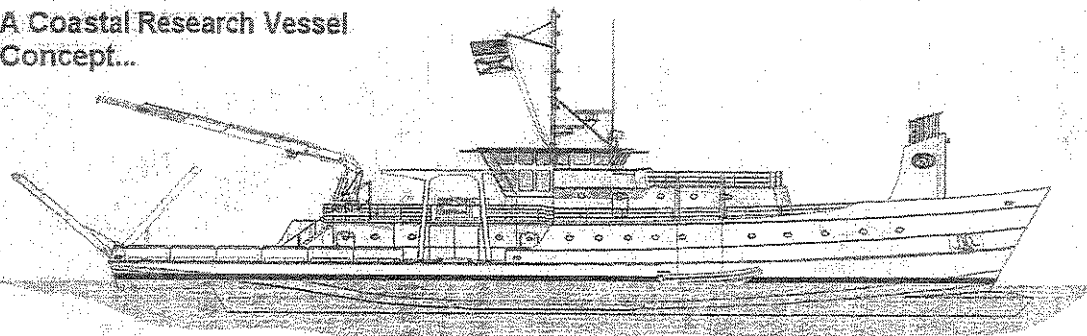


# FLORIDA INSTITUTE OF OCEANOGRAPHY



A Coastal Research Vessel Concept...



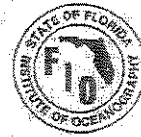
...For Florida's Ocean Future



## Florida Institute of Oceanography

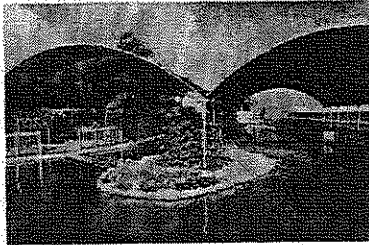
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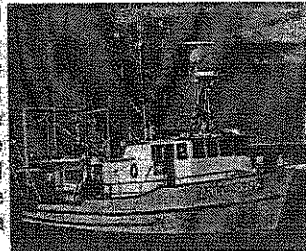
The Florida Institute of Oceanography (FIO) was established in 1970 to provide a centralized shared use infrastructure to support the state's ocean science education and research programs. Using a consortium approach, the institute was designed to minimize the expensive duplication of sea-going facilities and equipment needed by the state's academic and agency research and training programs. The Institute was based in the state's public university system at the St. Petersburg Campus of the University of South Florida. The FIO was co-located with the Florida Marine Research Institute (FMRI), both to facilitate ship operations using the Port of St. Petersburg, and to take advantage of the concentration of existing marine science resources and talent. The facilities provided to the state through the FIO include:

**Keys Marine Laboratory:** The Keys Marine Laboratory (KML) on Long Key, in the Florida Keys Marine Sanctuary was acquired by the State of Florida through the Florida Department of Environmental Protection (FDEP) and was placed under the cooperative jurisdiction of the Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute and the state's public universities, Florida Institute of Oceanography. Since 1989 this successful partnership has operated the KML as the only residential, full-service, tropical marine laboratory in the continental United States. A shared use facility, the KML serves a wide range of programs, including agency experimental research, undergraduate/graduate student and in-service teacher education, ecosystem management studies, Florida coastal zone monitoring and protection, marine bioproducts and health research, and coordinated regional and international environmental research.

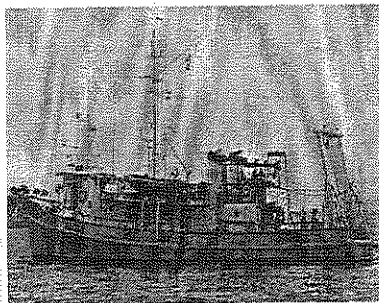


### Research Vessel BELLOWS:

The 71 Ft. Research Vessel BELLOWS is a shallow draft coastal vessel designed to work in Florida's estuarine and near shore waters, but also capable of cruises in the Bahamas and northern waters of the Caribbean. The BELLOWS is the primary academic vessel supporting training cruises, dissertation research, and near shore projects of the students and faculties of FIO state consortium members. The BELLOWS generally operates between Jacksonville, Florida and Mobile, Alabama including regular trips to the Bahamas and the Florida Keys. More than 5500 students have gotten their first sea going experience and career training aboard this vessel.



### Research Vessel SUNCOASTER:



The 110 Ft. Research Vessel SUNCOASTER is a general purpose coastal ocean research ship which has supported university, state and federal scientific research programs from the Gulf of Maine through the Gulf of Mexico as far south as Grenada in the Caribbean Sea. Once a "drug boat", the vessel was converted in 1981 and now carries 12 scientists where it once held 40 tons of marijuana. Although still operating a busy research schedule, the vessel lacks the capacity for modern multidisciplinary oceanographic science, and is increasingly difficult and expensive to maintain and repair. Although in heavy demand for funded research projects, it's age and condition has made it the weak link in the state's extensive programs of ocean science and technology. \*(see new ship brochure)

## **FLORIDA INSTITUTE OF OCEANOGRAPHY NEW RESEARCH VESSEL**

### **Introduction**

The Florida Institute of Oceanography (FIO) was established to provide necessary infrastructure to support Florida's coastal marine science and oceanography programs in education, training, research, public outreach, and marine resource management. For 30 years the state has realized this goal through the centralization of FIO management and facilities including research vessels, laboratories, and technical support on behalf of the Florida ocean science education and research community.

The FIO provides the expensive capital facilities for ocean training and research that no one member can readily afford or justify individually, but which are critical to the State's institutions and agencies. Collectively the FIO consortium (see cover map) is one of the largest coalitions of oceanographic education and research organizations in the country. No other organization in the State currently supports, attempts to support, or is able to support the broad diversity of programs, goals, needs, and missions of the statewide FIO consortium.

These FIO facilities currently include:

- Research Vessel BELLOWS 71'
- Research Vessel SUNCOASTER 102'
- Keys Marine Laboratory 9 Buildings on 8 acres

### **Current Facility Operations**

Over the last five years the Institute has generated more than \$15 million in outside grants and contracts, 92% of which have been directly distributed to member research and education programs. Collectively the state's public universities alone generate an estimated \$75-85 million per year in marine science and oceanographic research grants and contracts. Many related programs, particularly in the health sciences, marine bioproducts, pharmaceuticals, and aquaculture, increase that total significantly. Some researchers have estimated that 30-70% of their successful research programs have resulted from FIO support.

FIO support for these and related programs generates the \$800-900,000 user-based cash flow currently necessary for the operation of the state's academic research fleet. It is important to note that these funds are spent almost entirely within the state and, based on standard economic multipliers, can be important financial engines in some local economies.

Based on actual ship days utilized or contracted for the state fiscal years 2001-2004 , Chart I shows the distribution of FIO ship use by all state and federal agencies including FIO/state funded use by the consortium membership. The distribution illustrated is consistent with the pattern of the last 5 years. All users of shiptime are charged per diem costs at audited, pre-approved, fixed daily rates. Rates are based on a 24 hour operations day and are all-inclusive. One ship day is the basic unit of charge. Daily charges are not prorated or adjusted for number of passengers or transit vs. station time.

### **Distribution of Ship Use (Chart I)**

The state universities are the primary clients and beneficiaries of the research vessels. FIO awards grants to consortium members totalling 125-140 days of shiptime per year. These grants are funded centrally through the FIO budget. Awards are based on competitive proposals submitted primarily by university faculty. These grants are equal to \$500-570,000 of direct and indirect funding for education and research programs at Florida's education and research institutions.

Growth and expansion of undergraduate programs, environmental science degree programs, and marine science graduate programs have increased university demand and dependence to a thirty year high. Proposals for shiptime in 2004-05 exceed 200 days.

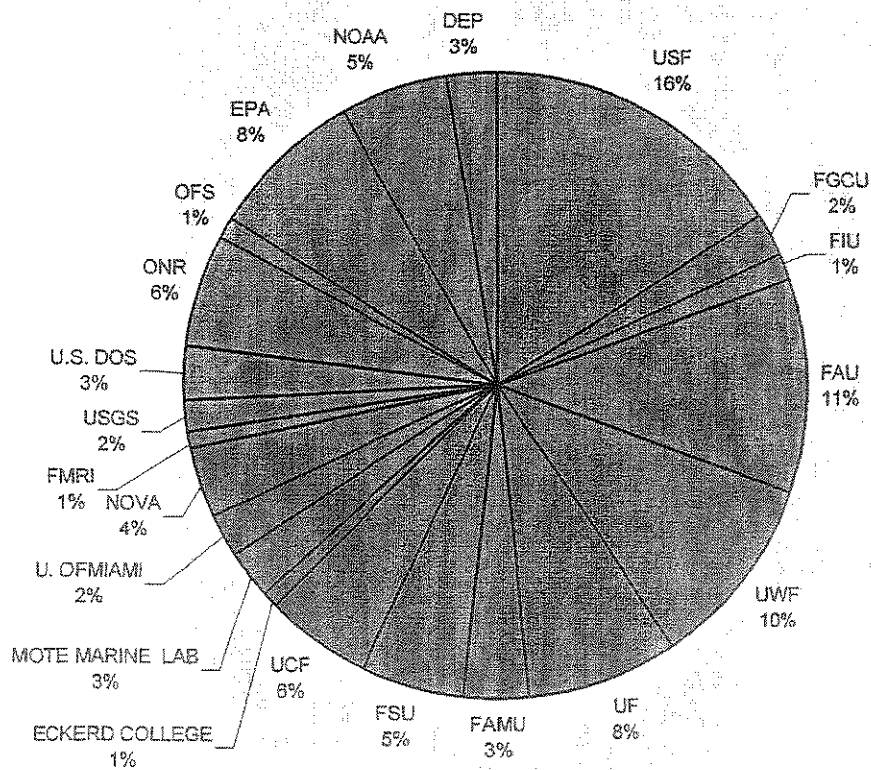
In addition to the growth and nationally recognized quality of Florida's ocean science curricula and faculty, Florida's unprecedented environmental restoration and monitoring initiatives and growing academic/high technology industry partnerships have focussed significant attention on ocean issues and fueled demand for multidisciplinary coastal ocean studies and the sea going research infrastructure to support them .

Regionally and locally based research platforms specific to the demands of modern coastal ocean studies are not readily available, which makes the state's fleet, the vessels of choice in the region and creates a growing potential market for the FIO ship. Major research programs in the Gulf of Mexico/ Caribbean region are underway and/or under development. The Integrated Ocean Observing Network (IOOS) is already partially established in Florida and requires regular ship support from FIO. This coastal monitoring system is poised to expand significantly and will require more shiptime and more ship technology. Other programs like EcoHab (Ecology of Harmful Algal Blooms) and NEON (Neotropical Ecological Observing Network) will also require extensive ship support as will the newly created Florida Ocean Initiative. Florida's Governor has recognized the need for the state to take a leadership role in managing our coastal oceans and it is important that the state have the proper equipment to fulfil those goals over the next decades. A 21<sup>st</sup> century research vessel is critical to that role.

Chart I

State and Federal Agency Ship Use  
 FY 01/02 - FY 03/04  
 Based on 813 Fleet Days

FMRI- Florida Marine Research Institute  
 USGS- U.S. Geological Survey  
 U.S. DOS- U.S. Department of State  
 ONR- Office of Naval Research  
 OFS- Other Funding Sources  
 EPA- Environmental Protection Agency  
 NOAA- National Oceanic and Atmospheric  
 Administration  
 DEP-Department of Environmental Protection



### *Other Agencies (EPA, NASA, ONR, NOAA, FDEP and FWC/FMRI)*

These agencies use FIO ships through FIO member institutions. The conditions and programs noted above have increased the number and types of grants requiring ship support. FIO ship use is shown by agency/institution on Chart I. With the exception of FWC/FMRI, FDEP, and NOAA, the non-university institutions do not generally use the ships for internal agency work. FWC/FMRI, a founding member of FIO, has always been a significant user of shiptime for agency programs which it funds through cooperative grants and contracts with the FIO.

NOAA maintains a cooperative agreement with FIO allowing the consolidation of funding to FIO member institutions and programs through the Institute's management services. Any office of NOAA can use the agreement to transfer funds to FIO for distribution to FIO members or for use directly by NOAA. To date the Man in the Biosphere Program and the National Marine Fisheries Service have used the state ships for agency purposes. Of shiptime funded by NOAA under the agreement, 88% has been in direct support of FIO member institutions.

### ***New Research Vessel Replacement of the RV SUNCOASTER***

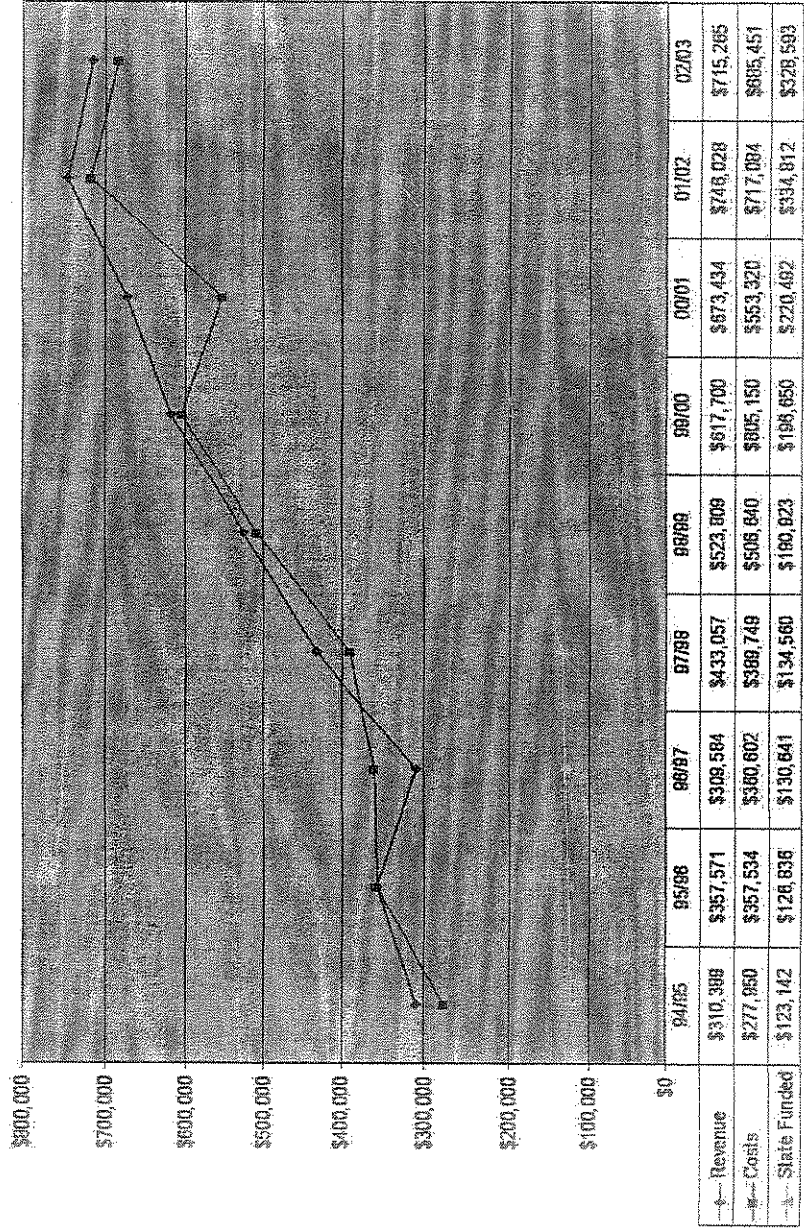
#### *Suncoaster costs and condition*

The Suncoaster is a 40 year old "drug boat" which was acquired and renovated by the FIO in 1980. It has been the primary ocean platform for grant and contract research programs involving member institutions. The vessel has become increasingly marginal in this supporting role because of its hull limitations, lack of scientific storage space, lack of adequate isolated laboratory spaces and under way data acquisition capability, and limited number of scientist accommodations. Modern coastal ocean science demands expanded multidisciplinary capabilities and technologies to address critical marine issues. In more and more cases the Suncoaster cannot meet, nor can it be modified to accommodate, the growing scientific demands.

In spite of increased business and revenues, maintenance and repair costs for the Suncoaster consume more of the budget than ever before. An ever-increasing portion of the operations funding must be expended on repairs and escalating maintenance. The age and condition of the ship preclude economically feasible modifications. This severely limits any upgrades that might be considered and critically restricts improvements to those life and safety issues mandated by law. The vessel is over age, overworked, and obsolete.

Graph I tracks Suncoaster costs vs. revenues over the last nine years. The graph shows a predictable trend associated with aging, obsolete capital facilities. The "state funding" indicated on the graph represents the base salaries and benefits of the crew. Aside from an increasing inability to serve complex research missions, the Suncoaster's mechanical and structural components need increasingly expensive repairs and intensive maintenance which pre-empt significant technical or capability enhancements.

Graph I  
RV SUNCOASTER  
FY 94/95 - 02/03



These costs are driving the Suncoaster ship rate to unmarketable levels while providing no improvement or expansion of service or capabilities. Current increases in activity and ship rate can barely keep pace with these costs, and will ultimately result in non-competitive marketability, significant loss of business, and an operational dependence on internal, state funded resources. Given the realistic limits to any potential increase in the FIO state budget, operation and maintenance of the Suncoaster would become unsustainable. This would effectively remove the Suncoaster from state service and could leave Florida's academic and environmental agencies dependent on distant, mostly out of state operators at considerably greater expense.

The Suncoaster was an economical and beneficial acquisition in 1980, and has proved the worth and wisdom of its operation on behalf of the state. It is however analogous to a 1960's Volkswagen – appropriate for its time, place, and level of service, but 25 years later, hopelessly inadequate for current needs. It is past time to replace it.

### ***Cost Comparison FY 2003/04***

Table I shows a breakdown of operational costs for the Suncoaster in FY 03/04. By comparison a similar breakdown of costs for the proposed replacement vessel is provided based on the same operational schedule for the same time period. The new vessel costs are estimated on the basis of professional naval architect projections and design specifications, performance criteria, conservative estimates of fuel consumption and costs, and definable increases in personnel costs for technology support and crewing. The significant reduction in maintenance and repair costs coupled with greater design efficiencies create a clear fiscal and market advantage in operating a new ship.

The primary marketability efficiencies identified for the new vessel operations are:

- New technologies reducing manning and life cycle costs
- Advanced propulsion systems coupled with special hull design allowing recognized fuel savings
- Enhanced cruising speeds based on appropriate hull design reducing transit times and maximizing on station science time
- Environmentally friendly propulsion system (both in terms of marine life and water quality impact)
- Advanced electronics and navigation systems allowing vessel tracking within +/- 5 meters further saving time and fuel
- Dynamic positioning capability allowing more efficient science operation and reducing station time
- Larger scientific payload allowing multidisciplinary operations or larger training options in a given discipline
- Dramatic improvement in operability and maintainability of vessel systems and equipment with particular emphasis on command, control, and safety items
- Enhanced livability (significant marketing factor)



**Table I**  
**Operational Cost Comparison**

Suncoaster Costs 7/1/03 - 6/30/04	Estimated New Ship Costs (for the same time period)	
<b>Salaries</b>	286,411	406,411
Regular & OT	286,411	
<b>Total Personnel</b>	<u>\$ 286,411</u>	<u>\$ 406,411</u>
*Fuel (.488 -1.00 per gal.)	\$ 45,123	\$ 95,445 (@1.00 per gal.)
Food	\$ 20,770	\$ 35,000
Repairs/Maintenance	\$ 182,796	\$ 100,000
Communications/Navigation	\$ 8,285	\$ 12,000
Travel	\$ 903	\$ 1,000
Insurance	\$ 13,566	\$ 14,000
Science/Technical Support	\$ 5,300	\$ 10,000
<b>Total Costs</b>	<u>\$ 563,154</u>	<u>\$ 673,856</u>
	Total station days operated	175
	Daily approved charge rate	3,000
	Total revenue	577,000
	Estimated balance	\$ 13,846
	**Total station days operated	175
	Estimated rate	4,200
	Estimated revenue	735,000
	Estimated balance	\$ 61,144

\*Based on 5 year average wholesale costs

\*\*Increased speed and efficiency results in fewer station days.

### *Vessel Comparison*

Modern oceanography requires many teams of researchers and technologies impossible to accommodate aboard a vessel like the Suncoaster. The new ship will not be much longer than the current Suncoaster, but it will have a considerably greater volume. Multiple teams of scientists create a critical need for laboratory spaces that can be isolated from other activities, electronics and communications systems for data transmittal, and the ability to conduct multidisciplinary sampling concurrently. The new ship must also have dedicated space for transmission of live telecommunications direct to base stations for rebroadcast to classrooms and research centers. This capability alone would vastly increase the utility of the science programs and expand classroom training options enormously.

	<b>Suncoaster</b>	<b>New Ship</b>
Length	102'	125'
Beam	24'	32'
Draft	8'	8'
Bow Thruster	None	200 hp
Satellite communications, Navigation and integrated Data system	None	Full Capability
Lab, main	350 sf	400 sf
Lab, chem	None	130 sf
Lab, wet	50 sf	150 sf
Lab, electronic	None	60 sf
Study area	None	120 sf
Science storage below	None	850 cf
Science storage main deck	None	800 cf
Freezer/refrigerator	125 cf	400 cf
Main deck work area	600 sf	1,030 sf
Main deck length	27' port and stb	33' port and stb
Total main deck area	1,000 sf	3,940 sf
Fume hoods	None	2
Van capability, main deck	One 8 x 20	Two 8 x 20
Van, 01 deck	None	One 8 x 20
Fuel capacity	17,500 gals.	30,000 gals.
Water capacity	8,500 gals.	15,000 gals.
Endurance	15 days	30 days
Crew	5	7
Scientists	12	18
Tonnage, net	149	299

### **Proposed Budget: New Research Vessel, \$ 11,200,000**

Replacement of the RV Suncoaster is important to sustain Florida's ocean science training and research programs and continue academic and agency leadership in coastal ocean management practices and research. A new vessel, designed for Florida's specific needs will provide a badly needed platform to support the technologies

and interdisciplinary strategies of modern oceanography at a competitive rate, with greatly expanded capabilities and marketability, and enhanced operational funding support from national and international sources. The new vessel will be a key support component of Florida's Ocean Initiative, ocean resources research, training, and management programs. These programs are critical to an ocean dependent state economy powered by more than \$105 billion in ocean industries and commerce.

Design, construction, equipping, and launching the new vessel is budgeted at \$11.0 million, one time cost.

An additional \$200,000 in salaries and benefits will be required to complete crewing and technical support (4 FTE positions) for this new vessel. This increase in the FIO budget would be an on-going cost to the system along with the existing crew salaries. However these costs will be built into the daily ship rate and are partially recoverable through user fees. No additional funds beyond the existing FIO budget (with the additional crewing supplement) will be required for the operation of the vessel.

#### BUDGET

Initial Concept Drawings	.02 M
Naval Architect/Engineer	.60 M
Vessel Construction	8.6 M
Outfitting	.40 M
Electronics	.20 M
Computer Network	.18 M
Science Systems	1.00 M
Construction Subtotal	11.0M
Crewing (4 FTE)	.200 M
Grand Total	11.200 M

