR	1:500,000	processed
Soils	vector	USGS	1:750,000	processed
Hydrography	vector	USGS	1:24,000	to be digitized
Transportation	vector	USGS	1:24,000	to be digitized
Elevation	raster	USGS	1:250,000	processed

*GDNR - Georgia Department of Natural Resources
USFWS - United States Fish and Wildlife Service
USGS - United States Geologic Survey.

To complete the outreach element of the project, two documents are being produced in conjunction with DCA. A model wetland protection ordinance for use by local governments is being drafted and will be available by the end of 1993. Developing the ordinance for three different physiographic regions will increase the likelihood that it will be useful to local governments in all regions of the state. A landowner's guide to protecting wetlands while conducting activities on or near them is also being drafted by DCA. These documents represent direct, immediate methods of affecting wetlands and water quality protection by educating landowners and policy-makers; the database demonstration will have a more indirect effect by offering an approach to land-use planning that incorporates wetland and water resource protection elements.

METHODS

The steps involved in producing the database for the project watershed will be offered as a methodology to be used by planners when assembling a watershed database for their purposes. The watershed is first defined by selecting two points on the stream that represent the top and bottom of the watershed. Delineation using topography at a 1:24,000 scale includes all that area which drains into the defined stream segment. In a demonstration of a digital database, a first step is the digitization from base maps of the boundary of the watershed. Sub-basins within the watershed will be excerpted from the database. These sub-basins correspond to stream sample station locations used in analysis for the Clean Lakes Program project work.

General soil association and geology maps are digitized for the watershed. Where this information is available at a variety of scales, a decision as to which scale is appropriate for the size of the study area is made. For this project, soil information is limited such that only generalized associations will be mapped.

A digital elevation model derived from 1:250,000 scale topographic maps provides the input to an algorithm that calculates slope. The resulting slope layer is important in water quality modeling in that it is used in soil erosion rate prediction and in modeling the structure of drainage networks.

Landcover data exists in digital form for the project watersheds, based on classification of Landsat TM data. An opportunity exists to reclassify the original data to produce landcover information at higher levels of classification and accuracy than the existing database. One result of the classification work will be an understanding of the effort involved in mapping the entire state at higher levels of classification and accuracy than are found in the current database.

An accurate landcover database is critical to assessing impacts to water resources and contains information on

the areal extent of those resources. To complement the wetland and open water landcover information available in the Landsat-based database, the National Wetland Inventory maps produced by the U.S. Fish and Wildlife Service will be digitized for the project watersheds.

Additional layers of information including linear data such as hydrology and transportation and point data such as well sites and discharge points may be useful in watershed modeling. All information will be integrated in the database before project completion near the end of 1993. The scope of this project is to provide those layers detailed above to modelers who may wish to supplement the data as necessary for their particular uses. What is being demonstrated is a methodology for gathering a suite of information to serve as input into water quality modeling and resource protection planning.

A large portion (approximately \$60,000) of the funding for this project went to the purchase of the hardware and software components of the GIS. Training on the GIS workstation, although an ongoing process, accounted for much of the project time used in the earliest phases. It was important to establish a support network early on in the project made up of individuals who provide guidance and expertise in the use of GIS hardware and software. In turn, this expertise is made available to the planners to whom the outreach efforts are directed.

RECOMMENDATIONS

Local and regional planning agencies in Georgia will have a model of a watershed-based database suitable for use in water resource protection planning with the completion of the Lake George and Lake Blackshear database development project. It is recommended that agencies that would benefit from the use of such watershed-based information in their planning efforts undertake those efforts in a cooperative fashion with those neighboring agencies with whom they share watersheds and water resource protection concerns.