

PROJECT SUMMARY

Florida Bay Inner Basins Circulation and Exchange Study: Northeast and Western Basins

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In response to the Announcement of Funding Opportunity by the CSCOR/COP South Florida Ecosystem Research and Monitoring Program (SFP 2002), a two year continuation study of the circulation and exchange processes that regulate the residence times and flushing rates within interior basins of Florida Bay is proposed. The project will be conducted through CIMAS, Task 3, Theme 3: Coastal Ocean Ecosystem Processes. The Florida Bay Science Oversight Panel (FBSOP) and Program Management Committee (PMC) have identified the determination of circulation and exchange rates between interior basins of Florida Bay and the southwest Florida shelf as a primary research need for predicting the effects of modifying fresh water supply to the Everglades as part of Everglades restoration plans. At present it is not understood how the proposed changes in water delivery, with increased fresh water flows to the Shark River and Taylor Slough, will affect salinity variability within Florida Bay. However, it is generally agreed that the large seasonal and longer period variations of salinity within the Bay have significant impacts on the sea grass and plankton communities within the Bay, and possibly also with adjacent marine ecosystems of the southwest Florida shelf and Florida Keys National Marine Sanctuary (FKNMS), due to transport processes linking the regions. Reliable model predictions of the physical and biological effects of Everglades restoration plans require a better understanding of the physical processes regulating water exchange and residence times within the Bay and with adjacent coastal regions. The research proposed here will provide this information, as well as address a central question presented in the Strategic Science Plan for Florida Bay: *How and at what rates do storms, changing freshwater flows, sea level rise and local evaporation and precipitation patterns influence circulation and salinity patterns within Florida Bay and the outflow from the Bay to adjacent waters?* Results will also aid understanding of nutrient transports and impacts on algal blooms and recruitment pathways.

The objectives are to quantify the circulation and exchange rates influencing salinity variability in the eastern and western regions of the Bay; to determine their interactions with connecting regions; and to identify the controlling physical processes. This information will aid evolution and evaluation of hydrodynamic models for prediction of future water deliveries. The effort will be a continuation of a previous study which investigated Whipray Basin in the central Bay. Measurement strategies similar to those developed for Whipray will be employed. Observational methods will consist of Eulerian and Lagrangian measurements, rapid shipboard surveying and ADCP transects to directly measure the volume and salt transports and changes of basin-average salinity needed for salt balance estimates and exchange rates in the dry and wet seasons. The measurement program is designed for determining seasonal changes in basin salt balance and exchange patterns. The proposed effort is coordinated with ongoing and planned projects that will place the local basin dynamics in the context of the larger Bay-wide processes as well as the entire South Florida coastal system, to better understand the linkages over different spatial scales important to management and restoration of the South Florida coupled ecosystems.