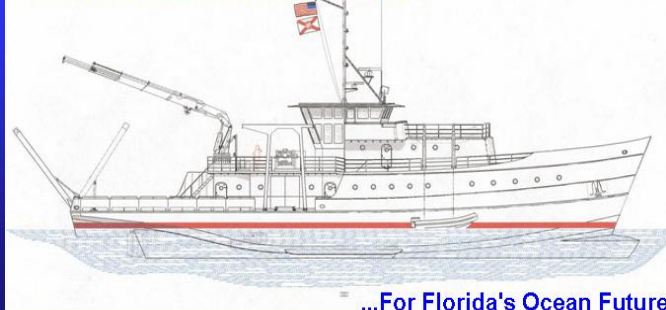


FLORIDA INSTITUTE OF OCEANOGRAPHY

A CONSORTIUM OF STATE AND PRIVATE UNIVERSITIES, RESEARCH INSTITUTIONS AND AGENCIES WORKING TO SUPPORT MARINE SCIENCE EDUCATION AND RESEARCH



A Coastal Research Vessel Concept...



...For Florida's Ocean Future

NEW SHIP BUSINESS PLAN 2007



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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 Fish and Wildlife Research Institute (FWRI), 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, Fish and Wildlife 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 10,000 students have gotten their first sea going experience and career training aboard this vessel.



Research Vessel SUNCOASTER:



The 102 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.

FLORIDA INSTITUTE OF OCEANOGRAPHY NEW RESEARCH VESSEL

Business Concept

The Florida Institute of Oceanography (FIO) was established to provide an affordable infrastructure necessary to support Florida's coastal marine science and oceanography programs in education, training, research, public outreach, and marine resource management. For 35 years the state has realized this goal through the centralization of FIO facilities and services including research vessels, laboratories, technical support, and multi-institutional grant/contract management on behalf of Florida's public and private 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 21 member 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 supports, attempts to support, or is able to support the broad diversity of needs, goals, programs, and missions of the statewide FIO consortium. The facilities and services of the FIO are specifically targeted to Florida's coastal ocean issues and the missions and goals of its members. This captures a broad and sustainable market niche locally and regionally while allowing access to more national/international oriented market opportunities.

FIO facilities currently include:

- Research Vessel BELLOWS 71'
- Research Vessel SUNCOASTER 102'
- Keys Marine Laboratory – nine buildings on eight acres

Current Facility Operations

Over the last five years the Institute has generated more than \$15 million in outside grants and contracts, 92 percent of which have been directly distributed to member research and education programs. State researchers have estimated that 30-70 percent of their successful programs have resulted from FIO support. 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, marine sensor technology, and aquaculture, increase that total significantly.

FIO ship support for these programs generates the \$800-900,000 user-based cash flow currently necessary for the operation of the state's primary 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 contributing financial engines in some local economies.

Based on actual ship days awarded and contracted for the state fiscal years 01/02 through 05/06, Chart I shows the distribution of FIO ship use by all university, state, and federal agencies including FIO/state funded use awarded to the consortium membership. The distribution illustrated is consistent with the pattern of the last ten years. This reflects the broad based dependence of the 21 member constituency on the state's FIO resources to accomplish institutional and agency missions. While the chart shows the domination of state university users and illustrates why the operation of the FIO is housed within the State University System, it also clearly shows that no single member or organization has the resources or use level sufficient to support the facilities independently.

All users of shiptime are charged per diem costs at audited and approved, pre-determined, 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. Collectively the consortium can, and has, sustained these ship facilities and operations for three decades based on this model.

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

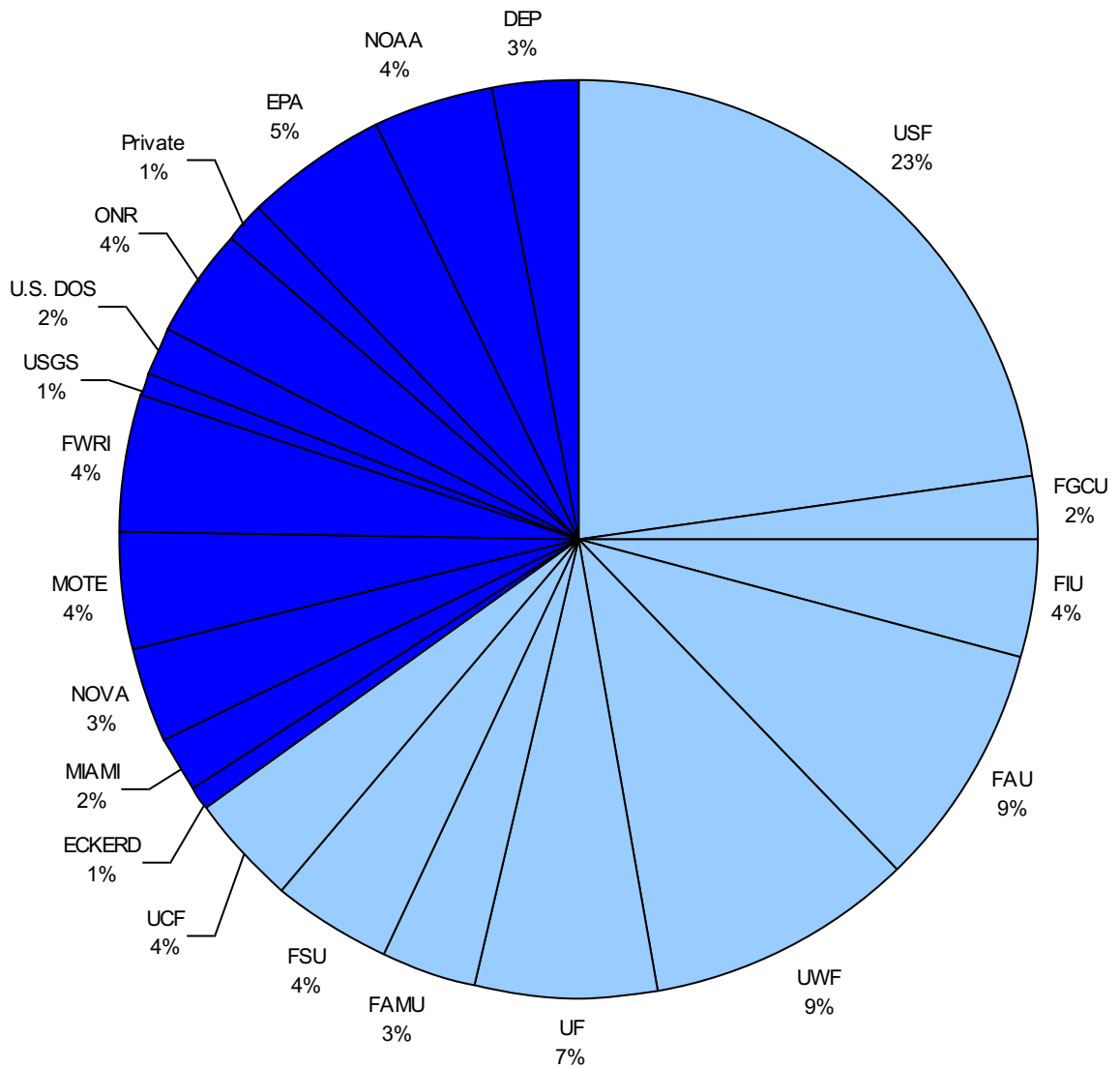
These agencies use FIO ships through FIO member institutions. The conditions and programs noted above have increased the number and types of grants requiring ship support. FIO ship use is shown by agency/institution on Chart I. With the exception of FWC/FWRI, FDEP and NOAA, the non-university organizations do not generally use the ships for internal agency work. FWC/FWRI, 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. There are additional opportunities to expand business extensively in the Caribbean with an appropriate vessel.

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 percent has been in direct support of FIO member institutions.

Chart 1

Customer Base

University, State and Federal Agency Ship Use
Based on 5 years (1,317 fleet days)
FY 01/02 - FY 05/6



FWRI- Fish and Wildlife Research Institute
USGS-U.S. Geological Survey
U.S. DOS-U.S. Department of State
ONR-Office of Naval Research
EPA-Environmental Protection Agency
NOAA-National Oceanic and Atmospheric Adm.
DEP-Department of Environmental Protection
Private Users

Market Analysis

Current Market

The state universities are the primary clients and beneficiaries of the research vessels. FIO awards grants to consortium members averaging 125-140 days of shiptime per year. These grants are funded centrally through the FIO state budget. Awards are based on competitive proposals submitted 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 marine programs, environmental science and policy degree programs, and marine science graduate programs have increased university demand and dependence to a 30-year high. Proposals for shiptime in 2006-07 exceeded 200 on-station days, which with transit days, would require a 280-290 day operating schedule. Current state funding to FIO cannot support that level of internally awarded activity, but it is clear evidence of increasing demand and is consistent with the trend observed since FY 94/95.

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 focused significant attention on ocean issues and fueled demand for multidisciplinary coastal ocean studies and the sea-going research infrastructure to support them.

Market Target and Opportunities

Regionally and locally based research platforms specific to the demands of modern coastal ocean studies are not readily available or affordable, which makes the state's fleet the vessels of choice in the region and creates a growing potential market for the FIO ships.

Major research programs in the Gulf of Mexico/ Caribbean region are underway or under development. The Integrated Ocean Observing System (IOOS) is already partially established in Florida and requires regular ship support from FIO. This coastal ocean 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 the increasing demand for expanded Red Tide research on Florida's coasts will also require extensive ship support as will the newly created Gulf of Mexico/Florida Ocean Initiative. Recognizing the need for the state to take a proactive leadership role in managing our coastal oceans, the Governor and Legislature established the Florida Oceans and Coastal Resources Council to define specific goals and priorities for conserving our coastal oceans while generating economic benefits from their use. This new focus on coastal ocean resources will result in additional demands for ship support. It is important that the state have the proper equipment to fulfill those goals over the next decades. A 21st century research vessel is critical to that role.

Product/Services Evaluation

Suncoaster costs and condition

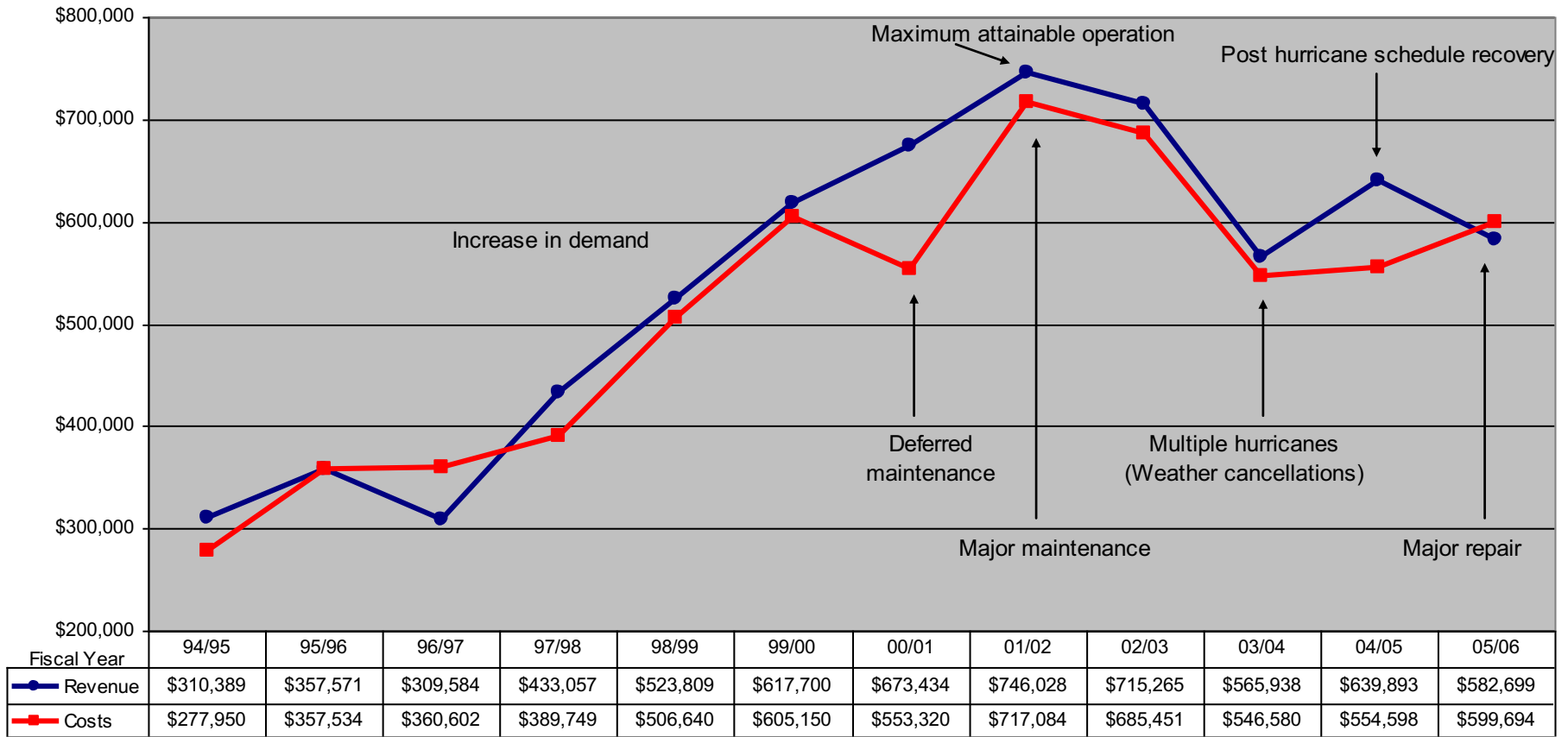
The Suncoaster is a 40-year-old "drug boat" that was acquired and renovated by the FIO in 1980. It has been the primary ocean platform for grant and contract research programs involving member institutions. The vessel has become increasingly marginal in this supporting role because of its hull limitations, original construction, lack of scientific storage space, lack of adequate isolated laboratory spaces and under way data acquisition capability, and limited number of accommodations for scientists. 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 expanding 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 old, 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. Aside from an increasing inability to serve complex research missions, the Suncoaster's mechanical and structural components need increasingly expensive, intensive maintenance, overhaul, and repair which pre-empt significant technical or capability enhancements. 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. These escalating costs and structural limitations will ultimately result in non-competitive marketability, significant loss of business and an operational dependence on internal, state-funded resources.

This predictable vulnerability was highlighted by the 2004-2005 hurricane seasons which disrupted schedules resulting in multiple contract shiptime cancellations and severely impacted cash flow revenues. In the same timeframe serious structural failures in the hull required major repairs. The repairs were only accomplished by depleting all reserve funds and acquiring a bridge loan from the university system. Such future events could easily create a condition in which the continued operation of the Suncoaster would be unsustainable. This would effectively remove the Suncoaster from state service and leave Florida's academic and environmental agencies dependent on distant, mostly out-of-state operators at considerably greater expense.

Graph I
RV SUNCOASTER FISCAL OPERATIONS
FY 94/95 - FY 05/06



Major maintenance: Regularly scheduled and planned major overhaul
 Major repair: Unanticipated capital repairs resulting from age and original construction defects

Marketing and Operations

Cost Comparison FY 2005/06

Table I shows a breakdown of operational costs for the Suncoaster in FY 05/06.

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 and automation efficiencies create a fiscal and market advantage in operating a new ship.

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

- New automation technologies reducing manning requirements 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 (a significant marketing factor).

TABLE 1				
Annual Operational Cost Comparison				
	Suncoaster Costs		Estimated New Ship Costs	
Salaries (5 crew)		\$ 314,842	(7 crew)	\$ 435,500
Fuel (@ 1.90 per gal.)		\$ 73,108	(@2.39 per gal.)	\$ 119,550
Food		\$ 26,276		\$ 37,500
Repairs/Maintenance		\$ 156,078		\$ 100,000
Communications/Navigation		\$ 2,568		\$ 3,500
Travel		\$ 750		\$ 1,000
Insurance		\$ 12,493		\$ 20,000
Science/Technical Support		\$ 370		\$ 10,000
6% Admin. Ovh'd		\$ 13,209		\$ 43,623
Depreciation		0		\$ 360,000
	Total Costs	\$ 599,694		\$ 1,130,673
Annual Revenue Comparison				
Total station days operated	176		Total station days operated	180
Daily charge rate	3,300		Daily charge and depreciation rate	6,500
Total revenue (days x rate)	582,699		Total revenue (days x rate)	1,170,000
Estimated profit/loss	\$ (16,995)		Estimated profit/loss	\$ 39,327
			Depreciation reserve	\$ 360,000

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.

	Suncoaster	New Ship
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, \$ 15,000,000

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. This will enhance 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 \$14.74 million, a one-time cost. This can all be accomplished in Florida with Florida enterprises.

It is important to note that the essential officers and crew along with the organizational infrastructure for ship operations already exists and is funded by the state through FIO. The FIO also operates through, and with the support of the University of South Florida administration and financial services and functions in accordance with university policies and procedures. No additional administrative infrastructure is required.

An additional \$260,000 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 ongoing cost to the State 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

Architect Plan and Design	1.5 M
Vessel Construction	9.7 M
Outfitting	1.80 M
Electronics	.47 M
Computer Network	.40 M
Science Systems	.87 M
Construction Subtotal	14.74 M
Crewing (4FTE)	.260 M
Grand Total	15.00 M

PHASED BUDGET			
Architect Plan and Design	1.50 M	}	Phase 1 \$1.50M Design, engineer, and pre-construction Duration 6-8 months
Vessel Construction	9.70 M		}
Outfitting	1.80 M		
Electronics	0.47 M	}	*Phase 3 \$1.74M Furnishing Duration 2 months
Computer Network	0.40 M		
Science Systems	<u>0.87</u> M		
Construction Subtotal	14.74 M		*Note: Phase 3 is included in the last 2 months of Phase 2
Crewing (4FTE)	<u>0.260</u> M		
Grand Total	15.000 M		

