Draft May 12th

A Proposal for

The Florida Institute for Oceanography Academic Infrastructure Support Organization (AISO)—A Renewed View of the SUS Role in Florida's Ocean Environments

May, 2009

Purpose of the AISO

Vision Statement

The Florida Institute for Oceanography will facilitate Florida's emergence as the preeminent state in the nation for understanding coastal ocean processes and how these control economically essential natural resources and associated hazards.

Mission Statement

The FIO will provide a statewide forum addressing problems of general concern in oceanographic research and education. The FIO will integrate existing physical and intellectual resources within the State, anticipate and plan for future infrastructure needs, and promote and support cooperative ocean-related research and education statewide.

Oceanography and the State of Florida

Introduction

This proposed Academic Infrastructure Support Organization defining the Florida Institute for Oceanography (FIO) enables the State University System to provide an intellectual center for the mature, diverse, but fragmented marine science enterprise that exists in the state. A redefined FIO, different from the existing FIO that was established as a Type 1 SUS Center in 1980, will provide a more comprehensive state-wide interaction with the established components in academia, government, and the private sector to promote research, education, and project management. This AISO will enhance public awareness of ocean science issues affecting all Floridians.

By definition* Academic Infrastructure Support Organizations provide "underlying technology, equipment, facilities, services, and resources for academic programs and research in the State University System of Florida". This new AISO would apply this mandate to promote research and education of Florida's coastal ocean.

Florida benefits enormously from comprehensive, over-arching organizations such as the Florida Oceans Coastal Council (FOCC), the Florida Oceans Alliance (FOA), the Florida Coastal Ocean Observing System Consortium (FLCOOS), the three NOAA cooperative institutes, and now the new NOAA cooperative institute to focus on ocean exploration, research, and technology development led by and headquartered at the Harbor Branch Oceanographic Institute at Florida Atlantic University in Fort Pierce. The intent of this AISO is to bring together the marine and oceanographic components of the SUS to collaborate more effectively with these groups.

This AISO will provide state-wide leadership in helping the populace understand issues such as climate change, sea-level rise, red-tide outbreaks, the health of living marine resources such as coral reefs and fisheries, impacts from offshore oil drilling, impacts from fresh water usage, estuarine and costal water quality and hurricane associated risks. Additionally, this AISO will provide critical infrastructure necessary to operate research vessels support field stations and enhance awareness of major research and educational capabilities throughout the State. This AISO will promote increased scientific collaboration and economy of human resources. This new AISO will transform the way we conduct coastal ocean research and education in Florida and bring the State of Florida/SUS and other members to national prominence in coastal ocean science.

The earth system is changing. We are engaging in unsustainable human activity. The future will require an educated and informed populace and a new breed of ocean scientists and engineers to maintain a productive, sustainable environment for Florida and all Floridians. The Florida Institute for Oceanography will be an essential partner in realizing that future.

The Significance of the Coastal Ocean

The reconstituted FIO will have within its purview all aspects of oceanography that affect the State of Florida. These are intrinsically broad-ranging because Florida, as a peninsula nearly surrounded by water, is fully impacted by the workings of the coupled ocean-atmosphere system. With Florida's economy largely based on tourism and agriculture and with relentlessly growing coastal populations, it can be said that no aspect of the Florida's economic health goes untouched by Florida's bounding oceans. Nevertheless there are areas for which FIO must be particularly attuned.

There are three regions of oceanographic concern. The first, consisting of the upland drainage basins that feed into the rivers, the estuaries and the aquifers begins on land and continues offshore to the state water limits. The second is the *coastal ocean--the continental shelf region between the shoreline and the deep-ocean* where society literally meets the sea, where most commercial and recreational fisheries take place and where phenomena such as harmful algae blooms (red tides) occur. The third is the deep-ocean extending beyond the shelf break. The properties of the coastal ocean are determined by the interactions that occur between the coastal ocean and the deep-ocean and between the coastal ocean and the uplands via land drainage through rivers and estuaries. The coastal ocean derives it nutrients from these sources (deep-ocean and land), distributes these

nutrients in a way that unites them with light, fueling primary productivity and thence all higher trophic level interactions that constitute ecology. For instance, if our concerns are with: (1) beach conditions that affect tourism, (2) shellfish bed conditions for public health, and (3) the nature of our sustainable fisheries resources, then we must focus on the coastal ocean in its entirely because that is what determines the water properties at the beach, the shellfish beds, and at the fish habitats. Since shoreline conditions are not local, they cannot be studied locally. Instead, environmental stewardship for the State of Florida requires a systems-wide approach.

How do we achieve such a systems-wide approach to State of Florida environmental stewardship, and what is the principal role to be played by the new, reconstituted FIO? Climate and weather in Florida have their basis in global, ocean-atmosphere interactions that influence the state and are modified to some degree by local conditions. As global phenomena, their study is guided by national and international agencies. For instance, the NOAA, National Weather Service, National Centers for Environmental Prediction (NCEP) provides daily and long-range weather forecasts. The National Science Foundation, along with other applied agencies, supports basic research aimed at improving forecasts. These same agencies are charged with improving our understanding of the deep-ocean.

For the upland watershed, the estuaries, and the coastal zone itself there are a number of applied agencies within the State of Florida. Water resources are the purview of the Water Management Districts; public health concerns fall within the Florida Department of Health, which monitors shellfish beds; environmental concerns on land and within near-shore state waters fall to the Florida Department of Environmental Protection, and other fish and wildlife aspects are the purview of the Florida Wildlife Commission, for instance, red tides. With the deep-ocean and the uplands to the near-shore (within the 3 or 9 mile limits as defined by statute) covered to a large degree by other agencies, *it is the coastal ocean that requires primary attention of a new, reconstituted FIO.*

FIO is the only State of Florida entity poised to coordinate and facilitate coastal ocean research and education for that particular body of water upon which a healthy Florida economy depends. As an example, consider some of the primary commercial and recreational fisheries. Many of the grouper/snapper species live and spawn offshore (grouper are commercially fished from the 40 m isobath to the shelf break at about 80 m), whereas the juveniles grow to be adults in the estuaries and near-shore regions. Hence the life history of the grouper/snapper complex (a $40 billion Florida industry) spans the coastal ocean. Ecologically-based management of this important resource demands a coastal ocean perspective that no other Florida agency can facilitate. The same can be said of red tide research. Whereas the red tide organism, *Karenia brevis*, manifests itself at the beach, driving away tourists, closing restaurants, hotels, and shellfish harvests. But, *K. brevis* does not develop at the beach. Instead it develops offshore, and hence its understanding and mitigation demand a systems-wide coastal ocean focus. Linking all of these topics is fresh-water inflow from land drainage. "If only we could divert water resources from the north that flow wastefully into the Gulf of Mexico we could solve all of central and south Florida's water resource problems" is an often heard refrain. This

ignores the fact that the distribution of fresh water inflow to Florida's coastal ocean is critical to the maintenance of a healthy, coastal ocean ecology. Again, the FIO is the only independent, encompassing entity that can provide for systems-wide coastal ocean research and education on matters of such importance to the State of Florida.

Along with serving as a coordinating body for all oceanographic research and education for the Florida across academia, the state and federal agencies and the private sector, FIO's core mission must be to ensure the facilitation of research and education on Florida's coastal oceans. This requires several attributes. First and foremost must be infrastructure support for sea-going operations. Historically, Florida's east and south coasts drew ship operations from the Harbor Branch Oceanographic Institute (HBOI) and the University of Miami (UM), both of whom are University Oceanographic Laboratory System (UNOLS) ship operators. Additional sea-going operations were facilitated by smaller vessels operated by Florida Atlantic University SeaTech and NOVA Southeastern University. The entire west coast of Florida had ready access to the former FIO vessels *R/V Suncoaster* and *R/V Bellows*, along with more limited, local support by FSU. Without the FIO vessels there would not have been any substantive coastal ocean research for the West Florida continental shelf, a coastal ocean region that is as large as the entire sub-aerial State of Florida landmass. This situation at least for the west coast of Florida remains unchanged. Presently the *R/V Weatherbird II* and *R/V Bellows* continue to provide infrastructure support for seagoing operations. Without these two ships we would revert back to essentially no substantive research for this essential Florida water body. Such needs are further heightened by how close Florida recently came to passing legislation enabling offshore drilling across all of Florida's waters. The UNOLS ship operations by HBOI and UM along with the FIO ship operations remain critically important infrastructure needs for the promotion of coastal (and deep) ocean research and education for the State of Florida.

FIO's focus and emphasis will be the *coastal ocean—the continental shelf/slope region between the shoreline (beach) and the deep-ocean.*

The Interdependency of Florida and the Coastal Ocean

A recent United Nations study predicts that the global, human population will increase from approximately 6.77 billion now (World POPClock Projection) to about 10 billion by the year 2100**. Following past trends, many if not most of the new additions to the Earth's population will live near the coastal ocean. The US and Florida will, most likely, follow these trends (perhaps not at the same rate) thus placing increased burdens on the State's coastal ocean environment and its resources. In contrast, as a global society, we are engaged in a huge experiment with the Earth's natural systems that may lead to significant changes in climate resulting in sea-level rise, changing rainfall patterns, and perhaps changing storm patterns. Thus, the health of the coastal ocean and human society are inextricably interdependent upon each other.

Additionally, as has been pointed out in other documents***, Florida's past and present economy and quality of life are enormously dependent upon the coastal ocean and all life

contained therein. For example, The Florida Oceans and Coastal Council*** reports that over $25 billion GSP is generated from the ocean, and over $560 billion is generated in the coastal counties. There is no reason to believe that this dependency will abate, but will only increase. Hence, there is an urgency to have an efficiently operated AISO that addresses Florida's coastal ocean.

Consistency with the BOG Strategic Plan

We paraphrase from the Strategic Plan of the SUS BOG adopted June 9, 2005 extending 2005—2013; "The State University System of Florida consists of ten public universities [New College is 11th entity]…the shared mission is to serve the needs of a diverse state through excellence in teaching, research, and public service". Three relevant state goals are: (1) access to and production of degrees, (2) meeting statewide professional and workforce needs, and (3) building world-class academic programs and research capacity". As an AISO, the Florida Institute for Oceanography's vision and mission are aligned with the SUS Strategic Plan applied to issues dealing with Florida coastal ocean environment.

Anticipated Funding

The purpose of the three AISOs is that their funding is external to that of the host university legislative request. FIO will be support by funds flowing from the State Legislature, fees charged for use of FIO facilities, appropriate charges to administer contracts and grants awarded to or passed through FIO, and overhead returned.

How the Proposed AISO FIO Will Differ From the Existing FIO Type 1 Center?

Research

1. Assist principal investigators and chief scientists to network and collaborate from generating ideas to locating and procuring equipment and technical assistance during cruise preparations. Identify technologies required for new oceanographic research and promote development of that research within the state. Promote research priorities identified by FOCC, FOA, FLCOOS, Sea Grant, the four NOAA cooperative institutes and help state scientists translate these areas of emphasis into research programs.
2. FIO will become proactive in forging inter-SUS interdisciplinary activity, e.g., sponsoring workshops to promote scientific collaboration within Florida.
3. Provide a gateway for PI's to access high-end analytical facilities and new technologies that exist within Florida. As a starting point, generate a data base on research facilities in the state and provide contact information.
4. Operate the *R/V Weatherbird* which is twice the size of the *R/V Suncoaster* (194 tons vs 90 tons), has much greater sea-keeping capability (bow-thruster), is technologically enhanced, and will sail with a science tech as part of ship's crew. See photo below.

5. Expand active membership of and provide the administrative support for the Florida COOS Consortium (public-private partnership formed to continue the development of a COOS for Florida). FIO will become an effective advocate for the entire statewide ocean and coastal network.
6. Assist principal investigators and chief scientists to recruit scientific crew members so that students within the FIO membership have maximum opportunity to sail on research vessels. Coordinate and assist operations of other, smaller research vessels within Florida.
7. Place summaries of research conducted using FIO facilities (cruise title, chief scientist, cruise objectives, preliminary results). Publish schedule of upcoming cruises. Maintain list of publications, theses and dissertations dependent upon use of FIO facilities.
8. Engage similar organizations within the other US bordering the Gulf of Mexico (Alabama, Mississippi, Louisiana, Texas) and develop ties to Mexico, Cuba and other island nations in the Caribbean.

Education

1. Transmit science operations in real time from *R/V Weatherbird* and other seagoing platforms via ship-to-shore technology for appropriate distribution to education sites around state and beyond.
2. Maintain listing of undergraduate and graduate level courses taught within the FIO membership addressing some aspect of marine science and oceanography. Develop a relationship with the Florida College System of community colleges to assist them with post-secondary education in the marine and ocean sciences. Engage initiatives such as the proposed Florida Distance Learning Consortium.
3. Facilitate: (a) short courses and course modules to elevate understand of key marine science issues for non-scientists, (b) educational products for primary and secondary schools, (c) workshops for scientists to develop concept papers to guide future science initiatives in Florida, Gulf of Mexico, and the SE US, (d) programs like the National Ocean Science Bowl, (e) a program to recruit teachers to sail as part of the scientific crew (teachers could transmit lessons from the ships at sea), and (f) marine science summer camps at multiple sites around state.
4. Develop talking points to explain complex scientific issues for general use. Recruit and identify speakers to educate the populace on critical issues. Identify experts of various marine science and oceanographic research areas who would be willing to share their expertise. Make list available to the media with contact information.
5. Maintain an education/outreach component of the FIO website. Publish an electronic newsletter informing members of appropriate issues and upcoming events (e.g., promoting seminars at FIO member institutions).
6. Develop linkage with Consortium for Ocean Leadership education specialists.

Future Directions/Initiatives

1. Facilitate acquisition and maintenance of a research vessel on east coast of Florida at appropriate facility that is equipped to handle research vessel operations.

2. Significant upgrade the ocean-going equipment inventory maintained by FIO such as a ROV with high-resolution underwater video, multibeam seafloor mapping tool, and real-time high speed data transmission and reception capability.

R/V Weatherbird II in Bayboro Harbor, St. Petersburg, FL. FIO now operates this recently acquired research vessel.

Keys Marine Laboratory located on Long Key. The FIO was instrumental in the state purchase of the Keys Marine Laboratory (KML) in Layton in 1991—the only tropical laboratory in the contiguous U.S. The KML has operated in an 18-year partnership with the FWC, much like a land-based ship. Basic infrastructure expenses and employees are shared by the partners and operational expenses are generated by fees. The KML was substantially damaged by Hurricane Wilma in 2005, but has been re-built and anticipates renewed interest on the part of visiting university groups, graduate students and agency research on the high profile environments of the Florida Keys.

Footnotes

* SUS Board of Governors (BOG) Regulation 10.014.

** Ruddiman, W.F., 2008, Earth's Climate Past and Future: W.H. Freeman and Co. (Figure 19-1, p. 344), 388p.

***Florida Oceans and Coastal Council's Annual Science Research Plan 2009-2010; Florida Oceans and Coastal Council, 12p.

See Attachment #1 Draft Memorandum of Understanding required by SUS BOG Regulation 10.014

Attachment #1

D R A F T

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNIVERSITY OF SOUTH FLORIDA (USF),
BOARD OF TRUSTEES, a public body corporate

AND

THE FLORIDA
BOARD OF GOVERNORS
DIVISION OF COLLEGES AND UNIVERSITIES
ON BEHALF OF THE
FLORIDA INSTITUTE FOR OCEANOGRAPHY,
AN ACADEMIC INFRASTRUCTURE AND SUPPORT ORGANIZATION

This is a MOU between the University of South Florida (USF) and the Florida Board of Governors (BOG) of the State University System, Division of Colleges and Universities (DCU) whereby USF assumes administrative responsibility for the operation of the Florida Institute for Oceanography (FIO), an Academic Infrastructure Support Organization (AISO) of the State of Florida under the Board of Governors, Division of Colleges and Universities (DCU).

The terms and conditions of this MOU are outlined below as Operating Procedures for the Florida Institute for Oceanography. It shall be in effect from the date of final execution by USF and the DCU and may be reviewed annually on or before June 30 by USF, the DCU and the Council.

1. **Members of the FIO**

The FIO consists of the 11 state universities and 10 other institutions which include faculty, staff, and scientists conducting research and teaching and who may wish to utilize ships, facilities, and other services provided by the Institute. These currently are: Eckerd College; Florida Sea Grant College; University of Miami, Rosenstiel School of Marine and Atmospheric Science; Florida Department of Environmental Protection; Florida Fish & Wildlife Conservation Commission, Florida Wildlife Research Institute; Florida Institute of Technology; Mote Marine Laboratory; Nova Southeastern University; and the Smithsonian Institution Marine Laboratory. The total current membership is 21 institutions.

2. Mission and Goals of the FIO

The FIO will serve as a statewide forum to address problems of general concern in marine research and education, to integrate existing physical and intellectual resources that already exist in the state, to anticipate and plan for future infrastructure needs, and to

promote and support cooperative coastal ocean research and education statewide. Specifically:

- The FIO will serve as a statewide cooperative to achieve economies of scale in the shared use of expensive facilities and equipment including research vessels, laboratories and capital equipment.
- As assigned by the Council the FIO will provide administrative and logistical services for inter-institutional grants and contracts, such as the Florida Coastal Ocean Observing System (FLCOOS), which serves public and private interests in Florida.
- The FIO will maintain an inventory of member facilities and equipment and assist in access and scheduling of use where appropriate. Where equipment has been obtained by cooperative effort the Council may assign maintenance and scheduling of this equipment to the FIO.
- The FIO will maintain a directory of coastal and ocean scientists from among the membership and elsewhere and assist in providing access to these individuals. The Council and FIO management may draw upon this broader group to support research efforts requiring specialized expertise.
- The FIO will proactively assist in the facilitation of education through distance learning, interactive web site, electronic newsletter and by supporting other efforts in public outreach.
- To have the State of Florida/SUS and other members become a consortium representing national excellence in ocean and coastal science.

3. FIO Management and Organizational Structure

a. **The FIO Council**

The Council will consist of one representative from each member organization who is appointed by the president, CEO or respective designee and who is an active member of the Florida ocean and coastal research and education community. As the host institution, USF representation will consist of the Dean of the College of Marine Sciences and the Vice-President for Research. A representative of the BOG/DCU will be a member of the Council. The Council will serve the primary planning unit for the FIO. The Council shall elect a Chairman biennially from the membership and will meet at least once in person each year at the invitation of a member institution and by telephone conference as needed. Meetings will be reported to the membership and the USF Provost.

The Council may elect to membership other institutions in the Florida ocean science education and research community upon presentation and review of appropriate credentials.

b. The Executive Committee

The Executive Committee, chaired by the Executive Director and consisting of the Council Chair, two elected members and the Dean of the College of Marine Science. The Executive Committee will meet at least three times per year and provide administrative oversight of the FIO in cooperation with the USF Provost.

c. Executive Director

The FIO Executive Director shall be appointed by the USF President on the recommendation of the Council and will report to the USF Provost who will review his performance annually. The Executive Director will be responsible for the day-to-day operations of the Institute and will compile budgetary recommendations and Legislative Budget Requests with advice from the President and the Council. The director will submit any proposed budget increases to the DCU through the USF.

The Director shall complete an annual report no later than October 31 of each year covering the previous fiscal year. Prior to its submission to the Chancellor, the report must be approved by the USF Provost and reviewed by the Council of Academic Vice Presidents (CAVP). The Director will be evaluated annually by the Executive Committee and the membership which will report to the USF Provost using existing administrative criteria amended as necessary.

4. Responsibilities of the Host Institution

As the host institution, the USF shall provide all administrative and logistical support for the Institute including, but not limited to, personnel, purchasing, financial, legal, risk management and physical plant services. The budgetary and administrative practices of the Institute shall conform to those of USF and the DCU.

The USF with input from the FIO Executive Committee and membership and following DCU procedures for AISOs shall conduct a review of the Institute at least every 5 years.

Personnel of the Institute may be eligible for consideration for appointment to faculty positions at USF or participating universities in conformity with established procedures of the university.

All of the above conditions shall conform to all appropriate statutes and the rules and regulations of the Board of Governors/Division of Colleges and Universities.

5. Processing of Grants and Contracts and Overhead Distribution

Contracts and grants proposed by FIO to outside funding agencies shall be processed through the USF Division of Sponsored Research. Overhead costs will be calculated at the approved USF rate. One-half (50%) of USF's retained overhead will revert directly to FIO.

6. Guidelines for Appointing/Funding/Supervising/Evaluating AISO Leadership

7. Procedures for Recommending Increases/Decreases in the Appropriation of State Funds

8. Ongoing Planning and Operating Expectations Criteria for Cyclic Review

9. Termination or Conversion

The FIO may be terminated at the recommendation of the CAVP and upon the approval of the BOG. Alternately, the FIO may be converted into a State of Florida Institute/Center or University Institute/Center through the same process. The request for terminating or converting the FIO may be initiated by the BOG, host university, or

CAVP. The request must include a plan for allocation of equipment, facilities, real property and any unused funds.

10. Five Year Budget Plan

Under construction

11. Organization Chart of FIO