

Consolidated Observation Requirements List (CORL)

NOAA Program Observation Requirements Document (PORD)

**FINAL for Program Verification
Version 1.0**

FY 2010

Commerce and Transportation Goal

**Surface Weather Program
(CT-SFX)**

January 10, 2012¹

¹ PORD Document Date reflects date for publication of this [FINAL with Requirements Validation]
CORL Data was downloaded at [1/10/2012 1:12:21 PM]

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Signatures

Observation Requirement Validation

NOSC Endorsement

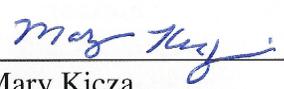
The NOSC has received the Surface Weather Program's Observation Requirements with Goal Lead and Line Office concurrence, and is satisfied with the Level-of-Validation provided for the Priority-1 Requirements.



Dr. Kathryn Sullivan
Chair, NOSC

2/6/12
Date

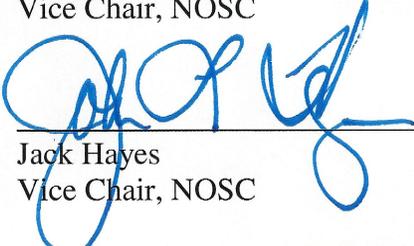
✓
Endorsed



Mary Kicza
Vice Chair, NOSC

2/6/12
Date

✓
Endorsed



Jack Hayes
Vice Chair, NOSC

2/7/12
Date

✓
Endorsed

Goal Lead and Line Office Concurrence

The Program Manager's Supervisor and Surface Weather Program's Goal Team Lead concur with the Observation Requirements and are satisfied with the Level-of-Validation provided for the Priority-1 Requirements.



David Caldwell
Director
NWS Office of Climate, Water and Weather Services

1/19/12
Date

✓
Validated



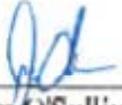
Donald Berchhoff
Director
NWS Office of Science & Technology
NWS Representative, NOSC

16 JAN 2012
Date

✓
Validated

Program Manager Validation

The Surface Weather Program Manager has validated the Priority-1 Observation Requirements by providing the Documentation listed in Appendix B as evidence of a substantiated basis for each of the five key attributes of those requirements.



Jim O'Sullivan
Program Manager, Surface Weather Program

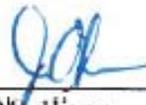
1/17/2012
Date

✓
Validated

Observation Requirement Verification

The Program Manager, with Program Membership concurrence, has verified that the Surface Weather Program's Observation Requirements, as documented in the CORL and reproduced in this document, comprise the Surface Weather Program's Threshold and Objective level requirements for environmental observations, and are ready for Validation.

Program Manager Verification



Jim O'Sullivan
Program Manager, Surface Weather Program

1/17/2012
Date

✓
Verified

Program Membership Concurrence



Andrew Stern

1/17/12
Date

✓
Concurred



Kevin Schrab

1/17/12
Date

✓
Concurred

1. Program Summary

NOAA's Surface Weather Program applies multi-disciplinary expertise in monitoring, predicting, and geo-spatial positioning to reduce the 7,400 deaths, 700,000 injuries, 1.5 million crashes and \$42 billion in economic loss annually attributed to adverse road weather conditions.

Representing the needs of all surface transportation sectors, i.e., roadways, rail, transit and pipeline operations, the Program currently focuses on monitoring, analyzing, characterizing and predicting weather zero to two meters above the ground and in the zero- to three-hour time frame. Outreach to internal and external customers is a focus of the Surface Weather Program and a key component to educating the surface transportation enterprise on relevant data and information facilitated by the Program. The Surface Weather Program also leverages efforts and results from two Department of Transportation (DOT) initiatives, the *Clarus* Initiative and the Connected Vehicle Initiative. *Clarus* is a proof of concept and demonstration activity to validate the utility of road weather data and information. The Connected Vehicle Initiative, via a government/research/automobile manufacturer partnership, is focused on the development and use of environmental data derived from vehicle-borne sensors. The key gaps in the Surface Weather Program are: obtaining, integrating and utilizing relevant observations; increasing the spatial and temporal resolution of short-term predictions; and establishing a mobile vehicle sensor network akin to those in the Aviation Weather and Marine Weather Programs. To address these gaps, the Surface Weather Program leverages existing NOAA efforts and interagency cooperation to provide and demonstrate local, regional and, ultimately, national-level environmental support for the surface transportation system. Existing NOAA efforts include: environmental modeling improvements; GPS-based height modernization efforts to alert law enforcement and emergency managers of safe evacuation routes; and short-term warning and forecast technique enhancements. Interagency cooperation is exemplified by a formal partnership with DOT's Federal Highway Administration (FHWA) that results in alignment of performance measures and road weather data management research with NOAA's and DOC's Strategic Goals 1 and 3 (Maximize U.S. competitiveness and enable economic growth for American industries, workers, and consumers, and Promote environmental stewardship, respectively). Additionally, FHWA and other affiliated DOT proof of concept and demonstration activities provide relevant customer interaction and requirements validation for the Program.

2. Observation Requirements Summary

The **Surface Weather** Program of NOAA's Commerce and Transportation Goal requires a total of 29 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: 29

2.1 Observation Requirements by Priority

The Surface Weather program's observation requirements are distributed among priority levels as follows:

13 = **Priority 1, Mission Critical:** Cannot meet operational mission objectives without this data.

16 = **Priority 2, Mission Optimal:** Data not critical but would provide significant improvement to operational capability.

0 = **Priority 3, Mission Enhancing:** Needed to enhance state of knowledge / assess potential for operational capability.

The following chart provides the distribution of the Surface Weather program's requirements by priority.

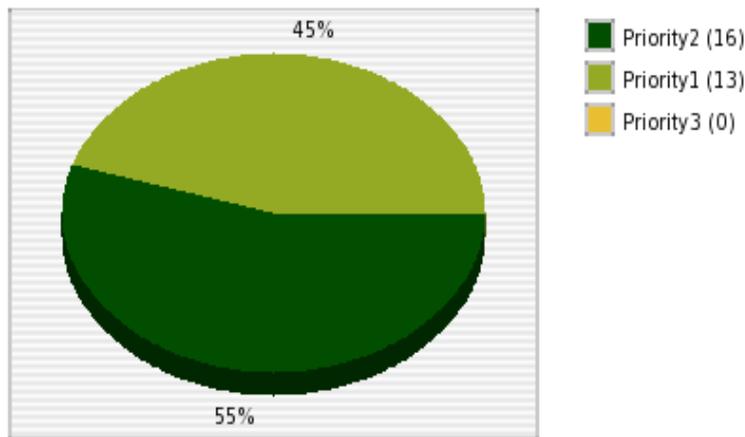


Figure 1: CT-SFX Observation Requirements by Priority (%)

2.2 Observation Requirements by Discipline

The Surface Weather program's observation requirements are distributed among environmental disciplines as follows:

21 = Atmosphere

0 = Biosphere

1 = Cryosphere

0 = Human Dimensions

1 = Terrestrial Hydrosphere

2 = Land Surface

1 = Oceans

0 = Solid Earth

3 = Spectral/Engineering

0 = Sun-earth Interactions

The following chart provides the distribution of the Surface Weather program's requirements by discipline.

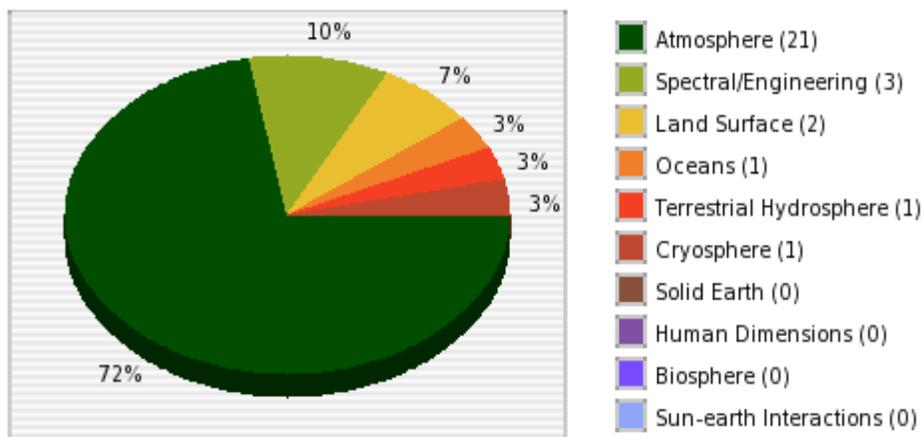


Figure 2: CT-SFX Observation Requirements by Discipline.

2.3 Observation Requirements by Type

The Surface Weather program's observation requirements are distributed among types as follows:

0 = Biological

1 = Chemical

28 = Physical

0 = Social

0 = Socio-economic

0 = Other

The following Chart gives the distribution of the Surface Weather program's requirements by type.

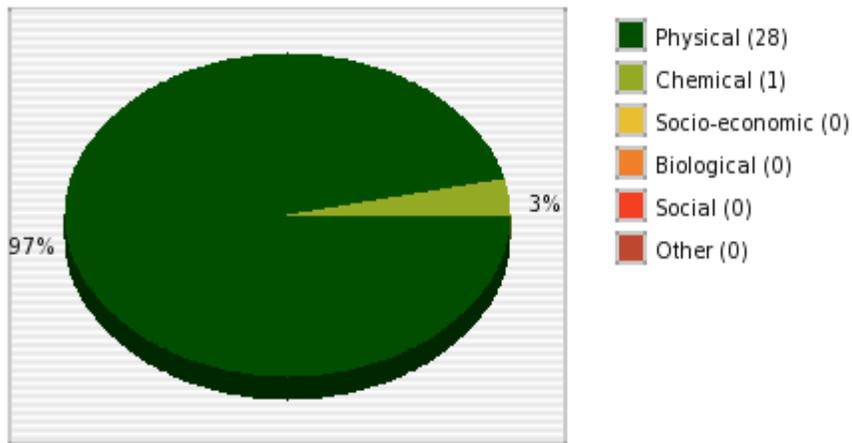


Figure 3: CT-SFX Observation Requirements by Type.

3. Observation Requirements Mapping to Performance Measures

Section to be completed in future version of the CT-SFX PORD.

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 Surface Weather Program. All attributes at the Priority-1/Threshold Level must be completed to allow for observation gap analyses to be conducted.

Table 1: CT-SFX Observation Requirement Attributes Remaining [blank] or [tbs]

Priority	Key Threshold Attributes	Other Threshold Attributes
1	0	na
2	0	na
3	0	na
Total	0	na

Note: The five key attributes are: Geographic Coverage, Vertical Resolution, Horizontal Resolution, Measurement Accuracy, and Sampling Interval. The other attributes, not included in this PORD, are: Vertical Range, Measurement Range, Data Latency, Long-term Stability, and Operational Days At Sea/Flight Hours.

NOAA Program Observation Requirements Document (PORD)

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(CT-SFX)

Jan. 19, 2012

Appendix A Surface Weather Program, Observation Requirements

Observation Requirement	Observation Requirement Priority	Threshold/Objective	Geographic Coverage		Vertical Resolution			Horizontal Resolution			Measurement Accuracy			Sampling Interval		
			V	W	V	U	W	V	U	W	V	U	W	V	U	W
Air Pressure: Surface	1	T	CONUS+AK+HI+US Territories	25	na	na	0	25	km	25	0.1	hPa	40	1	min	10
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Air Temperature: Surface	1	T	CONUS+AK+HI+US Territories	25	na	na	0	25	km	25	0.1	K	40	1	min	10
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Blowing Sand/Blowing Dust	1	T	CONUS+AK+HI+US Territories	25	na	na	0	2.5	km	50	na	na	0	5	min	25
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Dew Point Temperature: Profiles	1	T	CONUS+AK+HI+US Territories	20	100	m	0	100	km	10	0.5	K	65	5	min	5
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Dew Point Temperature: Surface	1	T	CONUS+AK+HI+US Territories	25	na	na	0	25	km	25	0.1	K	40	1	min	10
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Precipitation Amount	1	T	CONUS+AK+HI+US Territories	20	na	na	0	2.5	km	30	0.5	mm	40	1	min	10
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Precipitation Rate	1	T	CONUS+AK+HI+US Territories	15	100	m	10	2.5	km	25	0.1	in/hr	40	1	min	10
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Precipitation Type	1	T	CONUS+AK+HI+US Territories	25	na	na	0	25	km	25	PT	PT	40	1	min	10
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Roadway Temperature: Sub-surface	1	T	CONUS+AK+HI+US Territories	20	na	na	0	100	km	20	0.2	K	50	10	min	10
		O	Hemi US		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Roadway Temperature: Surface	1	T	CONUS+AK+HI+US Territories	20	na	na	0	30	km	20	0.2	K	50	10	min	10
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Visibility	1	T	CONUS+AK+HI+US Territories	20	na	na	0	400	m	30	100	m	30	1	min	20
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Wind Direction: Profiles	1	T	CONUS+AK+HI+US Territories	20	100	m	15	100	km	10	1	deg	35	5	min	20
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Wind Speed: Profiles	1	T	CONUS+AK+HI+US Territories	20	100	m	15	100	km	10	0.5	m/sec	35	5	min	20
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	

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Observation Requirement	Observation Requirement Priority	Threshold/Objective	Geographic Coverage		Vertical Resolution			Horizontal Resolution			Measurement Accuracy			Sampling Interval		
			V	W	V	U	W	V	U	W	V	U	W	V	U	W
Air Temperature: Boundary Layer	2	T	CONUS+AK+HI+US Territories		100	m		100	m		0.5	K		1	min	
		O	Hemi US		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Air Temperature: Profiles	2	T	CONUS+AK+HI+US Territories		100	m		100	km		0.5	K		5	min	
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Dew Point Temperature: Boundary Layer	2	T	CONUS+AK+HI+US Territories		100	m		100	m		0.5	K		1	min	
		O	Global		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Imagery: Infrared	2	T	CONUS+AK+HI+US Territories		na	na		2	km		1	km		5	min	
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Imagery: Microwave	2	T	CONUS+AK+HI+US Territories		na	na		10	km		5	km		1	hr	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Imagery: Visible	2	T	CONUS+AK+HI+US Territories		na	na		1	km		0.5	km		5	min	
		O	CONUS+AK+HI+US Territories		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Lightning Detection	2	T	CONUS+AK+HI+US Territories		na	na		0.5	km		0.5	km		0.001	sec	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Precipitable Water: Total	2	T	CONUS+AK+HI+US Territories		na	na	0	100	km		0.1	mm		10	min	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Sea Surface Height	2	T	CONUS+AK+HI+US EEZ		na	na		25	km		15	cm		1	day	
		O	CONUS+AK+HI+US EEZ		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Snow Depth	2	T	CONUS+AK+HI+US Territories		na	na		5	km		1	cm		1	hr	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Total Water Level	2	T	CONUS+AK+HI+US EEZ		na	na		10	km		1	cm		1	hr	
		O	CONUS+AK+HI+US EEZ		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Water Vapor: Imagery	2	T	CONUS+AK+HI+US Territories		na	na		2	km		1	km		5	min	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	
Wind Direction: Gust, Near-Surface	2	T	CONUS+AK+HI+US Territories		na	na		2.5	km		1	deg		1	min	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	

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Observation Requirement	Observation Requirement Priority	Threshold/Objective	Geographic Coverage		Vertical Resolution			Horizontal Resolution			Measurement Accuracy			Sampling Interval		
			V	W	V	U	W	V	U	W	V	U	W	V	U	W
Wind Profiles: Direction, Boundary Layer	2	T	CONUS+AK+HI+US Territories		100	m		100	m		1	deg		30	sec	
		O	CONUS+AK+HI+US Territories		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Wind Profiles: Speed, Boundary Layer	2	T	CONUS+AK+HI+US Territories		100	m		100	m		0.5	m/sec		30	sec	
		O	CONUS+AK+HI+US Territories		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Wind Speed: Gust, Near-Surface	2	T	CONUS+AK+HI+US Territories		na	na		25	km		0.5	m/sec		1	min	
		O	Global		na	na		tbs	tbs		tbs	tbs		tbs	tbs	

Table Key and Definitions:

Column Titles: V=value, U=units, W=weight

Table Entries: na=not applicable, tbs=to be supplied, PT=Precipitation Type (e.g., rain, freezing rain, sleet, snow, hail)

Observation Requirements Modifiers:

Profile: An observation that shows the variation of a meteorological parameter with height.

Surface: Typically refers to an observation at standard measuring levels above a surface, such as 2m for temperature and 10m for winds.

PT: Precipitation Type

Appendix B CT-SFX, Priority-1 Requirements Validation

Appendix B.1 Validation Documents Submitted

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

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

Doc #	Validation Document Title	Document Type
1	A Phenomenological Approach to the Specification of Observational Requirements, 02 June 2005	Peer-reviewed Journal Article
2	An OSSE Framework Based on the Ensemble Square Root Kalman Filter for Evaluating the Impact of Data from Radar Networks on Thunderstorm Analysis and Forecasting	Peer-reviewed Journal Article
3	Automated Surface Observing System (ASOS) User's Guide - March 1998	System Users' Guide
4	FEDERAL METEOROLOGICAL HANDBOOK No. 1 - Surface Weather Observations and Reports	US Met Federal Handbook
5	FEDERAL METEOROLOGICAL HANDBOOK NO. 11 - DOPPLER RADAR METEOROLOGICAL OBSERVATIONS, PART C, WSR-88D PRODUCTS AND ALGORITHMS, April 2006	US Met Federal Handbook
6	Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8	WMO Guide
7	Mobile Doppler Radar Observations of a Tornado in a Supercell near Bassett, Nebraska, on 5 June 1999. Part I: Tornadogenesis (OSSE)	Peer-reviewed Journal Article
8	MULTIFUNCTIONAL MESOSCALE OBSERVING NETWORKS, BAMS, July 2005	Peer-reviewed Journal Article
9	NATIONAL WEATHER SERVICE INSTRUCTION, NWSI 10-1301, Feb 2010, Aviation & Synoptic Observations	NWS Instruction
10	NATIONAL WEATHER SERVICE MANUAL 10-507, November 2009: PUBLIC GEOGRAPHIC AREAS OF RESPONSIBILITY	NWS Manual
11	Observing Weather and Climate FROM THE GROUND UP, A Nationwide Network of Networks, National Research Council, The National Academies Press	NRC Technical Document
12	SURFACE WEATHER OBSERVING (DOT/FAA) - May 11, 2001	DOT/FAA Instruction
13	Toward a New National Weather Service - Assessment of NEXRAD Coverage and Associated Weather Services	NRC Report
14	Subject Matter Expert (SME) Statement	SME Statement
15	Analysis of Environmental Sensor Station Deployment Alternatives: Final Report, North Dakota Department of Transportation, Nov 2009	ND DOT Technical Report
16	IRS31-UMB – Intelligent Road Sensor	System Guide

Appendix B.2 Validation Documents Mapping to Observation Requirements

Surface Weather 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 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

Observation Requirement	Documents Submitted
Air Pressure: Surface	3, 6, 8, 10
Air Temperature: Surface	3, 4, 8, 10
Blowing Sand/Blowing Dust	10, 14
Dew Point Temperature: Profiles	1,2,10, 11
Dew Point Temperature: Surface	3, 4, 8, 10
Precipitation Amount	3, 9, 10, 11
Precipitation Rate	2, 3, 5, 10
Precipitation Type	3, 10, 8
Roadway Temperature: Sub-surface	10, 14, 15, 16
Roadway Temperature: Surface	10, 14, 15, 16
Visibility	3, 9, 10, 12
Wind Direction: Profiles	1, 3, 7, 10
Wind Speed: Profiles	1, 3, 7, 10

Appendix B.3 Validation Assessment for Priority-1 Requirements

Surface Weather 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				
	Geographic Coverage	Vertical Resolution	Horizontal Resolution	Measurement Accuracy	Sampling Interval
Air Pressure: Surface	CONUS+AK+HI+US Territories	na	25 km	0.1 hPa	1 min
Air Temperature: Surface	CONUS+AK+HI+US Territories	na	25 km	0.1 K	1 min
Blowing Sand/Blowing Dust	CONUS+AK+HI+US Territories	na	2.5 km	na	5 min
Dew Point Temperature: Profiles	CONUS+AK+HI+US Territories	100 m	100 km	0.5 K	5 min
Dew Point Temperature: Surface	CONUS+AK+HI+US Territories	na	25 km	0.1 K	1 min
Precipitation Amount	CONUS+AK+HI+US Territories	na	2.5 km	0.5 mm	1 min
Precipitation Rate	CONUS+AK+HI+US Territories	100 m	2.5 km	0.1 in/hr	1 min
Precipitation Type	CONUS+AK+HI+US Territories	na	25 km	PT	1 min
Roadway Temperature: Sub-surface	CONUS+AK+HI+US Territories	na	100 km	0.2 K	10 min
Roadway Temperature: Surface	CONUS+AK+HI+US Territories	na	30 km	0.2 K	10 min
Visibility	CONUS+AK+HI+US Territories	na	400 m	100 m	1 min
Wind Direction: Profiles	CONUS+AK+HI+US Territories	100 m	100 km	1 deg	5 min
Wind Speed: Profiles	CONUS+AK+HI+US Territories	100 m	100 km	0.5 m/sec	5 min

Legend: Level of Validation

Direct Validation Documentation Submitted	
Associated Validation Documentation Submitted	
SME Consensus Validation Documentation Submitted	
Not Validated	
Attribute not applicable	

Appendix C Program Acronym List

Acronym	Definition
CL-COM_Atmos	Climate - Observations and Monitoring, Atmosphere Sub-Program
CL-COM_CF	Climate - Observations and Monitoring, Climate Forcing Sub-Program
CL-COM_Land	Climate - Observations and Monitoring, Land Sub-Program
CL-COM_Oceans	Climate - Observations and Monitoring, Ocean Sub-Program
CL-CRM	Climate - Research & Modeling
CT-AWX	Commerce and Transportation - Aviation Weather
CT-GEO	Commerce and Transportation - Geodesy
CT-MTS	Commerce and Transportation - Marine Transportation Systems
CT-MWX	Commerce and Transportation - Marine Weather
CT-SFX	Commerce and Transportation - Surface Weather
EC-AQC	Ecosystem - Aquaculture
EC-CMR	Ecosystem - Coastal Marine Resources
EC-COR	Ecosystem - Corals
EC-EAP	Ecosystem - Ecosystems Assessment Program
EC-ERP	Ecosystem - Ecosystem Research
EC-HAB	Ecosystem - Habitat
EM-EMC	Environmental Modeling - Environmental Modeling Center
MS-IOS	Mission Support - Integrated Ocean Observing System
MS-TRP	Mission Support - Technical Requirements, Planning and Integration
WW-AQL	Weather and Water - Air Quality
WW-CEO	Weather and Water - Coasts, Estuaries and Oceans (CEO)
WW-IWF	Weather and Water – Integrated Water Forecasting
WW-LFW/WFO-SPC	Weather and Water - Local Forecasts and Warnings, Weather Forecast Office/Storm Prediction Center Sub-Program
WW-LFW/NHC	Weather and Water - Local Forecasts and Warnings, National Hurricane Center Sub-Program
WW-SWX	Weather and Water - Space Weather
WW-WWS	Weather and Water - W&W Science & Technology Infusion
WW-WWS_HURR	Weather and Water - W&W Science & Technology Infusion, Hurricanes Sub-Program
WW-WWS_OCW	Weather and Water - W&W Science & Technology Infusion, Ocean & Coastal Weather Sub-Program
WW-WWS_SEV	Weather and Water - W&W Science & Technology Infusion, Severe Weather Sub-Program
WW-WWS_WR	Weather and Water - W&W Science & Technology Infusion, Water Resources Sub-Program

Appendix D PORD Table Column Definitions

[Note: In PORA tables "V" = attribute value, "U" = attribute units, "W" = attribute weight]

Attribute Weight: Attribute weight: relative weight of each of the basic attributes, a value from 1 to 100, with the most important of the attributes given the highest relative value. All weights across a requirement row should add up to 100.

Observational Requirement Title	Geographic Coverage Weight	Vertical Resolution Weight	Horizontal Resolution Weight	Measurement Accuracy Weight	Sampling Interval Weight	Number of ODS/Flt Hrs/HODs Weight*
Air Temperature: Surface	50	0	10	30	10	0
Land Cover	0	0	30	50	20	0
Water Vapor: Profiles	20	30	10	30	10	0
At Sea Data Collection	20	10	10	10	10	40
Airborne Data Collection	30	10	10	10	10	30

*Only for Program that have At Sea Data Collection, Flight Hours, or Human Observer Observation Requirements

Data Latency (Data Ltncy): Elapsed time from data acquisition until delivery of data to the user. Latest time by which an element can be delivered and still be useful to the customer.

Data Latency Units: Measurement units for data latency of the element.

Use:

- "sec" for 1-59 seconds
- "min" for 1-59 mins
- "hr" for 1-23 hours
- "day" for 1-6 days
- "wk" for 1-3 wks
- Etc.

Data Latency Weight: See "Attribute Weights."

Geographic Coverage (Geo Cov): Geographic coverage categories can be defined as needed for the Program. See separate list of Geo Cov category definitions.

Geographic Coverage Weight: See "Attribute Weights."

GPRA: Government Performance and Results Act

Horizontal Resolution (Horiz Res): The smallest horizontal increment needed of the data. Spatial granularity in the horizontal with which information and data are required.

Horizontal Resolution Units: Measurement units for horizontal resolution of the element. Use:

- "km" for kilometers
- "m" for meters
- Etc.

Horizontal Resolution Weight: See "Attribute Weights."

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Sampling Interval (Smplng Intvl): Average time interval between consecutive measurements of the same area of the environment.

Sampling Interval Units: Measurement units for sampling interval of the element. For example: Use:
"sec" for 1-59 seconds
"min" for 1-59 mins
"hr" for 1-23 hours
"day" for 1-6 days
"wk" for 1-3 wks
Etc.

Sampling Interval Weight: See "Attribute Weights."

Threshold (T)/Objective (O): Threshold is the minimum acceptable specification. Objective is the optimal specification that, if met, would significantly enhance meeting the mission.

T/O: Threshold/Objective. See definitions above.

Type: Observation requirement type

- "B" = Biological
- "C" = Chemical
- "P" = Physical
- "S" = Socio-economic
- "E" = Economic

Vertical Range (Vert Range) Low: Lowest value of vertical range of parameter, within which the parameters must be measurable or reportable (e.g., for temperature profile with vertical range of surface to 15 kilometers enter 0)"

Vertical Range High: Highest value of vertical range of parameter, within which the parameters must be measurable or reportable (e.g., for temperature profile with vertical range of surface to 15 kilometers enter 15)"

Vertical Range Units: Measurement units for vertical resolution of the element.

Use:

- "km" for kilometers
- "m" for meters
- "hPa" for hectopascal
- Etc.

Vertical Range Weight: See "Attribute Weights."

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Geographic Coverage Table

CORL Geographic Coverage Category*	Definition*
Arctic	TBD; definition to be added by NOS and TPIO agreement
Coastal Global	The coast is defined as the part of the land adjoining or near the ocean. Coastal is a few km either side of water/land boundary. Includes both littoral and sub littoral (http://en.wikipedia.org/wiki/Littoral_zone).
Coastal US	The coast is defined as the part of the land adjoining or near the ocean.
CONUS	Contiguous U.S. rectangle, 3000 km N/S by approx 5000 km E/W.
CONUS+AK+HI	Contiguous U.S. rectangle, 3000 km N/S by approx 5000 km E/W. Plus Alaska and Hawaii.
CONUS+AK+HI+US EEZ	Contiguous U.S. rectangle, 3000 km N/S by approx 5000 km E/W. Plus Alaska, Hawaii and US Exclusive Economic Zone (see below for definition of EEZ.)
CONUS+AK+HI+US Territories	Contiguous U.S. rectangle, 3000 km N/S by approx 5000 km E/W. Plus Alaska, Hawaii, US EEZ and US Territories (Palmyra Atoll, U.S. coastal waters out to 12 nautical miles, U.S. flag vessels at sea, Guam, Northern Mariana Islands (commonwealth), Puerto Rico (commonwealth), United States Virgin Islands, American Samoa, Wake Island, Midway Islands, Johnston Atoll, Baker Island, Howland Island, Jarvis Island, Kingman Reef, Bajo Nuevo Bank, Serranilla Bank, Navassa Island)
EEZ Global	Under the law of the sea, an Exclusive Economic Zone (EEZ) is a sea zone over which a state has special rights over the exploration and use of marine resources. Generally a state's EEZ extends to a distance of 200 nautical miles (370 km) out from its coast. The exception to this rule occurs when EEZs would overlap; that is, state coastal baselines are less than 400 nautical miles apart. When an overlap occurs, it is up to the states to delineate the actual boundary. Generally, any point within an overlapping area defaults to the most proximate state. States also have rights to the seabed of the continental shelf up to 350 nautical miles from the coast, where this extends beyond the EEZ, but this does not form part of their EEZ.
EEZ US	The Exclusive Economic Zone starts at the coastal baseline and extends 200 nautical miles out into the sea, perpendicular to the baseline. Thus, the EEZ overlaps both the contiguous zone and US territorial waters.
Equatorial EEZ	The Equatorial EEZ starts at the coast of all states/countries within the equatorial regions of the world (limited in latitude by the Tropic of Cancer in the northern hemisphere at approximately 23°26' (23.4°) N latitude and the Tropic of Capricorn in the southern hemisphere at 23°26' (23.4°) S latitude) and extends 200 nautical miles (370 kilometers) out into the sea, perpendicular to the baseline.
Equatorial Ocean	Seated in the equatorial regions of the world, limited in latitude by the Tropic of Cancer in the northern hemisphere at approximately 23°26' (23.4°) N latitude and the Tropic of Capricorn in the southern hemisphere at 23°26' (23.4°) S latitude
Global	Of, relating to, or involving the entire earth; worldwide. (http://www.thefreedictionary.com/global)
Global Land	The continents and islands that cover nearly 30% of the surface of the earth.
Global Ocean	The whole body of salt water that covers 71% of the surface of the earth.
Great Lakes	One of the eight NOAA identified ecosystem regions.
Gulf of Mexico	One of the eight NOAA identified ecosystem regions.
Hemi US	Hemispheric coverage centered on the US.
North America + US Territories	The United States, including AK, HI and U.S. Territories, plus Canada and Mexico
Pacific Island Complex	One of the eight NOAA identified ecosystem regions.

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CORL Geographic Coverage Category*	Definition*
Point Source	A single identifiable localized source; has negligible extent.
tbs	to be specified
TC/Marine/Surface Analysis AOR	Area of Responsibility for tropical cyclone and marine analysis, forecasting, and warning operations, and surface analysis responsibilities of the National Hurricane Center and Central Pacific Hurricane Center/WFO Honolulu. This includes the North Atlantic Ocean, Gulf of Mexico, Caribbean Sea and adjacent land areas; the Eastern and Central North Pacific Ocean and adjacent land areas; and portions of the Central and Eastern South Pacific Ocean.
Tropics (30N-30S)	Seated in the equatorial regions of the world, limited in latitude by 30N-30S
Other	Other geo cov category as defined by program. Program provides specific details/definition.
35 deg Pitch Angle	Pitch angle is the position angle between the geocentric north pole and the solar rotational north pole measured eastward from geocentric north.
3-axis orthogonal	3-axis orthogonal refers to 3 measurements made at 90 degrees to each other to define a vector
Greater than 30 deg N and S	The components of the geomagnetic field at the surface of the Earth. These elements are usually denoted thus in the literature: X-the geographic northward component; Y - the geographic eastward component However, in NOAA use, the geomagnetic northward and geomagnetic eastward components are called the H and D components. The H axis direction is defined by the mean direction of the horizontal component relative to the geomagnetic north by using the small-angle approximation. Thus the D component = H (the horizontal intensity) multiplied by delta D (the declination angle relative to geomagnetic north, expressed in radians).
Greater than 75 deg N Geomagnetic	The components of the geomagnetic field at the surface of the Earth. These elements are usually denoted thus in the literature: X-the geographic northward component; Y - the geographic eastward component However, in NOAA use, the geomagnetic northward and geomagnetic eastward components are called the H and D components. The H axis direction is defined by the mean direction of the horizontal component relative to the geomagnetic north by using the small-angle approximation. Thus the D component = H (the horizontal intensity) multiplied by delta D (the declination angle relative to geomagnetic north, expressed in radians).
Heliocentric	A location relative to the center of the sun, or in some cases, relative to the center of the observed solar disk.
L1 In-situ	An observation made at the solar Lagrange point, or libration point, between Earth and sun. At this position a satellite can remain between Earth and sun as Earth revolves about the sun. It is about 99 % of the distance from sun to Earth or 0.99 AU (astronomical units) from the Sun. The location is about 1.5 million km from Earth or about 230 Earth radii from Earth towards the sun.
LEO In-situ, Polar	A local observation made in low-Earth polar orbit