WORKPLAN FOR FY2006 - 2008

PROPOSAL TITLE:	Long-term monitoring of benthic habitat in the Florida Keys National Marine Sanctuary
INSTITUTION:	Florida International University
INVESTIGATOR:	James W. Fourqurean
TOTAL PROPOSED BUDGET:	$261,680
BUDGET PERIOD:	June 2006 - May 2008

ABSTRACT:

This proposal describes the continuation of the long-term monitoring of benthic habitat in the Florida Keys National Marine Sanctuary (FKNMS). This program was designed to address the following objectives: 1) Define the present distribution of benthic communities within the FKNMS, 2) Provide high-quality, quantitative data on the status of the seagrasses within the FKNMS, 3) Quantify the importance of seagrass primary production in the FKNMS, 4) Define the baseline conditions for the seagrass communities, 5) Determine relationships between water quality & benthic community status, and 6) Detect trends in the distribution and status of the benthic communities. In this project, two sampling strategies are used: 1) semi-synoptic maps of indicator parameters are generated through sampling ca. 350 randomly-located points in a 19,000 km^2 area that includes the FKNMS and the region of shallow coastal water to the north of the Sanctuary, south of Cape Romano, and west of Everglades National Park; and 2) quarterly sampling of fixed transects at 30 permanent monitoring sites in the FKNMS. Indicators of the status of the seagrass communities assessed include: species composition, cover and abundance of macrophyte communities, elemental and stable isotopic content of seagrass leaves, seagrass morphology, and seagrass growth rate. The reasons for the selection of these indicators is given in the proposal. At the permanent sites, quarterly measures of these indicators have been made since winter of 1995. Eight of the 30 permanent monitoring sites displayed change consistent with models of eutrophication responses of tropical seagrass beds. At 4 sites, macroalgae have become relative more abundant, and at 4 other sites the elemental content of seagrass leaves has shifted towards the "Seagrass Redfield Ratio." The rates of change of the permanent stations have been slow, except for three sites which have been severely impacted by hurricanes in the monitoring period. The slow rates of change indicate the need for monitoring for long periods to be able to detect net change; the fact that storms have affected 10% of these randomly selected locations indicates that all stations are needed in order to assure long-term records in the absence of storm-induced disturbance. Synoptic mapping was carried out during the years 1996-2000. In 2003, the 300 stations originally surveyed in 1996 were revisited, in 2004 the stations visited in 1997 were revisited, and in 2005 the stations visited in 1998 were revisited. This will allow for over 1000 pairwise measurements of the magnitude and direction of change in seagrass communities in the region. Lastly, statistical models describing the relationships between seagrass habitat status and water quality will be developed in conjunction with the water quality monitoring program for the FKNMS.