

**Program Observation  
Requirements Document  
(PORD)**

**for**

**Ocean In situ Observation Requirements**

**National Ocean Service (NOS)**

**November 15, 2012**

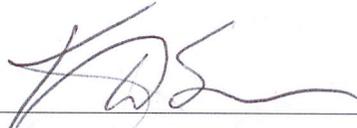
# Table of Contents

<b>Signature Page</b> .....	<b>3</b>
NOSC Endorsement.....	3
Goal and Line Office Concurrence .....	4
Program Membership Concurrence .....	5
<b>1. Document Overview</b> .....	<b>6</b>
<b>2. Observation Requirements Summary</b> .....	<b>7</b>
2.1 National Centers for Coastal Ocean Science (NCCOS) .....	7
2.1.1 Program Summary .....	7
2.1.2 Validation Assessment for Priority-1 Requirements .....	8
2.1.3 Validation Documents Submitted .....	10
2.2 Coast Survey (OCS) .....	13
2.2.1 Program Summary .....	13
2.2.2 Validation Assessment for Priority-1 Requirements .....	15
2.2.3 Validation Documents Submitted .....	16
2.3 National Marine Sanctuaries (ONMS) .....	16
2.3.1 Program Summary .....	16
2.3.2 Validation Assessment for Priority-1 Requirements .....	17
2.3.3 Validation Documents Submitted .....	18
2.4 Coral Program.....	18
2.4.1 Program Summary .....	18
2.4.2 Validation Assessment for Priority-1 Requirements .....	19
2.4.3 Validation Documents Submitted .....	20
2.5 Integrated Ocean and Coastal Mapping (IOCM) .....	21
2.5.1 Program Summary .....	21
2.5.2 Validation Assessment for Priority-1 Requirements .....	22
2.5.3 Validation Documents Submitted .....	23

# Signature Page

## NOSC Endorsement

The NOSC has received the National Ocean Service's Observation Requirements with Goal Lead and Line Office concurrence, and is satisfied with the Level-of-Validation provided for the Priority-1 Ocean *In Situ* requirements.

  
\_\_\_\_\_  
Dr. Kathryn Sullivan  
Chair, NOSC

12/7/12  
\_\_\_\_\_  
Date

✓  
\_\_\_\_\_  
Endorsed

  
\_\_\_\_\_  
Mary Kicza  
Vice Chair, NOSC

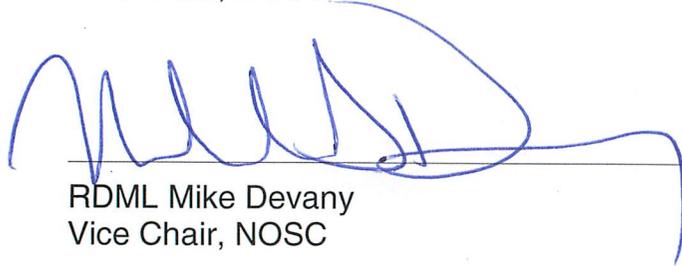
12/3/12  
\_\_\_\_\_  
Date

✓  
\_\_\_\_\_  
Endorsed

  
\_\_\_\_\_  
Laura K. Furgione  
Vice Chair, NOSC

12/4/12  
\_\_\_\_\_  
Date

✓  
\_\_\_\_\_  
Endorsed

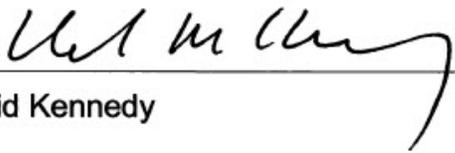
  
\_\_\_\_\_  
RDML Mike Devany  
Vice Chair, NOSC

11/29/12  
\_\_\_\_\_  
Date

✓  
\_\_\_\_\_  
Endorsed

## Goal and Line Office Concurrence

The National Ocean Service's Line Office and Coastal Goal's Lead concur with the Observation Requirements and are satisfied with the Level-of-Validation provided by the Priority-1 Ocean *In Situ* requirements.

  
\_\_\_\_\_  
David Kennedy  
AA

11/15/12      ✓  
\_\_\_\_\_  
Date                      Validated

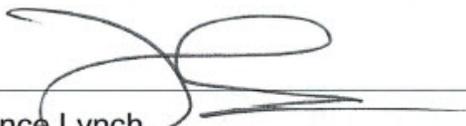
  
\_\_\_\_\_  
Jim Sullivan  
Coastal Goal Lead

11/19/12      ✓  
\_\_\_\_\_  
Date                      Validated

## Program Membership Concurrence

  
\_\_\_\_\_  
Jawed Hameedi  
NCCOS

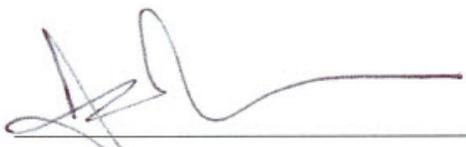
11-16-2012 ✓  
Date Concurred

  
\_\_\_\_\_  
Terence Lynch  
OCS

11/20/2012 ✓  
Date Concurred

  
\_\_\_\_\_  
Steve Gittings  
ONMS

11/20/12 ✓  
Date Concurred

  
\_\_\_\_\_  
Ashley Chappell  
IOCM / OCS

11/21/12 ✓  
Date Concurred

  
\_\_\_\_\_  
John Christensen  
Coral Reef Conservation Program

11/26/12 ✓  
Date Concurred

# 1. Document Overview

NOAA's Ocean *In Situ* requirements validation process creates a baseline of objectively verifiable requirements based on:

- Documentation via mandates, scientific studies, or ongoing research, and/or
- Consensus among Program Members, Program Managers, Goal Leads, and Line Office AAs

With these, NOAA can better set priorities based on mission needs and stakeholder input. The validated requirements can then be the basis for justification and gap analysis of NOAA observing systems satisfying those requirements, positioning NOAA to operate the right mix of assets and options to meet at-sea sampling requirements now and in the future.

The National Weather Service (NWS) worked closely with the Technology, Planning, and Integration for Observations (TPIO) Office, Office of Marine and Aviation Operation (OMAO), and Subject Matter Experts (SMEs) to document their list of Ocean *In Situ* requirements.

TPIO, on behalf of the NOAA Observing Systems Council (NOSC), follows a standard process when documenting observation, system-independent, requirements with NOAA Line Offices. This template includes the priority of each requirement based on its importance to the group mission:

- Mission Critical (Priority-1)
- Mission Optimal (Priority-2)
- Mission Enhancing (Priority-3)

Specific attributes for each Priority-1 requirement are then documented and validated. In support of generation of the NOAA Fleet Plan in late 2012, the NOSC's Observation Requirements process was modified for application to more system specific Ocean *In Situ* requirements. The validation process for each Line Office's Ocean *In Situ* requirements has been applied to the 1) observational need; 2) geographic coverage and 3) sampling frequency. In addition, the number of Days At Sea (DAS) associated with each requirement is also provided to assist with the NOAA Fleet Plan. The requirements list and attributes are verified by the Line Offices representatives and SMEs who then provide validation documentation to support each Priority-1 requirement and its specified attributes values. Validation is important as it provides independent confirmation of the needs of the program either through the results of scientific studies, operational use, or subject matter experts. Both the Line Office representatives and TPIO assess the applicability of the documents and prepare a summary of the validation of Priority-1 requirements. The NOAA Line Office obtains their leadership concurrence and presents the requirements summary to the NOSC for their endorsement of the validation process.

## 2. Observation Requirements Summary

The National Ocean Service (NOS) and NOAA's Coastal Goal (CG) has a total of 60 separate Priority 1 Ocean *In situ* requirements to address its mission totaling 6904 days at sea. This document provides the list of requirements for the following NOS programs:

### 2.1 National Centers for Coastal Ocean Science (NCCOS)

#### 2.1.1 Program Summary

The National Centers for Coastal Ocean Science (NCCOS) program develops science-based strategies and performs a variety of research, modeling and monitoring studies to understand, protect and restore the health and resiliency of coastal ecosystems. The studies are conducted in-house, in partnership with other Federal and non-Federal entities, and through sponsorship of a competitive research program. In general, the studies focus on four national priorities: science to manage threats of Harmful Algal Blooms; understanding impacts of environmental pollution including hypoxia; advancing knowledge of environmental response to climate variability and weather events (e.g., hurricanes, drought, etc.); and broadening coastal science portfolio, including socio-economic aspects, to manage competing demands for natural resources and space use. NCCOS develops and disseminates ecological forecasts, analytical tools and technologies; provides quality-assured datasets, technical reports and assessments; and offers expert counsel to coastal managers and communities for making informed decisions about natural resources, ecosystem health, and the coastal environment and mitigate impacts from natural and anthropogenic stressors.

NCCOS is the NOAA lead for implementing the Harmful Algal Bloom and Hypoxia Research and Control Act, and executor of the Nation's longest-running coastal pollution and assessment program, required under other Federal legislation, including the National Coastal Monitoring Act. NCCOS centers and field offices utilize a broad spectrum of coordinated and complementary data from shipboard sampling, remotely-sensed imagery, field and laboratory experiments, characterization of natural and man-made products, and novel environmental monitoring arrays to derive new knowledge, design faster and more accurate environmental sensors with potential for commercial use, and develop improved analytical and ecological forecasting capabilities in support of NOAA mission goals and enterprises.

Most of the NCCOS research, assessment and monitoring activities, notably those related to forecasting of harmful algal blooms, hypoxia and pathogen proliferation, are carried out on a regional basis. Environmental cues, climate and other factors as well as coastal watershed use activities that greatly influence the onset, severity and duration of such events are more readily discerned at regional or sub-regional scales. Furthermore, transitioning the scientific knowledge and analytical tools to

operational capability and applications for coastal resource management are more effective at a smaller spatial scale.

### 2.1.2 Validation Assessment for Priority-1 Requirements

NCCOS and TPIO representatives worked jointly to review the submitted documentation, and identify the “level of validation” for the Priority-1 Observation Requirement.

**Table 1: NCCOS Validation Assessment for Priority-1 Requirements**

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Sampling	Mean DAS	Validation Docs
NOS.COS.001	Validated	HAB Forecasting: NE, Mid-Atl & SE	Coastal US: East Coast	1 yr	58	17, 18, 22, 28 53 (SME)
NOS.COS.002	Validated	HAB Forecasting: WC, AK & GL Lakes	Coastal US: West Coast, AK & Great Lakes	1 yr	45	15, 16, 22, 28 54 (SME)
NOS.COS.003	Validated	HAB Forecasting: WC, AK & GL Lakes_Small Boats	Coastal US: West Coast, AK & Great Lakes	1 yr	30	15, 16, 22, 28 54 (SME)
NOS.COS.004	Validated	HAB Forecasting: GOM, PAC & CI	Coastal US: GOM, Pacific, Carribean Is	1 yr	5	19, 22, 28,52 (SME)
NOS.COS.005	Validated	HAB Forecasting: GOM, PAC & CI_Small Boats	Coastal US: GOM, Pacific, Carribean Is	1 yr	100	19, 22, 28, 52 (SME)
NOS.COS.006	Validated	Coral Health and Disease Research_ Shallow Water Reefs	US Shallow Water Coral Reefs (15 sites)	2 yr	30	1, 6, 20 (SME)
NOS.COS.007	Validated	Benthic Habitat Mapping & Characterization	Coastal US: 200 Sites	1 yr	60	1, 2
NOS.COS.008	Validated	Bioeffects: Ocean Contaminants	US Esturaries:30 sites within each	1 yr	21	1, 3, 21 (SME)
NOS.COS.009	Validated	Bioeffects: Benthic Characterization	US Esturaries:30 sites within each	1 yr	21	1, 3, 21 (SME)
NOS.COS.010	Validated	Bioeffects: Sediment Toxicity	US Esturaries:30 sites within each	1 yr	21	1, 3, 21 (SME)

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Sampling	Mean DAS	Validation Docs
NOS.COS.011	Validated	Hypoxia Forecasting	GOM & Coastal US	1 yr	69	22, 23, 24, 25,26, 27, 28
NOS.COS.012	Validated	Hypoxia Forecasting_small boats	GOM & Coastal US	1 yr	31	22, 23, 24, 25,26, 27, 28
NOS.COS.015	Validated	Contaminants in water and sediment (coastal)	Coastal US	6 per yr	7	1, 4, 29, 30 (SME)
NOS.COS.016	Validated	Marine mammal health	Coastal US	50 per yr	100	31 (SME), 32, 33
NOS.COS.017	Validated	Ecological Assessments: Deep Sea Corals	Coastal US, NMS	2 yr	30	1, 13, 14, 34 (SME)
NOS.COS.018	Validated	Contaminants in seafood (coastal)	Coastal US	12 per yr	72	1, 4, 5, 30 (SME)
NOS.COS.019	Validated	Pathogens in water, sediment and seafood (coastal)	Coastal US	12 per yr	48	30 (SME), 35
NOS.COS.020	Validated	Ecol Characterization: Regional Assessments of Coastal Ecosystems_ Benthos	Regional ecosystems, NMS, NERRS	2 yr	30	1, 10, 11, 12, 36 (SME)
NOS.COS.021	Validated	Ecol Characterization: Regional Assessments of Coastal Ecosystems_ Demersal Fish	Regional ecosystems, NMS, NERRS	2 yr	30	1, 10, 11, 12, 36 (SME)
NOS.COS.022	Validated	Mesophotic Coral Ecosystems: Pulley Ridge and Dry Tortugas	Coastal US, Gulf of Mexico	1 yr	20	7, 8, 9, 37 (SME)
NOS.COS.023	Validated	Ocean Acidification Research	Coastal US	1 yr	20	38
NOS.COS.024	Validated	Sea Level Rise	Gulf of Mexico	1 yr	50	39, 40, 41, 51 (SME)
NOS.COS.025	Validated	Shoreline Habitat Impacts	Chesapeake Bay	1 yr	100	42 (SME), 43, 44, 45
NOS.COS.026	Validated	Coral reefs & Coastal Watersheds	Pacific Islands	1 yr	45	46, 47 (SME), 48
NOS.COS.031	Validated	Marine Acoustics Sensor Development	Coastal US and US EEZ	1 yr	10	2, 49 (SME), 50

Note: DAS numbers were not validated but were submitted by programs to indicated needed days at sea for each survey.

**Legend: Level of Validation**

- Validated
- Validated with SME Statement
- Not Validated (insufficient documentation)

**2.1.3 Validation Documents Submitted**

Program and Technology Planning and Integration Office (TPIO) representatives worked jointly to identify references to validate both the need for an observation requirement and its specific measurement attributes. These validation documents support one or more of the Priority-1 Requirements as shown in Table 1 above. For occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

The following Validation Documents have been submitted in support of the NCCOS Program's Priority 1 Observation Requirements.

**Table 2: NCCOS Validation Documents provided to support Priority-1 Requirements**

Doc #	Document Title
1	USC Title 33 Chapter 41 National Coastal Monitoring Act. Also known as Title V of Pub L. 92-532., <a href="http://ccma.nos.noaa.gov/about/coast/nsandt/download.aspx">http://ccma.nos.noaa.gov/about/coast/nsandt/download.aspx</a>
2	NOAA Technical Memorandum 130 Acoustics in Char Habitats ( <a href="http://www2.coastalscience.noaa.gov/publications/ccehbr/detail.aspx?resource=HCa+H9CfBjwgvCSraJEDck72csyKmvGq89UKzL+QIHA=">http://www2.coastalscience.noaa.gov/publications/ccehbr/detail.aspx?resource=HCa+H9CfBjwgvCSraJEDck72csyKmvGq89UKzL+QIHA=</a>
3	General and newer information is found on the link to the Chesapeake Bay report, <a href="http://ccma.nos.noaa.gov/publications/NCCOSTM47.pdf">http://ccma.nos.noaa.gov/publications/NCCOSTM47.pdf</a> "
4	Fulton, M., P. Key, A.K. Leight, J. Daugomah, D. Bearden, S. Sivertsen, and G. Scott. 2006. An evaluation of contaminated estuarine sites using sediment quality guidelines and ecological assessment methodologies. <i>Ecotoxicology</i> 15:573-581.
5	<a href="ftp://ftp.ngdc.noaa.gov/tmp/metdata/NOSA/NOS-NST-MUSSEL.xml">ftp://ftp.ngdc.noaa.gov/tmp/metdata/NOSA/NOS-NST-MUSSEL.xml</a>
6	Downs, C., Woodley, C., Fauth, J., Knutson, S., Burtscher, M., May, L., Avadanei, A., and G. Ostrander. 2011. A survey of environmental pollutants and cellular-stress biomarkers of <i>Porites astreoides</i> at six sites in St. John, U.S. Virgin Islands. <i>Ecotoxicology</i> 20:1914-1931.
7	Regional Ecosystem Prediction Program 2011 Project, Grant award to Robert Cowen (UMiami) et al. Project titled "Population Connectivity of the Pulley Ridge-South Florida coral Reef Ecosystem: Processes to Decision-Support Tools, <a href="http://www.cop.noaa.gov/stressors/resourcelanduse/current/repp_proj_2011.aspx">http://www.cop.noaa.gov/stressors/resourcelanduse/current/repp_proj_2011.aspx</a>
8	Mesophotic Coral Ecosystems Research Strategy Workshop, <a href="http://www.cop.noaa.gov/ecosystems/coralreefs/current/PDF/Mesophotic_Strategy_medres.pdf">http://www.cop.noaa.gov/ecosystems/coralreefs/current/PDF/Mesophotic_Strategy_medres.pdf</a>
9	MARMAP sampling technique for fish reproductive sampling: <a href="http://www.sefsc.noaa.gov/sedar/download/S10DW05%20Atl%20Fishind%20sam.pdf?id=DOCUMENT">http://www.sefsc.noaa.gov/sedar/download/S10DW05%20Atl%20Fishind%20sam.pdf?id=DOCUMENT</a>
10	Balthis, W. L., J. L. Hyland, C. Cooksey, M. H. Fulton, E. F. Wirth, D. Cobb, & D. N. Wiley. 2011. Ecological Condition of Coastal Ocean Waters within Stellwagen Bank NMS: 2008. NOAA Tech Memo NOS NCCOS 129, NOAA/NOS, Charleston, SC 29412-9110. 59 pp.

Doc #	Document Title
11	Balthis, W.L., J.L. Hyland, M.H. Fulton, E.F. Wirth, J.A. Kiddon, & J.Macauley. 2009. Ecological Condition of Coastal Ocean Waters Along the U.S. Mid-Atlantic Bight: 2006. NOAA Tech Memo NOS NCCOS 109, NOAA/NOS, Charleston, SC 29412-9110. 63 pp.
12	Regional EcoAssessments_Handout_Sep11[1].pdf
13	Brancato, M.S., C.E. Bowlby, J. Hyland, S.S. Intelmann, and K. Brenkman. 2007. Observations of Deep Coral and Sponge Assemblages in Olympic Coast National Marine Sanctuary, Washington. Cruise Report: NOAA Ship McArthur II Cruise AR06-06/07. Marine Sanctuaries Conservation Series NMSP-07-03. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Sanctuary Program, Silver Spring, MD. 48 pp
14	Hyland, J., C. Cooksey, E. Bowlby, M.S. Brancato, and S. Intelmann. 2005. A Pilot Survey of Deepwater Coral/Sponge Assemblages and their Susceptibility to Fishing/Harvest Impacts at the Olympic Coast National Marine Sanctuary (OCNMS). Cruise Report for NOAA Ship McARTHUR II Cruise AR-04-04: Leg 2. NOAA Tech. Memo. NOS NCCOS 15. NOAA/NOS/CCEHBR, Charleston, SC. 13 p.
15	Justification for offshore monitoring of HAB cells and toxins - with sensor (e.g. ESP) and ship requirements - on West Coast Regional HAB Summit web page: <a href="http://www.cop.noaa.gov/stressors/extremeevents/hab/current/HAB_Summit09/west_coast_summit_post.aspx">http://www.cop.noaa.gov/stressors/extremeevents/hab/current/HAB_Summit09/west_coast_summit_post.aspx</a>
16	HABHRCA legislatively mandated ECOHAB Fiscal Year 2011 Projects, Grant Award to Raphe Kudela UCSC) et al., Project titled, "A Regional Comparison of Upwelling and Coastal Land Use Patterns on the Development of HAB Hotspots Along the California Coast, <a href="http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_ECOHAB.aspx#Upwelling">http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_ECOHAB.aspx#Upwelling</a>
17	HABHRCA legislatively mandated MERHAB Program Fiscal Year 2011 Projects, Grant award to Don Anderson (WHOI) et al., Project titled "Incorporation of Environmental Sample Processor Technology into Gulf of Maine HAB Monitoring and Management <a href="http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_MERHAB.aspx#GOMProcessor">http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_MERHAB.aspx#GOMProcessor</a>
18	Modeling Needs Related to the Regional Observing System in the Gulf of Maine RARGOM Report 05-1: Theme Session, 6-7 July, 2005, Cliff House, Ogunquit, Maine, <a href="http://www.rargom.org/theme/RARGOM_Report%2005-1.pdf">http://www.rargom.org/theme/RARGOM_Report%2005-1.pdf</a>
19	HABHRCA legislatively mandated ECOHAB Fiscal Year 2011 Projects, Grant Award to Michael Parsons (FGCU) et al., Project titled "CIGUAHAB: Ciguatera Investigations in the Greater Caribbean Region: Ecophysiology, Population Connectivity, Forecasting, and Toxigenesis", <a href="http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_ECOHAB.aspx#CIGUAHAB">http://www.cop.noaa.gov/stressors/extremeevents/hab/current/abs_ECOHAB.aspx#CIGUAHAB</a>
20	NOS.COS.006_SMEstatement_Woodley
21	NOS.COS.008-009&0010_SME_statement_hartwell
22	Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA); <a href="http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca">http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca</a> ) in 1998 and its reauthorization in 2004.

Doc #	Document Title
23	HABHRCA legislatively mandated NGOMEX Program Fiscal Year 2009 Projects, Grant award to Steven DiMarco (TAMU) et al., Project titled "Mechanisms Controlling Hypoxia: Integrated Causal Modeling" <a href="http://www.cop.noaa.gov/stressors/pollution/current/DiMarcoNGOMEX.pdf">http://www.cop.noaa.gov/stressors/pollution/current/DiMarcoNGOMEX.pdf</a> (NCCOS_DiMarcoNGOMEX_hypoxia.pdf)
24	FY2010 Hypoxia Zone Monitoring Implementation Plan <a href="http://www.ncddc.noaa.gov/activities/healthy-oceans/gulf-hypoxia-stakeholders/index.html">http://www.ncddc.noaa.gov/activities/healthy-oceans/gulf-hypoxia-stakeholders/index.html</a> NCCOS_FY10-Hypoxic-Zone-Monitoring-Coordination-Plan-and-Report.pdf"
25	HABHRCA legislatively mandated NGOMEX Program Fiscal Year 2009 Projects, Grant award to Nancy Rabalais (LUMCON) et al., Project titled "Integrated Ecosystem Modeling of the Causes of Hypoxia", <a href="http://www.cop.noaa.gov/stressors/pollution/current/RabalaisNGOMEX.pdf">http://www.cop.noaa.gov/stressors/pollution/current/RabalaisNGOMEX.pdf</a> (NCCOS_RabalaisNGOMEX_Hypoxia.pdf)
26	NCCOS_Hypoxia_Task_Force_FY_2011_Annual_Operating_Plan.pdf
27	NCCOS_Gulf-of-Mexico-Hypoxia-Monitoring-Implementation-Plan-09.pdf (revised August 2012)
28	NCCOS_HABHRCA_fact.sheet.pdf
29	Contaminants in Seafood - <a href="http://ccma.nos.noaa.gov/about/coast/nsandt/download.aspx">http://ccma.nos.noaa.gov/about/coast/nsandt/download.aspx</a>
30	NOS.COS.0015-18-19_SMEstatement_Fulton
31	NOS.COS.0016_SMEstatement_marine_mammal
32	Stavros, HW, Stolen, M, Noke Durden, W, McFee,W, Bossart,GD and PA Fair. 2011. Correlation and toxicological inference of trace elements in tissues from stranded and free-ranging bottlenose dolphins ( <i>Tursiops truncatus</i> ). <i>Chemosphere</i> 82: 1649-1661.
33	Green, M., McFee, W., and N. Levine. 2010. A GIS analysis of coastal development and trends in bottlenose dolphin strandings in Charleston, SC: implications for coastal and marine spatial planning. NOAA Technical Memorandum NCCOS 124. 56 pp.
34	NOS.COS.0017_SMEstatement_Hyland
35	Webster, L., B. Thompson, M. Fulton, D. Chestnut, R. Van Dolah, A. Leight, G. Scott. 2004. Identification of sources of <i>Escherichia coli</i> in South Carolina estuaries using antibiotic resistance analysis. <i>Journal of Experimental Marine Biology and Ecology</i> 298:179-195.
36	NOS.COS.0020 & 21_SMEstatement_Hyland
37	SME_Mesophotic Coral Ecosystems_Pulley Ridge and Dry Tortugas_092712
38	NOAA Ocean and Great Lakes acidification Research Plan, <a href="http://www.research.noaa.gov/pdfs/noaa-ocean-acidification.pdf">http://www.research.noaa.gov/pdfs/noaa-ocean-acidification.pdf</a>
39	Ecological Effects of Sea Level Rise Program 2010 Project, Grant Award to Scott Hagen (UCF) Project titled "Integrated modeling for the Assessment of Ecological Impacts of Sea Level Rise" <a href="http://www.cop.noaa.gov/stressors/climatechange/current/slr/slr_northern_gom.pdf">http://www.cop.noaa.gov/stressors/climatechange/current/slr/slr_northern_gom.pdf</a>
40	Incorporating Sea Level Change Scenarios at the Local Level: <a href="http://csc.noaa.gov/digitalcoast/_/pdf/slcScenarios.pdf">http://csc.noaa.gov/digitalcoast/_/pdf/slcScenarios.pdf</a>
41	Marshes on the Move: <a href="http://www.csc.noaa.gov/digitalcoast/_/pdf/Marshes_on_the_move.pdf">http://www.csc.noaa.gov/digitalcoast/_/pdf/Marshes_on_the_move.pdf</a>
42	SME_Mid-Atlantic_Shoreline_Impacts_092712

Doc #	Document Title
43	Regional Ecosystems Prediction Program 2009 Project, Grant Award to Thomas Jordan (SI) et al. Project titled "A regional approach to multiple stresses in Mid-Atlantic Shoreline Habitats, <a href="http://www.cop.noaa.gov/stressors/resourcelanduse/current/msrp.aspx">http://www.cop.noaa.gov/stressors/resourcelanduse/current/msrp.aspx</a>
44	Management, Policy, Science and Engineering of Nonstructural Erosion Control in the Chesapeake Bay: Proceedings of the 2006 Living Shoreline Summit , <a href="http://www.cbtrust.org/attf/cf/%7BEB2A714E-8219-45E8-8C3D-50EBE1847CB8%7D/2006%20LS%20Proceedings-full.pdf">http://www.cbtrust.org/attf/cf/%7BEB2A714E-8219-45E8-8C3D-50EBE1847CB8%7D/2006%20LS%20Proceedings-full.pdf</a>
45	The National Academy of Sciences Report on "Mitigating Shore Erosion Along Sheltered Coasts" <a href="http://www.nap.edu/catalog.php?record_id=11764#toc">http://www.nap.edu/catalog.php?record_id=11764#toc</a>
46	Quantifying the impact of watershed urbanization on a coral reef, <a href="http://malamamaunlua.org/wp-content/uploads/2011/07/Quantifying-Impact-of-Watershed-Urbanization-on-Coral-Reef.pdf">http://malamamaunlua.org/wp-content/uploads/2011/07/Quantifying-Impact-of-Watershed-Urbanization-on-Coral-Reef.pdf</a>
47	SME for 026 Coral Reef links to watersheds
48	Integrating coral reef ecosystem management with watershed-based activities, <a href="http://www.yisi.com/media/pdfs/A521-Integrating-Coral-Reef-Ecosystem-Management-with-Watershed-based-Activities.pdf">http://www.yisi.com/media/pdfs/A521-Integrating-Coral-Reef-Ecosystem-Management-with-Watershed-based-Activities.pdf</a>
49	NOS_COS_031_MarineSensorTech_SME_signed
50	NCCOS.031 noaaTechMemo66
51	SME Sea Level Rise_092712
52	SME HAB Forecasting GOM, PAC & CI_092712
53	SME HAB Forecasting NE, Mid-Atl & SE_092712
54	SME HAB Forecasting WC, AK & GLakes_092712

## 2.2 Coast Survey (OCS)

### 2.2.1 Program Summary

The Office of Coast Survey is part of the National Ocean Service (NOS) and manages the production of NOAA nautical charts and its nautical data collection and information programs. This integrated suite of programs in hydrography and cartography helps protect life and property, supports economic growth and development, and protects the environment, in addition to the overall mission of promoting safe navigation. OCS is responsible for surveying and charting U.S. and territorial waters to the limits of the Exclusive Economic Zone, an area of about 3.4 million square nautical miles. The Coast and Geodetic Survey Act of 1947 authorizes OCS to perform surveys and provide nautical charts and products for safe maritime commerce. It also authorizes OCS to provide basic data for engineering and scientific purposes.

#### OCS Programs:

- Nautical charting - OCS is NOAA's nautical chart producer, delivering charts and related publications for navigation in the coastal areas of the United States, its territories, and the Great Lakes.

- Hydrographic surveying - OCS acquires and processes hydrographic survey data in U.S. coastal and territorial waters.
- Coastal oceanography, research, and development - OCS continually seeks to improve its cartographic, hydrographic, and oceanographic systems to provide products and services to the marine community
- Customer outreach - To ensure that OCS products are relevant and useful, OCS must communicate well with customers and stakeholders. Navigation managers are the agency's representatives in the field, interacting with mariners to learn user requirements and hear recommendations for product improvement. OCS also deploys navigation response teams who support customer needs in emergencies.

As waterways become ever more congested, mariners increasingly need accurate, reliable, and up-to-date nautical chart information. Without adequate information, navigating the nation's waterways is like maneuvering through unmapped minefields: a mariner can only guess at what lies beneath the water and hope for the best. Advanced navigation information tools reduce human error by providing accurate real-time data and supporting automated advanced warning systems. Coast Survey's nautical charts, Coast Pilot publications, hydrographic surveys, and other navigation products help to eliminate the guesswork in navigation and support a safe and profitable Marine Transportation System (MTS).

OCS is responsible for surveying and charting U.S. and territorial waters to the limits of the Exclusive Economic Zone, an area of about 3.4 million square nautical miles. The Coast and Geodetic Survey Act of 1947 authorizes OCS to perform surveys and provide nautical charts and products for safe maritime commerce. It also authorizes OCS to provide basic data for engineering and scientific purposes.

### **Nautical Charting**

OCS is NOAA's nautical chart producer, delivering charts and related publications for navigation in the coastal areas of the United States, its territories, and the Great Lakes. Nautical charts are the basic tool for marine navigation, ocean operations, and marine resources planning and management. They provide the basis for enforcement of numerous U.S. laws offshore.

NOAA's digital nautical charting products, including electronic navigational charts (ENC), meet user demands for U.S. waterway information that provides the basis for navigation decision-making. Nautical charts protect life, property, and the environment while they support maritime commerce efficiency.

### **Hydrographic Surveying**

OCS acquires and processes hydrographic survey data in U.S. coastal and territorial waters. Multi-beam and side-scan sonar systems determine water depths. They locate obstructions such as wrecks and rocks. They detect seabed changes due to earthquakes and storms, and they find other underwater features. This precise data is the backbone of ENCs. The data warns mariners of dangers, and supports port and homeland security, coastal zone management, and emergency planning.

## Coastal oceanography, research, and development

OCS continually seeks to improve its cartographic, hydrographic, and oceanographic systems to provide products and services to the marine community. The services support safe navigation and contribute to efficient utilization and protection of the coast. The Joint Hydrographic Center at the University of New Hampshire is an important partner in developing new hydrographic techniques and technologies for efficiency gains. The program also develops methods for accurate real-time forecast predictions of oceanographic, atmospheric, and water quality parameters. The predictions help mariners make decisions for loading cargo and in estimating transit time.

### Customer outreach

To ensure that OCS products are relevant and useful, OCS must communicate well with customers and stakeholders. Navigation managers are the agency's representatives in the field, interacting with mariners to learn user requirements and hear recommendations for product improvement. OCS also deploys navigation response teams who support customer needs in emergencies. These teams have boats that can be transported over land quickly to emergency sites. They conduct hydrographic surveys in order to update nautical products and assist in keeping waterways open to maritime traffic.

### 2.2.2 Validation Assessment for Priority-1 Requirements

Office of Coast Survey and TPIO representatives worked jointly to review the submitted documentation, and identify the "level of validation" for the Priority-1 Observation Requirement.

**Table 1: OCS Validation Assessment for Priority-1 Requirements**

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Samp-ling	Mean DAS	Validation Docs
NOS.OCS.001	Validated	Hydrographic surveying; Region 1	Coastal US and US EEZ	1 yr	160	1 thru 8
NOS.OCS.002	Validated	Hydrographic surveying; Region 2	Coastal US and US EEZ	1 yr	657	1 thru 8
NOS.OCS.003	Validated	Hydrographic surveying; Region 3	Coastal US and US EEZ	1 yr	414	1 thru 8
NOS.OCS.004	Validated	Hydrographic surveying; Region 4	Coastal US and US EEZ	1 yr	455	1 thru 8
NOS.OCS.005	Validated	Hydrographic surveying; Region 5	Coastal US and US EEZ	1 yr	52	1 thru 8
NOS.OCS.006	Validated	Hydrographic surveying; Region 6	Coastal US and US EEZ	1 yr	1084	1 thru 8
NOS.OCS.007	Validated	Hydrographic surveying; Region 7	Coastal US and US EEZ	1 yr	2113	1 thru 8
NOS.OCS.008	Validated	Hydrographic surveying; Region 8	Coastal US and US EEZ	1 yr	65	1 thru 8

Note: DAS numbers were not validated but were submitted by programs to indicated needed days at sea for each survey.

**Legend: Level of Validation**

- Validated
- Validated with SME Statement
- Not Validated (insufficient documentation)

**2.2.3 Validation Documents Submitted**

Program and Technology Planning and Integration Office (TPIO) representatives worked jointly to identify references to validate both the need for an observation requirement and its specific measurement attributes. These validation documents support one or more of the Priority-1 Requirements as shown in Table 1 above. For occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

The following Validation Documents have been submitted in support of the OCS Program’s Priority 1 Observation Requirements.

**Table 2: OCS Validation Documents provided to support Priority-1 Requirements**

Doc #	Document Title
1	Natl Ocean Policy Implementation Plan
2	NOAA NAO 216-101 on Data Management
3	POTUS Exec order 13547
4	NOAA_Seafloor_Mapping_Standards_2.0 provide standards of data management and mapping seafloor standards requirements
5	Coast and Geodetic Survey Act of 1947
6	Hydrographic Service Improvement Acts of 1998/2002/2008
7	Title 33 of Code of Federal Regulations
8	Ocean and Coastal Mapping Integration Act (OCMIA) (2009) PL111-11_SubtitleB

**2.3 National Marine Sanctuaries (ONMS)**

**2.3.1 Program Summary**

NOAA is trustee for a system of 14 marine protected areas that are designated as either National Marine Sanctuaries or Marine National Monuments. Using science, education, outreach, enforcement, and resource protection programs, the Office of National Marine Sanctuaries (ONMS) delivers on its mission to conserve, protect, and enhance the biodiversity, ecological integrity and cultural legacy of these places. The office conducts, sponsors, and facilitates research to better understand ecosystems and cultural resources in marine sanctuaries, their changing condition, and the significance of natural and human-caused threats. It uses conservation science to support policy decisions, develop effective response capabilities, evaluate

management practices, and strengthen the role of the ONMS to support broader, NOAA-wide responsibilities for marine conservation and management.

Sanctuaries work in partnership with universities, public and private research centers, government agencies, international partners and other organizations to characterize, monitor and study the oceans, habitats, heritage resources, and the plants and animals in and around them. Knowledge gained from this work plays an important role in the management of all our national marine sanctuaries. Research conducted in these protected areas adds to our understanding of the dynamic ocean along our coast. One goal is to simply discover and characterize what is present within sanctuaries. Another is to monitor changes in the status of water, habitat, living, and cultural resources. A third is to continue to gain understanding of fundamental processes controlling ocean ecosystems. All these activities provide resource managers in NOAA and beyond with decision-support information that can be applied to resource protection, mitigation, and restoration of coastal ecosystems. Current issues of common concern among many marine sanctuaries include invasive species, the need for improved water quality and climate change monitoring, and the impacts of biodiversity loss, marine debris, resource extraction, and increasing levels of coastal and ocean demand on ecosystem integrity.

### 2.3.2 Validation Assessment for Priority-1 Requirements

ONMS and TPIO representatives worked jointly to review the submitted documentation, and identify the “level of validation” for the Priority-1 Observation Requirement.

**Table 1: ONMS Validation Assessment for Priority-1 Requirements**

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Samp-ling	Mean DAS	Validation Docs
NOS.NMS.001	Validated	Habitat Mapping & Characterization	Sanctuaries Only (14)	1 yr	130	1, 3, 5, 6, 7, 8, 9 (SME), 10, 11
NOS.NMS.002	Validated	Inventory of Fishes, Marine Mammals, Corals, Birds, Benthic Invertebrates, and Cultural Resources	Sanctuaries Only (14)	1 yr	145	1, 3, 5, 8, 9 (SME), 10, 11
NOS.NMS.003	Validated	Living Resource Quality and Quantity Nutrients	Sanctuaries Only (14)	1 yr	140	1, 3, 5, 8, 9 (SME), 10
NOS.NMS.004	Validated	Water Quality Contaminants	Sanctuaries Only (14)	1 yr	140	1, 3, 5, 8, 9 (SME), 10

Note: DAS numbers were not validated but were submitted by programs to indicated needed days at sea for each survey

**Legend: Level of Validation**

-  Validated
-  Validated with SME Statement
-  Not Validated (insufficient documentation)

**2.3.3 Validation Documents Submitted**

Program and Technology Planning and Integration Office (TPIO) representatives worked jointly to identify references to validate both the need for an observation requirement and its specific measurement attributes. These validation documents support one or more of the Priority-1 Requirements as shown in Table 1 above. For occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

The following Validation Documents have been submitted in support of the ONMS Program’s Priority 1 Observation Requirements.

**Table 2: ONMS Validation Documents provided to support Priority-1 Requirements**

Doc #	Document Title
1	A Monitoring Framework for the National Marine Sanctuary System, 2004, <a href="http://sanctuaries.noaa.gov/science/assessment/welcome.html">http://sanctuaries.noaa.gov/science/assessment/welcome.html</a>
2	Annual ONMS Ship Time requests
3	E.O. 13178 est. Northwestern Hawaiian Isl Coral Reef Reserves.
4	IOCM Plan and Annual Ship Time requests
5	National Marine Sanctuaries Act
6	Presidential Proclamation 8336 <a href="http://sanctuaries.noaa.gov/science/assessment/welcome.html">http://sanctuaries.noaa.gov/science/assessment/welcome.html</a>
7	Presidential Proclamation 8337
8	Executive Order 13158; Establishing Marine Protected Areas
9	ONMS SME DAS Validation_ltr091912
10	Each Sanctuaries Management Plan (Consult <a href="http://sanctuaries.noaa.gov/about/welcome.html">http://sanctuaries.noaa.gov/about/welcome.html</a> )
11	National Historic Preservation Act

**2.4 Coral Program**

**2.4.1 Program Summary**

NOAA’s Coral Reef Conservation Program (Coral Program) brings together multidisciplinary expertise from over 30 NOAA offices and partners with state, jurisdictional and international coastal resource managers to protect, conserve, and restore coral reef resources that sustain livelihoods and economic development. Unfortunately, coral reefs are under threat from unsustainable fishing practices,

land-based sources of pollution, and climate change impacts (Reefs at Risk Revisited, 2011).

In response to these threats, NOAA’s Coral Program monitors the status and trends of coral reef ecosystems to provide a national-level context for local-level monitoring efforts; build marine protected area (MPA) management capacity; foster partnerships to address and reduce impacts of land-based sources of pollution; and monitor, model, and forecast climate-related risks and vulnerabilities to coral reefs. Monitoring approaches include: the direct observation of biological, physical, and chemical conditions by ship-based divers and underwater researchers; indirect observation of physical and biological benthic structure by remote sensing; collection of continuous measurements of environmental conditions by *in situ* instrumentation; interpretation of satellite observations of the ocean’s physical variables and integration with *in situ* measurements to produce regional and global annual trends and near-real-time condition reports and forecasts; and investigation of the economic and cultural uses of coral reef resources by coastal human communities. Data collected from these approaches are integrated under the Coral Program’s National Coral Reef Monitoring Plan (NCRMP) to describe the status and trends of U.S. coral reef ecosystems.

To date, the Coral Program’s integrated coastal management efforts across NOAA and with 170+ partners have mapped over 50% of U.S. shallow reef ecosystems, conducted integrated ecosystem monitoring in both populated and uninhabited domestic coral reef areas, and developed watershed management plans in over 85% of U.S. jurisdictions with coral reef habitats. These collaborations have supported 20 assessments on MPA management effectiveness, increased reef managers’ monitoring and response efforts on coral bleaching events, and addressed the release of land-based sources of pollution from over 200 square miles discharging to six priority site coral reef habitats.

#### 2.4.2 Validation Assessment for Priority-1 Requirements

Office and TPIO representatives worked jointly to review the submitted documentation, and identify the “level of validation” for the Priority-1 Observation Requirement.

**Table 1: Coral Program Validation Assessment for Priority-1 Requirements**

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Samp-ling	Mean DAS	Validation Docs
NOS.COR.001	Validated	Coral Reef Biological Surveys: NWHI	US Coral Reefs	3 yr	35	8,9,10
NOS.COR.002	Validated	Coral Reef Biological Surveys: MHI	US Coral Reefs	3 yr	30	8,9,10
NOS.COR.003	Validated	Coral Reef Biological Surveys: CNMI and Guam	US Coral Reefs	3 yr	80	8,9,10
NOS.COR.004	Validated	Coral Reef Biological Surveys: AS and PRIA	US Coral Reefs	3 yr	84	8,9,10

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Sampling	Mean DAS	Validation Docs
NOS.COR.005	Validated	Coral Reef Biological Surveys: FL and FGB	US Coral Reefs	2 yr	21	8,9,10
NOS.COR.006	Validated	Coral Reef Biological Surveys: PR and USVI	US Coral Reefs	2 yr	46	8,9,10

Note: DAS numbers were not validated but were submitted by programs to indicated needed days at sea for each survey.

**Legend: Level of Validation**

- Validated
- Validated with SME Statement
- Not Validated (insufficient documentation)

**2.4.3 Validation Documents Submitted**

Program and Technology Planning and Integration Office (TPIO) representatives worked jointly to identify references to validate both the need for an observation requirement and its specific measurement attributes. These validation documents support one or more of the Priority-1 Requirements as shown in Table 1 above. For occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

The following Validation Documents have been submitted in support of the Coral Reef Conservation Program’s Priority 1 Observation Requirements. More documents are listed than those that support the observing requirements for DAS. The Coral program has other observing requirements such as SST and salinity that do not need DAS so are not listed here.

**Table 2: Coral Program Validation Documents provided to support Priority-1 Requirements**

Doc #	Document Title
1	NOS COR Feely, R.A., R. Wanninkhof, J. Stein, M.F. Sigler, E. Jewett, F. Arzayus, D.K. Gledhill, and A.J. Sutton (2010): NOAA Ocean and Great Lakes Acidification Research Plan. NOAA Special Report, April 2010, 143 pp
2	NOS COR FY11 NOAA Form 77-65 Request for Ship Time (2009). PIFSC. Mariana Archipelago and Wake Island Coral Reef Assessment and Monitoring (RAMP)
3	NOS COR FY11 NOAA Form 77-65 Request for Ship Time (2009). PIFSC. Main Hawaiian Islands Coral Reef Assessment and Monitoring Program (RAMP)
4	NOS COR FY12 NOAA Form 77-65 Request for Ship Time (2010). CCMA. Characterizing benthic and demersal fish habitat of the U.S. Caribbean
5	NOS COR FY12 NOAA Form 77-65 Request for Ship Time (2010). PIFSC. American Samoa/PRIA Coral Reef Ecosystem Assessment
6	NOS COR FY12 NOAA Form 77-65 Request for Ship Time (2010). SEFSC. Survey of Coral and Fish Assemblages on Pulley Ridge, SW Florida

Doc #	Document Title
7	NOS COR FY13 NOAA Form 57-11-01 Ship Time Request (2011). NOS. Northwest Hawaiian Islands Reef Assessment and Monitoring (RAMP)
8	NOS COR NOAA CRCP Mapping Achievements and Unmet Needs (2011). CRCP Mapping Working Group. Internal Memo to the CRCP Program Manager and Senior Management Council. 68 pp
9	NOS COR NOAA CRCP National Coral Reef Monitoring Plan (2012-in review). CRCP National Coral Reef Monitoring Plan Working Group. Silver Spring, MD, NOAA Technical Memorandum CRCP XX, NOAA Coral Reef Conservation Program
10	NOS COR Proposed CRCP Geographic Coverage Category (2011). Memo from CRCP to TPIO. US Coral Reef Ecosystems Region
11	SME memo201203 from CRCP to TPIO. Observational Requirement/Specification for Ocean Temperature Profiles
12	SME Memo 201203 from CRCP to TPIO. Observational Requirement/ Specification for Sea Surface Temperature
13	NOS COR WMO Observing Requirements Database - Air pressure (at surface) - Over sea - High Res NWP
14	NOS COR WMO Observing Requirements Database - Air temperature (at surface) - Over sea - Ocean Applications
15	NOS COR WMO Observing Requirements Database - Sea surface temperature - Coast - Marine biology
16	NOS COR 2000804 NOAA CRCP State of the Reefs Report Executive Summary
17	NOS COR CoRIS 1 <sup>st</sup> FY12 Quarterly Status Report [1]

## 2.5 Integrated Ocean and Coastal Mapping (IOCM)

### 2.5.1 Program Summary

As defined in the Ocean and Coastal Mapping Integration Act of 2009, ocean and coastal mapping is the acquisition, processing, and management of physical, biological, geological, chemical, and archaeological characteristics and boundaries of ocean and coastal areas, resources, and sea beds using a variety of mapping technologies. The NOAA Integrated Ocean and Coastal Mapping (IOCM) program implements planning, acquiring, documenting, managing, integrating, and disseminating these data and derivative products in a manner that permits easy access to and use by the greatest range of users.

NOAA IOCM supports a “whole ocean” approach to management and planning, leveraging limited resources by identifying common mapping requirements, ensuring proper stewardship of mapping data to consistently generate the products that were originally intended, as well as the innovative re-use of these data to derive additional products to serve national needs. NOAA is adopting these practices throughout its mapping programs with the philosophy of “map once, use many times.” This philosophy is also reflected in the concepts of efficient government as promoted by the National Ocean Policy, OMB Circular A-16 on Coordination of Geographic Information and Related Spatial Data Activities, and other federal directives.

IOCM requires intra- and inter-agency coordination and collaboration with a focus on streamlining operations, reducing redundancies, improving efficiencies, developing common standards, and stimulating innovation and technological development. IOCM involves three primary tasks:

- Integrated Data Acquisition among mapping organizations within NOAA and other agencies to avoid duplication of effort and increase efficiency by leveraging joint capabilities;
- End-to-End Data Management to provide an efficient system to assure that all data collected is consistently processed and provided to the national archive centers; and
- Maximum Use and Re-use of the total archive of mapping data to consistently produce and distribute the products that were originally intended, as well as the innovative re-use of data to produce additional products to serve national needs.

Integrated Data Acquisition is the primary area dependent on Days at Sea for observations. The point of IOCM is to demand of ourselves that we maximize expensive NOAA platforms and Days at Sea to the fullest extent possible for the greatest return on investment. Utilizing NOAA platforms and Days at Sea resources most effectively means piggybacking projects on cruises, aligning projects on vessels based on the capability of the vessel, acquiring data to agreed-upon standards for multi-purpose use, and operating every sensor on a NOAA vessel while underway, not just the ones needed for a particular project. Observations and data acquired may not have a direct requirement at the moment of acquisition, but these data will find use in follow-on scientific studies – saving the very high cost of revisiting an area again for a different purpose.

### 2.5.2 Validation Assessment for Priority-1 Requirements

IOCM and TPIO representatives worked jointly to review the submitted documentation, and identify the “level of validation” for the Priority-1 Observation Requirement.

**Table 1: IOCM Validation Assessment for Priority-1 Requirements**

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Samp-ling	Mean DAS	Validation Docs
NOS.OCM.001	Validated	HO-IOCM Stock Assessment mapping of biological resources_AK	Alaska Complex	1 yr	OB	1 thru 6 (SME)
NOS.OCM.002	Validated	HO-IOCM Stock Assessment mapping of biological resources_Coastal	Coastal US	1 yr	OB	1 thru 6 (SME)
NOS.OCM.003	Validated	HO-IOCM Stock Assessment mapping of biological resources_EEZ	EEZ US	1 yr	OB	1 thru 6 (SME)
NOS.OCM.004	Validated	HO-IOCM Stock Assessment MSP EEZ	EEZ US	1 yr	OB	1 thru 6 (SME)

Req ID	Validation Assessment	Observation Requirement	Geo Coverage	Sampling	Mean DAS	Validation Docs
NOS.OCM.005	Validated	HO-IOCM Mapping of MM and ESA Species Assessment_AK	Alaska Complex	1 yr	OB	1 thru 6 (SME)
NOS.OCM.006	Validated	CG-IOCM Mapping of MM and ESA Species Assessment-US EEZ	EEZ US	1 yr	OB	1 thru 6 (SME)
NOS.OCM.007	Validated	HO-IOCM Habitat Mapping & Characterization AK	Alaska Complex	2 yr	OB	1 thru 6 (SME)
NOS.OCM.008	Validated	CG-IOCM Habitat Mapping & Characterizations US EEZ	EEZ US	2 yr	OB	1 thru 6 (SME)
NOS.OCM.009	Validated	CG-IOCM Water Quality Contaminants mapping	Coastal US	1 yr	OB	1 thru 6 (SME)
NOS.OCM.010	Validated	CG-IOCM Habitat Mapping & Characterization coastal	Coastal US	1 yr	OB	1 thru 6 (SME)
NOS.OCM.011	Validated	Benthic Habitat AK	Alaska Complex	1 yr	OB	1 thru 6 (SME)
NOS.OCM.012	Validated	Benthic Habitat Natl	North Atlantic	1 yr	OB	1 thru 6 (SME)
NOS.OCM.013	Validated	Benthic Habitat: Water Quality	North Atlantic	1 yr	OB	1 thru 6 (SME)
NOS.OCM.014	Validated	Benthic Habitat: MSP	North Atlantic	1 yr	OB	1 thru 6 (SME)
NOS.OCM.015	Validated	Hydrography_MTS (Multipurpose mapping)	Coastal US and US EEZ	1 yr	OB	1 thru 6 (SME)
NOS.OCM.016	Validated	Hydrography_MSP (Multipurpose mapping for ocean planning)	Coastal US and US EEZ	1 yr	OB	1 thru 6 (SME)
NOS.OCM.017	Validated	Biological Surveys and Benthic Habitat Mapping Coral Reefs	US EEZ: US Coral Reefs	1 yr	OB	1 thru 6 (SME)

Note: DAS numbers were not validated but were submitted by programs to indicated needed days at sea for each survey.

**Legend: Level of Validation**

- Validated
- Validated with SME Statement
- Not Validated (insufficient documentation)

**2.5.3 Validation Documents Submitted**

Program and Technology Planning and Integration Office (TPIO) representatives worked jointly to identify references to validate both the need for an observation requirement and its specific measurement attributes. These validation documents support one or more of the Priority-1 Requirements as shown in Table 1 above. For

occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

The following Validation Documents have been submitted in support of the IOCM Program's Priority 1 Observation Requirements.

***Table 2: IOCM Validation Documents provided to support Priority-1 Requirements***

<b>Doc #</b>	<b>Document Title</b>
1	Natl Ocean Policy Implementation Plan
2	NOAA NAO 216-101 on Data Management
3	POTUS Exec order 13547
4	IOCM Act _2009_PL111-11_SubtitleB_Ocean and Coastal Mapping Integration Act (OCMIA)
5	NOAA_IOCM_Seafloor_Mapping_Standards_2.0 provide standards of data management and mapping seafloor standards requirements
6	IOCM SME All reqs