

## **ACES Annual Report Summary**

### **Part 1 Web Summary Report**

**Date of Report:** January 24, 2003

**Title:** Changes in water conditions and sedimentation rates associated with construction of the Mobile Bay Causeway

**Investigators:** Miriam Fearn, Douglas Haywick, Justin Sanders

**Institution:** University of South Alabama

**Research category:** Regular grant

**Period covered by report:** October 2001 to January 2003

**Award Number:** R-827072-01-1)

**Objectives:** This research focuses on Chocalata Bay, a floodbasin now isolated from the larger estuary of Mobile Bay by the Mobile Bay Causeway. Sediment cores from selected locations to the north and south of the Causeway are used to give information on pre- and post-construction conditions in and around Chocalata Bay that can help decision-makers to determine the best course of action to take in mitigating the environmental impact of the Causeway. The study uses (1) diatom analysis as an indicator of water conditions; (2) pollen and phytoliths as indicators of vegetation change; (3) grain size analysis as an indicator of energy conditions; and (4) Cesium 137 (Cs-137), Lead-210 (Pb-210), and Carbon-14 (C-14) to provide dating control for critical horizons in the cores. This work provides research experiences for undergraduate/graduate students in geography, geology, physics, biology, and marine sciences.

**Progress summary/accomplishments:** Much of the field work was accomplished during the summer of 2002. At least three sediment cores were taken at each of four sites in Chocalata Bay. The longest core (190 cm) was retrieved from the northernmost site. Cores in Chocalata Bay north of the Causeway are at least 1 meter long, those south of the Causeway are slightly shorter. One graduate student participated in the field work. Six undergraduate students (1 from physics, 2 from biology, 2 from geography, and 1 from geology) are currently in training to work on this project during the spring and summer of 2003.

**Publications/Presentations:** None

**Future Activities:** In 2003, we will concentrate on analyzing the sediment cores for microfossils, grain size, and Cesium-137. One additional site in the marsh will be cored this year. Fall submission of abstracts for poster presentations by students involved in the research is also a prime objective for 2003.

**Supplemental keywords:** estuary, indicators, decision making, Alabama, EPA Region 4.

**Relevant web sites:** <http://www.usouthal.edu/geography/fearn/Causeway.htm>

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## **ACES Annual Report Summary**

### **Part 2 Performance Report**

**Date of Report:** January 24, 2003

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**Investigators:** Miriam Fearn, Douglas Haywick, Justin Sanders

**Institution:** University of South Alabama

**Research category:** Regular grant

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**Award Number:** R-827072-01-1)

#### **Comparison of completed to projected research progress**

Most sediment cores for this project have been retrieved and are in cold storage awaiting analysis. We are behind on the processing and analyses due to efforts to complete two previous grants that involve similar work. Additionally, the wet chemistry lab that Dr. Fearn shared with a cancer researcher is no longer available, and some supplies and equipment were inadvertently removed by other researchers and had to be replaced. Currently, chemical processing has to be done in borrowed space that is not always available or adequate.

#### **Report of Expenditures to date**

<b>Item</b>	<b>Budget</b>	<b>Expenditure</b>	<b>Remaining</b>
Personnel	\$17,829.00	\$7,158.09	\$10,670.91
Students	\$41,600.00	\$3,161.46	\$38,438.54
Fringe	\$4,457.00	\$1,725.93	\$2,731.07
Supplies	\$13,420.00	\$995.52	\$12,424.48
Travel	\$3,500.00	\$0.00	\$3,500.00
Equipment	\$4,000.00	\$3,438.12	\$561.88
Indirect	\$27,474.00	\$5,951.18	\$21,522.82
Total	\$112,280.00	\$22,430.30	\$89,849.70