PINELLAS COUNTY RESTORE ACT DIRECT COMPONENT PROJECT PROPOSAL SUBMITTAL FORM

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1. **POC Name:** Dr. Robert Weisberg

2. **POC Organization:** University of South Florida, College of Marine Science

3. **POC Title:** Distinguished University Professor

4. **POC Email:** weisberg@usf.edu

5. **POC Phone:** 727-553-1568

6. **Proposed Activity Name:** Coastal Ocean Monitoring and Prediction System (COMPS): Publically accessible, real time wind, waves and currents from Pass-a-Grille Channel, Pinellas County.

7. **Restoration Council Goals Addressed:**
   (Step 1 and Step 2 - Criteria 1 and 2)
   List which of the following goal(s) will be addressed and how each goal will be addressed.

   A. Restore and Conserve Habitat
   B. Restore Water Quality
   C. Replenish and Protect Living Coastal and Marine Resources
   D. Enhance Community Resilience
   E. Build and Revitalize the Gulf Economy

   This project addresses all 5 Restoration Council Goals in the context of the comprehensive coastal ocean observing and modeling program within which it resides. A description of this system is provided in responses to questions 7, 8 and 10. As part of a broader effort, the benefit to cost ratio is very high when considering the varied applications of the system in which the proposed project is a part of.

   The College of Marine Science (CMS), University of South Florida (USF) initiated a Coastal Ocean Monitoring and Prediction System (COMPS) in 1998 to observe and predict coastal ocean phenomena of societal importance. COMPS observations are of surface meteorology, ocean currents, waves, temperature and salinity using moored buoys, HF-radar and robotic gliders, all supporting predictive models. COMPS utilizes a systems science approach to describing and understanding coastal ocean phenomena through the coordination of observations with models. Models are necessary as the coastal ocean is both vast and three dimensional and observations alone are impractical to fully describe it. Similarly, models without observations for data assimilation, initialization, boundary conditions and veracity testing are of little use. Thus, to describe the coastal ocean one must employ science based physical models which are coordinated with real, sustained observations. This is the essence of COMPS.

The presently proposed project will solidify funding for one observing station that is part of the COMPS system. This station (hereafter referred to as the C21 station) is located 1 mile offshore of Pass-a-Grille beach and will measure winds, waves, currents, temperature, relatively humidity, barometric pressure, sea surface temperature and salinity and will report these data to the general public in near real-time via the internet.

A., B. & C. Restore and Conserve Habitat; Restore Water Quality; Replenish and Protect Living Coastal and Marine resources

Habitat, water quality and living coastal marine resources all fall under the umbrella of coastal ocean ecology as ecology integrates all of the processes that are responsible for organism success. This success (or lack of it) begins with the coastal ocean circulation, which unites nutrients with light, fueling primary productivity and thence all higher trophic level interactions. It is the coastal ocean circulation that determines the evolution of the water properties within an organism's habitat, including nutrients and pollutants. Thus, the utility of COMPS in understanding and predicting coastal ocean circulation directly applies to any efforts regarding restoration and conservation of habitat, water quality or living marine resources. Specific examples are provided in our recent publications on gag grouper recruitment, harmful algae bloom prediction and explanations of fish lesions post Deepwater Horizon spill.

D. Community Resilience

COMPS observations and models can be utilized as effective community resilience tools. The waves measurements proposed at C21 in conjunction with COMPS wave and surge models make possible further scenario studies on the severity and location of storm surge and waves for a multitude of extreme weather events, thus providing a valuable tool for emergency management planning. Additionally, COMPS was shown to be effective for tracking surface and subsurface oil during the Deepwater Horizon spill, and this utility would apply to any future hazardous material spill. Finally, along with providing near real-time observations for recreational and commercial mariners at the entrance to one of the major Pinellas County inlets, the observations collected at C21 will help to ensure the quality and accuracy of COMPS circulation models which make possible applications such as our harmful algal bloom tracking tool in partnership with FWC and the availability of real time data and models to the US Coast Guard for SAROPS.

E. Build and Revitalize the Gulf Economy

Similar to the economy of the gulf, the state of funding for COMPS suffered greatly in the wake of the Deepwater Horizon spill. Ironically, the prospect of penalty monies hindered the availability of other funds for observing systems such as COMPS and to this point RESTORE funds have not supported such systems. We maintain that investment in a scientifically defensible observing and prediction system such as COMPS will have longstanding positive economic benefits to Pinellas County (and elsewhere along Florida's west coast) as it provides valuable information to both recreational and commercial boaters, beach goers and county planners. In other words, tourism, resiliency and ecosystems services are all directly impacted.

8. RESTORE Act Eligible Activities Addressed:
(Step 1 and Step 2 - Criteria 3 and 4)
List which of the following activities will be addressed and how each activity will be addressed.

1. **Restoration/protection of natural resources, ecosystems, fisheries, marine wildlife habitats, beaches, and coastal wetlands**
2. **Mitigation of damage to fish, wildlife, and natural resources**
3. Implementation of Federally-approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring
4. **Workforce development and job creation**
5. Improvements to or on State parks in coastal areas affected by Deepwater Horizon oil spill
6. Infrastructure projects benefitting the economy or ecological resources, including port infrastructure
7. **Coastal flood protection and related infrastructure**
8. **Promotion of Gulf Coast Region tourism, including recreational fishing**
9. **Promotion of the consumption of seafood harvesting from the Gulf Coast Region**
10. **Planning assistance**

As mentioned in Question 7 above, not only does the proposed waves, water quality and meteorological observing site address RESTORE Act Activities directly, but the COMPS system of which it is part greatly expands upon these RESTORE ACT applications.

1. & 2. Restoration/protection of natural resources, ecosystems, fisheries, marine wildlife habitats, beaches and coastal wetlands; Mitigation of damage to fish, wildlife and natural resources

As in addressing Question 7, goals A, B and C we reiterate that the coastal ocean circulation provides the underpinning for ecosystem functionality. Ecology is not simply biology. It is multidisciplinary, combining all of the processes that promote organism success. This begins with the circulation physics,which connects the deep ocean to the continental shelf and the shelf with the estuaries. Nutrients that fuel primary productivity are transported by the circulation. The circulation and waves are also responsile for beach morphology, flushing of the coastal wetlands and estuaries and determining beach water quality. All of the RESTORE ACT environmental goals are critically tied to the coastal ocean circulation.

4. Workforce development and job creation

COMPS employs trained technical and computer science staff; trains graduate students and post-doctoral associates and provides undergraduate intern opportunities. Thus it contributes directly to the present workforce and provides STEM training for the future workforce. Indirectly it also adds significantly to the safety and enjoyment of recreational and tourism activities, thereby positively affecting workforce enhancements throughout Pinellas County.

7. & 10. Coastal flood protection and related infrastructure; Planning assistance

The C21 site at Pass-a-Grille is in place but not functioning due to a lack of funding. Bringing the waves and meteorological sensors back on line will contribute to the continuation of storm surge and wave studies that have been central to COMPS research activities for the past decade. This work is published in numerous peer reviewed journals (see list of relevant publications) and has been the

subject of numerous briefings to emergency management and private citizen groups on the risks from hurricane storm surge and waves. This work is vital to identifying regions vulnerable to inundation during severe weather events and as such is critical information for emergency managers and city planners.

8. Promotion of Gulf Coast Region tourism, including recreational fishing

As a real-time station reporting oceanographic and meteorological parameters, particularly wave height and wind velocity, the C21 site will be a useful online tool for beach tourism and recreational and commercial fishing in determining beach wave conditions and sea state for safe marine outings. Securing the requested funding will also allow the COMPS program to pursue the development of a real-time app that will greatly increase the accessibility and profile of the coastal observations.

9. Previous Claim:

Is the proposed activity included in any claim for compensation paid out by the Oil Spill Liability Trust Fund after July 6, 2012? If yes, this activity is not eligible for Direct Component grant.
Yes: ___ No: X

10. RESTORE Act Pinellas County priorities addressed:

(Step 2 - Criteria 5 and 6)
List which of the following priorities will be addressed and how each priority will be addressed.

a. Protect and restore native habitats
b. Provide stormwater quality improvements
c. Create policies, programs, and/or mechanisms to remediate environmental and/or economic damages
d. Create policies, programs, and/or mechanisms to protect against future environmental and/or economic vulnerability
e. Provide climate change/sea-level rise planning, adaptation and/or related community engagement
f. Provide flood and storm protection to infrastructure and other publically owned assets that consider resilience and changing sea levels
g. Implement or further actions in the Pinellas County Post Disaster Redevelopment Plan Link to Plan: http://www.postdisasterplan.org/pdrp.shtml
h. Diversify and improve the economy including tourism
i. Promote sustainable recreational fishing and consumption of seafood dependent on Gulf ecosystem, and/or protect or promote working waterfronts

a. Protect and restore native habitats;

As outlined in Questions 7 and 8 above, circulation plays a foundational role in coastal ocean ecology and habitat. Circulation provides the highway upon which nutrients and pollutants are transported throughout the coastal ocean, and any discussion of habitat health must be predicated on some understanding of the circulation of the region. Direct evidence for this statement lies in our explanations and recent predictions of harmful algae blooms, explanations of gag grouper recruitment success or lack of same and explanations of fish lesions post Deepwater Horizon spill. The coastal ocean is hardly static; it is the movement of water that largely determines ecosystems functionality and habitat viability. The COMPS observational and modeling system adds significantly to our understanding of habitat and how it may be sustained or restored..

c. Create policies, programs, and/or mechanisms to protect against future environmental and/or economic vulnerability

COMPS observations and models assist in the protection against future environmental damage by illustrating the pathways through which potential hazardous material spills or natural occurrences may transit within the coastal ocean, inlets and estuaries. To protect we must first define our vulnerability and this begins with an understanding of the circulation and the ability to portray how materials and organisms may be transported throughout the coastal ocean.

e. & f. Provide climate change/sea-level rise planning, adaptation and/or related community engagement; Provide flood and storm protection to infrastructure and other publically owned assets that consider resilience and changing sea levels

Issues regarding sea-level rise planning and flood and storm protection planning are related in that issues regarding damage to infrastructure due to sea-level rise will likely be episodic in nature due to storm events. It will not be the steadily increasing sea-level that will pose the greatest risk to infrastructure, but rather the combined effects of severe weather induced waves and surge superimposed on top of a rising sea level. Therefore, studies made possible through the addition of wave measurements at C21 will provide additional information and knowledge necessary for productive community engagement. Long-term observations from COMPS also provides important information on what may actually be changing in Pinellas county coastal waters using real data.

g. Implement or further actions in the Pinellas County Post Disaster Redevelopment Plan

As with e. and f. above, establishing a permanent waves station at Pass-a-Grille beach will increase knowledge regarding the impacts of waves and surge from severe weather events on Pinellas County property and infrastructure. It makes possible the continuation and advancement of local expertise in areas critical to the implementation of the PDRP, namely further quantifying both major hazards such as hurricanes and floods and related vulnerability analyses.

i. Promote sustainable recreational fishing and consumption of seafood dependent on Gulf ecosystem, and/or protect or promote working waterfront

Gag recruitment had always been a mystery until we explained the mechanism using COMPS observations and models. We now know why some years may be successful recruitment years and others may not be. Such knowledge as it works its way into agency use may offer improved methods for sustainable fisheries and associated services.

11. Project Location

The C21 Waves site is located on the USCG navigation tower located approximately one nautical mile west of the entrance to the Pass-a-Grille North Channel. Coordinates for the site are 27° 40.6'N, 82°46.0'W. The tower structure as modified by COMPS and installed in 2009 is shown in the image below.

COMPS Observing Array: Present Status

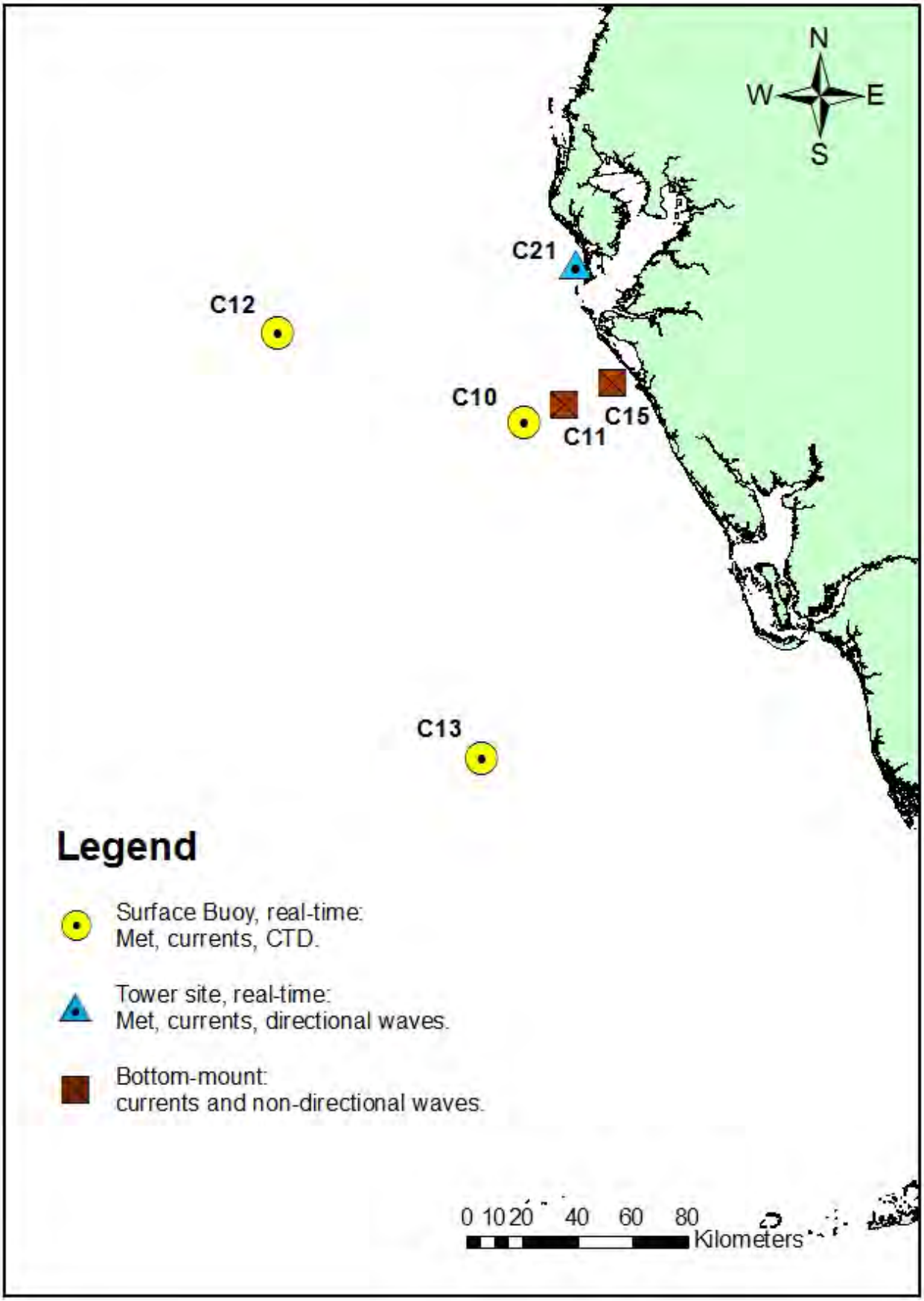

Figure 1: COMPS observing array. Pass-a-Grille site (C21) shown as blue triangle.

12. Region or Geographic Area Impacted by Project

(Step 1 and Step 2 - Criterion 7)

Provide a description of the project area or region in which environmental or economic benefits will be realized. Be as specific as possible by listing cities or geographical boundaries and why.

The addition of waves measurements at the Pass-a-Grille channel marker will affect Pinellas County and neighboring counties as well. The availability of meteorological and sea state data (winds, waves) will be useful to recreational beach goers and boaters throughout Pasco, Pinellas, Sarasota and Manatee counties. Furthermore, the addition of environmental data at this location augments COMPS modeling efforts which covers the entire west Florida shelf.

Discussion of Specific Activity

Describe the project by responding to each of the following topics.

13. Project Description – Discuss the essential elements of the project. Include what is proposed, clearly list major project tasks or program milestones, the project duration, and why it should be done.

This project will solidify one COMPS observational site at the entrance to Pass-a-Grille Channel (St. Pete Beach) in Pinellas County, FL. Real time observations of winds, waves, currents, barometric pressure, relative humidity, air temperature and sea surface temperature will be provided to the general public via the internet, thereby facilitating safe navigation for recreational and commercial boaters and environmental data for tourists, beachgoers, researchers and agencies. Real time salinity measurements will also be added. Measurements of salinity, an important variable that tends to correlate with beach water quality, are generally lacking in near shore waters.

The proposed project duration is five years. Year one entails purchasing two new waves sensors, meteorological sensors and upgrading the telemetry system. During the first year the complete system will be tested at the USF COMPS facility in preparation for deployment before the end of the first year. It is anticipated that by the end of year two the system will be in standard operational mode with years three through five entailing regular maintenance and annual recovery and re-deployment of all sensors. Two months of salary is included annually for a systems administrator and a data analyst.

The proposed project provides key observational measurements that are lacking in the nearshore region of west Florida coastal waters. Very few reliable real-time waves measurements exist on the west Florida shelf, particularly near the coast. The same is true for salinity, while long time series for salinity exist from offshore buoys few measurements are made near the coast where salinity acts as an indicator of beach water quality. The inclusion of additional sensors into the real-time telemetry data stream is made possible by the flexibility of the data logger and telemetry system, which allows for the anticipated inclusion of additional water quality sensors in the future. Lastly, the addition of meteorological sensors, particularly wind will improve COMPS modeling efforts while also providing useful data to beach goers and boaters.

14. Project Manager and Key Project Team Members - include credentials and experience doing similar work.

Project Manager: Dr. Robert Weisberg, USF Distinguished University Professor

Dr. Weisberg has over 40 years of oceanographic research experience with nearly 25 years of research specifically on the west Florida shelf. With over 90 papers in refereed journals through the COMPS program alone he is an expert on the circulation dynamics of the west Florida coastal ocean.

Key Team members: Jason Law, USF Research Associate and Mooring Technician
Randy Russell, COT Electrical Engineer

15. Environmental and/or Economic Benefits - Describe environmental and/or economic benefits of the project.

Environmental Benefits:

Ocean water properties are determined by physical, biological and chemical connections that occur across space, time and trophic levels. Coastal ocean environmental stewardship is predicated on understanding this complex system functionality and applying that understanding toward prediction in a quantitative, scientifically defensible manner. Only in this way can forecasts be made regarding the consequences of either human or natural occurrences. Understanding the coastal ocean ecosystem begins with understanding the coastal ocean circulation because it sets the background state for all else. Five recent examples of this are: 1) our emergent ability to forecast the occurrence (2014) or lack of occurrence (2010 and 2013) of WFS HABs, 2) our explanation of gag grouper recruitment success, 3) our explanation of WFS fish lesions and liver chemistry anomalies subsequent to the Deepwater Horizon oil spill, 4) the use of our model trajectory forecasts by NOAA during the Deepwater Horizon event itself and 5) our numerous briefings to emergency management and private citizen groups on hurricane storm surge and wave risks. With observations and understanding comes predictive capabilities that enable circulation and the evolution of water properties to be modeled and forecast. But models must be continually veracity tested, requiring continued observations. With sustained observations, coordinated with models, we steadily increase our ability to predict coastal ocean processes and their environmental consequence. The environmental benefit is thus improved, scientifically defensible environmental stewardship of value to county, state and federal agencies and the general public.

Economic and Social Benefits:

As a peninsula nearly surrounded by water there is little of the Florida economy that is not influenced by the ocean. Even inland agriculture is influenced by land-sea breeze and the ensuing rainfall. Tourism, in particular, is related in large measure to the attraction of the sea and Florida's bountiful living marine resources. The understanding of such ecosystem services begins with the data collection proposed and the use of data in conjunction with predictive models. For instance, matters of real property and personal safety under extreme conditions require the ability to track storm systems, forecast storm surge and waves and provide information for use by emergency managers, activities enhanced by ocean observations. Direct near real time observations of winds, waves and currents, along with the associated model forecasts are also of immediate application for recreational and commercial boaters and fishers to inform safe and successful outings. Employment of skilled technical and scientific staff for operations and related science provides another benefit. Further employment will derive through improved tourist attraction as a consequence of better environmental stewardship. These data and model simulations will also serve the present and next generation of students through outreach and education.

16. Technical Feasibility - Describe technologies and relevant past experience or proven success with similar projects.

The monitoring station at Pass-a-Grille is in place but without a functioning waves sensor. A modified tower platform was constructed and installed in 2009 to house the meteorological sensors and surface telemetry. The inventory, infrastructure and expertise necessary to properly assemble, deploy and maintain the proposed atmosphere and ocean observations at Pass-a-Grille Channel are already in place at USF.

COMPS has been a functioning asset to science and to the coastal community at large for nearly two decades, albeit in a presently diminished capacity. Measurements on the WFS by the University of South Florida, College of Marine Science, Ocean Circulation Group (under the direction of Dr. Robert Weisberg) began in 1993. Real time observations of both atmosphere (wind, atm. pressure, relative humidity, air and sea surface temperatures and short and long wave radiation) and ocean (currents and temperature/salinity) began in 1998. Modeling evolved in conjunction with the moored array beginning in 1998. We subsequently added HF-radar for surface currents and gliders/profilers for water column temperature/salinity bio-optics, oxygen and (in some instances) bio-acoustics. The site is also capable of adding nutrient and other sensors as robust versions become available. COMPS data and nowcast/forecast models are all publically available on the internet.

Recognizing that our technology was vintage 1998 we invested funds through our Center for Ocean Technology to redesign and build new telemetry and data loggers. The transition period

began over the past year and the results are satisfying. Outages that we may now be experiencing from time to time entail antenna failures or power lapses due to sea bird droppings on solar panels. In other words, our proposed observing system is robust and reliable, and we are ready to perform.

17. Public Acceptance - Describe any known or potential public approval or opposition to the project.

We know from the calls and emails received when a COMPS buoy goes down that our real time data are regularly used by the general boating public. While unheralded, the buoys graphically shown by local weather reporters are COMPS buoys, and the data provided to the agencies via the GTS are used in local weather forecasts. COMPS provides real time data to beachgoers, sailors and fishers making their outings safer and more enjoyable. Pass-a-Grille is a particularly important location for Pinellas County, given its point of access to the greater Gulf of Mexico for so many boaters. The coastal ocean is where society meets the sea, and we are committed to contributing our scientific expertise to the benefit of society.

18. Project Activity Budget Justification:

Provide the total project cost and costs by identified tasks for the following items. Provide specific justification for all that apply.

- Personnel and fringe: $166,210
- Travel including the number of trips and estimated cost per trip: N/A
- All equipment greater than $1,000: $85,200
- Supplies including a list of major types of supplies: See attached.
- Contractual costs: N/A
- Administrative costs not to exceed 3% of the total award:

Pass-a-Grill (C21) 5-Year Budget

New Purchases, Repairs to Existing:						
Waves Sensors (2 ea.)	72,000	-	-	-	-	
CTD Calibration and repair	3,000	-	-	-	-	
Telemetry Upgrade to include Met	16,500	-	-	-	-	
Met Sensors (2 sets WND, RH, BP)	13,200	-	-	-	-	
Antennas, Batteries, Solar panels	4,400	-	-	-	-	
Diving supplies and certifications	5,500	-	-	-	-	
Machine Shop time	3,300	-	-	-	-	
Misc Brackets and Hardware	1,100	-	-	-	-	
Subtotal	***119,000***	***0***	***0***	***0***	***0***	***119,000***
Annual Expense:						
80 meter armored data cable	2,475	2,475	-	2,475	2,475	
Misc Hardware	-	1,100	1,100	1,100	1,100	
Misc Mooring Supplies	-	3,300	3,300	3,300	3,300	
Machine Shop time	-	2,200	2,200	2,200	2,200	
Calibrations	-	6,500	1,000	6,500	1,000	
Diving Supplies	-	1,100	1,100	1,100	1,100	
Deployment Ship-time	10,000	10,500	10,500	11,000	11,000	
Service Trips	4,400	4,400	4,400	4,400	4,400	
Subtotal	***16,875***	***30,575***	***22,600***	***31,075***	***25,575***	***126,700***
Salary:						
Systems Administrator	2 months	2 months	2 months	2 months	2 months	
Data Analyst/Oceanographer	2 months	2 months	2 months	2 months	2 months	
Subtotal	***33,242***	***33,242***	***33,242***	***33,242***	***33,242***	***166,210***
TOTALS	***169,117***	***64,817***	***56,842***	***65,317***	***59,817***	***415,910***

19. Describe how the project will utilize a collaborative approach that incorporates partnerships, if applicable.

(Step 2 - Criterion 8)

List any project partners and briefly describe their involvement and contribution to the project.

This project proposes to incorporate several partnerships. First, local dive and charter boat captains have agreed to assist with servicing of the site as well as maintaining regular cleaning of the solar panels, which greatly extends the system's battery life. Additionally the opportunity to assist with instrument set-up and deployment as well as processing and analyzing of waves will be incorporated into an extant NOAA EPP Internship program that the COMPS group participated in during 2014. Lastly, the site will also be incorporated into a SECOORA regional association educational partnership through Florida Gulf Coast University whereby undergraduate students are provided the opportunity to assist with planning and carrying out regular field work.

20. Describe how the project will support, further, or help implement one or more Pinellas County Comprehensive Plan Element goal(s) as identified in the overarching project goals, if applicable. Clearly list each Comprehensive Plan Element goal addressed.

(Step 2 - Criterion 9)

Link to Applicable Comprehensive Plan Element Goals:
www.pinellascounty.org/restore/pdf/comp-plan-goals.pdf

- **Future Land Use and Quality Communities Element: Goal Three**
  Pinellas County shall promote a balanced relationship between the natural environment and development
  This goal is furthered by the COMPS program overall. As described in detail previously, the COMPS program is by definition the monitoring of the natural environment that is the coastal ocean. By increasing our knowledge of the coastal ocean and maintaining continuous monitoring efforts of circulation and water quality we assure that we remain ever vigilant and prepared in the event of any future man-made or naturally occurring harmful substance events.

- **Natural Resources Conservation and Management Element: Goal Four**
  Strengthened connections to the water – Pinellas County will remain a leader in the restoration of its surface waters and the dependent habitats and resources which are essential to this county's character, economy and quality of life
  Again, as previously detailed the COMPS program goal is to observe, describe and predict the coastal ocean circulation and how it contributes to coastal ocean ecology. The importance of circulation as a driving factor in coastal ocean ecology is unfortunately not a priority for other sources of RESTORE funding. Pinellas County has the opportunity to be a true leader in recognizing and supporting the value inherent to the COMPS program in observing and forecasting coastal ocean circulation and its myriad effects on ecology and the environment.

- **Coastal Management Element: Goal One**
  Natural Disaster Planning – Pinellas County will protect human life, private property and public investment from the effects of hurricanes and other natural disasters
  As mentioned in previous sections, the addition of waves measurements at Pass-a-Grille allows COMPS researchers to advance published research on severe weather events such as hurricanes.

- **Recreation, Open Space and Culture: Goal Three**
  Strengthening Connections to the Water – To strengthen public connections to Pinellas County waters and waterways through the maintenance, promotion and environmentally sensitive expansion of recreational spaces
  The coastal ocean in our neighboring Gulf of Mexico is the ultimate recreational space, and is the major attraction for leisure activities for residents and tourists alike. Supporting COMPS observing station C21 at Pass-a-Grille strengthens the connection to this ultimate recreational space by putting the current conditions at the beach and on the water at the fingertips of those who seek to utilize our most precious asset… the Gulf of Mexico.

21. Describe the benefits the project will provide, for how long, and why:

(Step 2 - Criterion 10)

Benefits may be economic, social, and/or environmental. Explain how the benefits will or could be identified, assessed, and/or measured. Describe and quantify environmental and/or economic benefits as applicable [e.g., area restored (acres, linear feet), improved ecosystem services, jobs created/preserved, pollutants and/or nutrients removed (e.g., kg, pounds, tons)].

In the short term the C21 site will provide the public with useful and desirable observational data and predictive models that will allow for informed decisions regarding activities on or near the coastal waters. The primary long term benefits of the C21 project begin with a better understanding of coastal ocean circulation in general. This leads to a better understanding of effects of waves and surge during severe weather events and how this can be applied to events on infrastructure and private property. Advancing knowledge of the circulation of the coastal ocean on the west Florida shelf advances our understanding and thus our predictive capabilities regarding the health of the coastal ocean ecosystem as well. It allows us to assess our ecosystem vulnerabilities and therefore to better protect it when possible and when not possible to anticipate the effects of harmful substance events. Of lasting benefit is the advancement of knowledge as it pertains to coastal ocean science and the ability to share and apply that knowledge to other geographic regions through scientific publications and collaborations.

22. Possible material risks to implement and maintain the proposed activity:

List possible material risks, e.g., operational, legal, regulatory, budgetary or ecological. Include brief description of mitigation strategy to address each identified risk.

No material risks exist other than the ever present risk of deploying scientific instrumentation in the harsh ocean environment. However, we have decades of experience in this arena, this site has been functional in the past and we are only in need of sufficient funds to bring it back to an expanded operational status.

23. Best Available Science:

Models and observations are only as good as the underlying science. This project builds upon a long history of scientific applications to the west Florida coastal ocean and Tampa Bay. The instrumentation and sensors are state of the art and the COMPS personnel have decades of experience in deploying such gear. Since the creation of COMPS nearly 90 peer reviewed articles have been published utilizing COMPS data and models. Recent peered reviewed publications using the COMPS system explained why there was no red tide bloom along Florida's west coast in 2010, how gag grouper juveniles get from offshore spawning to near shore settlement sites and why fish lesions were prominent on the west Florida continental shelf after the Deepwater Horizon spill. In summary, COMPS observations and models are all based on state of the art equipment and models and COMPS work regularly appears in refereed professional journals. By applying best available

science we regally contribute to the understanding and prediction of societally relevant coastal ocean phenomena as well as providing useful real time information to the general public.

24. Matching/Other funding (Step 2 - Criterion 11) *Indicate:*

- The amount and percent of the total project cost secured and the source of each matching fund secured. Restore Act funds can be matched with other federal sources of funding.
- If matching funds are not secured, specify the amount of matching funds requested or expected.
- The date the amount of secured funds will be known.
- Future costs related to maintaining the project, the funding source, and responsible entity.

Matching funds have been requested through the NOAA IOOS South East Coastal Ocean Observing Regional Association (SECOORA) in the amount of $50k. In addition the technician support is provided for through the USF College of Marine Science.

Readiness for Implementation
(Step 3)
Complete the following:

25. Will the project be completed within 5 years from date funding is confirmed?
Yes: X No: _____

It is anticipated that US IOOS funding will ramp up to provide sustaining funds beyond the 5-year interval proposed here.

26. Identify each project milestones and proposed duration (no. of months) to complete each step and the total number of months or years to complete the project.

Upon receipt of funds orders will be placed immediately for all required instruments and supplies pertaining to year one. It is anticipated that within 3 months all supplies will be in house and after 9 months the system will be integrated, tested and ready for deployment in the field. A functional system returning real-time waves, currents, wind, temperature, barometric pressure, relative humidity, salinity and sea surface temperature will be realized before the end of year one. Subsequent years will involve regular maintenance with the instrumentation recovered and re-deployed on an annual basis.

27. How long before the project can start after funds are available (months)?

The project can start immediately.

28. Describe project design work, permit requirements and hurdles (federal, state, or local), and/or permitting that is in progress *(attach applicable permits or design work)*.

C21 is an active COMPS station in regards to USCG Aids To Navigation requirements, therefore no additional permits are required.

29. Describe any issues or reasons that may delay project start or completion.

None.

END OF QUESTIONS

Additional Information

Tables and Figures:

1. Table 1. 5 Year Budget.
    - https://drive.google.com/a/mail.usf.edu/file/d/0B5PGt0arj3QZUXBMdE5uSG5jb0E/view?usp=sharing
2. Figure 1. COMPS moorings, monthly glider tracks and model domains. Shows existing assets and phased implementation of new moorings and glider deployments.
    - https://drive.google.com/a/mail.usf.edu/file/d/0B5PGt0arj3QZdW5fQnFtZ2NVYlk/view?usp=sharing

Online Data and Product Sources, and tracking tools:

1. C21 (Pass-a-Grill) Station Page:
    - http://comps.marine.usf.edu/index?view=station&id=C21
2. COMPS program homepage. All real-time sites shown on interactive map for simple, clickable access to current ocean-atmosphere observations.
    - http://comps.marine.usf.edu/
3. Ocean Circulation Group homepage. Interactive website displaying OCG monitoring and modeling efforts.
    - http://ocgweb.marine.usf.edu/
4. SECOORA regional association homepage. COMPS data is displayed in real-time.
    - http://secoora.org/

Relevant Publications:

1. Weisberg, R. H. (2011). Coast Ocean Pollution, Water Quality, and Ecology. MTS Journ., 45(2), pp. 35-42.
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