

Assessing Pinellas County Water Quality Using a Three-Tiered Monitoring Approach

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Biographical Sketches of Authors

Kelli Hammer Levy is the Environmental Program Manager for the Water Resources Management Section of the Pinellas County Department of Environmental Management. Kelli received her Masters Degree from the University of South Florida's College of Marine Science in Marine Chemistry with an emphasis in nutrient chemistry. Since 1998, Kelli has worked on a variety of projects including watershed management, phytoplankton taxonomy, and lake habitat restoration.

Mark Flock is a Senior Environmental Scientist in the Water Resources Management Section of the Pinellas County Department of Environmental Management. Mark received his Masters Degree from the University of South Florida's College of Marine Science in Marine Fisheries. Since 1990, Mark has been involved in many fisheries, seagrass and water quality related projects in the Tampa Bay area. Together with co-authors, David Wade and Anthony Janicki of Janicki Environmental, Inc., the Water Resources Management Section developed and implemented a probabilistic water quality monitoring program for Pinellas County open water bodies.

Abstract

The Pinellas County Department of Environmental Management (DEM) has conducted a surface water quality monitoring program at a series of fixed stations since 1991. The site locations were selected to represent ambient surface water quality conditions. However, the 1991-2002 program does not allow statistical estimation or trend analysis for the receiving water bodies, limiting inferences to the location of the fixed station. In addition, the design of the 1991-2002 program resulted in many large geographic data gaps. In order to better assess water quality status and trends, provide loading estimates, and to expand the geographical range of the program, the DEM employed a three-tiered monitoring program in 2003. The first tier of the program is a coastal and open water body monitoring program that incorporates a probabilistic design that parallels the Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP). A probabilistic approach includes randomly selected station locations where each site represents an unequal but known proportion of the population of interest. This approach eliminates bias associated with site selection and allows for statistically defensible inferences of seasonal, annual and long-term water quality status and trends. The second tier of the program is designed to provide loading estimates from water quality and flow data collected at a series of fixed stream locations. Lastly, the focus of third tier is on the development of basin specific storm event mean concentrations (EMCs) to evaluate stormwater improvement projects and provide EMC loading data to meet the County's NPDES permit requirements.

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