

# **Sediment Quality Assessment and Monitoring in the St. Johns River Water Management District, Florida**

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## **Biographical Sketch of Authors**

Greg Durell is a senior research scientist with more than 15 years' experience in environmental chemistry. His primary responsibilities have been designing and directing multidisciplinary environmental assessment and monitoring studies, and determining the fate and impact of contaminants in the aquatic environment.

Aisa Ceric is an environmental scientist with more than 25 years experience in water resources management. The last ten years she has been responsible for designing and conducting water quality, sediment, and biological monitoring studies in Northeastern Florida, preparing regional assessments and providing data to the public. Her educational background includes a Bachelor of Science in Civil Engineering and a Master of Science in Environmental Engineering.

## **Abstract**

In 1996 the St. Johns River Water Management District initiated a program to investigate the sediment quality in a 19-county region of northeastern Florida. Analytical protocols with detection limits orders of magnitude below standard EPA methods were employed; sediment MDLs for 100+ organic compounds (including PAHs, PCBs, pesticides) were around 0.1 ppb and 0.01 to 0.5 ppm for 15 metals. Sediments were collected from 126 locations to obtain a First Tier baseline assessment and to identify areas of potential concern. The data were assessed using geographical methods, inter-site analysis, comparisons to Regional and National conditions, and sediment quality guidelines. Second Tier detailed assessment was performed at locations identified as possibly impacted, and ecological risk-based assessments were added to the interpretation. Sediments within the lower St. Johns River and several of its tributaries were notably contaminated. The St. Johns River urban reach, and the urban and industrial reach of the Cedar-Ortega Rivers, had high concentrations of PCB, PAH, DDT, chlordane, and several heavy metals. In addition, two other areas, water systems around Gainesville and the Harris chain-of-lakes, were identified as impacted by industrial (e.g., PCB, lead, and cadmium) and agricultural chemicals (e.g., DDT, chlordane, and BHC), respectively, at levels indicating a significant possibility for ecological harm. Hazard indices above 10 were calculated for extended areas, using the contaminant data and conservative ecological sediment quality assessments. Third Tier investigations, including detailed contaminant distribution mapping, benthic ecology assessment, toxicology and bioaccumulation studies, and interpretation of contaminant availability and impact will be performed to determine the environmental significance of the contamination. These focused studies will direct source identification and control, and will guide potential remediation and other management decisions.