

PROGRESS REPORT

Project: **The Alliance for Coastal Technologies (ACT):** National-Scale Efforts Toward Verification and Validation of Observing Technologies

Grant No. **NA11NOS0120037**

Reporting Period: 12/01/14 - 5/31/15

1) Project Summary:

The Alliance for Coastal Technologies (ACT, www.act-us.info) is a collaborative partnership of academic institutions, state and federal resource managers, and private sector companies dedicated to fostering the development and adoption of effective and reliable sensors and sensor platforms for environmental monitoring and long-term stewardship of coastal and ocean resources. ACT seeks to achieve progress towards our goals to: (a) rapidly and effectively transition emerging technologies to operational use; (b) maintain a dialogue among technology users, developers, and providers; (c) identify technology needs and novel tools and approaches to meet those needs; (d) document technology performance and potential; and (e) provide U.S. IOOS with information required for the deployment of reliable and cost-effective networks. ACT pursues these goals through a three-pronged strategy of: (a) verification and validation of sensors and platforms for coastal and ocean observing systems through Technology Evaluations in different environments, utilizing both field experiments and laboratories to recreate environmental conditions; (b) capacity-building through Technology Workshops that involve researchers, manufacturers, users, regulators, and facilitators; and (c) knowledge exchange through an Information Clearinghouse and Technology Database that connects users with technology suppliers worldwide, presenting a forum to explore instrumentation options, and ultimately to share knowledge and experience, and exchange best practices. A unifying principle among these core activities is collaboration between technology/knowledge producers and users to provide input to ACT at every step of each process—from documenting national and regional needs, selecting sensor classes for evaluation and topics for workshops based on established regional priorities, to end-user application of new information.

2) Scope of Work:

ACT's proposed Year 4 Work Plan included the following tasks for sustaining core technical functions. Details on milestones and progress during this reporting period are provided below in the tables under Section 3, Progress and Accomplishments.

- A. *Complete pH Sensors Verification Reports and Publication.* ACT will conclude the field tests of the in situ pH sensor verification in mid-summer 2014. ACT will work with the pH Technical Advisory Committee to review, verify, and validate all data collected during the laboratory and three field tests, including both data from the test instruments and data generated from the reference method. A final evaluation report will be prepared for each verified technology and reviewed by the respective participating vendor, ACT PIs, and the pH Technical Advisory Committee. In addition, we will also work with the Technical Advisory Committee to draft a broad, peer-reviewed publication on approaches to measuring in situ pH based on the results and lessons learned during this Technology Evaluation.
- B. *Initiate DO Sensors Verification.* The DO sensor verification will follow ACT's standard evaluation process. During the current Year 4, ACT will 1) establish a DO Technical Advisory Committee, (b) release a Request for Technologies for companies to participate in the verification, (c) develop Test Plans for laboratory and field testing, (d) complete laboratory evaluations of instrument performance, and (e) extend winter field testing of instruments in an under-ice, freshwater deployment in the Great Lakes.
- C. *Partner on Nutrient Sensor Innovations.* ACT will collaborate with OSTP, NOAA, EPA, USGS, USDA and NIST to develop a market stimulation challenge. The Nutrient Sensor Challenge is focused on developing and deploying next-generation nitrate/nitrite and phosphate sensors that make tracking

nutrients easier, cheaper, and more accurate.

- D. *Establish NOAA National Ocean Service Technology Evaluation Consortium.* We propose to bring together and facilitate the coordination/collaboration between the different programs within NOS who conduct instrument testing, in particular ACT, the CO-OPS Center Ocean Systems Test and Evaluation Program (OSTEP), and the Coast Survey's Hydrographic Systems and Technology Programs (HSTP). ACT will take the lead on establishing partnerships by holding an organization meeting in 2014 that will provide opportunities for all participants to provide summaries of their objectives, processes, and end-users, and to build consensus on partnership, collaborations, and joint activities.
- E. *Outreach and Community Involvement.* We plan to continue some fundamental outreach activities, including participation in national conferences, symposia or related workshops. We will also work with IOOS Association and the RAs to solicit RA input on priorities for ACT Technology themes and to promote ACT and RA collaborations. Finally, we will continue communications with, or support of, NDBC, CO-OPS, USACE, NWQMC, and QARTOD, and will continue joint activities with other related agencies including NIST, MARAD, USCG and EPA.
- F. *Technology Information Clearinghouse.* ACT will continue maintenance of its website and the Technology Database. We will regularly update content of the website, including posting new Technology Evaluation and Workshop final reports (as download PDF files), related news items and web links, and basic ACT program information. The searchable Technology Database will also be maintained and expanded, where possible.
- G. *Program Administration.* ACT will maintain routine governance responsibilities and management functions and schedules. Dr. Tamburri (CBL) will continue to coordinate core functions and guide program-wide activities, such as partnerships with other agencies and linkages with the coastal management community, with support from the other funded PIs. Monthly PI conference calls and one annual organizational meeting will continue.

3) Progress and Accomplishments

The following table provides a comparison of actual versus proposed accomplishments with the goals and objectives for the period, and reasons why objectives/goals were not met (if needed).

Technology Related Tasks		
Activity	Purpose	Status
Complete pH Sensors Verification Testing and Release Reports	Complete the verification testing of commercially available pH sensors at four ACT test sites and draft final reports for each instrument. Provide independent third-party test results on instrument performance to help vendors identify limitations and diverse user groups select the instruments that best meet their needs.	<u>Completed.</u> The field tests of pH sensors at MLML, HIMB, CBL and UM, and analysis of all resulting data, has been completed. Individual reports were drafted, reviewed, and released on the ACT website.

Initiate DO Sensors Verification	Evaluate the performance of in situ dissolved oxygen sensors for use in a variety of water quality monitoring applications. Provide independent third-party test results on instrument performance to help vendors identify limitations and diverse user groups select the instruments that best meet their needs.	<u>Ongoing/On Schedule.</u> A Technical Advisory Committee has been established and final test protocols agreed to during a two-day workshop. Laboratory testing has been completed and field-testing of the eight individual DO sensors is progressing as planned.
Launch the Nutrient Sensor Challenge	ACT is working with OSTP, NOAA, EPA, USGS, NIST, USDA and others to implement a market stimulation challenge to produce the next generation of inexpensive, accurate and reliable in situ instruments for measurements of nitrate/nitrite and/or phosphate.	<u>Ongoing/On Schedule.</u> A Technical Advisory Committee has been established; a two-day workshop was held; the Challenge process, criteria and schedule developed; and Dr. Sullivan (NOAA Administrator) announces the launch on Dec 17 at the AGU meeting in San Francisco. Twenty-nine teams have registered for the Challenge and plans are underway for the Summit and Beta Testing.

Technology Information Clearinghouse		
Activity	Purpose	Status
Manage, maintain, and update interactive on-line database.	Provide ocean technology community a single resource for identifying available technology options; facilitate coastal observing technology providers and users to match needs in a virtual “marketplace” environment.	<u>Ongoing / On Schedule.</u> ACT website will soon include 57 Technology Evaluation reports, 40 Technology Workshop reports, and over 4,000 instrument listings (from over 300 international companies) in the searchable Technology Database. All ACT reports, including Test Protocols, Technology Evaluations, Workshops, and Needs and Use Assessments, will continue to be searchable and available as download pdf files through the website.

Outreach and Community Involvement		
Activity	Purpose	Status
Invited presentation on ACT to the EPA Offices of Water, Air and Research and Development, Washington, DC.	Build awareness, identify community needs and develop collaborations.	<u>Completed.</u> December 2, 2014
Participated in exhibits and the launch of the Nutrient Sensor Challenge by Dr. Sullivan at the AGU meeting, San Francisco, CA.	Build awareness, identify community needs and develop collaborations.	<u>Completed.</u> December 17, 2014

Organized and hosted a Nutrient Sensor Challenge Webinar. Over 100 participants worldwide.	Build awareness, explain the goals and processes, answer questions	<u>Completed</u> . February 12, 2015
Annual IOOS Program and RA Planning Meeting, Silver Spring, MD.	Assess program accomplishment and develop plans for future activities.	<u>Completed</u> . March 2-3, 2015
Invited presentation on Emerging Technologies in Water Quality Monitoring at the 67th Annual Interstate Seafood Seminar, Ocean City, MD.	Build awareness, explain the goals and processes, answer questions	<u>Completed</u> . April 15, 2015
Participated in QARTOD meetings and planning, ACT Director as member of the QARTOD Board.	Build awareness, identify community needs and develop collaborations.	<u>Ongoing</u> , periodic Board calls
Participated in NWQMC Sensor Working Group call, ACT Director an active member of this committee for several years.	Build awareness, identify community needs and develop collaborations.	<u>Ongoing</u> , periodic Working Group calls
Challenging Nutrients Coalitions meetings and planning.	Build awareness, identify community needs and develop collaborations.	<u>Ongoing</u> , periodic calls

Program Administration		
Activity	Purpose	Status
ACT Partner conference calls	Coordination, progress reports, and planning.	<u>Ongoing</u> , first Thursday of each month.

4) Budget Analysis

Actual expenditures have been incurred in accordance with the spending plan provided in the UMCES application. While some very minor changes to the original scope of work have been made, funds designated for categories such as subcontracts, salary/benefits, supplies, and travel have not been altered. It is not anticipated that any budget modifications will be needed during the next reporting period. All financial reports for this award are up to date.