EVALUATING WATER QUALITY OF NAVIGABLE WATERS IN GEORGIA USING A GEOGRAPHIC INFORMATION SYSTEM

Diane C. Burgoon[1] and Keith W. McFadden[2]

AUTHORS: [1]Physical Scientist and [2]Computer Specialist, U.S. Geological Survey, 3039 Amwiler Road, Suite 130, Peachtree Business Center, Atlanta, Georgia 30360-2824.

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Abstract. As mandated by the Clean Water Act, the State of Georgia, Georgia Department of Natural Resources (GDNR), is required to prepare biennial reports describing current quality of the navigable waters in the State (Georgia Department of Natural Resources, 1997). The U.S. Geological Survey (USGS), in cooperation with the GDNR constructed a geographic information system (GIS) map and accompanying relational database to make water-quality data more accessible and useful to the public than in previously published table formats. Using GIS methods and techniques, GDNR attribution data first were combined to the U.S. Environmental Protection Agency River Reach files; and then combined with the USGS-Digital Raster Graphic Files to construct the current map product and database.

INTRODUCTION

The Federal Clean Water Act of 1972 requires the State of Georgia, Georgia Department of Natural Resources (GDNR), to prepare biennial reports known as 305B reports describing current quality of navigable waters in the State. The most recent GDNR biennial report, titled "Water Quality in Georgia, 1994-1995", assesses whether the quality of navigable waters in the State meet minimum criteria to support designated categories for drinking water, recreation, fishing, coastal fishing, and wild and scenic rivers. Water-quality conditions are delineated in the biennial report in table format as (1) supporting, (2) partially supporting, or (3) not-supporting designated water uses (Georgia Department of Natural Resources, 1997).

MAP CONSTRUCTION

The U.S. Geological Survey (USGS), in cooperation with the GDNR, is constructing maps and accompanying relational databases for selected Georgia river basins to make water-quality data more accessible and informative to the public. The primary data classifications for these basins are fishing, drinking water, and recreation.

The 305B biennial report results were incorporated into maps and relational databases using geographic information system (GIS) methods and techniques for the Chattahoochee and Flint River basins. Illustrations and tables required for the 305B report are produced simultaneous with construction of a relational database system tractable for data updates, retrieval, exchange; and most importantly, analyses necessary to delineate water-quality conditions.

The attributions of water-quality conditions as supporting, partially supporting, and not-supporting designated water uses were added to the U.S. Environmental Protection Agency (USEPA) River Reach Files (RF3) for the classifications on the Chattahoochee and Flint Rivers. The newly created geospatial data were overlayed on USGS Digital Line Graph Files; thus, constructing the current GIS map. The GIS provides the GDNR with an informative and useful map and builds a data base and map-project for generating future maps. A map project can be updated without having to reproduce an entirely new map project for the next biennial report.

The USGS and USEPA are creating a hybrid dataset that contains the spatial accuracy of the USGS Digital Line Graph (DLG) data and the attribution of the River Reach Files. This hybrid data set—known as the National Hydrography Dataset (NHD)—includes streamflow data for surface-water studies. By utilizing the NHD data set for future 305B report compilations, the GDNR will address data needs of hydrologists and water-use planners by creating a second generation NHD digital data set that can easily be updated with the most current water-quality conditions of navigable waters in the State of Georgia.

SELECTED REFERENCES

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