Technnology Planning and Integration Office (TPIO)

United States Department of Commerce
National Oceanic and Atmospheric Administration

NOAA Program Observation Requirements Document (PORD)

Consolidated Observation Requirements List (CORL)

NOAA Program Observation Requirements Document (PORD)

FINAL with Requirements Validation Version 1.1

FY 2009

Commerce and Transportation Goal

Aviation Weather Program (CT-AWX)

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Signatures

Observation Requirement Validation

NOSC Endorsement

The NOSC has received the Aviation 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.

Mary Kicza Co-Chair, NOSC	8-16-2010 Date	Endorsed
Jack Hayes Co-Chair, NOSC	08.16.2010 Date	✓ Endorsed

Goal Lead and Line Office Concurrence

The Program Manager's Supervisor and Aviation 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.

Gerd Glang Goal Lead, Commerce and Transportation Goal	28 JUN 2010 Date	GG Concurred
Donald Berchoff Director, Office of Science & Technology	16 APR 10 Date	DB Concurred

Program Manager Validation

The Aviation 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.

Cynthia Abelman Program Manager, Aviation Weather Program	15 April 2010 Date	✓ Validated

Observation Requirement Verification

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

Program Manager Verification

Cynthia Abelman Program Manager, Aviation Weather Program	3/24/2010 Date	✓ Verified

Program Membership Concurrence

Cecilia Miner	3/26/2010 Date	✓ Concurred

1. Program Summary

The Aviation Weather Program is focused on improving the accuracy, timeliness and consistency of aviation weather products and services to improve the safe and efficient flow of air traffic in the National Airspace System (NAS). Over the past decade, weather has contributed to 70% of air traffic delays, resulting in over $41B annual losses to the economy as a whole, $28B of which are related to weather. The FAA estimates nearly two thirds of these delays are preventable with better, more timely weather information, integrated into the tools used by NAS Air Traffic Managers.

The program supports the Federal Aviation Administration (FAA), International Civil Aviation Organization (ICAO), and the World Meteorological Organization (WMO), as well as the aviation industry and stakeholders. As outlined in the CT-AWX charter, there are several key legislative drivers contained within Title 49 USC. Because these drivers and mission requirements overlap with FAA, the Aviation Weather Program coordinates with FAA extensively. Several reimbursable agreements have been established to address roles and responsibilities of both agencies and to commit resources. In response to requirements of the international community and FAA, aviation weather products issued by NWS span the globe.

The program is comprised of FTEs from the Alaska Aviation Weather Unit (AAWU), Aviation Services Branch (ASB), the Office of Science and Technology, Aviation Weather Center (AWC), and the FAA reimbursed Center Weather Service Units (CWSUs). CT-AWX also funds one FTE in each regional headquarters, the Regional Aviation Meteorologist, whose responsibilities are shared with other service areas. Additionally, CT-AWX serves as the focal point for NOAA's role in the multi-agency Next Generation Air Transportation System (NextGen) and is the lead for NOAA's development of the Weather Information Database (WIDB). CT-AWX also manages the acquisition and implementation of aircraft-based water vapor sensors and a variety of product enhancements and training activities. All aviation weather projects support increasing and improving observation capabilities, improved forecast products and techniques, outreach and training, operational adaptation of applied research, and verification of forecast products.

2. Observation Requirements Summary

The **Aviation Weather** Program of NOAA's Commerce and Transportation Goal requires a total of 63 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: 63

2.1 Observation Requirements by Priority

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

55 = **Priority 1, Mission Critical:** Cannot meet operational mission objectives without this data.
4 = **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 Aviation Weather program's requirements by priority.

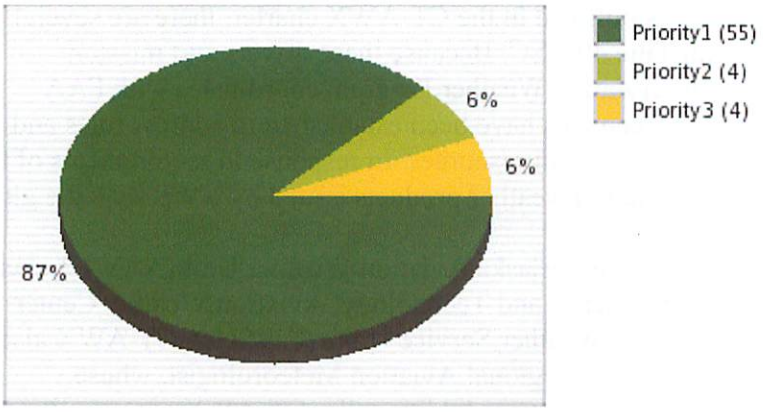

Figure 1: CT-AWX Observation Requirements by Priority (%)

2.2 Observation Requirements by Discipline

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

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

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

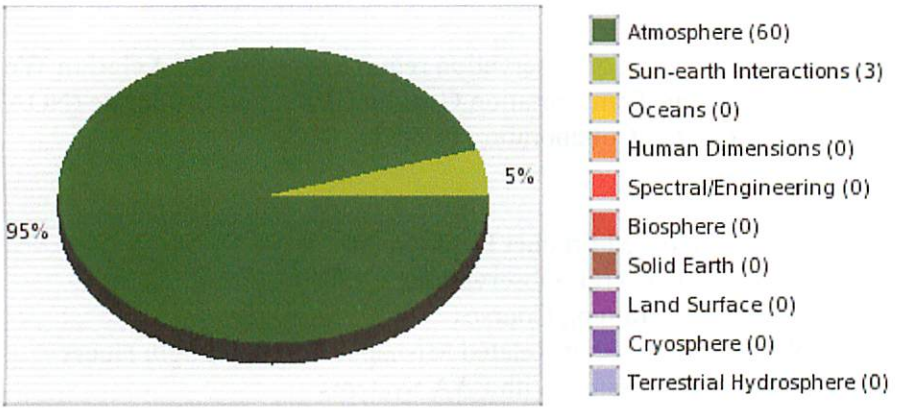

Figure 2: CT-AWX Observation Requirements by Discipline.

2.3 Observation Requirements by Type

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

0 = Biological
2 = Chemical
61 = Physical
0 = Social
0 = Socio-economic

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

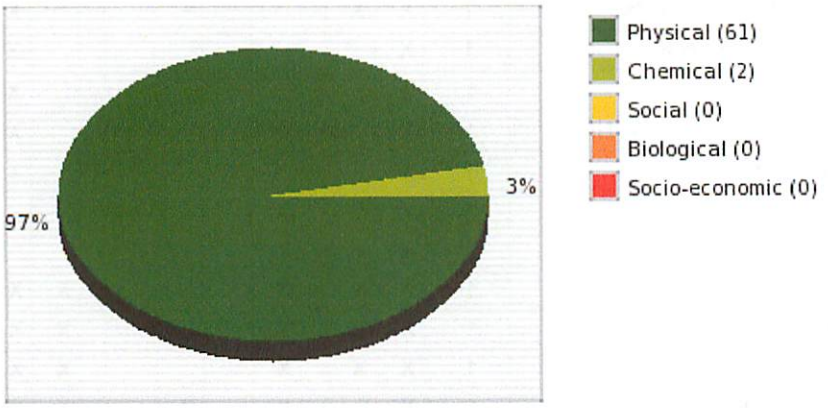

Figure 3: CT-AWX Observation Requirements by Type.

3. Observation Requirements Mapping to Performance Measures

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

NOAA-1: CT-AWX - New / Improved Product Deployment
NOAA-2: CT-AWX - Number of Aircraft Observations
NOAA-3: CT-AWX - Number of Training Courses
NOAA-4: CT-AWX - Number of Weather Related Mishaps / 100,000 Flight Hours
NOAA-5: CT-AWX - Products Integrated With FAA Systems
NOAA-6: CT-AWX - Satellite Observations
NOAA-7: CT-AWX - Terminal Aerodrome Forecasts
NOAA-8: CT-AWX - Trained Personnel
NOAA-9: CT-AWX - Weather Related Air Traffic Delays
NOAA-10: CT-AWX- Accuracy of Convective Forecasts

RC-1: Hazard Resilient Coastal Communities
RC-2: Integrated Ecosystem Assessments
RC-3: Integrated Water Resource Services

Table 1: CT-AWX Observation Requirements Mapping to Performance Measures

Requirement	Priority	NOAA										RC		
		1	2	3	4	5	6	7	8	9	10	1	2	3
Air Temperature: Boundary Layer CONUS + AK & HI	1	X					X							
Air Temperature: Boundary Layer Global	1	X	X								X			
Air Temperature: Boundary Layer Meso, Global Airports	1	X	X								X			
Air Temperature: Profiles CONUS + AK & HI	1	X					X							
Air Temperature: Profiles Global	1	X	X								X			
Air Temperature: Profiles Meso, Global Airports	1	X	X								X			
Air Temperature: Surface CONUS + AK & HI	1	X									X			
Air Temperature: Surface Global	1	X									X			
Atmospheric Pressure: Surface CONUS + AK & HI	1	X									X			
Atmospheric Pressure: Surface Global	1	X									X			
Cloud Amount: Boundary Layer	1	X			X									
Cloud Amount: Profiles	1	X			X									
Cloud Base Height: Boundary Layer	1	X	X		X					X	X			
Cloud Base Height: CONUS + AK & HI	1	X	X		X					X	X			
Cloud Base Height: Global	1	X	X		X					X	X			
Cloud Top Height: CONUS + AK & HI	1	X			X		X			X	X			
Cloud Top Height: Global	1	X			X		X			X	X			
Dewpoint Temperature: Boundary Layer CONUS + AK & HI	1	X			X					X	X			
Dewpoint Temperature: Boundary Layer Global	1	X			X					X	X			

Requirement	Priority	NOAA										RC		
		1	2	3	4	5	6	7	8	9	10	1	2	3
Dewpoint Temperature: Boundary Layer Meso, Global Airports	1	X			X					X	X			
Dewpoint Temperature: Profiles CONUS + AK & HI	1	X			X					X	X			
Dewpoint Temperature: Profiles Global	1	X			X					X	X			
Dewpoint Temperature: Profiles Meso, Global Airports	1	X			X					X	X			
Dewpoint Temperature: Surface CONUS + AK & HI	1	X			X					X	X			
Dewpoint Temperature: Surface Global	1	X			X					X	X			
Lightning	1	X			X					X	X			
Precipitation Rate CONUS + AK & HI	1	X			X	X	X			X	X			
Precipitation Rate Global	1	X			X	X	X			X	X			
Precipitation Type	1	X			X	X	X			X	X			
Turbulence	1	X	X		X	X				X				
Visibility: Runway Visual Range GT 400m - LE 800m, Meso, Global Airports	1	X			X	X		X		X	X			
Visibility: Runway Visual Range GT 800m, Meso, Global Airports	1	X			X	X		X		X	X			
Visibility: Runway Visual Range LE 400m, Meso, Global Airports	1	X			X	X				X	X			
Visibility: Surface GT 1600m, Meso, Global Airports	1	X			X	X		X			X			
Visibility: Surface GT 600m - LE 1600m, Meso, Global Airports	1	X				X								
Visibility: Surface LE 600m, Meso, Global Airports	1	X			X	X		X		X	X			
Volcanic Ash: Detection and Height	1	X			X	X	X			X				
Volcanic Ash: Detection and Horizontal Extent	1													
Wind Direction: Boundary Layer CONUS + AK & HI	1	X				X	X							
Wind Direction: Boundary Layer Global	1	X				X	X							
Wind Direction: Boundary Layer Meso Global Airports	1	X	X		X	X				X				
Wind Direction: Profiles CONUS + AK & HI	1	X				X	X							
Wind Direction: Profiles Global	1	X				X	X							
Wind Direction: Profiles Meso Global Airports	1	X	X		X	X				X				
Wind Direction: Surface Global	1	X				X	X							
Wind Direction: Surface Meso Global Airports	1	X			X	X				X				
Wind Speed: Boundary Layer CONUS + AK & HI	1	X				X	X							
Wind Speed: Boundary Layer Global	1	X				X	X							
Wind Speed: Boundary Layer Meso, Global Airports	1	X	X		X	X				X				
Wind Speed: Profiles CONUS + AK & HI	1	X				X	X							
Wind Speed: Profiles Global	1	X				X	X							
Wind Speed: Profiles Meso, Global Airports	1	X	X		X	X				X				
Wind Speed: Surface Global	1	X			X	X		X		X	X			
Wind Speed: Surface Meso Global Airports GT 20 m/s	1	X			X	X	X			X	X			
Wind Speed: Surface Meso Global Airports LE 20 m/s	1	X				X	X							
Cloud Droplet Concentration	2	X			X					X				
Cloud Particle Size	2	X			X					X				
Cloud Particle Size Distribution: Boundary Layer	2	X			X					X				

Requirement	Priority	NOAA										RC		
		1	2	3	4	5	6	7	8	9	10	1	2	3
Water Content: Total	2	X								X	X			
Space Weather: Coronal Mass Ejections	3													
Space Weather: Geomagnetic Storms	3													
Space Weather: Solar Flares	3													
Space Weather: Solar Radiation	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 Aviation Weather Program. All attributes at the Priority-1/Threshold Level must be completed to allow for observation gap analyses to be conducted.

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

Priority	Key Threshold Attributes	Other Threshold Attributes	Objective Attributes
1	0	0	180
2	2	3	5
3	48	56	112
Total	50	59	297

Note: The five key attributes are: Geographic Coverage, Vertical Resolution, Horizontal Resolution, Measurement Accuracy, and Sampling Interval. The other attributes are: Vertical Range, Measurement Range, Data Latency, and Long-term Stability.

Appendix A Aviation Weather 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
Air Temperature: Boundary Layer CONUS + AK & HI	1	T	CONUS+AK+HI	20	0	2	km	5	150	m	15	10	km	15	200	320	K	5	1	K	20	1	hr	5	3	min	15	na	na	0
		O	CONUS+AK+HI	20	0	2	km	5	100	m	15	5	km	15	195	325	K	5	0.5	K	20	15	min	5	3	min	15	na	na	0
Air Temperature: Boundary Layer Global	1	T	Global	20	0	2	km	5	1	km	15	100	km	15	200	320	K	5	1	K	20	6	hr	5	30	min	15	na	na	0
		O	Global	20	0	2	km	5	0.3	km	15	15	km	15	195	325	K	5	0.5	K	20	1	hr	5	15	min	15	na	na	0
Air Temperature: Boundary Layer Meso, Global Airports	1	T	Targeted Meso	20	0	2	km	10	30	m	15	na	na	0	200	320	K	10	1	K	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	0	2	km	10	30	m	15	na	na	0	195	325	K	10	0.5	K	20	15	min	10	3	min	15	na	na	0
Air Temperature: Profiles CONUS + AK & HI	1	T	CONUS+AK+HI	20	2	18	km	5	150	m	15	5	km	15	200	320	K	5	1	K	20	12	hr	5	1	hr	15	na	na	0
		O	CONUS+AK+HI	20	2	18	km	5	100	m	15	5	km	15	195	325	K	5	0.5	K	20	6	hr	5	30	min	15	na	na	0
Air Temperature: Profiles Global	1	T	Global	20	2	18	km	5	1	km	15	100	km	15	200	320	K	5	1	K	20	6	hr	5	1	hr	15	na	na	0
		O	Global	20	2	18	km	5	0.3	km	15	15	km	15	195	325	K	5	0.5	K	20	1	hr	5	30	min	15	na	na	0
Air Temperature: Profiles Meso, Global Airports	1	T	Targeted Meso	20	2	18	km	10	150	m	15	na	na	0	200	320	K	10	1	K	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	2	18	km	10	150	m	15	na	na	0	195	325	K	10	0.5	K	20	15	min	10	3	min	15	na	na	0
Air Temperature: Surface CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	4	km	15	193	333	K	10	0.1	K	20	5	min	10	1	min	20	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	4	km	15	193	333	K	10	0.1	K	20	5	min	10	1	min	20	na	na	0
Air Temperature: Surface Global	1	T	Global	20	na	na	na	0	na	na	0	50	km	15	193	333	K	10	1	K	20	6	hr	10	1	min	20	na	na	0
		O	Global	20	na	na	na	0	na	na	0	15	km	15	193	333	K	10	0.5	K	20	1	hr	10	1	min	20	na	na	0
Atmospheric Pressure: Surface CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	30	km	15	892	1100	hPa	10	0.1	hPa	20	15	min	10	3	min	20	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	8	km	15	892	1100	hPa	10	0.1	hPa	20	15	min	10	3	min	20	na	na	0
Atmospheric Pressure: Surface Global	1	T	Global	20	na	na	na	0	na	na	0	100	km	15	870	1100	hPa	10	1	hPa	20	6	hr	10	3	min	20	na	na	0
		O	Global	20	na	na	na	0	na	na	0	15	km	15	870	1100	hPa	10	0.5	hPa	20	1	hr	10	3	min	20	na	na	0
Cloud Amount: Boundary Layer	1	T	Global	20	0	2	km	5	30	m	15	1	km	15	0	100	%	5	10	%	20	5	min	5	1	min	15	na	na	0
		O	Global	20	0	2	km	5	30	m	15	1	km	15	0	100	%	5	10	%	20	5	min	5	1	min	15	na	na	0
Cloud Amount: Profiles	1	T	Global	20	2	20	km	5	150	m	15	20	km	15	0	100	%	5	10	%	20	30	min	5	1	min	15	na	na	0
		O	Global	20	2	20	km	5	150	m	15	1	km	15	0	100	%	5	10	%	20	5	min	5	1	min	15	na	na	0
Cloud Base Height: Boundary Layer	1	T	Global	20	na	na	na	0	na	na	0	15	km	15	0	2	km	10	30	m	20	30	min	10	1	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	4	km	15	0	2	km	10	30	m	20	5	min	10	1	min	15	na	na	0

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
Cloud Base Height: CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	20	km	15	0	20	km	5	300	m	20	30	min	5	1	min	15	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	4	km	15	0	20	km	5	300	m	20	5	min	5	1	min	15	na	na	0
Cloud Base Height: Global	1	T	Global	20	na	na	na	0	na	na	0	15	km	15	0	20	km	5	0.5	km	20	3	hr	5	15	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	5	km	15	0	20	km	5	0.2	km	20	1	hr	5	15	min	15	na	na	0
Cloud Top Height: CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	8	km	15	0	20	km	10	1	km	20	15	min	10	3	min	15	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	4	km	15	0	20	km	10	500	m	20	15	min	10	3	min	15	na	na	0
Cloud Top Height: Global	1	T	Global	20	na	na	na	0	na	na	0	15	km	15	0	20	km	10	0.5	km	20	3	hr	10	3	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	5	km	15	0	20	km	10	0.2	km	20	1	hr	10	3	min	15	na	na	0
Dewpoint Temperature: Boundary Layer CONUS + AK & HI	1	T	CONUS+AK+HI	20	0	2	km	5	500	m	15	10	km	15	230	305	K	5	1	K	20	1	hr	5	3	min	15	na	na	0
		O	CONUS+AK+HI	20	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Boundary Layer Global	1	T	Global	20	0	2	km	5	1	km	15	100	km	15	230	305	K	5	1	K	20	6	hr	5	30	min	15	na	na	0
		O	Global	20	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Boundary Layer Meso, Global Airports	1	T	Targeted Meso	20	0	2	km	10	30	m	15	na	na	0	230	305	K	10	1	K	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	tbs	tbs	tbs		tbs	tbs		na	na	0	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Profiles CONUS + AK & HI	1	T	CONUS+AK+HI	20	2	18	km	5	150	m	15	5	km	15	230	305	K	5	1	K	20	12	hr	5	1	hr	15	na	na	0
		O	CONUS+AK+HI	20	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Profiles Global	1	T	Global	20	2	18	km	5	1	km	15	100	km	15	230	305	K	5	1	K	20	6	hr	5	1	hr	15	na	na	0
		O	Global	20	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Profiles Meso, Global Airports	1	T	Targeted Meso	20	2	18	km	10	150	m	15	na	na	0	230	305	K	10	1	K	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	tbs	tbs	tbs		tbs	tbs		na	na	0	tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Surface CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	4	km	15	230	305	K	10	0.1	K	20	5	min	10	1	min	20	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Dewpoint Temperature: Surface Global	1	T	Global	20	na	na	na	0	na	na	0	50	km	15	230	305	K	10	1	K	20	6	hr	10	1	min	20	na	na	0
		O	Global	20	na	na	na	0	na	na	0	tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Lightning	1	T	Global	20	na	na	na	0	na	na	0	4	km	20	na	na	na	0	30	%	20	10	sec	10	1	min	20	na	na	0
		O	Global	20	na	na	na	0	na	na	0	4	km	20	na	na	na	0	1	%	20	Continuous	na	10	1	min	20	na	na	0
Precipitation Rate CONUS + AK & HI	1	T	CONUS+AK+HI	20	na	na	na	0	na	na	0	10	km	20	0	100	mm/hr	15	1	mm/hr	20	15	min	10	3	min	15	na	na	0
		O	CONUS+AK+HI	20	na	na	na	0	na	na	0	10	km	20	0	100	mm/hr	15	1	mm/hr	20	15	min	10	3	min	15	na	na	0

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
Precipitation Rate Global	1	T	Global	20	na	na	na	0	na	na	0	15	km	20	0	100	mm/hr	15	1	mm/hr	20	3	hr	10	3	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	5	km	20	0	100	mm/hr	15	1	mm/hr	20	1	hr	10	3	min	15	na	na	0
Precipitation Type	1	T	Global	20	na	na	na	0	na	na	0	10	km	15	na	na	Categorical: Snow (S), Rain (R), Freezing Rain (ZR), Sleet (IP), mix	10	20	%	20	15	min	5	3	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	5	km	15	na	na	Categorical: Snow (S), Rain (R), Freezing Rain (ZR), Sleet (IP), mix	10	10	%	20	15	min	5	3	min	15	na	na	0
Turbulence	1	T	Global	20	0	20	km	5	300	m	15	100	km	15	Categorical Light	Categorical Extreme	Categorical Light, Moderate, Severe, Extreme	5	5	%	20	1	hr	5	10	min	15	na	na	0
		O	Global	20	0	20	km	5	300	m	15	50	km	15	Categorical Light	Categorical Extreme	Categorical Light, Moderate, Severe, Extreme	5	5	%	20	5	min	5	5	min	15	na	na	0
Visibility: Runway Visual Range GT 400m - LE 800m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.4	0.8	km	5	25	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.4	0.8	km	5	25	m	20	1	min	10	1	min	20	na	na	0
Visibility: Runway Visual Range GT 800m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.8	2	km	5	80	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.8	2	km	5	80	m	20	1	min	10	1	min	20	na	na	0
Visibility: Runway Visual Range LE 400m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	0.4	km	5	10	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	0.4	km	5	10	m	20	1	min	10	1	min	20	na	na	0
Visibility: Surface GT 1600m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	1.6	10	km	5	160	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	1.6	10	km	5	160	m	20	1	min	10	1	min	20	na	na	0
Visibility: Surface GT 600m - LE 1600m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.6	1.6	km	5	100	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0.6	1.6	km	5	100	m	20	1	min	10	1	min	20	na	na	0
Visibility: Surface LE 600m, Meso, Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	0.6	km	5	50	m	20	1	min	10	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	0.6	km	5	50	m	20	1	min	10	1	min	20	na	na	0
Volcanic Ash: Detection and Height at Volcano	1	T	Global	20	0	20	km	5	0.5	km	15	na	na	0	0	20	km	5	20	%	15	15	min	10	1	min	15	na	na	0
		O	Global	20	0	20	km	5	200	m	15	na	na	0	0	20	km	5	10	%	15	5	min	10	30	sec	15	na	na	0

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
Volcanic Ash: Detection and Horizontal Extent at Volcano	1	T	Global	20	na	na	na	0	na	na	0	2	km	15	0	500	km	5	20	%	15	15	min	10	1	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		na	na	0
Wind Direction: Boundary Layer CONUS + AK & HI	1	T	CONUS+AK+HI	20	0	2	km	5	100	m	15	30	km	15	0	360	deg	5	10	deg	20	3	hr	5	0.5	hr	15	na	na	0
		O	CONUS+AK+HI	20	0	2	km	5	100	m	15	30	km	15	0	360	deg	5	5	deg	20	1	hr	5	0.5	hr	15	na	na	0
Wind Direction: Boundary Layer Global	1	T	Global	20	0	2	km	5	1	km	15	100	km	15	0	360	deg	5	10	deg	20	6	hr	5	0.5	hr	15	na	na	0
		O	Global	20	0	2	km	5	0.5	km	15	15	km	15	0	360	deg	5	10	deg	20	1	hr	5	0.5	hr	15	na	na	0
Wind Direction: Boundary Layer Meso Global Airports	1	T	Targeted Meso	20	0	2	km	10	60	m	15	na	na	0	0	360	deg	10	10	deg	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	0	2	km	10	30	m	15	na	na	0	0	360	deg	10	10	deg	20	15	min	10	3	min	15	na	na	0
Wind Direction: Profiles CONUS + AK & HI	1	T	CONUS+AK+HI	20	2	18	km	5	100	m	15	30	km	15	0	360	deg	5	10	deg	20	3	hr	5	0.5	hr	15	na	na	0
		O	CONUS+AK+HI	20	2	18	km	5	100	m	15	30	km	15	0	360	deg	5	5	deg	20	1	hr	5	0.5	hr	15	na	na	0
Wind Direction: Profiles Global	1	T	Global	20	2	18	km	5	1	km	15	100	km	15	0	360	deg	5	10	deg	20	6	hr	5	0.5	hr	15	na	na	0
		O	Global	20	2	18	km	5	0.5	km	15	15	km	15	0	360	deg	5	10	deg	20	1	hr	5	0.5	hr	15	na	na	0
Wind Direction: Profiles Meso Global Airports	1	T	Targeted Meso	20	2	18	km	10	100	m	15	na	na	0	0	360	deg	10	10	deg	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	2	18	km	10	30	m	15	na	na	0	0	360	deg	10	5	deg	20	15	min	10	3	min	15	na	na	0
Wind Direction: Surface Global	1	T	Global	20	na	na	na	0	na	na	0	100	km	20	0	360	deg	5	10	deg	20	6	hr	10	15	min	20	na	na	0
		O	Global	20	na	na	na	0	na	na	0	15	km	20	0	360	deg	5	10	deg	20	1	hr	10	15	min	20	na	na	0
Wind Direction: Surface Meso Global Airports	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	360	deg	10	10	deg	20	5	min	20	1	min	20	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	360	deg	10	5	deg	20	5	min	20	1	min	20	na	na	0
Wind Speed: Boundary Layer CONUS + AK & HI	1	T	CONUS+AK+HI	20	0	2	km	5	100	m	15	30	km	15	0	75	m/sec	5	2	m/sec	20	3	hr	5	0.5	hr	15	na	na	0
		O	CONUS+AK+HI	20	0	2	km	5	100	m	15	30	km	15	0	75	m/sec	5	1	m/sec	20	1	hr	5	0.5	hr	15	na	na	0
Wind Speed: Boundary Layer Global	1	T	Global	20	0	2	km	5	1	km	15	100	km	15	0	75	m/sec	5	3	m/sec	20	6	hr	5	0.5	hr	15	na	na	0
		O	Global	20	0	2	km	5	0.5	km	15	15	km	15	0	75	m/sec	5	1	m/sec	20	1	hr	5	0.5	hr	15	na	na	0
Wind Speed: Boundary Layer Meso, Global Airports	1	T	Targeted Meso	20	0	2	km	10	60	m	15	na	na	0	0	75	m/sec	10	2	m/sec	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	0	2	km	10	30	m	15	na	na	0	0	75	m/sec	10	1	m/sec	20	15	min	10	3	min	15	na	na	0
Wind Speed: Profiles CONUS + AK & HI	1	T	CONUS+AK+HI	20	2	18	km	5	100	m	15	30	km	15	0	100	m/sec	5	2	m/sec	20	3	hr	5	0.5	hr	15	na	na	0
		O	CONUS+AK+HI	20	2	18	km	5	100	m	15	30	km	15	0	100	m/sec	5	1	m/sec	20	3	hr	5	0.5	hr	15	na	na	0
Wind Speed: Profiles Global	1	T	Global	20	2	18	km	5	1	km	15	100	km	15	0	100	m/sec	5	3	m/sec	20	6	hr	5	0.5	hr	15	na	na	0
		O	Global	20	2	18	km	5	0.5	km	15	15	km	15	0	100	m/sec	5	1	m/sec	20	1	hr	5	0.5	hr	15	na	na	0

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
Wind Speed: Profiles Meso, Global Airports	1	T	Targeted Meso	20	2	18	km	10	100	m	15	na	na	0	0	100	m/sec	10	2	m/sec	20	15	min	10	3	min	15	na	na	0
		O	Targeted Meso	20	2	18	km	10	30	m	15	na	na	0	0	100	m/sec	10	1	m/sec	20	15	min	10	3	min	15	na	na	0
Wind Speed: Surface Global	1	T	Global	20	na	na	na	0	na	na	0	100	km	20	0	75	m/sec	5	1	m/sec	20	6	hr	5	15	min	15	na	na	0
		O	Global	20	na	na	na	0	na	na	0	15	km	20	0	75	m/sec	5	1	m/sec	20	1	hr	5	15	min	15	na	na	0
Wind Speed: Surface Meso Global Airports GT 20 m/s	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	20	75	m/sec	5	2	m/sec	20	5	min	5	15	min	15	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	20	75	m/sec	5	2	m/sec	20	5	min	5	15	min	15	na	na	0
Wind Speed: Surface Meso Global Airports LE 20 m/s	1	T	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	20	m/sec	5	1	m/sec	20	5	min	5	15	min	15	na	na	0
		O	Targeted Meso	20	na	na	na	0	na	na	0	na	na	0	0	20	m/sec	5	1	m/sec	20	5	min	5	15	min	15	na	na	0
Cloud Droplet Concentration	2	T	Hemi US	20	0	20	km	5	60	m	15	5	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
		O	Global	20	0	20	km	5	60	m	15	5	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
Cloud Particle Size	2	T	Hemi US	20	0	20	km	5	150	m	15	2	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
		O	Global	20	0	20	km	5	150	m	15	2	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
Cloud Particle Size Distribution: Boundary Layer	2	T	Hemi US	20	0	2	km	5	60	m	15	2	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
		O	Global	20	0	1	km	5	60	m	15	2	km	15	0	50	mm	5	1	mm	20	1	hr	5	3	min	15	na	na	0
Water Content: Total	2	T	Hemi US	20	0	20	km	5	Total Column	na	15	2	km	15	tbs	tbs	tbs	5	tbs	tbs	15	15	min	10	1	min	15	na	na	0
		O	Global	20	0	20	km	5	Total Column	na	15	2	km	15	tbs	tbs	tbs	5	tbs	tbs	15	15	min	10	1	min	15	na	na	0
Space Weather: Coronal Mass Ejections	3	T	Global		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	%		tbs	tbs		tbs	tbs		tbs	tbs	
		O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Space Weather: Geomagnetic Storms	3	T	Global		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	%		tbs	tbs		tbs	tbs		tbs	tbs	
		O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Space Weather: Solar Flares	3	T	Global		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	%		tbs	tbs		tbs	tbs		tbs	tbs	
		O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	
Space Weather: Solar Radiation	3	T	Global		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	%		tbs	tbs		tbs	tbs		tbs	tbs	
		O	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs		tbs	tbs	

Appendix B Priority-1 Observation Requirements Validation

Appendix B.1 Validation Documents Submitted

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

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

#	Validation Document Title	Document Type
1	Program Charter for Aviation Weather Program	NOAA Program Charter
2	Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8	WMO Guide
3	A Phenomenological Approach to the Specification of Observational Requirements, Rev 6, 19 June 2008	NOAA Requirements Document
4	Observing Weather and Climate FROM THE GROUND UP, A Nationwide Network of Networks, National Research Council, The National Academies Press	NRC Technical Document
5	Data Requirements for WMO	WMO Requirements Document
6	WMO Measurement Requirements for Meteorological Observations	WMO Requirements Document
7	NERON Cost and Operational Effectiveness Analysis (COEA)	NWS Analysis
8	ASOS User's Guide	NWS Guide
9	Manual on Automatic Meteorological Observing Systems at Aerodromes, ICAO, First Edition, 2006	ICAO Manual
10	Manual on the Global Data-Processing and Forecasting System, WMO-No. 485	WMO Manual
11	Rolling Review of Requirements and Statements of Guidance, WMO Statement of Guidance Update	WMO Technical Document
12	Manual on the Global Observing System, Vol I, Global Aspects, 2003 ed., WMO-No. 544	WMO Manual
SME	Memo from Subject Matter Experts	SME Statement

Appendix B.2 Validation Documents Mapping to Observation Requirements

Aviation 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	Priority	Documents Submitted
Air Temperature: Boundary Layer CONUS + AK & HI	1	1,2,4
Air Temperature: Boundary Layer Global	1	1,5
Air Temperature: Boundary Layer Meso, Global Airports	1	1,2,4
Air Temperature: Profiles CONUS + AK & HI	1	1,2,4
Air Temperature: Profiles Global	1	1,5
Air Temperature Profiles Meso, Global Airports	1	1,2,4
Air Temperature: Surface CONUS + AK & HI	1	1,4,7
Air Temperature: Surface Global	1	1,5
Atmospheric Pressure: Surface CONUS + AK & HI	1	1,7
Atmospheric Pressure: Surface Global	1	1,5
Cloud Amount: Boundary Layer	1	1,6,SME
Cloud Amount: Profiles	1	1,3,6,SME
Cloud Base Height: Boundary Layer	1	1,3,6,SME
Cloud Base Height: CONUS + AK & HI	1	1,3,6
Cloud Base Height: Global	1	1,5
Cloud Top Height: CONUS + AK & HI	1	1,5,SME
Cloud Top Height: Global	1	1,5
Dewpoint Temperature Boundary Layer CONUS + AK & HI	1	1,2,4
Dewpoint Temperature Boundary Layer Global	1	1,2,5
Dewpoint Temperature: Boundary Layer Meso, Global Airports	1	1,2,5
Dewpoint Temperature: Profiles CONUS + AK & HI	1	1,2,5,SME
Dewpoint Temperature: Profiles Global	1	1,2,4,5
Dewpoint Temperature: Profiles Meso, Global Airports	1	1,2,4
Dewpoint Temperature: Surface CONUS + AK & HI	1	1,2,4
Dewpoint Temperature: Surface Global	1	1,2,4
Lightning	1	1,2,SME
Precipitation Rate CONUS + AK & HI	1	1,3,9
Precipitation Rate Global	1	1,5
Precipitation Type	1	1,3
Turbulence	1	1,10,SME
Visibility: Runway Visual Range GT 400m - LE 800m, Meso, Global Airports	1	1,2,6
Visibility: Runway Visual Range GT 800m, Meso, Global Airports	1	1,2,6
Visibility: Runway Visual Range LE 400m, Meso, Global Airports	1	1,2,6
Visibility: Surface GT 1600m, Meso, Global Airports	1	1,6,8

Visibility: Surface GT 800m, - LE 1600m, Meso, Global Airports	1	1,6,8
Visibility: Surface LE 600m, Meso, Global Airports	1	1,6,8
Volcanic Ash: Detection and Height at Volcano	1	1,11,12,SME
Volcanic Ash: Detection and Horizontal Extent at Volcano	1	1,11,12,SME
Wind Direction: Boundary Layer CONUS + AK & HI	1	1,2,4
Wind Direction: Boundary Layer Global	1	1,2,5
Wind Direction: Boundary Layer Meso Global Airports	1	1,2,4
Wind Direction: Profiles CONUS + AK & HI	1	1,2,4
Wind Direction Profiles Global	1	1,2,5
Wind Direction Profiles Meso Global Airports	1	1,2,4
Wind Direction Surface Global	1	1,5,6
Wind Direction: Surface Meso Global Airports	1	1,6,7
Wind Speed: Boundary Layer CONUS + AK & HI	1	1,2,4
Wind Speed Boundary Layer Global	1	1,5
Wind Speed Boundary Layer Meso Global Airports	1	1,2,4
Wind Speed: Profiles CONUS + AK & HI	1	1,2,4
Wind Speed: Profiles Global	1	1,5
Wind Speed: Profiles Meso Global Airports	1	1,2,4
Wind Speed: Surface Global	1	1,5,7
Wind Speed Surface Meso Global Airports GT 20 m/s	1	1,7,8
Wind Speed: Surface Meso Global Airports LE 20 m/s	1	1,7,8

Appendix B.3 Validation Assessment for Priority-1 Requirements

Aviation 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	Meas Accuracy	Sampling Interval
Air Temperature Boundary Layer CONUS + AK & HI	CONUS + AK & HI	150 m	10 km	1 K	1 hr
Air Temperature Boundary Layer Global	Global	1 km	100 km	1 K	6 hr
Air Temperature: Boundary Layer Meso, Global Airports	Targeted Mesoscale	30 m	na	1 K	15 min
Air Temperature: Profiles CONUS + AK & HI	CONUS + AK & HI	150 m	5 km	1 K	12 hr
Air Temperature: Profiles Global	Global	1 km	100 km	1 K	6 hr
Air Temperature: Profiles Meso, Global Airports	Targeted Mesoscale	150 m	na	1 K	15 min
Air Temperature: Surface CONUS + AK & HI	CONUS + AK & HI	na	4 km	0.1 K	5 min
Air Temperature: Surface Global	Global	na	50 km	1 K	6 hr
Atmospheric Pressure: Surface CONUS + AK & HI	CONUS + AK & HI	na	30 km	0.1 hPa	15 min
Atmospheric Pressure: Surface Global	Global	na	100 km	1 hPa	6 hr
Cloud Amount: Boundary Layer	Global	30 m	1 km	10 %	5 min
Cloud Amount: Profiles	Global	150 m	20 km	10 %	30 min
Cloud Base Height: Boundary Layer	Global	na	15 km	30 m	30 min
Cloud Base Height CONUS + AK & HI	CONUS + AK & HI	na	20 km	300 m	30 min
Cloud Base Height Global	Global	na	15 km	0.5 km	3 hr
Cloud Top Height CONUS + AK & HI	CONUS + AK & HI	na	8 km	1 km	15 min
Cloud Top Height Global	Global	na	15 km	0.5 km	3 hr
Dewpoint Temperature Boundary Layer CONUS + AK & HI	CONUS + AK & HI	500 m	10 km	1 K	1 hr
Dewpoint Temperature Boundary Layer Global	Global	1 km	100 km	1 K	6 hr
Dewpoint Temperature: Boundary Layer Meso, Global Airports	Targeted Mesoscale	30 m	na	1 K	15 min
Dewpoint Temperature: Profiles CONUS + AK & HI	CONUS + AK & HI	150 m	5 km	1 K	12 hr
Dewpoint Temperature: Profiles Global	Global	1 km	100 km	1 K	6 hr
Dewpoint Temperature: Profiles Meso, Global Airports	Targeted Mesoscale	150 m	na	1 K	15 min
Dewpoint Temperature: Surface CONUS + AK & HI	CONUS + AK & HI	na	4 km	0.1 K	5 min
Dewpoint Temperature: Surface Global	Global	na	50 km	1 K	6 hr
Lightning	Global	na	4 km	30 %	10 sec
Precipitation Rate CONUS + AK & HI	CONUS + AK & HI	na	10 km	1 mm/hr	15 min

Parameters	Attribute Validated				
	Geographic Coverage	Vertical Resolution	Horizontal Resolution	Meas Accuracy	Sampling Interval
Precipitation Rate Global	Global	na	15 km	1 mm/hr	3 hr
Precipitation Type	Global	na	10 km	20 %	15 min
Turbulence	Global	300 m	100 km	5 %	1 hr
Visibility RVR GT 400 m LE 800 m, Meso, Global Airports	Targeted Mesoscale	na	na	25 m	1 min
Visibility RVR GT 800 m, Meso, Global Airports	Targeted Mesoscale	na	na	80 m	1 min
Visibility: RVR LE 400 m, Meso, Global Airports	Targeted Mesoscale	na	na	10 m	1 min
Visibility Surface: GT 1600 m, Meso, Global Airports	Targeted Mesoscale	na	na	160 m	1 min
Visibility Surface: GT 600 m LE 1600 m, Meso, Global Airports	Targeted Mesoscale	na	na	100 m	1 min
Visibility Surface: LE 600 m, Meso, Global Airports	Targeted Mesoscale	na	na	50 m	1 min
Volcanic Ash: Detection and Height at Volcano	Global	0.5 km	na	20 %	15 min
Volcanic Ash: Detection and Horizontal Extent at Volcano	Global	na	2 km	20 %	15 min
Wind Direction: Boundary Layer CONUS + AK & HI	CONUS + AK & HI	100 m	30 km	10 deg	3 hr
Wind Direction: Boundary Layer Global	Global	1 km	100 km	10 deg	6 hr
Wind Direction Boundary Layer, Meso, Global Airports	Targeted Mesoscale	60 m	na	10 deg	15 min
Wind Direction: Profiles CONUS + AK & HI	CONUS + AK & HI	100 m	30 km	10 deg	3 hr
Wind Direction: Profiles Global	Global	1 km	100 km	10 deg	6 hr
Wind Direction: Profiles Meso Global Airports	Targeted Mesoscale	100 m	na	10 deg	15 min
Wind Direction: Surface Global	Global	na	100 km	10 deg	6 hr
Wind Direction: Surface Meso Global Airports	Targeted Mesoscale	na	na	10 deg	5 min
Wind Speed: Boundary Layer CONUS + AK & HI	CONUS + AK & HI	100 m	30 km	2 m/sec	3 hr
Wind Speed: Boundary Layer Global	Global	1 km	100 km	3 m/sec	6 hr
Wind Speed: Boundary Layer, Meso, Global Airports	Targeted Mesoscale	60 m	na	2 m/sec	15 min
Wind Speed: Profiles CONUS + AK & HI	CONUS + AK & HI	100 m	30 km	2 m/sec	3 hr
Wind Speed: Profiles Global	Global	1 km	100 km	3 m/sec	6 hr
Wind Speed: Profiles, Meso, Global Airports	Targeted Mesoscale	100 m	na	2 m/sec	15 min
Wind Speed: Surface Global	Global	na	100 km	1.m/sec	6 hr
Wind Speed: Surface Meso Global Airports GT 20 m/s	Targeted Mesoscale	na	na	2 m/sec	5 min
Wind Speed: Surface Meso Global Airports LE 20 m/s	Targeted Mesoscale	na	na	1 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	Climate - Observations and Monitoring
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
MS-IOS	Mission Support - Integrated Ocean Observing System
MS-EMP	Mission Support - Environmental Modeling
MS-EMP_Atmos	Mission Support - Environmental Modeling, Atmosphere Sub-Program
MS-EMP_Climate	Mission Support - Environmental Modeling, Climate Sub-Program
MS-EMP_Marine	Mission Support - Environmental Modeling, Marine Sub-Program
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	Weather and Water - Local Forecasts and Warnings
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."

Long-Term Stability (Long Stab): The maximum excursion of the short-term average measured value of a parameter under identical conditions over a stated period of time (e.g. decade). The smaller the maximum excursion, the greater the stability of the observations. The short-average is the average of a sufficient number of successive measurements of the variable under identical conditions such that the random error is negligible relative to the systematic error.

Long-Term Stability Units: Measurement units for Long-Term Stability of the element.

Long-Term Stability Weight: See "Attribute Weights."

Measurement Accuracy (Msmnt Accy): The systematic error, as specified by the difference between a measured or derived parameter and its true value in the absence of random errors.

Measurement Accuracy Units: Measurement units for Measurement Accuracy of the element. If possible use %.

Measurement Accuracy Weight: See "Attribute Weights."

Measurement (Meas Range) Range Low: Lowest value of range of parameter, within which the parameters must be measurable or reportable (e.g., for temperature 273 to 303 Kelvin enter 273)"

Measurement Range High: Highest value of range of parameter, within which the parameters must be measurable or reportable (e.g., for temperature 273 to 303 Kelvin enter 203)"

Measurement Range Units: Measurement units for measurement range of the element. For example: Kelvin enter "K"

Measurement Range Weight: See "Attribute Weights."

Number of ODS/Flt Hrs/HODs: Number of Operating Days at Sea (ODS), Flight Hours (Flt Hrs), or Human Observer Days (HODs)

Number of ODS/Flt Hrs/HODs Units: Measurement units for Number of Operating Days at Sea (ODS), Flight Hours (Flt Hrs), or Human Observer Days (HODs)

Number of ODS/Flt Hrs/HOD Weight: See "Attribute Weights."

Observational Requirement: Requirement Name

Observational Requirement Priority (Obs Req Prty):

- **"1"** = Mission Critical / Cannot meet operational mission objectives without this data. Not having these data will prevent performance of the mission or preclude satisfactory mission accomplishment.
- **"2"** = Mission Optimal / Data not critical but would provide significant improvement to operational capability.
- **"3"** = Mission Enhancing / Needed to enhance state of knowledge / assess potential for operational capability.

RC: Regional Collaboration Priorities

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."

Vertical Resolution (Vert Res): The smallest height increment of the data. Spatial granularity in the vertical with which information and data are provided, For example: distance between adjacent vertical grid points in a radiosonde observation.

Vertical Resolution Units: Measurement units for vertical resolution of the element.
Use:
"km" for kilometers
"m" for meters
Etc.

Vertical Resolution Weight: See "Attribute Weights."

Weight: See "Attribute Weights."

Geographic Coverage Table

CORL Geographic Coverage Category*	Definition*
Alaska Complex	One of the eight NOAA identified ecosystem regions.
California Current	One of the eight NOAA identified ecosystem regions.
Caribbean Sea	One of the eight NOAA identified ecosystem regions.
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)
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.
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 ot 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./td>

CORL Geographic Coverage Category*	Definition*
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 Eur	Hemispheric coverage centered on Europe and Africa.
Hemi India	Hemispheric coverage centered on India and the corresponding offshore waters.
Hemi Japan	Hemispheric coverage centered on Japan, Australia and southeast Asia.
Hemi US	Hemispheric coverage centered on the US.
Northeast US Shelf	One of the eight NOAA identified ecosystem regions.
Offshore	The zone beyond the near shore zone where sediment motion induced by waves alone effectively ceases and where the influence of the sea bed on wave action has become small in comparison with the effect of wind; the portion of the littoral system that is always submerged.
Pacific Island Complex	One of the eight NOAA identified ecosystem regions.
SE US Shelf	One of the eight NOAA identified ecosystem regions.
Targeted Mesoscale	Prefer to have programs define specific regions (example, NHC, SPC regions)
tbs	to be specified
Other	Other geo cov category as defined by program. Program provides specific details/definition.
GEO In-situ, Global	A local geosynchronous observation required at multiple locations in that orbit
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
MEO; 3-axis orthogonal	Medium Earth Orbit located above Low Earth Orbit (LEO) and below geosynchronous orbit (GEO); 3-axis orthogonal refers to 3 measurements made at 90 degrees to each other to define a vector
Whole Sun	Whole Sun plus out to some distance in corona (about 2 solar radii)

Note: "Targeted" can be added to any of the above