Southeast Coastal Ocean Observing Regional Association (SECOORA): A Framework for Monitoring, Prediction and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools

Revised Scope of Work - Year 4

TOPIC AREA 1: Continued Development of Regional Coastal Ocean Observing Systems
AWARD TYPE: Cooperative Agreement
PROJECT DURATION: June 1, 2011 – May 31, 2016

This revised grant proposal is submitted in response to the Funding Opportunity Title:
Continued Development of Regional Coastal Ocean Observing Systems
Revision Submitted: August 13, 2014
Year 4: June 1, 2014 - May 31, 2015
Funding Request: $2,530,144

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Introduction

SECOORA has been allocated $2,530,144 for Year 4 of its five-year Regional Coastal and Ocean Observing System (RCOOS) project. This is a slight increase from our U.S. IOOS® FY2013 award level but only represents 63% of the funding that was requested for Year 4 in our original 5 year proposal funding request. This revised scope of work describes the activities that will be undertaken with this level of funding. As per the U.S. IOOS® FY2014 award letter, SECOORA will commit: (1) $600,000 towards supporting priority High Frequency Radars (2) $108,008 for support to NOAA's Ocean Acidification Program, and (3) $20,000 for support to maintain the high frequency radar site located at Core Banks, NC. Major goals and objectives for Year 4 are described in Table 1.

Table 1. Major Goals and Objectives

Goals	Objectives
Goal 1: Sustain SECOORA as a Regional Information Coordination Entity	1.1: Ensure Stakeholders Inform RA Priorities and RCOOS Development and Implementation. 1.2: Coordinate and Implement a Conceptual Operations Plan for a Southeast (SE) RCOOS.
Goal 2: Sustain an Observing Subsystem for the SE	2.1: Sustain Moored and Coastal Stations. 2.2: Maintain High Frequency Radar (HFR) Operations. 2.3: Support coordinated Glider deployments in SE. 2.4: Support Hurricane Wind & Water Level Measurements. (Not funded in Year 4.) 2.5: Support to NOAA's Ocean Acidification Program. 2.6: Support to HFR Waves Data Project.
Goal 3: Support a Multi-Scale Multi-Resolution Modeling Subsystem	3.1: Support Regional and South Atlantic Bight (SAB) Subregional Circulation Modeling. 3.2: Implement Forecasting of Storm Surge, Inundation, and Coastal Circulation. 3.3: Support for Rip Current Forecasting. 3.4: Provide Species-specific Habitat Models that Integrate Remotely Sensed and In Situ Data to Enhance South Atlantic Fisheries Management Council (SAFMC) Stock Assessments. 3.5: Improve Beach/Shellfish Water Quality Advisories. 3.6: Support to Model Skill Assessment.
Goal 4: Enhance the Data Management and Communication (DMAC) Subsystem	4.1: Service data providers and Capture new data. 4.2: Provide data, data products and information to users and stakeholders rapidly and effectively. 4.3: Coordinate/Collaborate data management efforts with U.S Integrated Ocean Observing System (IOOS®). 4.4: Consolidate and develop a DMAC infrastructure plan to improve efficiency and operational status. 4.5 Upgrade SECOORA's data and maps portal. 4.6 Develop two new data products.
Goal 5: Support a Targeted and Leveraged Education and Outreach Subsystem	5.1: Provide Tools and Opportunities for Observing Related Science Education. (Not funded in Year 4.) 5.2: Increase Understanding of and Support for Observing Through Targeted Stakeholder Outreach. (Not funded in Year 4.)

Goal 1: Sustain SECOORA as a Regional Information Coordination Entity (RICE)

SECOORA is an independently operating 501(c) (3). We will provide fiscal management for this award. Megan Lee is SECOORA's Business Manager and serves as fiscal manager, with assistance from a part-time accountant/bookkeeper, and oversight from the Executive Director. We will be responsible for overall project management, which includes fiduciary oversight of all subawards, preparation and submission of financial and progress reports, and ensuring coordination and collaboration both among PIs within each RCOOS subcomponent and among PIs across the other RCOOS subcomponents. Fourteen PIs, two subcontractors and 18 separate sub-awards contribute to this project necessitating significant effort for project and fiscal management, technical communications, integration and task coordination. Responsibilities will be shared among the RCOOS Manager (V. Subramanian), Executive Director (D. Hernandez), and the Business Manager (M. Lee). A Communication Specialist will assist with website content, e-newsletters, Facebook and Twitter posts, and other related outreach activities.

SECOORA is a membership-based organization that seeks stakeholders with interests in coastal and ocean observing, data and information to help prioritize our activities and participate in developing stakeholder-based products and decision making tools. With Year 4 funding, SECOORA will continue to seek new members through our website, outreach via newsletters and direct recruitment by the staff and Board of Directors. We will also host a board meeting in December 2014 and an annual members and stakeholders meeting in May 2015. SECOORA will partner with stakeholders, such as the Governors' South Atlantic Alliance (GSAA), federal agency representatives, fishery managers, private agencies and others. SECOORA will continue advancement of a Conceptual Operations Plan for a fully instrumented RCOOS with defined service levels, commensurate with funding, that provides coordinated monitoring, assessment and prediction. We will also be working with SECOORA's Board, PIs and Members to prioritize activities in recognition of ongoing budget limitations. We will continue to interact with the IOOS Association, U.S. IOOS® Program Office (IOOS PO) and other IOOS Regional Associations to ensure that messages, products, and projects are coordinated and resources are leveraged. SECOORA will sponsor coastal ocean observing related meetings, activities; and SECOORA staff and Board will attend IOOS Association, IOOS® PO, and other RA meetings as funding allows. Additional coordination responsibilities include working closely with the neighboring GCOOS-RA in the West FL region, CaRA in the Caribbean region and MARACOOS in the Mid-Atlantic region.

Table 2. RICE Activities

Institution	Funding	Activity
SECOORA	$452,256	Ensure continued and efficient governance, management and operations of the RA. Coordinate RCOOS tasks, data management and integration projects. Provide forums, i.e. workshops, meetings, that enable stakeholder assessment, feedback and engagement. Coordinate with the Governors' South Atlantic Alliance (GSAA). Ensure SECOORA activities align with U.S. IOOS® Program Office guidance and/or requirements. Refine and maintain Strategic Operations Plan. Advance SECOORA Build-Out-Plan. Develop the SECOORA RICE U.S. IOOS® Certification application.
TOTAL	**$452,256**	

Goal 2: Sustain an Observing Subsystem for the SE

The observing subsystem provides the basis for the RCOOS by supporting and integrating existing assets and observations specific to the development of products identified in this proposal. In most cases, we propose to maintain existing systems deployed as part of pre-SECOORA programs. For all observing assets, the level of funding greatly impacts spare parts and technician support for maintenance of assets and management of data. It also limits principal investigator (PI) time and ability to interface with stakeholders. SECOORA will continue to support the operation and maintenance of offshore moored stations and coastal stations with the caveat that assets in the SECOORA footprint have been purchased through a mix of state, research and IOOS funding. Operations are not sustainable at current funding levels. USF and UNCW will maintain as many moorings and coastal stations as possible with the allocated funding, and any significant equipment failures will likely result in removing assets from the water. SECOORA is allocating $655,077 to the IOOS identified priority high frequency (HF) Radar sites in the SECOORA footprint. A new HF Radar site (Seasonde CODAR system) at Core Banks, NC that partially closes the gap that exists between the South and North Carolina waters has been installed and made operational by the University of North Carolina - Chapel Hill with funding from other sources. SECOORA will be committing $20,000 for the maintenance of the Core Banks, NC HF Radar site as instructed in the funding award letter, and request will be made to IOOS to identify this as a national priority radar site. Each observing asset will provide near-real-time data for multiple users, and provide information required to support proposed and existing stakeholder products (e.g., those required for oil spill response, National Weather Service Marine Weather Portal, Beach/Shellfish Water Quality Advisories, and search and rescue (SAR) operation surface current requests). Table 3 below provides specific information on the organizations, PIs, funding, and assets for the Observing Subsystem. In Year 4, $50,000 will be allocated to a coordinated glider experiment **(Objective 2.3),** which will support scientific and operational goals in the Southeast Region. Note that funding is not available for **Objective 2.4: Support Hurricane Wind and Water Level Measurements** in Year 4. **Objective 2.5: Support to NOAA's Ocean Acidification Program** funded by NOAA's Ocean Acidification Program will be continued. A new subaward will be issued to University of Delaware to support field data collection in Year 4. **Objective 2.6: Support to HFR Waves Data Project,** that integrates several observing subsystem activities started in Year 3, will be continued in Year 4.

Table 3.Observing Subsystem Activities

Institution	Funding	Activity
Objective 2.1: Sustain Moored and Coastal Stations		
University of South Florida (Weisberg)	$169,759	Funding for COMPS surface moorings: C10 measures wind velocity, relative humidity, barometric pressure, sea surface temperature (SST), air temperature (AT), incoming short and long-wave radiation, in-water velocity and temperature/salinity (T/S). C12 and C13 measure wind velocity, relative humidity, barometric pressure, SST, AT, in-water velocity and T/S. C11 and C15 measure in-water velocity and T. C21 measures wind velocity, relative humidity, pressure, SST, AT.
University of South Florida (Luther, Merz)	$52,484	Funding for COMPS in-shore tidal meteorological stations: Six stations located along Florida's Gulf of Mexico coast from Shell Point to Big Carlos Pass. These stations typically are outfitted with water level, wind velocity, relative humidity, AT, barometric pressure, water quality and precipitation sensors.

Institution	Funding	Activity
University of NC - Wilmington (Leonard)	$365,970	Oceanographic data from seven real-time moorings operated through partnerships of UNCW and USC will be maintained along NC and SC. Six systems measure wind velocity, barometric pressure, SST, AT, solar radiation, sea level, in-water velocity, and T/S. Two of the moorings also measure surface-waves. In addition, one coastal pier station that measures wind velocity, barometric pressure, SST, AT, solar radiation, sea level, S, and surface waves also will be supported.
TOTAL MOORED AND COASTAL	**$588,213**	
Objective 2.2: Maintain High Frequency Radar Operations		
University of South FL (Weisberg)	$151,963	Support three CODAR sites and transition to adding fourth CODAR site. Location: West Florida Shelf
Skidaway Institute of Oceanography (SkIO)- University of GA (Savidge)	$110,383	Support two WERA radar arrays. Location: St. Catherine's and Jekyll Island, GA
University of Miami (Shay)	$151,964	Support four WERA radar arrays. Location: Crandon, Virginia Key, Broad Key and Dania Beach
University of NC - Chapel Hill (Seim)	$130,384	Support three CODAR radar arrays. Location: Outer Banks of NC Note: A new station Core Banks, NC has been added and data are being sent to SECOORA and National HF Radar network. Funding for this additional site comes from other sources secured by the PI. Onetime funds ($20,000) are allocated for the maintenance of the third Core Banks Radar site.
University of South Carolina (Voulgaris)	$110,383	Support two WERA radar arrays. Location: Georgetown, SC and Fort Caswell, NC
TOTAL HFR	**$655,077**	
Objective 2.3: Support Operational Integration		
SECOORA Ocean Variable Experiment (Contractor TBD)	$49,840	SECOORA will conduct a coordinated ocean variable experiment in Year 4. We will be working with observing operators and stakeholders in our region to design and conduct the experiment. We will consider suiting gliders with CTD, Vemco acoustic receivers and optical sensors to collect valuable data that can be combined with HF Radar, in-situ stations, circulation models and satellites data. The proposed experiment is aimed at integration of SECOORA's observational, modeling and data management subsystem projects, and will support SECOORA's scientific and operational goals.
Objective 2.5: Maintain the Sensors on NOAA Gray's Reef National Marine Sanctuary (GRNMS) Buoy (NDBC 41008)		
University of Georgia (Noakes)	$35,426	Maintain the sensors on NDBC Gray's Reef National Marine Sanctuary (GRNMS) buoy (41008) as a part of international efforts to quantify the effects of ocean acidification on the world's ocean. These sensors include pCo2, pH, dissolved oxygen (DO), salinity and water temperature.
University of Delaware (Wei-Jun Cai)	$67,232	Funding is provided for collection of underway pCO2 data and bulk water samples for analyses during the spring and summer 2014 cruises at the Gray's Reef mooring site.

Goal 3: Support a Multi-Scale Multi-Resolution Modeling Subsystem

In Year 3 SECOORA re-assessed and reviewed its ongoing modeling projects based on the following criteria: 1) scientific and operational accomplishments and deliverables to date from three years of IOOS funding compared to the objectives; (2) Year 4 work plans; (3) utilization of SECOORA generated data and collaboration with other subsystem PIs over the past three years; and (4) evidence of use of data and products (either via PI website or SECOORA website) by end users and engagement of stakeholder groups.

Based on the review, the modeling components that will be carried out in Year 4 include the following:

Objective 3.1: Support South Atlantic Bight Gulf of Mexico (SABGOM) regional circulation modeling.
Objective 3.2: Support compilation of final report for the inundation modeling effort, Implement Forecasting of Storm Surge, Inundation, and Coastal Circulation.
Objective 3.3: Support rip current forecasting.
Objective 3.4: Provide species-specific habitat models that integrate remotely sensed and in situ data to enhance SAFMC stock assessments.
Objective 3.5: Improve and expand Beach/Shellfish water quality advisories.

Table 4. Modeling and Related Tools and Product Development

Objectives 3.1,3.2,3.4 and 3.5: SABGOM, Storm Surge, Fisheries and Beach Water Quality Modeling		
Institution	Funding	Activity
North Carolina State University (He)	$ 130,066	3.1: Support regional and SAB sub-regional circulation modeling.
University of Florida (Sheng) and North Carolina State University (Xie)	$25,000 and $25,000	3.2: Support compilation of the final report of the real-time forecasting of inundation and storm surge projects at University of Florida and North Carolina State University.
ROFFS (Roffer), University of Miami CIMAS (Muhling), and SAFMC (Pugliese)	$73,903	3.4: Develop data products derived from satellite and in situ observations for fisheries stock assessment.
University of South Carolina (Porter)	$64,977	3.5: Expand the beach water quality swimming advisories with other environmental variables. Demonstrate geographic transferability of modeling approach to a beach location FL.
TOTAL MODELING	**$318,946**	
Objective 3.3: Rip Current Forecasting		
Rip Current Forecasting (Contractors TBD)	$80,894	We conducted an initial review of the on-going Rip Current forecasting efforts carried out by NOAA CO-OPS, NOAA NWS, academic and other stakeholders in the SE region to understand the current status and gaps in rip currents observations and forecasting. Preliminary findings indicate that SECOORA has an opportunity to address the gaps in observations required for forecast model validation and also to expand the forecasting efforts via collaboration with NWS WFOs in the SE region. Funds are allocated in Year 4 to provide observation support for model validation and advance rip current forecasting in SE region.

Goal 4: Enhance the DMAC Subsystem

Building on previous work, SECOORA will optimize and improve access to regionally-aggregated information via a web interface that supports SECOORA's thematic priorities. This will be accomplished through continued investment of funding to

enhance the work accomplished under previous SECOORA RCOOS grants, and to incorporate the progress made by the complementary Carolinas RCOOS data management effort.

Table 5. Data Management and Communication

Institution	Funding	Objectives: 4.1, 4.2, 4.3 and 4.4: Activity
University of South Carolina (Porter)	$190,393	• Maintain SECOORA DMAC Infrastructure. • Assess and advance IOOS recommended SOS implementation. • Maintain and upgrade interactive maps and data portal. • Service and provide support to data providers. • Recruit and integrate new data to SECOORA data portal. • Support data providers and RCOOS Manager on implementation of QA/QC flags based on published QARTOD manuals. • Collaborate with SECOORA product development contractor.
Data Management Mini-Grants (Contractors TBD)	$91,867	We will award mini-grants to enhance and strengthen SECOORA data management programs and infrastructure; and to increase and improve access to SECOORA aggregated near-real-time and historical observational, and hindcast physical-biogeochemical model data for a wide range of end-user and stakeholders.
TOTAL DMAC	**$282,260**	

Goal 5: Support a Targeted and Leveraged Education and Outreach Subsystem

Due to funding limitations, the primary focus of the Education and Outreach (E&O) subsystem is to provide outreach to stakeholders regarding observing technologies, data, products and services. Outreach activities are provided by all SECOORA staff, Communication Specialist, RCOOS PIs as well as SECOORA Board. Resources for formal educators are maintained on the SECOORA website, and we continue to promote the Basic Observation Buoy as a STEM education tool. Note that Goals 1 and 3 include outreach activities that complement and contribute to the E&O subsystem.

Table 6. Education and Outreach Activities

Institution	Funding	Activity
SECOORA (Hernandez, Subramanian, Lee, Wakely)	Funding allocated in Goal 1	Develop success stories and related outreach information.
TOTAL EDUCATION AND OUTREACH	**Funding allocated in Goal 1**	

Milestone Chart

Table 7. Milestones for Year 4 by Quarter

	2014-2015 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
Goal 1: Sustain SECOORA as a Regional Information Coordination Entity				
A. Provide timely grant reports to NOAA		x		x
B. Hold Board Meetings and Member Meeting		x		x
C. Publish e-newsletters and other outreach material	x	x	x	x

	2014-2015 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
D. Coordinate with GCOOS on FL observing activities and other RAs to effectively respond to NOAA and other National level requirements, including RA Certification	x	x	x	x
E. Update SECOORA website with new content on data portal expansion, and PI, member, IOOS, IOOS Association activities	x	x	x	x
F. Refine and maintain RCOOS Conceptual Operations (Build out) Plan	x	x	x	x
G. Support local, regional, and national collaboration	x	x	x	x
H. Evaluate mechanisms to track operational statistics, product usage, and outcome measures and metrics	x	x	x	x
Goal 2: Sustain an Observing Subsystem for the SE				
A. Operate and maintain moored and coastal stations (COMPS and Carolina RCOOS)	x	x	x	x
i. Report moored and coastal stations data to secoora.org and NDBC	x	x	x	x
B. Operate and maintain Priority Radars				
i. Provide hourly surface current maps from the various regions via individual and SECOORA websites	x	x	x	x
ii. Provide estimates of experimental significant wave heights from the HF radar data	x	x	x	x
iii. Develop/report performance metrics of CODARs and WERAs throughout the SE including accuracy estimates of the surface currents	x	x	x	x
iv. Provide the radial currents to the National Servers (SIO) for the National HF radar network	x	x	x	x
C. Coordinated ocean variable experiment	x	x	x	x
D. Operate Gray's Reef Ocean Acidification Buoy	x	x	x	x
i. Maintain the sensors on Gray's Reef National Marine Sanctuary (GRNMS) buoy (41008)	x	x	x	x
ii. Collect underway pCO2 data and bulk water samples for analyses during the spring and summer 2014 cruises at the Gray's Reef mooring site.	x	x	x	x
Goal 3: Support a Multi-scale Multi-resolution Modeling Subsystem				
A. Support and enhance SABGOM model	x	x	x	x
i. Maintain and enhance NCSU Ocean circulation Nowcast/ Forecast modeling system and serve model output through the THREDDS server	x	x	x	x

Goals and Milestones	2014-2015 Quarter			
	1	2	3	4
ii. Conduct model skill assessment for all physical variables through appropriate comparisons with available observations; including near real-time comparisons with available coastal sea levels, buoy measured temperature/ salinity, HF Radar currents, and satellite observations	x	x	x	x
iii. Harmonize data and products delivery via PI website and SECOORA website; provide metadata for the products and data; provide data archival requirements and make available/share the software code for SECOORA funded product development	x	x	x	x
B. Provide real-time forecasting of inundation and storm surge				
i. University of Florida: Compile the final report of the project work covering Years 1-3, and make available any associated products and software codes that were developed with SECOORA funds	x	x	x	x
ii. North Carolina State University: Compile the final report of the project work covering the entire work period, and make available any associated products and software codes that were developed with SECOORA funds	x	x	x	x
C. Transfer of Habitat Model and Develop data products derived from satellite & in situ observations for fisheries stock assessment				
i. Determine transferability of habitat modeling approach to SAFMC stock assessment group	x	x	x	x
ii. Develop products working with observational, modeling and data management subsystems to assist SCDNR and SEAMAP on their stock assessment programs	x	x	x	x
iii. Attend stakeholder and SECOORA meetings		x		x
D. Provide a decision support tool for beach/shellfish WQ advisories				
i. Transfer the beach water quality swimming advisories application that allows users to see current water and air temperature, cloud cover and sun exposure, UV index, wind speed and direction, and surf conditions including rip tide warnings along with water quality advisories to a beach location in FL	x	x	x	x
E. Rip current forecasting	x	x	x	x
Goal 4: Implement a DMAC Subsystem				
A. Service Data Providers and RCOOS Subsystem PIs	x	x	x	x
B. Assess and advance IOOS recommended SOS implementation	x	x	x	x
C. Maintain DMAC infrastructure (hardware and software)	x	x	x	x

	2014-2015 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
D. Support data providers and RCOOS Manager on implementation of QA/QC flags based on published QARTOD manuals	x	x	x	x
E. Collaborate with product development support contractor	x	x	x	x
F. Upgrade SECOORA website services	x	x	x	x
G. Data Management Mini Grants (Regional coupled physical-biogeochemical model hindcast-data and DMAC infrastructure plan)	x	x	x	x
Goal 5: Support a targeted and leveraged Education and Outreach Subsystem				
A. Maintain web portal for BOB and other outreach activities	x	x	x	x
B. Develop outreach materials	x	x	x	x
C. Conduct community outreach highlighting the importance of observatories and SECOORA's products	x	x	x	x
D. Develop success stories with PIs to highlight on website, newsletters, one-pagers, etc.	x	x	x	x

Appendix A: SECOORA Priority Radar Sites

All Radar Sites identified in the table below support IOOS Key Activities: Search, Rescue, Oil Spill Response, Major Ports and Shipping Lanes; USF, with the support received will find a location and install the four CODAR site. UNC-CH installed a new site at Core Banks, NC with funding received from other sources. One time IOOS funds ($20,000) is allocated for the maintenance of this site in Year 4, hence it has been added to the SECOORA priority list of sites.

Responsible Agency/Vendor	Station Name/State	Latitude (N)	Longitude (W)	Nominal Frequency (MHz)
University of North Carolina/ CODAR	Duck, NC	36.18	-75.75	5.0
University of North Carolina/ CODAR	Cape Hatteras, NC	35.26	-75.52	5.0
University of South Carolina/ WERA	Georgetown, SC1	33.25	-79.15	8.3
University of South Carolina/ WERA	Caswell Beach, NC2	33.88	-78.11	8.3
Skidaway Institute of Oceanography (UGA)/WERA	St. Catherine, GA	31.69	-81.13	8.3
Skidaway Institute of Oceanography (UGA)/WERA	Jekyll Island, GA	31.06	-81.41	8.3
University of Miami/WERA	Dania Beach, FL	26.08	-80.12	12.6
University of Miami/WERA	Virginia Key, FL	25.74	-80.15	12.6
University of Miami/WERA	Crandon Park, FL	25.71	-80.15	16.0
University of Miami/WERA	Broad Key, FL3	25.35	-80.25	16.0
University of South Florida/CODAR	Redington Shores, FL	27.83	-82.83	5.0
University of South Florida/CODAR	Venice, FL	27.08	-82.45	5.0
University of South Florida/CODAR	Naples, FL	26.16	-81.81	5.0
University of SF/CODAR	To be determined	N/A	N/A	12.6
University of North Carolina, Chapel Hill	Core Banks, NC	34.76	-76.41	5.0

SECOORA
Southeast Coastal Ocean Observing Regional Association

SOUTHEAST COASTAL OCEAN OBSERVING REGIONAL ASSOCIATION

Budget sheet covers a one-year (or less) period.

Project Title: Southeast Coastal Ocean Observing Regional Association (SECOORA): A Framework for Monitoring, Prediction and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools

Principal Investigator(s): **Debra Hernandez** **Dates:** **Begin** 06/01/2014 **End** 05/31/2015

Institution: SECOORA

BUDGET ITEMS	No. of Individuals	Man-Months		Grant Funds
Salary and Wages		Grant	Match	
1. Principal Investigator (s): DH	1	10.40		$ 90,489
2. Associate Investigator(s): VS	1	12.00		$ 86,994
ML	1	10.75		$ 57,559
3. Professionals: CK	1	2.50		$ 4,167
4. Research Associates				
5. Research Asst. Grad. Students				
6. Prof. School Students				
7. Pre-Bac. Students				
8. Secretarial/Clerical				
9. Technical-Shop				
10. Other				
TOTAL SALARIES and WAGES				$ 239,209
Fringe Benefits - 28%				$ 66,978
TOTAL SALARIES, WAGES and FRINGE BENEFITS				$ 306,187
PERMANENT EQUIPMENT (list)				
EXPENDABLE SUPPLIES, etc.				$ 3,701
TRAVEL				
1. Domestic				$ 22,825
2. Foreign (requires prior approval)				
PUBLICATION COSTS				
OTHER COSTS				
Meeting/Workshop				
IOOS Association Dues				$ 4,500
CONTRACTUAL:				
1. SECOORA Miniproposals: Contractors TBD				$ 222,601
2. Program Support and Communications				$ 10,000
3. Accountant/ Audit				$ 10,000
4. Other				$ 3,000
USF- Luther Obs				$ 52,484
USF-Weisberg MOOR				$ 169,759
UNCW				$ 365,970
UNCCH				$ 130,384
USC-Voulgaris				$ 110,383
UGA-SkIO				$ 110,383
UM				$ 151,964
USF-Weisberg HFR				$ 151,963
USC- Porter DMAC				$ 190,393
NCSU-He				$ 130,066
NCSU-Xie				$ 25,000
UF				$ 25,000
ROFFS				$ 73,903
USC-Porter Model				$ 64,977
UGA- OA				$ 35,426
U Deleware- OA				$ 67,232
TOTAL DIRECT COSTS				$ 2,438,101
INDIRECT COSTS 1. On campus - 10.70%				$ 92,043
TOTAL COST				$ 2,530,144

SECOORA Year 4 Descope Budget Justification:

The total request for this award is **$2,530,144**

Salary: Total funds requested are **$306,187** for the PI (10.4 months), D. Hernandez, the RCOOS Manager (12.0 months), V. Subramanian, the Business Manager (10.75 months), M. Lee, and a part-time bookkeeper (2.5 months) C. Kight. Fringe is calculated at 28% of salary ($66,978).

Travel: $22,825 is requested to support trips by staff to IOOS and science meetings, regional workshops and visits to PIs, stakeholders and partners. Travel is also requested to support Board member travel to two meetings per year. All travel is domestic.

Supplies: $3,701 is requested for office supplies, printing, postage, computer related expenses, other meeting supplies, and miscellaneous supplies for observing assets.

Other: $4,500 for IOOS Association dues.

Indirect: SECOORA charges 10.70% on all direct charges and the first $25,000 in contracts/subawards.

CONTRACTS:
SECOORA Program Support and Communications: $10,000 is requested to support a contractor (A. Wakely) to provide communication and stakeholder engagement services, and website updates. **Other Contracts: $10,000** for a portion of audit and accounting expenses; **$3,000** for a portion of the following: legal expenses, tort insurance, etc.; **$222,601** is requested for Miniproposals (Contractors TBD). The Miniproposals include the following: **SECOORA glider experiment:** SECOORA will fund $49,840 towards a coordinated glider experiment in the SE region aimed at supporting the scientific and operational goals as well as integration of observational, modeling and data management projects. **Rip current forecasting:** SECOORA will allocate $80,894 to address the gaps in observations and modeling required for rip current forecast model validation, and to expand the forecasting efforts via collaboration with NOAA CO-OPS and National Weather Service Weather Forecast Offices in the SE region. **Data Management Mini Grants:** SECOORA will allocate $91,867 towards data management mini grants. Mini grants will be awarded to make available regional physical-biogeochemical coupled model hindcast data to stakeholder communities and to strengthen SECOORA data management programs and infrastructure.

Additional CONTRACTS and SUBAWARDS:

MODELING

<u>NCSU- Dr. Ruoying He</u>

TOTAL AWARD AMOUNT = $ 130,066

Salary: As the PI of the project, Dr. He will commit 1 month/yr to oversee the NCSU portion of the project and produce project report, journal publications. We request salary support

for a NCSU research associate (RA) for 12-month. The RA will assist Dr. He in refining SABGOM model, adding data assimilation component, model-data comparisons, model analysis and visualizations. Fringe benefits in University of North Carolina System are 30% and 17% for faculty, postdoc, respectively.

Travel: Travel funds ($3000 for domestic and $3500 for international) have been requested: (1) for Dr. He and his RA to attend SECOORA annual meeting [2 people for 3 days, the cost breakdown includes: $500 for airfare and ground transportation, $300 for lodging, and $200 for per diem, total $1000] (2) for Dr. He to attend AGU meeting to report research findings [1 people for 5 days, the cost breakdown includes: $900 for airfare and ground transportation, $900 for lodging, and $200 for per diem; total 2000]; (3) for Dr. He to attend EGU Spring meeting in Vienna Austria to report research findings [1 people for 5 days, the cost breakdown includes: $2000 for airfare and ground transportation, $ 1300 for lodge; and $200 for per diem, total $3500].

Publication Cost: We request publication funds to report our research findings in peer-reviewed journals ($1200).

Equipment: We request funds to purchase a 35-TB raid data server. SABGOM operational model simulations are data intensive. The equipment is critical for model data delivering and archiving ($20,000).

Supplies: Supplies not covered by administrative costs, including backup UPS batteries and computer/data storage cables are budgeted ($1416).

Indirect Costs: Indirect cost at North Carolina State University is 49% of Modified Total Direct Costs(MTDC). MTDC is the sum of all direct costs, minus equipment and tuition.

NCSU - Dr. Lian Xie

TOTAL AWARD AMOUNT = $ 25,000

Salary: $12,060 – 0.52 month summer salary for the PI and 0.85 month salary for the associate are charged to the project to carry out the proposed work. Fringe and benefit rate: 30% of total salary.

Travel: $1101 – domestic travel is budgeted for attending conferences and project meetings.

Indirect Costs: Indirect rate is 49% MTDC, the rate in place at the time of the original award.

ROFFS – Dr. Mitch Roffer

TOTAL AWARD AMOUNT = $73,903

Salary: Salary and fringe benefits are requested for Mitchell A. Roffer, Co Principal Investigator at 15% time for one year. Mitchell A. Roffer salary ($13,800) plus 20% fringe for a total of $16,560.00

Travel: Travel per year is requested for Mitchell A. Roffer (including per diem and personal automobile from ROFFS™ office Melbourne, FL) for (1) two day trip to Miami, FL. Also requested are (2) two day trips from Melbourne, FL to Charleston, SC.

Mitchell A. Roffer – Science Team

Melbourne, FL to Miami, FL (1) trip @ $350 per trip

Melbourne, FL to Charleston, SC (2) trips @ $970 per trip

Indirect Costs ROFFS™: The cost basis for the ROFFS™ overhead rate of 40% is calculated on the basis of operational costs (rent, maintenance, taxes etc) divided by direct labor costs. We certify that this is the lowest rate that we can provide.

Contractual CIMAS: Salary and fringe benefits are requested at 25% time for one year for Barbara Muhling (CIMAS Associate Research Scientist) at University of Miami – NOAA Institute for Marine and Atmospheric Science (CIMAS) Miami, FL

Barbara Muhling salary ($18,750.00) plus 42% fringe

Travel - $561

In Indirect Costs CIMAS: The cost basis for the CIMAS overhead rate of 55%, which is set standard for University of Miami, CIMAS.

Contractual SCDNR: Salary and fringe benefits are requested at 10% time for one year for associate (to be announced) for South Carolina Department of Natural Resources to assist in work relating to modeling and standardization of catch per unit effort

SCDNR Associate salary ($3,000) plus 38% fringe for a total of $4,140.00

In Indirect Costs South Carolina Department of Natural Resources: The cost basis for the SCDNR overhead rate of 21.37% which is set standard for South Carolina Department of Natural Resources

Supplies: Funding is requested for other costs such as supplies (DVD's, posters and other printing charges) for data analysis and product archival storage.

University of Florida – Dr. Peter Sheng

TOTAL AWARD AMOUNT= $ 25,000

Salary: Dr. Peter Sheng, ~2 weeks, will serve as PI for the project and will oversee UF's effort. Dr. Vladimir Paramygin, ~2 weeks to complete the final project report**.** Dr. Justin Davis, ~1 week to complete the final project report.

Indirect Costs: Indirect cost rates (IDC) are negotiated and determined by the Department of Health and Human Services. The University currently has an approved IDC rate of 49.0% of Modified Total Direct Costs (MTDC) for on-campus organized research – effective thru 6/30/2014 and 50.0% of Modified Total Direct Costs (MTDC) for on-campus organized research – effective beginning 7/1/2014.

University of South Carolina- Dr. Dwayne Porter

TOTAL AWARD AMOUNT = $64,977

Salary/Wages and Benefits ($27,508 + $2,245): Dr. Porter is PI of the project and will have overall responsibility for the activity, including project oversight, planning, implementation, and reporting. Dr. Porter is requesting 0.25 months of summer salary support. Funds are requested to partially support one core staff member who will have primary responsibilities for the data integration, modeling efforts, and information dissemination as described in the proposal. Funds are also requested to support a Graduate Research Assistant who will be responsible for data assimilation and integration, and model development. Fringe has been calculated at 23.81% of total wages plus insurance at $346.92 per month for the core staff member. The fringe rate on the GRA is 0.55%.

Expendable Supplies ($500): Funds are requested for basic IT-related supplies.

Travel ($1,100): Requested travel funds will partially support participation in offsite SECOORA meetings and meetings with product end users as related to product design, development, evaluation, and implementation. Allowable charges will adhere to state and federal per diem guidelines as appropriate.

Other Costs ($13,000): Continuation of our subcontract with Dr. Kelsey at UMCES. UMCES will provide technical support with and review of model development and validation activities, and establishing the framework to expand current "Where's the Beach" web and mobile apps to incorporate new areas.

Indirect Costs ($20,624): IDC is calculated as 46.5% of allowable direct costs.

DMAC

University of South Carolina – Dr. Dwayne Porter

TOTAL AWARD AMOUNT = $190,393

Salary/Wages and Benefits ($123,900 + $41,635): Dr. Porter is PI of the project and will have overall responsibility for the activity, including project oversight, planning, implementation, and reporting. Dr. Porter is requesting 0.4 months of summer salary

support. Funds are requested to partially support two core staff members who will have primary responsibilities for the data management and system maintenance activities as described in the proposal. Fringe has been calculated at 23.81% of wages plus insurance at $837.38 per month for the staff member with full family benefits and at $346.92 for the staff member with individual benefits.

Expendable Supplies ($1,145): Funds are requested for basic IT supplies.

Travel ($1,200): Requested travel funds will partially support participation in offsite SECOORA meetings. Allowable charges will adhere to state and federal per diem guidelines as appropriate.

Indirect Costs ($22,513): IDC is calculated as 13.41% of allowable direct costs. This rate reflects the SECOORA federally-approved IDC rate and represents a significant reduction from the USC federally-approved rate. This is a significant allowance on the part of USC in an effort to maintain the SECOORA DMAC infrastructure to ensure continuity of operations.

OBSERVATIONS

University of Georgia/ Skidaway Institute of Oceanography – Dr. Dana Savidge

TOTAL AWARD AMOUNT = $110,383

Salary	**$39,157+12,647=51804**
Travel	**$2,000**
Equipment	**$15,001**
Supplies	**$10,211**
Indirect Costs	**$31,367**

Salary support is requested for PI Dr. D. Savidge (0.5 month) and technical staff (7 months total) per year. Fringe benefit rates are 17.98% for faculty and 34% for technical personnel. Materials and supplies are $10211 per year for rental fees, electricity, communications and small spare parts. Travel costs are budgeted at $2K per year. Small boat and institute vehicle charges are required to access radar sites on the islands at $200 per trip for 10 days per year, 5 for each of two sites. SkIO's HF-radar budget for repair parts and spares is $15,001. Our budget office has agreed that for FY15 these funds will be exempt from overhead charges. This exemption will be reassessed on a yearly basis. Waived costs include $1K for computer maintenance support, and publications costs of $2K per year. SkIO's indirect cost rate of 49% of MTDC is applied to the balance.

University of Miami – Dr. Nick Shay

TOTAL AWARD AMOUNT = $151,964.00

Salary + Fringe: $85,039.00 + $23,528.00

Travel: $6,000.00

Electricity/Phone: $2,525.00

Supplies: $1,514.00

Student Insurance: $2,000.00

Indirect Costs: (26%) $31,358.00

Salary support is requested for Dr. L. K. Shay (1 month), Mr. Jorge Martinez-Pedraja (Technician: 11 months) and a student (9 months) in 2014-2015 to operate and maintain WERAs in South Florida. Fringe benefits for faculty are 26.7 and approximately 42.8% for the technician. As part of this year's activity, we expect to deploy a fourth radar in North Key Largo pending state approval. Direct costs include telephone lines and electricity at the sites ($2.5K), expendable supplies ($1.5K) such as, disks/CDs to store data, and computing services. Travel (~$6K) is primarily to/from the sites and attend national meetings like HF Radar National Steering team committee usually in Boulder, Colorado. We have also included $2K per year for student insurance as they have no fringe benefits at UM. The off campus UM indirect cost recovery is 26% of MTDC since the data collection is from remote sites off campus.

University of North Carolina – Chapel Hill – Dr. Harvey Seim

TOTAL AWARD AMOUNT = $130,384

Salary: Support is requested for the PI H. Seim (0.25 mons), M. Muglia, the lead technical staff, who lives on the Outer Banks and will perform or lead the bulk of needed maintenance (6 mons), S. Haines, who is responsible for data management (3 mons), and two staff at the Institute of Marine Sciences, T. Whipple and R. Neve, who will help Muglia support the Core Banks installation (6 weeks each). Fringe benefits are calculated as 22.4% of salary plus $440.42 per month for staff health insurance.

Travel: A budget of $5,100 for travel is requested to cover routine trips to service and repair equipment at all sites which are all remote. The Core Banks installation is particularly remote, requiring a ferry and 4-wheel drive vehicle for access, and may require a separate vessel for access during winter months when the ferry does not operate. As expenses allow these funds may also support travel to radar operator meetings.

Supplies: Under this category are supplies, power and communications costs, generator and shed maintenance and repair costs, budgeted at $21,000. At the Buxton site the month power bill is approximately $150/month and maintenance/repair and diesel fuel costs to maintain the backup diesel generator (the unit is older and has required consider upkeep) are budgeted at $2000. Similar costs are anticipated at the Core Banks site ($2000). $600 are budgeted for upkeep of the sheds that house the electronics at these sites. Communications costs are roughly $300/month/site, or $10,800 total. $5,600 is requested in supplies to cover costs associated with equipment repairs/replacements. In the past these have included component failures in the electronics, antenna repairs, lightning protection replacement and cable replacement.

Indirect Costs: The off-campus indirect charge of 26% is requested because the installations are all on the Outer Banks and the bulk of the funding goes to Muglia who works at the coast. All expenses are eligible for indirect costs for a total of $26,905.

University of North Carolina – Wilmington – Dr. Lynn Leonard

TOTAL AWARD AMOUNT = $365,970

Salary: Salary is requested for the following personnel: Two RCOOS mooring technicians who provide O&M support for the 7 buoys and one pier system operated by UNCW. Total requested salary support for technicians equals $82,161. 8.0 months of support is requested for the project manager ($34,086) to provide on-going communications with permitting agencies (USCG, USACE) and stakeholders regarding observing activities in the Carolinas region, participate in field work in support of mooring operations, manage budgets and contracts, prepare project and personnel reports, coordinate integration activities and manage the project team on a daily basis.

UNCW assesses benefits at 37% of total salaries for the mooring technicians and 34.6% of the total salary for the project manager. This equals $42,193 for all personnel involved on the project. The total salary request, inclusive of base pay plus benefits, equals $158,441.

Supplies: Expendable supplies are requested ($11,900). Examples of items that are purchased from supply funds include buoy modems, data loggers, wiring, cables, buoy batteries, and lab supplies.

Travel: RCOOS personnel request funds for travel in support of mooring deployments and pier maintenance activities. The mooring technicians have to travel around NC, SC and GA to provide maintenance for the RCOOS moorings. Travel support funds are used to pay for the mileage fees accrued on State of NC vehicles (used in support of the RCOOS project) and for boat fuel for UNCW small boat usage. Also funds are used to support PI travel for SECOORA meetings. The total travel request equals $7,000.

Purchased Services: Support for mooring operations and maintenance, and sensors associated with each mooring is requested ($40,000). These funds will be used for mooring turnarounds on the R/V Savannah, R/V Cape Fear, or other UNOLS or commercially

available vessels. Additionally, funds will cover the cost of equipment calibrations (e.g. weather sensors, CTDs) and telemetry costs so that moorings provide real-time data.

Due to the fact that $40,000 does not provide the level of support required for mooring operations, UNCW is investigating ways to reduce the cost of mooring operations. As such we are in the process of determining if cell phone communications could be used instead of Iridium satellite communication. Other options which may help reduce costs include the reduction of mooring reports from hourly to once every two hours. RCOOS personnel will notify SECOORA staff prior to reducing the mooring reporting frequency. Additionally, if the cell phone communications are successful, we will report this to SECOORA for inclusion in the IOOS bi-annual progress report.

Additionally, it should be noted that personnel will try to complete all mooring turnarounds from the R/V Cape Fear since the day rate is lower (~$2,800 + fuel); however, if buoy anchors have to be recovered, then all of this funding will have to be used to complete turnaround missions from the R/V Savannah or coastal ocean class UNOLS, NOAA, or university research vessels. The day rate for R/V Savannah is ~$10,000 and UNCW typically requires 3-4 days of vessel time per year if we need to turnaround all of the moorings using this ship.

Contracted Services: UNCW will issue a contract to Second Creek Consulting who will provide support to the SECOORA data management team, provide QA/QC expertise for the data provided by UNCW moorings, assist with data recovery for the cell phone modem communications testing, and manage the CORMP website. Total contract award value equals $42,000.

Indirect Costs: IDC at UNCW is assessed at 44% on everything except equipment purchases and only on the first $25,000 of subcontracts. Total IDC charged for this award is $106,630.

<u>University of South Carolina – Dr. George Voulgaris</u>

TOTAL AWARD AMOUNT = $110,383

Salary: 1 month of summer salary ($11,000) is requested for the PI (G. Voulgaris) responsible for the management and administration of the 2 site radars. Three months of salary ($16,900) is requested for technical support to assist in the operations and on-site maintenance of the two sites. This support is offered by Mr. Jeffrey Jefferson, who has been trained in WERA systems and has sufficient experience to carry out the requested tasks. Finally a 7.5 month support (1 academic semester and 1 summer, total $14,280) is requested for a graduate student to assist in the maintenance and mainly in data analysis of the HF Radars. The total request for salaries and wages is $42,180. Fringe benefits (see: https://sam.research.sc.edu/fringebenefits.html, accessed on 6/6/2014) at 23.81% for the technical support and the PI and at 0.55% for the student (enrolled) are estimated; in addition $346.92 per month for medical benefits for the technician has been accounted for

(employ only medical: $335.20 and dental: $11.72). The total cost of fringe benefits is $7,762. The total request for salaries and Fringe benefits is $49,942.

Travel: Domestic: 12 day trips (1 per month) to each site (442mile return trip for CSW station; 250 miles return trip to GTN station, 692miles x 12 x 50.5c per mile= $4,193), daily allowance $32 x 12 x 2 = $768. Participation of PI to SECOORA spring and fall meetings $1,800. Total domestic travel request is: $6,762.

Supplies: Various RF connectors ($700); consumables for repairs (tape, insulation tubes, cable protective pipes etc.) $1,144; field laptop for troubleshooting $1,980; backup cell network modem, and router for Verizon network $810; upgrades to remote station computer boards and CPU $1,800 ($900 each); various field tools and incidentals $452. Total Supplies: $6,886.

Other Costs: (1) Electricity charges (to be paid to the Bell W. Baruch Foundation, property owner of the radar installation site) for the GTN station is estimated on average at $125 per month (total $1,500 per year), internet connection with static IP provided through Verizon is estimated on $40 per month per station, total cost of $960. Total for electricity and communication charges: $2,460. (2) System hardware maintenance charges for the radar equipment pro-rated at $1,100/ month for part replacements to ensure rapid maintenance of sites and replacement of faulted parts and upgrades. Total cost $13,200 per year. (3) Tuition Costs for the graduate student (6 hrs during the academic semester and 1 hr during the summer session) at a cost of $485 per credit hour (see:http://sc.edu/bursar/fees.shtml, accessed 6/6/2014) have been included in this category (total for tuition: $3,395).

Indirect Costs: The USC negotiated rate (see attached document) for service projects of 35% (see:https://sam.research.sc.edulpdf/IDC%20Rate%20Agreement.pdf) on all expenses excluding equipment and tuition has been applied making the total IDC $27,738.

University of South Florida – Coastal Stations– Dr. Mark Luther

TOTAL AWARD AMOUNT = $ 52,484

Salary: 1.0 month salary and benefits each for M. Luther and C. Merz are requested. Fringe benefits include FICA, Retirement, Medicare and Worker's Comp. These total benefits are calculated at the standard state university rates of 16.09% of salary plus $1269/month for health and life insurance for Merz. Total salary and benefits requested is $21,255.

Travel: Funds are requested for travel for the PI/Co-PI's and/or Field Engineer to attend 2 professional/technical meetings (Airfare: $500 each=$1000; Per Diem and incidentals: 3 days each @ $250/day=$1500). Additional local travel to service coastal observing sites in the amount of $500 is requested. Total travel requested is $3,000.

Supplies: The total cost estimate for expendable supplies is $10,851, which includes but is not limited to mooring and miscellaneous expenses such as mounting hardware and

supplies for mounting instrumentation, power, and telemetry equipment, batteries, solar cells, boat fuel, and lab supplies needed in the preparation/calibration of sensor equipment, as well as data acquisition equipment and oceanographic or meteorological sensors, costing under $5,000, as needed. Specific sensor equipment to be purchased is unknown until such time as equipment fails in the field.

Indirect Costs: Indirect Costs are charged at 49.5% of Modified Total Direct Costs.

University of South Florida – HFR – Dr. Bob Weisberg

TOTAL AWARD AMOUNT = $ 151,963

Salary and Fringe = $52,627

R. Weisberg (0.5) = $7,300

C. Merz (2)= $18,000

Y. Liu (1.5)= $8,600

J. Donovan (1)= $8,700

Travel= $1,500 domestic, $2,500 foreign

Equipment= $46,000

Supplies= $7,500

Other= $8,076

Indirect Costs= $33,760

P.I., R.H. Weisberg, will provide overall project guidance assisted by co-P.I. C. Merz. J. Donovan will help to manage data and computational systems. Y. Liu will assist with data analyses. The number of man months for each is given in parentheses above. These salary monies will provide partial support together with other related projects. Fringe benefits are calculated @ 16.09%, plus 1269/mo. (medical insurance) on faculty and staff and @ 1.85%, plus 6598/yr. (medical insurance) on post-doctoral associates and @ 0.5%, plus 2012/yr. (medical insurance) on graduate students. Indirect costs are charged @ 49.5% on MTDC. MTDC for this award is TDC minus equipment and telephone/electric costs.

Equipment continues the staged acquisition of componentry to complete a fourth CODAR installation.

Travel is for $1,500 of domestic travel that includes site servicing, P.I. interactions and dissemination of scientific information at professional meetings and $2,500 of foreign travel for attendance at the OCEANS '14 MTS/IEEE conference in St. John's Newfoundland, Canada

in mid-September, 2014; for the purpose of interaction and dissemination of scientific information.

Materials and supplies are for CODAR site maintenance, including a new laptop computer needed to communication on site with the CODAR system. Other costs are for site related telecommunications and electricity (both excluded in MTDC), CODAR service agreement, publication and freight (for shipping parts between USF and vendor).

University of South Florida – Moorings – Dr. Bob Weisberg

TOTAL AWARD AMOUNT = $169,759

Salary and Fringe= $90,718

R. Weisberg (1)= $15,900

Y. Liu (3)= $17,700

J. Donovan (2)= $17,300

Engr./Technical (3)= $18,500

Travel= $3,500

Supplies= $ 9,400

Other= $9,933

Indirect Costs= $56,208

P.I., R.H. Weisberg will provide overall project guidance assisted by co-P.I. Y. Liu. J. Donovan will help to manage data and computational systems. J. Law will provide sea-going expertise assisted by support from our CMS-COT engineering group. The number of man months for each is given in parentheses above. These salary monies will provide partial support together with other related projects. Fringe benefits are calculated @ 16.09%, plus 1269/mo. (medical insurance) on faculty and staff and @ 1.85%, plus 6598/yr. (medical insurance) on post-doctoral associates and @ 0.5%, plus 2012/yr. (medical insurance) on graduate students. Indirect costs are charged @ 49.5% on MTDC.

Travel is for P.I. interactions and dissemination of scientific information at professional meetings. Materials and supplies are for mooring system hardware, wire rope, cables, connectors, other expendables and batteries for powering equipment deployed at sea. Other costs are for small boat usage to service moorings, sensor calibration expenses, shop support, publication and freight (for calibrations).

OCEAN ACIDIFICATION

University of Georgia – Dr. Scott Noakes

TOTAL AWARD AMOUNT = $35,426

Salary: $18,572

Travel: $1,500

Supplies: $1,221

Direct Costs total = $28,116

Indirect Costs (26%) = $7,310

Personnel: salary support at the level of 2.9 months is requested for Dr. Noakes. He will be in charge of the GRNMS mooring sensors. A PhD student support is requested at 0.79 months to assist with buoy operations. Fringe is calculated at 39.87% (PI) and 5.00% (Graduate Student).

Materials and supplies: $1,221 is requested for materials associated with sensor deployment, recovery and maintenance.

Travel: $1,500 is requested for travel to Savannah, GA to visit the GRNMS mooring for servicing or repairs as needed. Travel is also needed for a national meeting related to ocean acidification.

University of Delaware – Dr. Wei-Jun Cai

TOTAL AWARD AMOUNT = $ 67,232

Personnel: The lead PI, Cai, requests a salary support at the level of 0.5 month. He will supervise the entire project activity as well as reporting to NOAA and writing scientific papers. A 3-month salary is requested for a technician to conduct the fieldwork. For fieldwork, he/she will be responsible for doing the underway pCO_2 analysis and DO Winkler titration together with the student. He will attend the GOMEC cruise to analyze TA. 6-month salary is requested for a graduate student who will help with and DIC analysis and TA titration. He or she will attend the GOMEC cruise. Salaries are increased 2% annually. Fringe benefit Per UD's negotiated agreement, fringe benefits are calculated at 34.7% for faculty, technical person, and postdoc, and 3.5% for the graduate student.

Materials and supplies: $2,607 is requested. This includes materials and chemicals for the titration and the specpH measurements, parts for the underway pCO_2 instrument, and two cases of CRM from Dickson.

Travel: $3,800 is requested for up to 5 trips to Savannah, GA for 2 people. Each trip is budgeted at $760 including rental van, hotel and per diem (2 nights hotel, 2 days per diem).

$1,200 is budget for the PI to attend one NOAA meeting.

Other costs: $2,100 is requested to support publication cost.

Indirect Costs: The University of Delaware's predetermined federal off-campus research rate of 28% was used.

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. IOOS	11.012	$	$	$ 2,530,144.00	$	$ 2,530,144.00
2. SECOORA ONLY						0.00
3.						0.00
4.						0.00
5. Totals		$ 0.00	$ 0.00	$ 2,530,144.00	$ 0.00	$ 2,530,144.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1) FY11	(2) Year 2	(3) Year 3*	Year 3*	(5)
a. Personnel	$ 110,408.00	$ 196,412.00	$ 211,698.00	$ 239,209.00	$ 757,727.00
b. Fringe Benefits	27,620.00	43,211.00	57,159.00	66,978.00	194,968.00
c. Travel	15,000.00	30,000.00	44,415.00	22,825.00	112,240.00
d. Equipment	0.00	0.00	0.00	0.00	0.00
e. Supplies	5,146.00	4,063.00	9,750.00	3,701.00	22,660.00
f. Contractual	1,854,826.00	1,896,943.00	2,049,959.00	2,100,888.00	7,902,616.00
g. Construction	0.00	0.00	0.00	0.00	0.00
h. Other	2,000.00	29,500.00	19,500.00	4,500.00	55,500.00
i. Total Direct Charges *(sum of 6a-6h)*	2,015,000.00	2,200,129.00	2,392,481.00	2,438,101.00	9,045,711.00
j. Indirect Charges		97,595.00	105,222.00	92,043.00	294,860.00
k. TOTALS *(sum of 6i and 6j)*	$ 2,015,000.00	$ 2,297,724.00	$ 2,497,703.00	$ 2,530,144.00	$ 9,340,571.00
7. Program Income	$	$	$	$	$ 0.00

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SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. IOOS - SECOORA ONLY	$	$	$	$ 0.00
9.				0.00
10.				0.00
11.				0.00
12. TOTAL *(sum of lines 8-11)*	$ 0.00	$ 0.00	$ 0.00	$ 0.00

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 2,015,000.00	$ 503,750.00	$ 503,750.00	$ 503,750.00	$ 503,750.00
14. Non-Federal	0.00				
15. TOTAL *(sum of lines 13 and 14)*	$ 2,015,000.00	$ 503,750.00	$ 503,750.00	$ 503,750.00	$ 503,750.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. IOOS - SECOORA ONLY	$ 2,530,144.00	$	$	$
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$ 2,530,144.00	$ 0.00	$ 0.00	$ 0.00

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges:	22. Indirect Charges:
23. Remarks: * Please note that the last column in Section B (column (#4)) should be titled "Year 4".	