

# Consolidated Observation Requirements List (CORL)

## NOAA Program Observation Requirements Document (PORD)

**FINAL with Requirements Validation  
Version 1.1**

**FY 2009**

**Commerce and Transportation Goal**

**Marine Transportation Systems Program  
(CT-MTS)**

**January 27, 2009<sup>1</sup>**

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<sup>1</sup> PORD Document Date reflects date for publication of this [FINAL with Requirements Validation]  
CORL Data was downloaded at 12-12-2008 11:53:03

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## Document Changes applied after Requirements Validation

Version	Date	Pages Affected	Description
v1.0	12/12/08	All (Baseline)	Final for Program Verification
Verified by		Program Manager Program Members	See Observation Requirement Verification Signatures
V1.1	01/27/09	Selected (details below)	Final with Requirements Validation
		Appendix B	Added Requirements Validation data
		Title Page, TOC	Updated to reflect new Version
Endorsed by:		NOSC Co-chairs	
V1.2	10/26/2009	Appendix A	Changed Air Gap Bridge Clearance horiz res from "na" to "50 sites."
	10/26/2009	Appendix A	Changed Hydrography horiz res from "2 m" to "10000 SNM."
	10/26/2009	Appendix A	Changed Hydrography samp int from "50 yr" to "1 yr."
	10/26/2009	Appendix A	Changed Ocean Currents: Direction, Profiles horiz res from "na" to "130 sites/yr."
	10/26/2009	Appendix A	Changed Ocean Currents: Direction, Surface horiz res from "na" to "130 sites/yr."
	10/26/2009	Appendix A	Changed Ocean Currents: Speed, Profiles horiz res from "na" to "130 sites/yr."
	10/26/2009	Appendix A	Changed Ocean Currents: Speed, Surface horiz res from "na" to "130 sites/yr."
	10/26/2009	Appendix A	Changed Precise GPS Orbital Parameters horiz res from "na" to "142 km."
	10/20/2009	Appendix A	Changed Sea Surface Winds: Direction, Coastal (Ice products) meas acc from "10 %" to "10 deg."
	10/20/2009	Appendix A	Changed Sea Surface Winds: Speed, Coastal (Ice products) meas acc from "10 %" to "10 m/sec."
	10/26/2009	Appendix A	Changed Water Level: Hydrography horiz res from "na" to "150 sites/yr."

Signatures

**NOSC Validation**

  
\_\_\_\_\_  
Mary Kicza  
Co-Chair, NOSC

3/16/2009  
Date

~~Validated~~  
Endorsed

  
\_\_\_\_\_  
Jack Hayes  
Co-Chair, NOSC

3/16/2009  
Date

~~Validated~~  
Endorsed

**Goal Lead Verification**

  
\_\_\_\_\_  
Steven Barnum  
Goal Lead, Commerce and Transportation Goal

12/15/08  
Date

Verified

**Program Manager Verification**

  
\_\_\_\_\_  
Rich Edwing (NOS)  
Program Manager, Marine Transportation Systems  
Program

12/15/08  
Date

Verified

**Program Membership Concurrence**

George F. Sharman                      15 December 2008                      Concurred  
George Sharman                      Date                      Concurred

\_\_\_\_\_  
Mike Aslaksen                      Date                      Concurred

\_\_\_\_\_  
Sharolyn Young                      Date                      Concurred

\_\_\_\_\_  
Ashley Chappell                      Date                      Concurred

Program Membership Concurrence

George Sharman Date Concurred

  
Mike Aslaksen Date 12/15/08 Concurred

Sharolyn Young Date Concurred

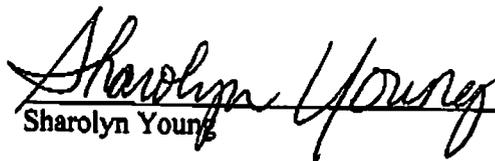
  
Ashley Chappell Date 12/15/08 Concurred

<b>NOAA Program Observation Requirements Document (PORD)</b> <b>FINAL w/ Pgm Concur (CT-MTS) Dec. 12, 2008</b>
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**Program Membership Concurrence**

George Sharman	Date	Concurred
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Mike Aslaksen	Date	Concurred
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 Sharolyn Young	Date	Concurred
	<i>12/15/2008</i>	

Ashley Chappell	Date	Concurred
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## **1. Program Summary**

The MTS is the network of navigable waterways, ports, and the intermodal hubs that link to rail, air, road, and pipeline systems. America's MTS is the world's most extensive system for moving cargo and people safely and reliably. It gives American businesses competitive access to suppliers and markets worldwide, making the U.S. the world's leading maritime trading nation. Most products purchased in the U.S travel through the system's waterways to railways and highways before reaching stores; two thirds of all consumer goods come to us by ship. Contributing roughly \$1T annually to the U.S. economy, the MTS employs 13M people, and ships over 95% by tonnage and over 37% by value of our foreign trade through America's ports.

The MTS Program provides information products, tools, and services for safe, efficient, and environmentally sound navigation. The Program's observations are also baseline data for Homeland Security and Maritime Domain Awareness. The MTS Program helps to reduce accidents, thereby saving lives, property and protecting the environment, works to increase navigation efficiency and thus the economic return of marine commerce, and facilitates the development of landside port infrastructure in an environmentally responsible way. Responsible for the entire US EEZ, the program concentrates efforts primarily along coastal and commercial navigation areas, including the Great Lakes. The combination of concentrated population, sensitive environmental areas, and industrial ports along US coasts is typically where marine transportation's need for adequate decision support tools is the greatest.

While NOAA provides the information that moves America, there are changes on the horizon. U.S. maritime trade is expected to double by 2020, impacting the overburdened MTS infrastructure even further. The nation's air and surface transportation system to which MTS links are faced with increasing congestion and delays. These growth and demand forecasts are intermodal and interrelated; our economy is dependent upon all three transport modes to move forward. Recent events such as the 2005 hurricanes serve to highlight the fragility of our transportation systems, their impact on the environment, our reliance on them for goods, services and movement, and their reliance on NOAA for accurate and updated information to make decisions. High impact events demonstrate the need for advance planning and preparedness in order to respond effectively, save lives, protect property and the environment, and help impacted communities and industries get back to business. The MTS program must work closely with other programs within C&T such as Geodesy, Emergency Response and Aviation, Marine and Surface Weather to bring NOAA capabilities and benefits to bear on the growing problems facing the Nation's transportation system. The MTS Program also relies heavily on NOAA Fleet and Aviation Services to accomplish its platform-dependent observations and objective

## **2. Observation Requirements Summary**

The **Marine Transportation Systems** Program of NOAA's Commerce and Transportation Goal requires a total of 65 environmental observation requirements to address its mission. The following graphs provide a breakdown of these requirements by mission Priority, environmental Discipline and Type.

Total Records: 65

## 2.1 Observation Requirements by Priority

The Marine Transportation Systems program's observation requirements are distributed among priority levels as follows:

- 43 = **Priority 1, Mission Critical:** Cannot meet operational mission objectives without this data.
- 18 = **Priority 2, Mission Optimal:** Data not critical but would provide significant improvement to operational capability.
- 4 = **Priority 3, Mission Enhancing:** Needed to enhance state of knowledge / assess potential for operational capability.

The following chart provides the distribution of the Marine Transportation Systems program's requirements by priority.

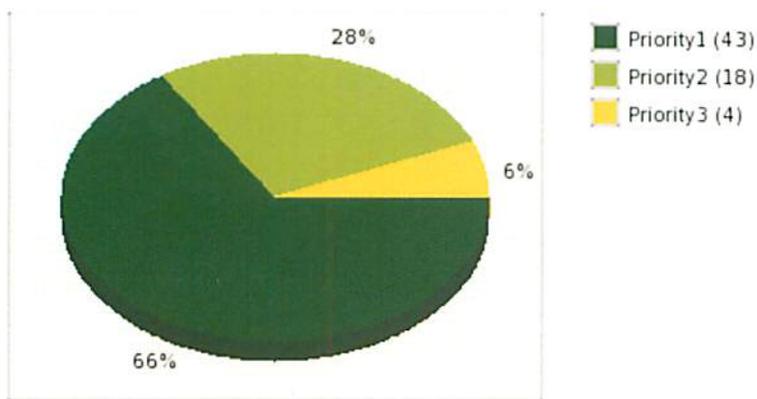


Figure 1: CT-MTS Observation Requirements by Priority (%)

## 2.2 Observation Requirements by Discipline

The Marine Transportation Systems program's observation requirements are distributed among environmental disciplines as follows:

- 10 = Atmosphere
- 0 = Biosphere
- 0 = Cryosphere
- 0 = Human Dimensions
- 0 = Terrestrial Hydrosphere
- 0 = Land Surface
- 52 = Oceans
- 2 = Solid Earth
- 0 = Spectral/Engineering
- 0 = Sun-earth Interactions

The following chart provides the distribution of the Marine Transportation Systems program's requirements by discipline.

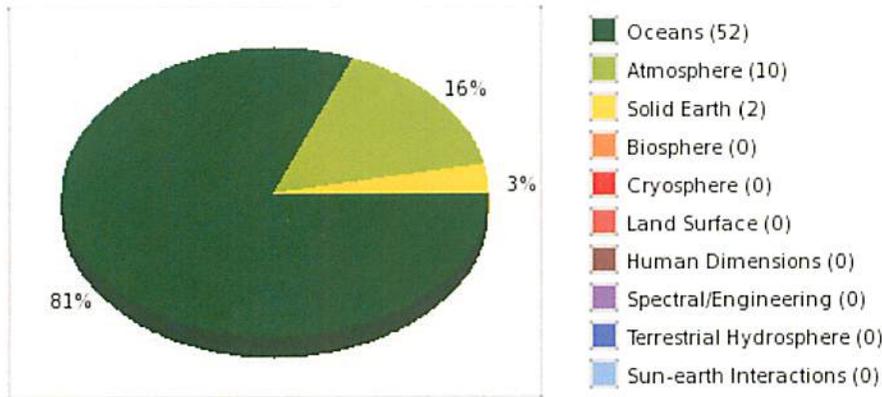


Figure 2: CT-MTS Observation Requirements by Discipline.

### 2.3 Observation Requirements by Type

The Marine Transportation Systems program's observation requirements are distributed among types as follows:

- 0 = Biological
- 0 = Chemical
- 64 = Physical
- 0 = Social
- 0 = Socio-economic

The following Chart gives the distribution of the Marine Transportation Systems program's requirements by type.

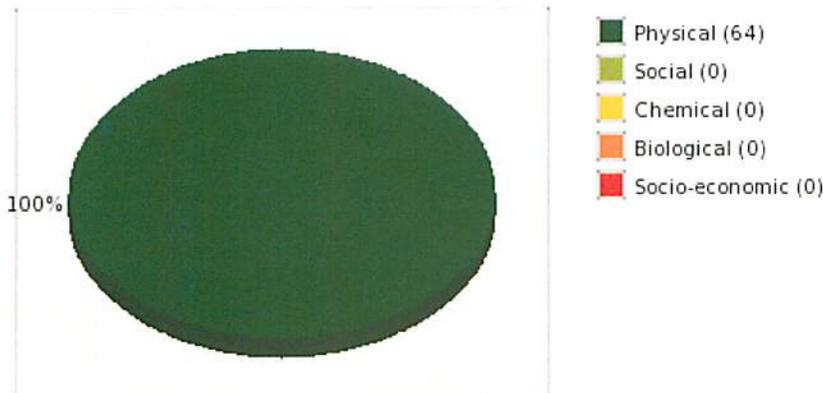


Figure 3: CT-MTS Observation Requirements by Type.

### **3. Observation Requirements Mapping to Performance Measures**

The following table provides the listing of observation requirements for the **Marine Transportation Systems Program** of NOAA's Commerce and Transportation Goal by GPRA and Corporate (NOAA) Performance Measures, and Regional Collaboration Priorities (RC).

**GPRA-1:** CT-MTS Reduce the hydrographic survey backlog within navigationally significant areas

**NOAA-1:** CT-MTS - Build and Maintain Electronic Navigational Chart database

**NOAA-2:** CT-MTS - Maintain the percentage validated customer required ice products produced and delivered.

**NOAA-3:** CT-MTS - Priority ports analyzed for shoreline change.

**NOAA-4:** CT-MTS Percent of top 175 United States seaports with access to full suite of NOAA's Navigation Products and Services

**NOAA-5:** CT-MTS Operational status of the National Water Level Observation Network

**NOAA-6:** CT-MTS Percent of ENC suite verified by Navigation Response Teams

**NOAA-7:** CT-MTS Increase Volume of Data Ingested Annually and placed into the archive

**NOAA-8:** CT-MTS U.S. shoreline delineated for application to Nautical Charts.

**NOAA-9:** CT-MTS % Ports Using NOAA environmental products and services for MTS planning

**NOAA-10:** CT-MTS - Shoreline for priority ports delineated and applied to nautical charts.

**NOAA-11:** CT-MTS Accuracy of tidal current predictions

**NOAA-12:** CT-MTS - Maintain the percentage Ice Nowcasts Produced using Synthetic Aperture Radar (SAR) Data

**RC-1:** Hazard Resilient Coastal Communities

**RC-2:** Integrated Ecosystem Assessments

**RC-3:** Integrated Water Resource Services

**Table 1: CT-MTS Observation Requirements Mapping to Performance Measures**

Requirement	Priority	GPRA			NOAA												RC		
		1	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
Absorbed Shortwave Radiation: Surface/ Hemispheric Heat Flux, Global	1			X															
Absorbed Shortwave Radiation: Surface/ Hemispheric Heat Flux, Regional	1			X															
Air Gap (Bridge Clearance)	1					X											X		
Geomagnetic Field	1							X											
Hydrography	1	X	X														X	X	
Ice Origin, Global	1			X															
Ice Origin, Local	1			X	X														
Ice Origin, Regional	1			X	X														
Incoming Shortwave Radiation: Surface	1			X															
Lake Ice: Thickness, Global	1			X	X														
Lake Ice: Thickness, Local	1			X	X														

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Requirement	Priority	GPRA		NOAA										RC					
		1	2	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Lake Ice: Thickness, Regional	1			X															
Ocean Currents: Direction, Profiles	1					X							X				X	X	X
Ocean Currents: Direction, Surface	1					X							X				X	X	X
Ocean Currents: Speed, Profiles	1					X							X				X	X	X
Ocean Currents: Speed, Surface	1					X							X				X	X	X
Precise GPS Orbital Parameters	1																		
Sea Ice: Concentration, Global	1			X															
Sea Ice: Concentration, Local	1			X	X														
Sea Ice: Concentration, Regional	1			X	X														
Sea Ice: Edge, Global	1			X															
Sea Ice: Extent, Local	1			X	X														
Sea Ice: Extent, Regional	1			X	X														
Sea Ice: Motion, Global	1			X															
Sea Ice: Motion, Local	1			X	X														
Sea Ice: Motion, Regional	1			X	X														
Sea Ice: Temperature, Global	1			X															
Sea Ice: Temperature, Local	1			X	X														
Sea Ice: Temperature, Regional	1			X	X														
Sea Ice: Thickness, Global	1			X															
Sea Ice: Thickness, Local	1			X	X														
Sea Ice: Thickness, Regional	1			X	X														
Sea Surface Temps, Global	1			X															
Sea Surface Temps, Local (Ice products)	1			X	X														
Sea Surface Temps, Local (Navigation)	1					X											X	X	X
Sea Surface Temps, Regional	1			X	X														
Sea Surface Winds: Direction, Coastal (Ice products)	1			X	X														
Sea Surface Winds: Direction, Coastal (Navigation)	1					X											X	X	X
Sea Surface Winds: Speed, Coastal (Ice products)	1			X	X														
Sea Surface Winds: Speed, Coastal (Navigation)	1					X											X	X	X
Shoreline Mapping: Remote Sensing	1					X			X	X							X		
Water Level	1	X				X	X		X	X							X	X	X
Water Level: Hydrography	1	X															X	X	X
Air Temperature: Local	2																		
Atmospheric Pressure: Surface (Ice Products)	2																		
Atmospheric Pressure: Surface(Navigation)	2																		
Imagery: Cloud, Global	2																		
Imagery: Cloud, Local	2																		
Imagery: Cloud, Regional	2																		
Ocean Temperature: Profiles, Coastal	2																		
Ocean Waves: Direction, Global	2																		
Ocean Waves: Direction, Local	2																		
Ocean Waves: Direction, Regional	2																		

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Requirement	Priority	GPRA			NOAA												RC		
		1	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
Ocean Waves: Period, Global	2																		
Ocean Waves: Period, Local	2																		
Ocean Waves: Period, Regional	2																		
Ocean Waves: Significant Wave Height, Global	2																		
Ocean Waves: Significant Wave Height, Local	2																		
Ocean Waves: Significant Wave Height, Regional	2																		
Salinity: Surface	2																		
Seafloor Characteristics: Type	2																		
Bathymetry Navigation	3																		
Bathymetry, models (Coastal)	3																		
Bathymetry, models (Global)	3																		
Visibility, Marine Fog	3																		

**4. Status of Program List**

As shown in Appendix A, each NOAA Observation Requirement is further specified by spatial, temporal and accuracy related attributes at both Threshold and Objective levels. The following table provides the attribute completion status of the observation requirements list for the Marine Transportation Systems Program. All attributes at the Priority-1/Threshold Level must be completed to allow for observation gap analyses to be conducted.

**Table 2: CT-MTS Observation Requirement Attributes Remaining [blank] or [tbs]**

Priority	Threshold	Objective
<b>1</b>	<b>28</b>	293
2	138	186
3	10	11
<b>Total</b>	<b>176</b>	<b>490</b>

# NOAA Program Observation Requirements Document (PORD) Validation

(CT-MTS)

Dec. 12, 2008

## Appendix A Marine Transportation Systems Program, Observation Requirements

Key: V=value, U=units, W=weight

Observation Requirement	Obs Req Prty	T/O	Geo Cov		Vert Range				Vert Res			Horiz Res			Meas Range				Msmnt Accy			Smplng intvl			Data Ltncy			Long Stab		
			V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W
Absorbed Shortwave Radiation: Surface/ Hemi Heat Flux, Global	1	T	Global	0	0	0	m	0	na	na	0	20	km	0	0	2000	W/m^2	0	10	W/m^2	80	12	hr	0	1	hr	20	tbs	tbs	0
		O	Global		0	0	m		0	m		10	km		0	2000	W/m^2		10	W/m^2	80	6	hr		30	min	20	tbs	tbs	
Absorbed Shortwave Radiation: Surface/ Hemi Heat Flux, Regional	1	T	CONUS	0	0	0	m	0	na	na	0	20	km	0	0	2000	W/m^2	0	10	W/m^2	80	12	hr	0	1	hr	20	tbs	tbs	0
		O	CONUS		0	0	m		0	m		5	km		0	2000	W/m^2		10	W/m^2	80	6	hr		30	min	20	tbs	tbs	
Air Gap (Bridge Clearance)	1	T	Coastal US	5	45	85	m	5	na	na	10	na	na	0	40	85	m	15	0.03	m	25	6	min	10	6	min	15	5	cm	15
		O	tbs	5	45	85	m	5	1	mm	10	na	na	0	45	85	m	15	1	cm	25	6	min	10	6	min	15	2	cm	15
Geomagnetic Field	1	T	Global	17	600	800	km	6	na	na	0	1	km	7	-60000	60000	nT	2	5	nT/axis	17	5	sec	10	90	min	17	5	nT/axis	17
		O	Global	17	0	800	km	6	na	na	0	0.1	km	7	-60000	60000	nT	2	2	nT/axis	17	1	sec	10	15	min	17	2	nT/axis	17
Hydrography	1	T	Coastal US	15	0	1000	m	5	na	na	20	2	m	20	0	1000	m	5	0.5	m	20	50	yr	5	420	day	5	1	m	5
		O	Coastal US	15	0	1000	m	5	0.1	m	20	0.5	m	20	0	1000	m	5	0.1	m	20	50	yr	5	90	day	5	0.5	m	5
Ice Origin, Global	1	T	Global	0	0	0	m	0	na	na	0	0.5	km	40	No	Yes	Presence	0	10	%	20	6	hr	0	3	hr	40	tbs	tbs	0
		O	Global		0	0	m		0	m		0.25	km	40	No	Yes	Presence		5	%	20	3	hr		30	min	40	tbs	tbs	
Ice Origin, Local	1	T	CONUS	0	0	0	m	0	na	na	0	0.05	km	40	No	Yes	Presence	0	10	%	20	3	hr	0	1	hr	40	tbs	tbs	0
		O	Targeted Meso		0	0	m		0	m		0.01	km	40	No	Yes	Presence		5	%	20	1	hr		30	min	40	tbs	tbs	
Ice Origin, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	0.25	km	40	No	Yes	Presence	0	10	%	20	3	hr	0	1	hr	40	tbs	tbs	0
		O	CONUS		0	0	m		0	m		0.1	km	40	No	Yes	Presence		5	%	20	1	hr		30	min	40	tbs	tbs	
Incoming Shortwave Radiation: Surface	1	T	Global	0	0	0	m	0	na	na	0	20	km	0	0	2000	W/m^2	0	10	W/m^2	80	12	hr	0	1	hr	20	tbs	tbs	0
		O	Global		0	0	m		0	m		10	km		0	2000	W/m^2		10	W/m^2	80	6	hr		30	min	20	tbs	tbs	
Lake Ice: Thickness, Global	1	T	Global Land	0	0	0	m	0	na	na	0	500	m	40	0	6	cm	0	30	cm	20	6	hr	0	3	hr	40	tbs	tbs	0
		O	Global		0	0	m		0	m		250	m	40	0	6	cm		30	cm	20	24	hr		30	min	40	tbs	tbs	
Lake Ice: Thickness, Local	1	T	CONUS	0	0	0	m	0	na	na	0	50	m	40	0	6	cm	0	30	cm	20	3	hr	0	1	hr	40	tbs	tbs	0
		O	Targeted Meso		0	0	m		0	m		10	m	40	0	6	cm		30	cm	20	24	hr		30	min	40	tbs	tbs	
Lake Ice: Thickness, Regional	1	T	Great Lakes	0	0	0	m	0	na	na	0	250	m	40	0	6	cm	0	30	cm	20	3	hr	0	1	hr	40	tbs	tbs	0

# NOAA Program Observation Requirements Document (PORD)

Validation

(CT-MTS)

Dec. 12, 2008

Observation Requirement	Obs Req T/O Prty	Geo Cov		Vert Range				Vert Res			Horiz Res			Meas Range				Msmnt Accy			Smping intrvl			Data Ltncy			Long Stab			
		V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W	
Ocean Currents: Direction, Profiles	1	O	CONUS		0	0	m		0	m		250	m	40	0	6	cm		30	cm	20	24	hr		30	min	40	tbs	tbs	
		T	Coastal US	5	0.5	110	m	5	1	m	10	na	na	0	0	360	deg	10	5	deg	30	6	min	15	6	min	15	5	deg	10
		O	tbs	5	0.5	110	m	5	1	m	10	na	na	0	0	360	deg	10	5	deg	30	1	min	15	6	min	15	5	deg	10
Ocean Currents: Direction, Surface	1	T	Coastal US	10	2	0	m	5	na	na	0	na	na	15	0	360	deg	10	5	deg	25	1	hr	15	15	min	10	10	deg	10
		O	tbs	10	2	0	m	5	na	na	0	100	m	15	0	360	deg	10	5	deg	25	15	min	15	15	min	10	10	deg	10
Ocean Currents: Speed, Profiles	1	T	Coastal US	5	0.5	110	m	5	1	m	10	na	na	0	0	10	m/sec	10	4	cm/sec	30	6	min	15	6	min	15	1	%	10
		O	tbs	5	0.5	110	m	5	0.5	m	10	na	na	0	0	10	m/sec	10	tbs	m/sec	30	tbs	tbs	15	tbs	tbs	15	tbs	tbs	10
Ocean Currents: Speed, Surface	1	T	Coastal US	10	2	0	m	5	na	na	0	na	na	15	0	5	m/sec	10	4	cm/sec	25	1	hr	15	15	min	10	0.1	m/sec	10
		O	tbs	10	2	0	m	5	na	na	0	tbs	m	15	tbs	tbs	m/sec	10	0.1	m/sec	25	1	hr	15	15	min	10	0.1	m/sec	10
Precise GPS Orbital Parameters	1	T	Global	0	26	26	km	0	na	na	0	na	na	0	26	COASTAL	km	0	2	cm	100	30	sec	0	1	day	0	30	sec	0
		O	Global		26	26	km		na	na		na	na		26	26	km		1	mm	100	30	sec		1	sec		30	sec	
Sea Ice: Concentration, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	10	km	40	0	100	%	0	10	%	20	6	hr	0	3	hr	40	tbs	tbs	0
		O	Global		0	0	m		0	m		5	km	40	0	100	%		10	%	20	24	hr		30	min	40	tbs	tbs	
Sea Ice: Concentration, Local	1	T	EEZ US	0	0	0	m	0	na	na	0	0.03	km	40	0	100	%	0	10	%	20	180	min	0	1	hr	40	tbs	tbs	0
		O	Targeted Meso		0	0	m		0	m		0.01	km	40	0	100	%		10	%	20	24	hr		30	min	40	tbs	tbs	
Sea Ice: Concentration, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	3	km	40	0	100	%	0	10	%	20	180	min	0	1	hr	40	tbs	tbs	0
		O	CONUS		0	0	m		0	m		1	km	40	0	100	%		10	%	20	24	hr		30	min	40	tbs	tbs	
Sea Ice: Edge, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	0.5	km	40	No	Yes	Presence	0	10	%	20	6	hr	0	3	hr	40	tbs	tbs	0
		O	Global		0	0	m		0	m		250	m	40	No	Yes	Presence		5	%	20	24	hr		30	min	40	tbs	tbs	
Sea Ice: Extent, Local	1	T	EEZ US	0	0	0	m	0	na	na	0	0.05	km	40	No	Yes	Presence	0	10	%	20	180	min	0	1	hr	40	tbs	tbs	0
		O	Targeted Meso		0	0	m		0	m		10	m	40	No	Yes	Presence		5	%	20	1	hr		30	min	40	tbs	tbs	
Sea Ice: Extent, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	0.25	km	40	No	Yes	Presence	0	10	%	20	180	min	0	1	hr	40	tbs	tbs	0
		O	CONUS		0	0	m		0	m		100	m	40	No	Yes	Presence		5	%	20	1	hr		30	min	40	tbs	tbs	
Sea Ice: Motion, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	15	km	0	0,0	360, 0.6	deg, m/sec	0	15	deg	20	6	hr	0	3	hr	80	tbs	tbs	0
		O	Global		0	0	m		0	m		10	km		0,0	360, 6	deg, m/sec		tbs	m/sec	20	3	hr		30	min	80	tbs	tbs	
Sea Ice: Motion, Local	1	T	EEZ US	0	0	0	m	0	na	na	0	1	km	0	0,0	360, 0.6	deg, m/sec	0	15	deg	20	3	hr	0	1	hr	80	tbs	tbs	0

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Observation Requirement	Obs Req T/O Prty	Geo Cov		Vert Range				Vert Res			Horiz Res			Meas Range				Msmnt Accy			Smplng intvl			Data Ltncty			Long Stab			
		V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W	
	O	Targeted Meso		0	0	m		0	m		0.5	km		0, 0	360, 6	deg, m/sec		tbs	m/sec	20	1	hr		30	min	80	tbs	tbs		
Sea Ice: Motion, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	5	km	0	0, 0	360, 0.6	deg, m/sec	0	15	deg	20	3	hr	0	1	hr	80	tbs	tbs	0
	O	CONUS		0	0	m		0	m		3	km		0, 0	360, 6	deg, m/sec		tbs	m/sec	20	1	hr		30	min	80	tbs	tbs		
Sea Ice: Temperature, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	0.5	km	0	213	280	K	0	0.5	K	50	6	hr	0	3	hr	50	tbs	tbs	0
	O	Global		0	0	m		0	m		0.25	km		213	280	K		0.5	K	50	3	hr		30	min	50	tbs	tbs		
Sea Ice: Temperature, Local	1	T	EEZ US	0	0	0	m	0	na	na	0	0.05	km	0	213	280	K	0	0.5	K	50	3	hr	0	1	hr	50	tbs	tbs	0
	O	Targeted Meso		0	0	m		0	m		0.03	km		213	280	K		0.5	K	50	1	hr		30	min	50	tbs	tbs		
Sea Ice: Temperature, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	0.25	km	0	213	280	K	0	0.5	K	50	3	hr	0	1	hr	50	tbs	tbs	0
	O	CONUS		0	0	m		0	m		0.1	km		213	280	K		0.5	K	50	1	hr		30	min	50	tbs	tbs		
Sea Ice: Thickness, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	0.5	km	80	0	6	cm	0	30	cm	0	6	hr	0	3	hr	20	tbs	tbs	0
	O	Global		0	0	m		0	m		250	m	80	0	6	cm		30	cm		3	hr		30	min	20	tbs	tbs		
Sea Ice: Thickness, Local	1	T	EEZ US	0	0	0	m	0	na	na	0	0.05	km	80	0	6	cm	0	30	cm	0	3	hr	0	1	hr	20	tbs	tbs	0
	O	Targeted Meso		0	0	m		0	m		10	m	80	0	6	cm		30	cm		1	hr		30	min	20	tbs	tbs		
Sea Ice: Thickness, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	0.25	km	80	0	6	cm	0	30	cm	0	3	hr	0	1	hr	20	tbs	tbs	0
	O	CONUS		0	0	m		0	m		250	m	80	0	6	cm		30	cm		1	hr		30	min	20	tbs	tbs		
Sea Surface Temps, Global	1	T	Global Ocean	0	0	0	m	0	na	na	0	0.5	km	0	213	280	K	0	0.5	K	80	6	hr	0	3	hr	20	tbs	tbs	0
	O	Global		0	0	m		0	m		0.25	km		213	280	K		0.5	K	80	3	hr		30	min	20	tbs	tbs		
Sea Surface Temps, Local (Ice products)	1	T	EEZ US	0	0	0	m	0	na	na	0	0.05	km	0	213	280	K	0	0.5	K	80	3	hr	0	1	hr	20	tbs	tbs	0
	O	Targeted Meso		0	0	m		0	m		0.03	km		213	280	K		0.5	K	80	1	hr		30	min	20	tbs	tbs		
Sea Surface Temps, Local (Navigation)	1	T	EEZ US	5	na	na	m	0	na	na	10	0.05	km	10	213	280	K	15	0.5	K	25	3	hr	10	1	hr	10	tbs	tbs	15
	O	Targeted Meso		5	na	na	m	0	0	m	10	0.03	km	10	213	280	K	15	0.5	K	25	1	hr	10	30	min	10	tbs	tbs	15
Sea Surface Temps, Regional	1	T	EEZ US	0	0	0	m	0	na	na	0	0.25	km	0	213	280	K	0	0.5	K	80	3	hr	0	1	hr	20	tbs	tbs	0
	O	CONUS		0	0	m		0	m		0.1	km		213	280	K		0.5	K	80	1	hr		30	min	20	tbs	tbs		
Sea Surface Winds: Direction, Coastal (Ice products)	1	T	Coastal US	0	10	10	m	0	na	na	0	5.0	km	0	0	360	deg	0	10	%	80	3	hr	0	6	min	20	5	deg	0
	O	Coastal US		tbs	tbs	tbs		tbs	tbs		tbs	na		tbs	tbs	tbs		tbs	tbs	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
Sea Surface Winds: Direction, Coastal (Navigation)	1	T	Coastal US	10	10	10	m	5	na	na	5	90	km	5	0	360	deg	15	5	deg	25	6	min	15	6	min	10	5	deg	10

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Observation Requirement	Obs Req T/O Prty	Geo Cov		Vert Range				Vert Res			Horiz Res			Meas Range				Msmnt Accy			Smping Intvl			Data Ltncy			Long Stab				
		V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W		
Sea Surface Winds: Speed, Coastal (Ice products)	1	O	tbs	10	tbs	tbs	tbs	5	tbs	tbs	5	tbs	na	5	tbs	tbs	tbs	15	tbs	tbs	25	tbs	tbs	15	tbs	tbs	10	tbs	tbs	10	
		T	Coastal US	0	10	10	m	0	na	na	0	5.0	km	0	0	60	m/sec	0	10	%	80	3	hr	0	6	min	20	0.1	m/sec	0	
Sea Surface Winds: Speed, Coastal (Navigation)	1	O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	na		tbs	tbs	tbs		tbs	tbs	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
		T	Coastal US	10	10	10	m	5	na	na	5	90	km	5	0	60	m/sec	15	0.3	m/sec	25	6	min	15	6	min	10	0.1	m/sec	10	
Shoreline Mapping	1	O	tbs	10	tbs	tbs	tbs	5	tbs	tbs	5	tbs	na	5	tbs	tbs	tbs	15	tbs	tbs	25	tbs	tbs	15	tbs	tbs	10	tbs	tbs	10	
		T	Coastal US	20	-10	100	m	5	na	na	5	2	m	20	na	na	na	0	5	m	20	20	yr	20	6,	24	mon	10	na	na	0
Water Level	1	O	tbs	20	-10	100	m	5	1	cm	5	0.2	m	20	na	na	na	0	0.5	m	20	10	yr	20	2,	6		10	na	na	0
		T	Coastal US	5	0	15	m	10	na	na	10	90	km	0	0	15	m	15	0.02	m	25	6	min	10	6	min	10	5	mm	15	
Water Level: Hydrography	1	O	tbs	5	0	15	m	10	0.001	m	10	tbs	na	0	tbs	tbs	tbs	15	tbs	tbs	25	tbs	tbs	10	tbs	tbs	10	tbs	tbs	15	
		T	Coastal US	20	0	12	m	20	na	na	0	na	na	0	0	12	m	15	0.02	m	15	6	min	20	12	min	5	0.1	m	5	
Air Temperature: Local	2	O	tbs	20	0	12	m	20	na	na	0	na	na	0	0	12	m	15	0.005	m	15	6	min	20	12	min	5	0.1	m	5	
		T	Coastal US	5	0	0	m	5	na	na	5	0.05	km	5	213	280	K	15	0.5	K	25	3	hr	15	1	hr	10	tbs	tbs	15	
Atmospheric Pressure: Surface (Ice Products)	2	O	Targeted Meso	5	0	0	m	5	0	m	5	0.03	km	5	213	280	K	15	0.5	K	25	1	hr	15	30	min	10	tbs	tbs	15	
		T	Coastal US		na	na	na		na	na		na	na		800	1100	hPa		0.5	hPa	50	6	min		6	min	50	0.5	hPa		
Atmospheric Pressure: Surface (Navigation)	2	O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	na		tbs	tbs	tbs		tbs	tbs	50	tbs	tbs		tbs	tbs	50	tbs	tbs		
		T	Coastal US	5	na	na	na	5	na	na	5	na	na	5	800	1100	hPa	15	0.5	hPa	25	6	min	15	6	min	10	0.5	hPa	15	
Imagery: Cloud, Global	2	O	tbs	5	tbs	tbs	tbs	5	tbs	tbs	5	tbs	na	5	tbs	tbs	tbs	15	tbs	tbs	25	tbs	tbs	15	tbs	tbs	10	tbs	tbs	15	
		T	Global		200	1050	hPa		tbs	tbs		1	km	50	No	Yes	Presence		10	%	0	1	day		3	hr	50	tbs	tbs		
Imagery: Cloud, Local	2	O	Global		200	1050	mb		tbs	tbs		0.5	km	50	No	Yes	Presence		5	%	0	12	hr		30	min	50	tbs	tbs		
		T	CONUS		200	1050	hPa		tbs	tbs		0.5	km	50	No	Yes	Presence		10	%	0	6	hr		3	hr	50	tbs	tbs		
Imagery: Cloud, Regional	2	O	Targeted Meso		200	1050	mb		tbs	tbs		0.1	km	50	No	Yes	Presence		5	%	0	3	hr		30	min	50	tbs	tbs		
		T	CONUS		200	1050	hPa		tbs	tbs		0.5	km	50	No	Yes	Presence		10	%	0	12	hr		3	hr	50	tbs	tbs		
Ocean Temperature: Profiles, Coastal	2	O	CONUS		200	1050	mb		tbs	tbs		0.1	km	50	No	Yes	Presence		5	%	0	6	hr		30	min	50	tbs	tbs		
		T	Coastal US		Other	na	na		na	na		na	na	50	271	308	K	50	0.2	K	0	6	min		6	min	50	0.2	K		
Ocean Waves: Direction, Global	2	O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	na	50	tbs	tbs	tbs		tbs	tbs	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
	T	Global Ocean		0	5	cm		tbs	tbs		5	km	50	0	360	deg		36	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs			

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Observation Requirement	Obs Req Prty	T/O	Geo Cov		Vert Range				Vert Res			Horiz Res				Meas Range				Msmnt Accy			Smping Intvl			Data Lncy			Long Stab		
			V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W	
Ocean Waves: Direction, Local	2	O	Global		0	5	cm		tbs	tbs		1	km	50	0	360	deg		18	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		T	EEZ US		0	5	cm		tbs	tbs		0.5	km	50	0	360	deg		36	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		O	Targeted Meso		0	5	cm		tbs	tbs		0.3	km	50	0	360	deg		18	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Ocean Waves: Direction, Regional	2	T	EEZ US		0	5	cm		tbs	tbs		1	km	50	0	360	deg		36	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		O	CONUS		0	5	cm		tbs	tbs		0.5	km	50	0	360	deg		18	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Ocean Waves: Period, Global	2	T	Global Ocean		0	5	cm		tbs	tbs		5	km	50	2	20	sec		10	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		O	Global		0	5	cm		tbs	tbs		1	km	50	2	20	sec		5	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Ocean Waves: Period, Local	2	T	EEZ US		0	5	cm		tbs	tbs		0.5	km	50	2	20	sec		10	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		O	CONUS		0	5	cm		tbs	tbs		0.3	km	50	2	20	sec		5	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Ocean Waves: Period, Regional	2	T	EEZ US		0	5	cm		tbs	tbs		1	km	50	2	20	sec		10	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
		O	Targeted Meso		0	5	cm		tbs	tbs		0.5	km	50	2	20	sec		5	%	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Ocean Waves: Significant Wave Height, Global	2	T	Global Ocean		0	5	cm		na	na		5	km		0.1	30	m		10	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
		O	Global		0	5	cm		tbs	tbs		1	km		0.1	30	m		5	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
Ocean Waves: Significant Wave Height, Local	2	T	EEZ US		0	5	cm		na	na		0.5	km		0.1	30	m		10	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
		O	Targeted Meso		0	5	cm		tbs	tbs		0.3	km		0.1	30	m		5	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
Ocean Waves: Significant Wave Height, Regional	2	T	EEZ US		0	5	cm		na	na		1	km		0.1	30	m		10	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
		O	CONUS		0	5	cm		tbs	tbs		0.5	km		0.1	30	m		5	%	80	tbs	tbs		tbs	tbs	20	tbs	tbs		
Salinity: Surface	2	T	Coastal US		na	na	na		na	na		na	na	50	0	35	psu		0.5	psu	0	6	min		6	min	50	0.5	psu		
		O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	na	50	tbs	tbs	tbs		tbs	tbs	0	tbs	tbs		tbs	tbs	50	tbs	tbs		
Seafloor Characteristics: Type	2	T	Coastal US		na	na	na		na	na		200	m	30	na	na	na		95	%	50	na	na		60	day	10	200	m	10	
		O	Coastal US		na	na	na		na	na		5	m	30	na	na	na		99	%	50	na	na		1	day	10	5	m	10	
Bathymetry Navigation	3	T	Coastal US	15	0	3	km	5	1	m	15	20	m	15	0	3000	m	5	1	m	15	166	yr	10	420	day	10	1	m	10	
		O	Coastal US	15	0	5	km	5	0.5	m	15	10	m	15	0	5000	m	5	0.5	m	15	50	yr	10	90	day	10	0.5	m	10	
Bathymetry, models (Coastal)	3	T	Coastal US	13	0	11000	m	3	1	m	17	20	m	17	0	11000	m	3	10	m	17	1	sec	17	1	yr	10	1	m/yr	3	
		O	Coastal US	13	0	11000	m	3	0.1	m	17	1	m	17	0	11000	m	3	0.1	m	17	0.1	sec	17	30	day	10	0	m/yr	3	
Bathymetry, models (Global)	3	T	Global Ocean	13	0	11000	m	3	10	m	17	20	m	17	0	11000	m	3	10	m	17	10	sec	17	1	yr	10	10	m/yr	3	

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Observation Requirement	Obs Req T/O Prty	Geo Cov		Vert Range				Vert Res			Horiz Res			Meas Range				Msmnt Accy			Smplng Intvl			Data Ltncy			Long Stab		
		V	W	Low	High	U	W	V	U	W	V	U	W	Low	High	U	W	V	U	W	V	U	W	V	U	W	V	U	W
	O	Global	13	0	11000	m	3	1	m	17	1	m	17	0	11000	m	3	1	m	17	1	sec	17	30	day	10	0	m/yr	3
Visibility, Marine Fog	3	Coastal US	10	tbs	tbs	tbs	5	tbs	tbs	5	tbs	tbs	5	tbs	tbs	tbs	20	tbs	tbs	25	tbs	tbs	10	tbs	tbs	10	tbs	tbs	10
	O	tbs	10	tbs	tbs	tbs	5	tbs	tbs	5	tbs	tbs	5	tbs	tbs	tbs	20	tbs	tbs	25	tbs	tbs	10	tbs	tbs	10	tbs	tbs	10

## **Appendix B CT-MTS Priority-1 Requirements Validation**

### **Appendix B.1 Validation Documents Submitted**

The following Validation Documents have been submitted in support of the Marine Transportation Systems Program's Priority-1 Observation Requirements.

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

#	Validation Document Title	Document Type
1	National Ice Center Mission Observations Requirements List (MORL) for Environmental Satellites	NIC Requirements List
2	Microwave Air Gap-Bridge Clearance Sensor Test, Evaluation, and Imp Report	NOAA Technical Report
3	The 10th-Generation International Geomagnetic Reference Field	Journal Article
4	The US/UK World Magnetic Model for 2005-2010	Technical Report
5	HYDROLOGICAL SERVICES IMPROVEMENT ACT AMENDMENTS OF 2007, Report 110-218	Congressional Act
6	U. S. Coast Guard National Ice Center Product Requirements	USCG Requirements
7	Final Report of the CEOS Disaster Management Support Group on Ice Hazards	CEOS DMSG Report
8	Manual on Sea Level Measurement and Interpretation	UNESCO Technical Manual
9	NOS Hydrographic Surveys; Specifications and Deliverables	NOS Technical Spec
10	NPOES Integrated Operational Requirements Document-II	Requirements Document
11	Hydrographic Services Improvement Act Amendments of 2008	Congressional Act
12	Summary of Requirements Documentation for Shoreline Mapping	Requirements Document
13	A Network Gaps Analysis for the National Water Level Obs Network	NOAA Technical Memo
14	National VDatum –The Imp of a National Vert Datum Transformation Database	NOAA Technical Paper
15	Tides and Water Level Requirements	NOAA Requirements Document
16	The National Geodetic Survey Ten-Year Plan	NGS Strategic Plan
17	NOAA Hydrographic Survey Priorities	NOAA Technical Document
18	Hydrographic Major Project Key Decision Point 1: Needs Identification and Def	NEP Decision Briefing
19	Accuracy of OPUS solutions for 1- to 4-h observing sessions	Journal Article
20	Observational Specifications for Center for Operational Oceanographic Products and Services Operational Programs	NOS Specification
21	Topographic Manual, Part II, Photogrammetry	Technical Manual
SME	Memo from Subject Matter Experts	SME Memo

**Appendix B.2 Validation Documents Mapping to Observation Requirements**

Marine Transportation Systems Program and 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 B-2 below. For occurrences where validation documents could not be identified, Program Subject Matter Experts (SME) justifications are provided.

**Table B-2: Validation Document Mapping to Observation Requirement**

<b>Observation Requirement</b>	<b>Priority</b>	<b>Document[s] Submitted</b>
Absorbed Shortwave Radiation: Surface/ Hemispheric Heat Flux, Global	1	1
Absorbed Shortwave Radiation: Surface/ Hemispheric Heat Flux, Regional	1	1
Air Gap (Bridge Clearance)	1	2, 20
Geomagnetic Field	1	3, 4, SME
Hydrography	1	5, 17, 18 SME
Ice Origin, Global	1	1
Ice Origin, Local	1	1
Ice Origin, Regional	1	1
Incoming Shortwave Radiation: Surface	1	1
Lake Ice: Thickness, Global	1	6, 7, SME
Lake Ice: Thickness, Local	1	1, 6, 7
Lake Ice: Thickness, Regional	1	1, 6, 7
Ocean Currents: Direction, Profiles	1	5, SME
Ocean Currents: Direction, Surface	1	5, SME
Ocean Currents: Speed, Profiles	1	5, SME
Ocean Currents: Speed, Surface	1	5, SME
Precise GPS Orbital Parameters	1	19, SME
Sea Ice: Concentration, Global	1	1, 6, 7
Sea Ice: Concentration, Local	1	1, 6, 7
Sea Ice: Concentration, Regional	1	1, 6, 7
Sea Ice: Edge, Global	1	1, 6
Sea Ice: Extent, Local	1	1, 7
Sea Ice: Extent, Regional	1	1, 7
Sea Ice: Motion, Global	1	1
Sea Ice: Motion, Local	1	1
Sea Ice: Motion, Regional	1	1
Sea Ice: Temperature, Global	1	1, 10
Sea Ice: Temperature, Local	1	1, 10
Sea Ice: Temperature, Regional	1	1, 10
Sea Ice: Thickness, Global	1	1
Sea Ice: Thickness, Local	1	1
Sea Ice: Thickness, Regional	1	1
Sea Surface Temps, Global	1	1, 10
Sea Surface Temps, Local (Ice products)	1	1, 10
Sea Surface Temps, Local (Navigation)	1	1, 5, 11

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<b>Observation Requirement</b>	<b>Priority</b>	<b>Document[s] Submitted</b>
Sea Surface Temps, Regional	1	1, 10
Sea Surface Winds: Direction, Coastal (Ice products)	1	1, 10
Sea Surface Winds: Direction, Coastal (Navigation)	1	5, 11, SME
Sea Surface Winds: Speed, Coastal (Ice products)	1	1, 10
Sea Surface Winds: Speed, Coastal (Navigation)	1	5, 11, SME
Shoreline Mapping: Remote Sensing	1	12, 16, 21
Water Level	1	5, 8, 13, 14, SME
Water Level: Hydrography	1	5, 9, 15

**Appendix B.3 Validation Assessment for Priority-1 Requirements**

Marine Transportation Systems Program and TPIO representatives worked jointly to review the submitted documentation and identify the “level of validation” for the threshold value of each of the five key attributes of each Priority-1 Observation Requirement.

**Table B-3: Level of Validation for each Priority 1 Requirement Attribute**

Parameters	Attribute Validated				
	Geo Cov	Vert Res	Horiz Res	MeaAcc	Freq
Absorbed Shortwave Radiation: Surface/ Hemi Heat Flux, Global	Global	na	20 km	10 W/m <sup>2</sup>	12 hr
Absorbed Shortwave Radiation: Surface/ Hemi Heat Flux, Regional	CONUS	na	20 km	10 W/m <sup>2</sup>	12 hr
Air Gap (Bridge Clearance)	Coastal US	na	na	0.03 m	6 min
Geomagnetic Field	Global	na	1 km	5 nT/axis	5 sec
Hydrography	Coastal US	na	2 m	0.5 m	50 yr
Ice Origin, Global	Global	na	0.5 km	10 %	6 hr
Ice Origin, Local	CONUS	na	0.05 km	10 %	3 hr
Ice Origin, Regional	EEZ US	na	0.25 km	10 %	3 hr
Incoming Shortwave Radiation: Surface	Global	na	20 km	10 W/m <sup>2</sup>	12 hr
Lake Ice: Thickness, Global	Global Land	na	500 m	30 cm	6 hr
Lake Ice: Thickness, Local	CONUS	na	50 m	30 cm	3 hr
Lake Ice: Thickness, Regional	Great Lakes	na	250 m	30 cm	3 hr
Ocean Currents: Direction, Profiles	Coastal US	1 m	na	5 deg	6 min
Ocean Currents: Direction, Surface	Coastal US	na	na	5 deg	1 hr
Ocean Currents: Speed, Profiles	Coastal US	1 m	na	4 cm/sec	6 min
Ocean Currents: Speed, Surface	Coastal US	na	na	4 cm/sec	1 hr
Precise GPS Orbital Parameters	Global	na	na	2 cm	30 sec
Sea Ice: Concentration, Global	Global Ocean	na	10 km	10 %	6 hr
Sea Ice: Concentration, Local	EEZ US	na	0.03 km	10 %	3 hr
Sea Ice: Concentration, Regional	EEZ US	na	3 km	10 %	3 hr
Sea Ice: Edge, Global	Global Ocean	na	0.5 km	10 %	6 hr
Sea Ice: Extent, Local	EEZ US	na	0.05 km	10 %	3 hr
Sea Ice: Extent, Regional	EEZ US	na	0.25 km	10 %	3 hr
Sea Ice: Motion, Global	Global Ocean	na	15 km	15 deg	6 hr
Sea Ice: Motion, Local	EEZ US	na	1 km	15 deg	3 hr
Sea Ice: Motion, Regional	EEZ US	na	5 km	15 deg	3 hr
Sea Ice: Temperature, Global	Global Ocean	na	0.5 km	0.5 K	6 hr
Sea Ice: Temperature, Local	EEZ US	na	0.05 km	0.5 K	3 hr
Sea Ice: Temperature, Regional	EEZ US	na	0.25 km	0.5 K	3 hr
Sea Ice: Thickness, Global	Global Ocean	na	0.5 km	30 cm	6 hr
Sea Ice: Thickness, Local	EEZ US	na	0.05 km	30 cm	3 hr
Sea Ice: Thickness, Regional	EEZ US	na	0.25 km	30 cm	3 hr
Sea Surface Temps, Global	Global Ocean	na	0.5 km	0.5 K	6 hr

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Parameters	Attribute Validated				
	Geo Cov	Vert Res	Horiz Res	MeaAcc	Freq
Sea Surface Temps, Local (Ice products)	EEZ US	na	0.05 km	0.5 K	3 hr
Sea Surface Temps, Local (Navigation)	EEZ US	na	0.05 km	0.5 K	3 hr
Sea Surface Temps, Regional	EEZ US	na	0.25 km	0.5 K	3 hr
Sea Surface Winds: Dir, Coastal (Ice prod)	Coastal US	na	5.0 km	10 %	3 hr
Sea Surface Winds: Dir, Coastal (Nav)	Coastal US	na	90 km	5 drg	6 min
Sea Surface Winds: Speed, Coastal (Ice prod)	Coastal US	na	5.0 km	10 %	3 hr
Sea Surface Winds: Speed, Coastal (Nav)	Coastal US	na	90 km	0.3 m/sec	6 min
Shoreline Mapping	Coastal US	na	2 m	5 m	20 yr
Water Level	Coastal US	na	90 km	0.02 m	6 min
Water Level: Hydrography	Coastal US	na	na	0.02 m	6 min

**Table B-4: Key: Basis of Support**

Direct Validation Documentation Submitted	
Associated Validation Documentation Submitted	
SME Consensus Validation Documentation Submitted	
Questions on Validation	
Attribute not applicable	