USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: Assessment of Conditions and Public Attitudes Concerning Marine Sanitation of the Lakes Encompassed by the Savannah River Watershed Region: Policy Projections for the Future

Focus Categories: 1. Water Quality-WQN 2. Management and Planning-M&P 3. Recreation-REC

Key Words: Marine sanitation, waste disposal, water quality management, lakes, boating, planning, watershed management recreation.

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Non-Federal (Matching) Funds: $42,838

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Congressional District: Third

Statement of Critical Regional Water Problems

Due to the population growth in the region comprising the Savannah River Watershed and counties adjacent to this area, two questions arise: how will this growth and its impacts affect water quality and how will it affect the management of these waters? Using and extending the results and insights gained in a study on the Clean Water Act in the State of Illinois, the current study deals with the determination and extent that sewage discharge by recreational vessels may have as a substantial contribution to regional degradation of water quality in the lakes comprising the Savannah River Watershed Area (Lakes Jocassee, Keowee, Hartwell, Russell and Thurmond). Discharge of treated or untreated sewage from boats may degrade water quality by introducing microbial pathogens into the environment and locally increasing biological oxygen demand. These conditions can negatively impact natural resources, contaminate potable water sources, affect recreational fisheries and tourism causing economic problems through such actions as requiring closure of recreational tourism facilities.

This research is useful to the South Carolina Department of Health and Environmental Control which is attempting to develop a plan to control dumping of waste into lakes. The same information would be useful to the Georgia Department of Natural Resources Environmental Protection Division and the United States Corps of Engineers (who control Lake Hartwell). An additional beneficiary of this data would be the committees of

the Savannah River Basin Watershed Management Project which is being sponsored by the US Environmental Protection Agency. All these agencies can use this data to fill information gaps on use, extent of public perception and attitudes on water quality and use and concentrations of recreational boaters on the lakes in the study region of South Carolina and Georgia.

Statement of the Results, Benefits, and/or Information: The study will provide information on the location, use, and types of existing pumpout stations and waste reception facilities. It will provide information to determine needs and potential locations for additional pumpout stations and waste reception facilities along the lakes in the study area. Additionally, the study will assess the size, distribution and aggregate characteristics of human populations important to the understanding of types of demands likely to be placed on management and planning in the coming decades. Using GIS, the study will identify areas of concentrated use of the lakes and suggest alternative means of dealing with waste and sanitation problems in a lake environment. It will identify an approach to educate and inform recreational boat users and operators of marinas and other sites where boats congregate of the environmental value and use of pumpout stations and waste reception facilities. In addition to the survey and GIS mapping, an informational brochure will be prepared for distribution on the environmental value and to promote understanding of and compliance with the federal, state, and local laws and regulations by recreational boaters and boat access operators concerning discharge of untreated human waste from recreational vessels.

INTRODUCTION

In 1992 the Congress of the United States of America passed the Clean Vessel Act (Wicks 1994). This act required each coastal state to conduct a survey of recreational boaters to determine the number and location of pump-out stations and waste reception facilities (dump stations). In 1998 in South Carolina the issue of recreational boaters dumping waste into its lakes became a public issue (Anderson Independent February 14, 1998). Concerns were being expressed about the current practice of dumping treated waste into the lakes of South Carolina and ways to ensure that these lakes continue to be as clean and safe as they have always been historically.

The current proposal deals with the determinant that sewage discharged by recreational vessels may be a substantial contributor to regional degradation of water quality in the lakes comprising the Savannah River Watershed Area (Lakes Jocassee, Keowee, Hartwell, Russell and Thurmond). Discharge of sewage from boats may degrade water quality by introducing microbial pathogens into the environment and locally increasing biological oxygen demand, particularly in poorly flushed water bodies. These conditions may negatively impact natural resources, contaminate potable water sources, and cause economic problems through such actions as requiring closure of recreational and tourism facilities.

The changes in rates of population growth as well as in the characteristics of the participant population have been major determinants of the rapid growth in recreational

activity in the past decades and created the context from which many of our conclusions regarding participation in recreation and tourism activities have been derived (Clawson 1985; Murdock et al 1990). Particularly, in areas where rapid increases in population have occurred, simultaneous increases in recreation activity has also tended to occur. This study will assess the population growth in and adjacent to the Savannah River Basin Region, to show the size, distribution and aggregate characteristics of the human population of the region. The demographic changes occurring in this region have social, economic and managerial implications for water resource managers.

The shoreline of the study area includes hundreds of miles within the states of South Carolina and Georgia. The adjacent areas include a number of large population centers (Atlanta, GA; Greenville, SC; Charlotte, NC); the largest discrete unit is the Atlanta Metropolitan Region with a population of nearly one million people.

Recreational boating in the study area of South Carolina and Georgia is a growing activity due to the large nearby population, an increasing number of immigrant retiree population, a popular sport fishery and a series of large and aesthetically attractive lakes. The burgeoning recreational boating industry includes a larger and diverse recreational vessel that contains portable toilets or type III marine sanitation devices. The number of these boats using these lakes is not determined nor the number using concentration areas. Similarly, the number and location of pump-out stations and waste reception facilities are not known nor is their relationship to concentration areas of recreational boats.

Due to the recreational and tourism economic value of these lakes in South Carolina and Georgia, efforts must be made to ensure degradation of its water quality does not occur. As water quality of these lakes can be degraded by human waste discharged from recreational vessels, the potential for discharge from recreational boats and locations where discharge is most probable and most concentrated must be determined. This information is required to determine the need for additional pump-out stations and waste reception facilities.

In addition to determining the need for additional facilities is a need for an educational process to be developed to provide awareness of the environmental benefits of the facilities and their locations. The level and type of education needed can only be determined after determining the existing attitudes and knowledge of boaters and marina operators of existing laws, regulations related to discharge of waste from recreational boats and benefits of pump-out facilities.

OBJECTIVES

The four primary objectives of this project are:

1. (a) To determine and map the number, location and condition of pump-out stations and waste reception facilities used by recreational boats and other types of lake visitors that are using the lakes comprising the Savannah River Watershed Region in South Carolina and Georgia.

(b) To assess and map the population growth as well as characteristics of the population involved in recreational and tourist us of the lakes comprising the Savannah River Watershed Region.

2. To determine the number of recreational vessels with type III marine sanitation devices or portable toilets that utilize these lakes in South Carolina and Georgia and the areas where they congregate.

3. To identify and map optimal locations for construction or renovation of pump-out stations and waste reception facilities needed to ensure that an adequate number are reasonably available for recreational vessels using these lakes.

4. To develop information and education literature on the value and use of pump-out stations and waste reception facilities for recreational boaters who use the lakes in the Savannah River Watershed Region.