

Lake Beauclair aquatic enhancement

Client

- Lake County Water Authority

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Location

- Lake County, Florida

Key Staff

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- Leon Seale, PE
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Project Cost

- \$420,000

Start Date

- 2007

Completion Date

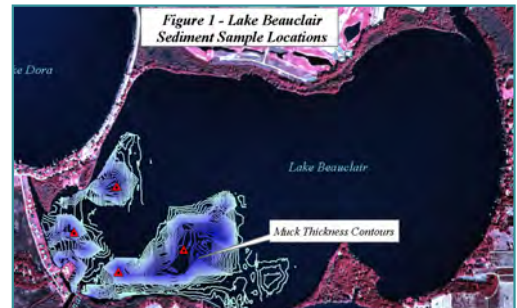
- 2010

Scope

Lake Beauclair is situated as the first lake downstream of Lake Apopka in the Harris Chain of Lakes, and receives controlled discharges from Lake Apopka through the Apopka-Beauclair (AB) Canal. Long-term sediment and nutrient inputs to Lake Beauclair have degraded the aquatic plant community and fish and wildlife assemblage, largely due to high levels of phosphorus and low dissolved oxygen. The Lake County Water Authority (LCWA) in partnership with St. Johns River Water Management District (SJRWMD) and the Florida Fish and Wildlife Conservation Commission, (FWC) contracted with AMEC to evaluate a sediment removal enhancement initiative to improve water quality, habitat, and navigation within the western-most portion of Lake Beauclair where anthropogenic sediment deposits are most pronounced.

This project enhances the water quality and navigability of the 1,100-acre Lake Beauclair by removing more than 1.3 million cubic yards of organic sediment. A partial lake pump-down, and installation of aquatic vegetation were also considered. AMEC has worked closely with the LCWA and a variety of stakeholders and funding partners to prepare the project feasibility assessment and alternatives assessment for deposition of sediments proposed for removal. During this process, AMEC has performed water quality and sampling analyses to assess nutrients, metals, and geotechnical/ agronomic characteristics and determine potential beneficial uses of sediments proposed for removal. We developed a water balance model of the Lake and designed a hydraulic system for the pumpdown to facilitate shoreline planting during project implementation. In addition, bathymetric surveys were performed to define the thickness of accumulated sediments atop the natural mineral Lake bottom.

AMEC provided recommendations for reducing navigational hazards, enhancing aquatic habitat, improving water quality, and minimizing impacts to a variety of listed species known to utilize the area. Pre-application meetings were



organized with our clients (LCWA and FWC), FDEP, SJRWMD, and USACE to determine permitting requirements and potential issues for design. Extensive jar tests were made of various coagulants, flocculants and nutrient removal aids to design the treatment train necessary to meet TMDL and other water quality requirements of the project. AMEC recommended use of the dredged material to cap pesticide-contaminated soils in a subsided muck farm near Lake Apopka at sufficient elevation to support wetland restoration (emergent marsh) as a beneficial use of the sediments.

AMEC completed the design of the disposal area embankments, chemical treatment system for the supernatant, and the pipeline and pumping system for sediment management at the recipient location. Our staff prepared permit applications in consultation with the LCWA, FDEP, FWC and the USACE to obtain regulatory project approvals necessary for project implementation, and provided representation to the LCWA to successfully defend against administrative challenge to the project. AMEC has also prepared bid documents and provided support to LCWA during the contractor selection process.

Lake Seminole sediment removal

Scope

Lake Seminole is a highly eutrophic lake located in Pinellas County, Florida, that is currently listed by FDEP and the EPA as an impaired waterbody pursuant to Section 393(d) of the federal Clean Water Act. The pollutants are nutrients (primarily phosphorus forms) that are present in elevated forms in water column and sediments.

This shallow, 684-acre, fresh water lake has been negatively impacted by nuisance sediments that impair water quality, cause habitat degradation, and impede recreational uses. The Lake Seminole Watershed Management Plan (2001) and The Lake Seminole Reasonable Assurance Plan (2007) recognize that the organic sediments are linked to the lake's nutrient-related impairment. The lake's approximately 3,500-acre watershed is highly urbanized, with commercial and residential land uses comprising most of the land service.

Prior to the mid-1940s Lake Seminole was an estuarine waterbody. It was converted to a freshwater system by the construction of a roadway which acted as a dam. This construction altered the lake's salinity regime from brackish to fresh, and the construction of the dam and several additional hydrologic modifications in the watershed have substantially reduced its flushing rate and increased its hydraulic residence time. The lake has also received discharges of untreated or minimally treated stormwater runoff from a variety of urban land uses for decades.

AMEC was retained in 2010 to provide professional environmental and engineering services requisite to the development of the Lake Seminole Dredging Project to remove approximately 1 million cubic yards of sediments from the lake. AMEC is providing assistance with the engineering, analytical, design, permitting, and administrative support services associated with the removal, processing, and disposal of the nuisance, nutrient rich sediments from within the lake.



AMEC's task assignments associated with this project, and currently in progress, include:

- Bathymetric and sediment surveys
- Physical, nutrient, and chemical characterizations of the sediment including moisture content and wet sieve analysis, specific gravity test, and total organic content analysis
- Geophysical and geotechnical site investigations
- Dredging and process design including prioritization of sediment laden areas; evaluation of sediment characteristics, volumes and material balance; and dredge and pumping system design
- Disposal area and structural foundation design
- Storm and sediment water management design
- Project plans
- Design report
- Permitting including agency communication and coordination; ERP permit applications; and permit RAI responses
- Public outreach
- Construction operations oversight and technical guidance

Client

- Pinellas County

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Location

- Pinellas County, Florida

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- Jeffrey Beriswill, PE
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- Mark Chomtid, PhD, PE
- Allan Biddlecomb, PG

Project Cost

- \$850,000

Start Date

- 2010

Completion Date

- Ongoing