

Assessing the Impacts of Observations

Prepared for the American Meteorological Society Annual Meeting
January, 23, 2017

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Assessing the Impacts of Observations

TPIO Mission: Providing comprehensive assessments for integrations, optimization, and sustainment of NOAA's observing systems and data management architectures.

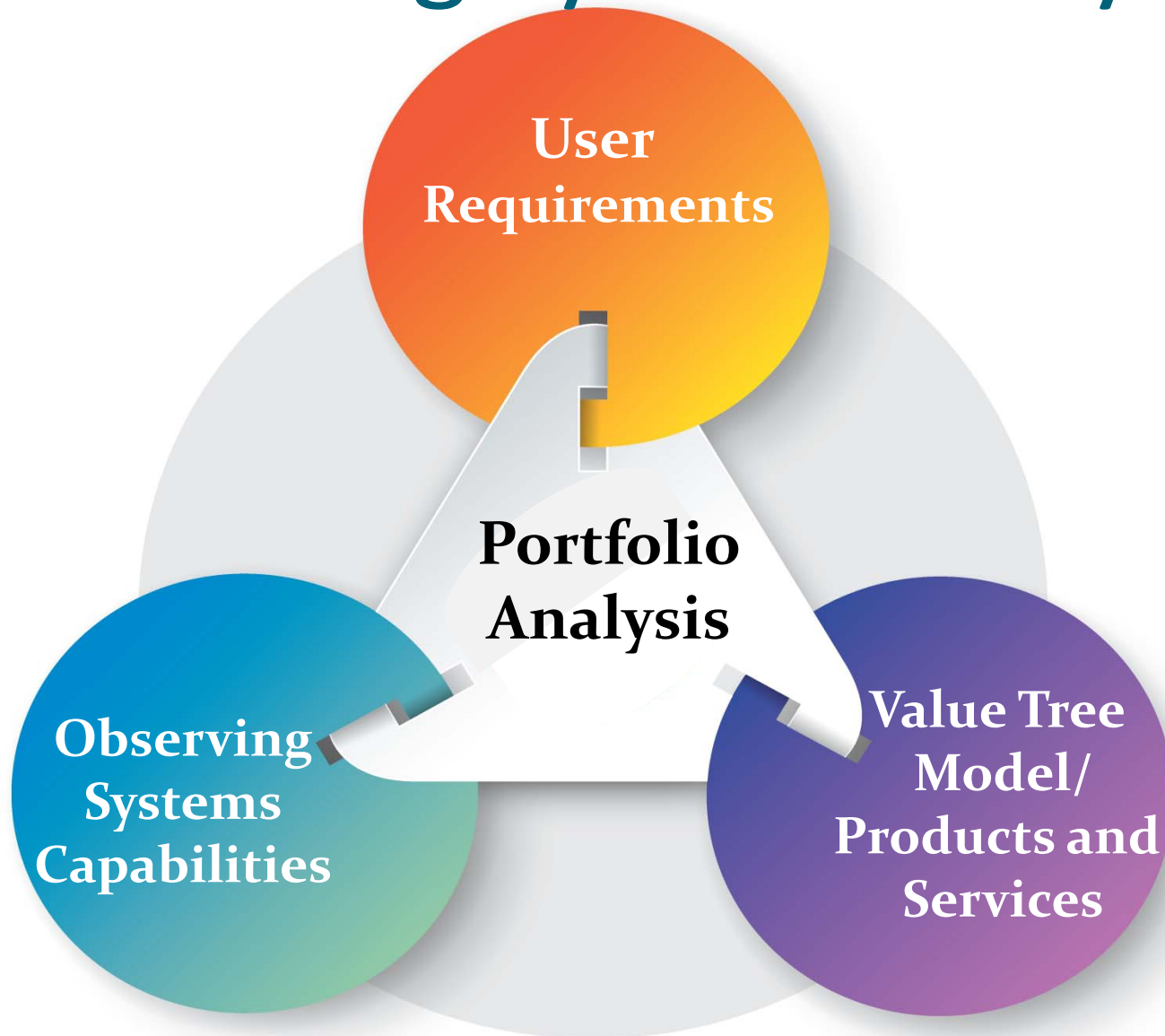
Who do we support?

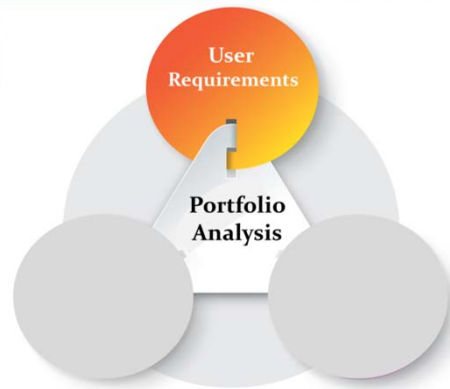
- NOAA Leadership
- NOAA Councils
- NOAA Line Offices – Service Portfolio Managers
- NOAA Line and Staff Office – Observing System Program Managers

Ongoing support includes:

- The Earth Observation Assessment with the Office of Science and Technology Policy (OSTP)
- The Future Weather Satellite Architecture with the National Satellite and Information Service (NESDIS)
- The Fleet Force Recapitalization Architecture with the Office of Marine and Aviation Operations (OMAO)
- Many more...

Observing System Analysis

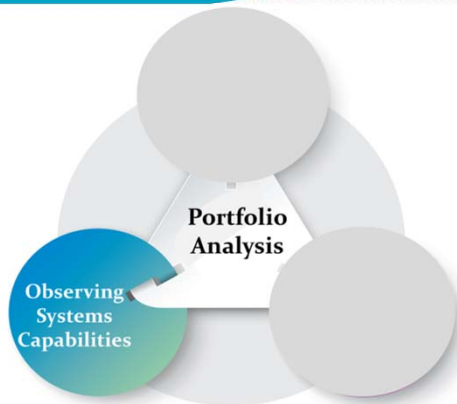




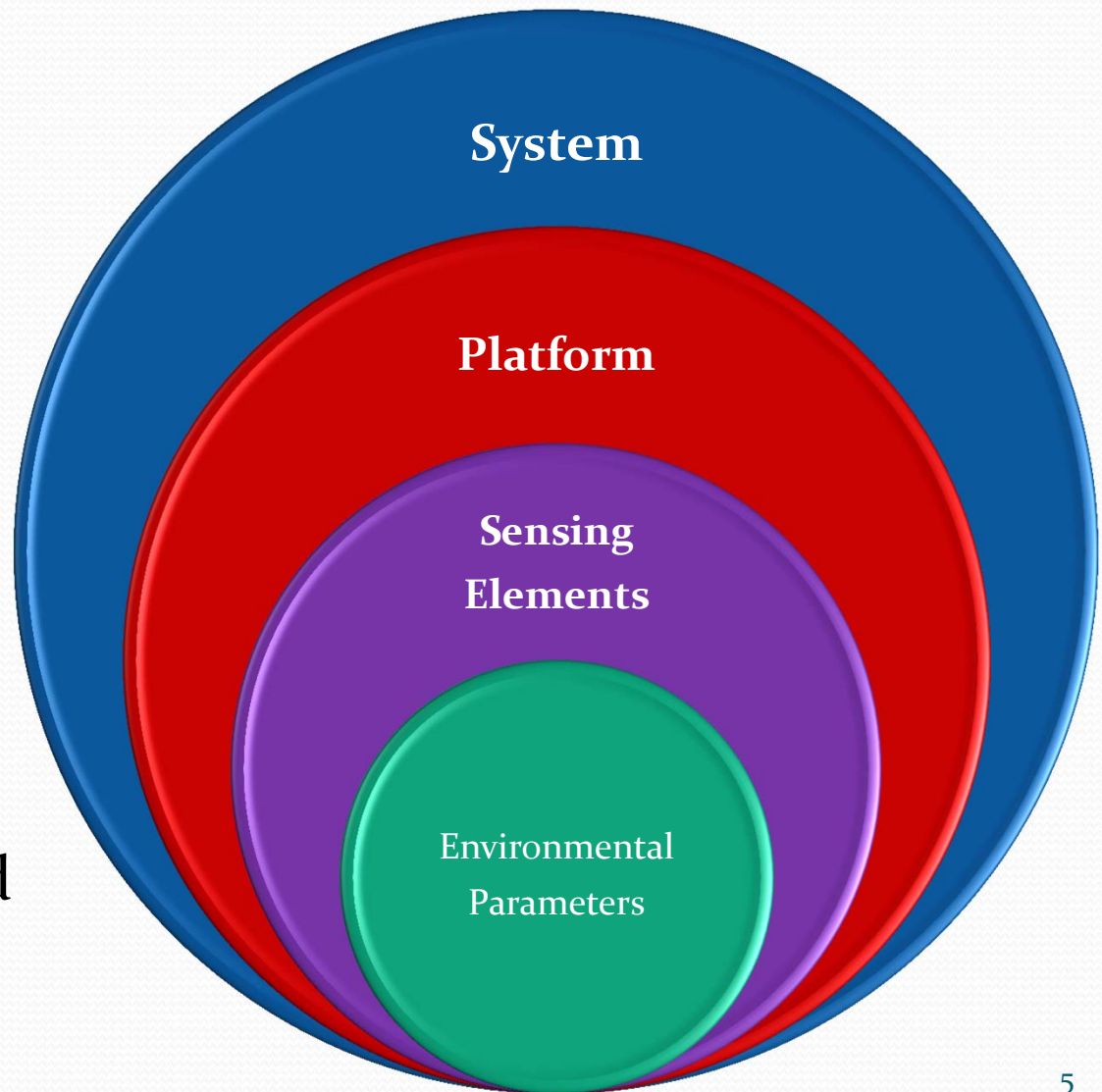
User Requirements

- Documented, validated user needs of environmental parameters
- Required to produce specific products and services
- Captured **independently** from observing technologies
 - Important so that they can be assessed against current or expected observing capabilities

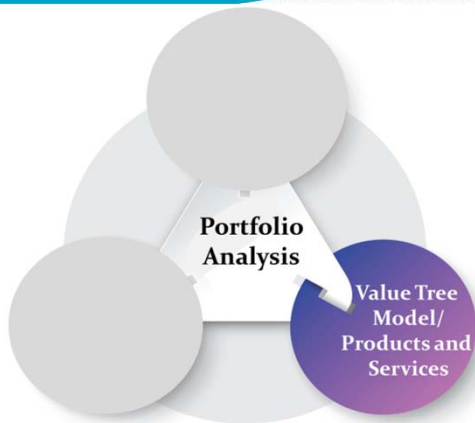
Observing Capabilities



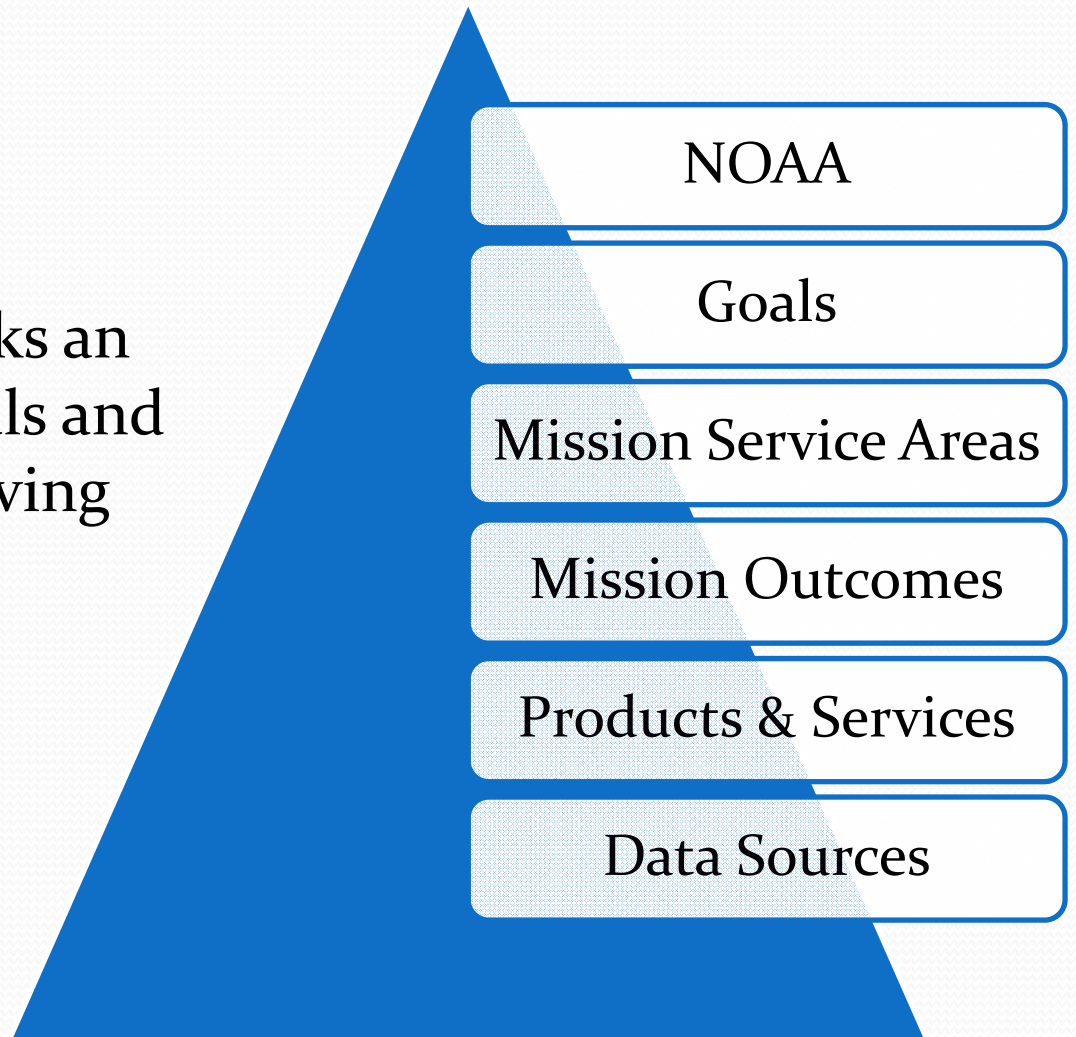
- Includes current and potential observing systems, platforms, and sensing elements
- The focus is on the environmental measurements provided by the system



Value Tree Model



A network model that links an organization's strategic goals and objectives to Earth observing capabilities





Database & Interface



Technology,
Planning, and
Integration for
Observations



NOAA Home
TPIO Home
Contact TPIO

Earth Observation Requirements Evaluation System (EORES)

HOME REQUIREMENTS ▾ SYSTEMS ▾ VALUE TREES ▾



Welcome **AMANDA.MITCHELL** !

You are logged in as a
DATA MANAGER

Explore EORES datasets

- » Browse EOR
- » Browse EOS
- » Browse VTI

EORES Version: v3.4.4 647

- [Report a problem/enhancement request](#)

Welcome to the EORES Application!

The purpose of EORES is to:

- Collect • Store • Visualize • Analyze • Report •

Utilizing data within and across the following entities:

- Earth Observation Requirements (*EOR*)
- Earth Observing Systems (*EOS*)
- Value Tree Information (*VTI*)

Employing an enterprise system providing capabilities which are:

- ★ Online Accessible ★ Responsive ★ User-Friendly ★



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Page Last Modified: Wednesday, December 14, 2016



Example:

The National Weather Service (NWS) wanted to know:

1. What user requirements can be satisfied by the proposed follow-on Rawinsonde capability?
2. What is the impact of the current Rawinsonde system?



Observing System

Observing System Information

System Name:	Radiosonde Frequency Migration Project (RFMP)	Edit
System Type:	BALLOON	
Description:	Since the late 1930's the National Weather Service (NWS) has measured vertical profiles of pressure, temperature, relative humidity, and wind velocity through the use of balloon-borne radiosondes. The NWS participates in the WMO's World Weather Watch Program by maintaining and operating a network of radiosonde stations in the contiguous U.S. (69 sites), Alaska Region (13), Caribbean (1), and (9) Pacific Region. In addition the Cooperative Hurricane Upper Air Stations (CHUAS) network in the Caribbean (10). For a total of 102 Upper Air Stations. Radiosonde observations are essential for producing accurate weather forecasts and warnings. Provides data to meteorological forecasting computer models.	[Less]
Intended Use:	OPERATIONAL	
Life Cycle Phase:	PLANNED	
Palma ID(s):		
Key Dates:	DATE FULL OPERATING CAPABILITY (FOC): 10-01-2022 DATE LAUNCHED: 10-01-2020	
System Documentation:	OBSERVING SYSTEM REFERENCE DOCUMENTS UPLOAD: RFMP Capabilities Document	
Deployment Plans:	A network of 92 operational radiosonde stations must be maintained and operated in the contiguous U.S. (69 sites), Alaska Region (13), Caribbean (1), and (9) Pacific Region in accordance with NWS Directive 10-1401.	
Cost Information (0)		
OSC Baseline Observing System Category:		
OSC Baseline Id Number:		
Observing System Point(s) of Contact (0)		
Organizations:	<ul style="list-style-type: none"><input type="checkbox"/> ACQUIRING ORGANIZATION (1)<input type="checkbox"/> U.S. FEDERAL GOVERNMENT AGENCY (1)<input type="checkbox"/> DOC (Department of Commerce) (1)<input type="checkbox"/> NOAA (National Oceanic and Atmospheric Administration) (1)<input checked="" type="checkbox"/> NWS (National Weather Service)	

Platform

Platforms / Sensors / Environmental Parameters

▼ Platforms (1)

Manage Platform Associations

▼ nws-raob-network-RFMP-project

Platform Name: nws-raob-network-RFMP-project (RFMP-raob)

Platform Alias(es):

Platform Type:

BALLOON

Description:

The radiosonde is carried aloft by a balloon. It collects and transmits meteorological data.

Life Cycle Phase:

PLANNED

Palma ID(s):

Key Dates:

DATE END OF LIFE (EOL): 01-01-2099

DATE FULL OPERATING CAPABILITY (FOC): 10-01-2022

DATE LAUNCHED: 10-01-2020

Platform Documentation:

Deployment Plans:

▶ Deployment Profile (0)

▶ Cost Information (0)

▶ Platform Point(s) of Contact (0)

Organizations:

▼ Sensing Elements (6)

Manage Sensing Element Associations

▶ NWS-RAWINSONDE-PRESSURE SENSOR-RFMP

▶ NWS-RAWINSONDE-RELATIVE HUMIDITY SENSOR-RFMP

▶ NWS-RAWINSONDE-TEMPERATURE SENSOR-RFMP

Edit

Sensing Element

▼ NWS-RAWINSONDE-PRESSURE SENSOR-RFMP

Sensing Element Name: NWS-RAWINSONDE-PRESSURE SENSOR-RFMP (RFMP-pressure)

Sensing Element Alias(es):

Edit

Sensing Element Type: RADIOSONDE

Description: The radiosonde pressure sensor is a small electronic capacitance cell that measures atmospheric pressure from 1070 hPa to about 2 hPa.

Life Cycle Phase: PLANNED

Palma ID(s):

Key Dates:

DATE END OF LIFE (EOL):	01-01-2099
DATE FULL OPERATING CAPABILITY (FOC):	10-01-2022
DATE LAUNCHED:	10-01-2020

Sensing Element

Documentation:

Deployment Plans:

- ▶ **Cost Information (0)**
- ▶ **Sensing Element Point(s) of Contact (0)**

Organizations:

▼ Environmental Parameters (2)

Manage Environmental Parameter Associations

- ▶ nws-rawinsonde-RFMP-pressure surface-400mb
- ▶ nws-rawinsonde-RFMP-Upper Atmospheric Pressure 400-4mb

Observing System Environmental Parameter

▼ nws-rawinsonde-RFMP-pressure surface-400mb

Name: nws-rawinsonde-RFMP-pressure surface-400mb

Actual / Derived:

Palma ID(s):

Edit

Global Change Master Directory Alignment



- Earth Science
- Atmosphere
- Atmospheric Pressure
- Atmospheric Pressure: Profiles

Attribute	Value	Units
★ Geographic Coverage	CONUS+AK+HI+US Territories	
★ Horizontal Resolution	315	km
★ Measurement Accuracy	1.8	hPa
★ Sampling Interval	12	hr
★ Vertical Resolution	5	m

▶ nws-rawinsonde-RFMP-Upper Atmospheric Pressure 400-4mb

User Requirements

Overview

Requirement Name	ct-awx - air temperature: profiles conus + ak & hi	
Requirement Identifier	30001	
Requirement Type	DIRECT OBSERVATION REQUIREMENT	
Priority	1	
Status	ACTIVE	
Mission Service Area	WRN_AWX	
End User Application	Winter Storms	
Validation Complete?	Y	
Validation Information:	Geographic Coverage	2 - Validated with operational documentation.
	Validation Level	
	Horizontal Resolution	2 - Validated with operational documentation.
	Validation Level	
	Measurement Accuracy	2 - Validated with operational documentation.
	Validation Level	
	Requirement Validation	2 - Validated with operational documentation.
	Level	
	Sampling Interval	2 - Validated with operational documentation.
	Validation Level	
	Vertical Resolution	2 - Validated with operational documentation.
	Validation Level	
Review Complete?	Y	
Key Dates:	DATE PORD ACCEPTED: 08-16-2010 DATE PORD GENERATED: 03-18-2010	
Requirement Documentation:	PORD DOCUMENT: CT-AWX PORD VALIDATION DOCUMENT: CT-AWX Program Charter_06_19_09.pdf VALIDATION DOCUMENT: Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8; World Meteorological Organization; ISBN-978-92-63-10008-5 VALIDATION DOCUMENT: Guide to Met Inst & Methods of Obs-WMO-No 8-7th Ed-2008.pdf VALIDATION DOCUMENT: NextGen-pPF-version 0 2c-5-10SEP_CORL_Temp.doc VALIDATION DOCUMENT: Observing Weather and Climate from the Ground Up: A Nationwide Network of Networks; Committee on Developing Mesoscale Meteorological Observational Capabilities to Meet Multiple Needs, National Research Council; ISBN: 0-309-12987-7; http://www.nap.edu/catalog/12540.html; 2008 VALIDATION DOCUMENT: Observing Weather and Climate from the Ground Up.pdf VALIDATION DOCUMENT: PROGRAM CHARTER FOR AVIATION WEATHER PROGRAM; NOAA; Jun 2009	

User Requirements

Attributes

Global Change Master Directory Alignment



- 1 → Earth Science
- Atmosphere
- Atmospheric Temperature
- Air Temperature: Profiles

Attribute	Type	Value	Weight	Notes
★ Geographic Coverage	OBJECTIVE	CONUS+AK+HI	20	
	THRESHOLD	CONUS+AK+HI	20	
★ Horizontal Resolution	OBJECTIVE	5 km	15	
	THRESHOLD	5 km; Trend: Decreasing	15	
★ Measurement Accuracy	OBJECTIVE	0.5 K	20	
	THRESHOLD	1 K; Trend: Decreasing	20	
★ Sampling Interval	OBJECTIVE	6 hr	5	
	THRESHOLD	12 hr; Trend: Decreasing	5	
★ Vertical Resolution	OBJECTIVE	100 m	15	
	THRESHOLD	150 m; Trend: Decreasing	15	
Data Latency	OBJECTIVE	30 min	15	
	THRESHOLD	1 hr	15	
Long Term Stability	OBJECTIVE			
	THRESHOLD			
Measurement Range	OBJECTIVE	[195 - 325 K]	5	
	THRESHOLD	[200 - 320 K]	5	
ODS Flt Hrs Hods	THRESHOLD	; Trend: Increasing		
Vertical Range	OBJECTIVE	[2 - 18 km]	5	
	THRESHOLD	[2 - 18 km]	5	

Other Remarks

Requirement Gap Analysis

CASrt 3.1 BETA

File Tabs Edit Help

Observables 1 +

Filters Add Remove All

Show Req Geo Coverage: 'CONUS', 'CO...' X

Show Req Validation Complete: 'Yes' X

Show Req Priority: '1' X

RFMP X

Platforms & Sensors

- Blank Platform
- 3D-Winds
- ACE
- ACRIMSAT
- ADEOS-II
- ADM Aeolus
- AERONET
- AERONET MAN
- AF Hurricane Hunters
- AIRNow
- ALOS
- AMNet
- AMoN
- ANSS
- AON
- ASCENDS
- ASOS
- AWOS
- AirCore
- AmeriFlux
- Animal Borne Sensors
- Antarctic UV
- Aqua
- Aquarius/SAC-D
- Argo
- Atmos Dispersion
- Aura
- BAO

Browse Mode: Requirements Observables Portfolio Analysis Timeline

Tree View Table View

GCMD Variable	Title	Geo Covera...	Vertical Res...	Horizontal R...	Accuracy	Sampling Fr...	RGAs
Air Temperature: Profiles							
[-] Air Temperature: Profiles	nws-rawinsonde-RFMP-Upper Air Temperature 400-4mb	CONUS+AK+HI...	5 m	315 km	0.3 K	12 hr	
Air Temperature: Profiles	ct-awx - air temperature: profiles conus + ak & hi	CONUS+AK+HI	150 m	5 km	1 K	12 hr	75
Air Temperature: Profiles	st-oar_nssl - hydrometeor type and content - temperature	CONUS	50 m	100 m	1 K		70
Air Temperature: Profiles	st-oar_arl - mercury studies: air temperature	CONUS+AK+HI	10 m	100 m	1 K		69
[-] Air Temperature: Profiles	nws-rawinsonde-RFMP-air temperature: profiles	CONUS+AK+HI...	5 m	315 km	0.3 K	12 hr	
Air Temperature: Profiles	ct-awx - air temperature: profiles conus + ak & hi	CONUS+AK+HI	150 m	5 km	1 K	12 hr	75
Air Temperature: Profiles	st-oar_nssl - hydrometeor type and content - temperature	CONUS	50 m	100 m	1 K		70
Air Temperature: Profiles	st-oar_arl - mercury studies: air temperature	CONUS+AK+HI	10 m	100 m	1 K		69
Air Temperature: Profiles, Boundary Layer							
[-] Air Temperature: Profiles, Boundary Layer	nws-rawinsonde-RFMP-air temperature: boundary layer	CONUS+AK+HI...	5 m	315 km	0.3 K	12 hr	
Air Temperature: Profiles, Boundary Layer	ct-awx - air temperature: boundary layer conus + ak & hi	CONUS+AK+HI	150 m	10 km	1 K	1 hr	71
Atmospheric Pressure: Profiles							
[-] Atmospheric Pressure: Profiles	nws-rawinsonde-RFMP-Upper Atmospheric Pressure 400-4...	CONUS+AK+HI...	5 m	315 km	0.5 hPa	12 hr	
Atmospheric Pressure: Profiles	st-oar_nssl - hydrometeor type and content - atmospheric...	CONUS	50 m	100 m	1 hPa		70
Atmospheric Pressure: Profiles	st-oar_arl - mercury studies: atmospheric pressure	CONUS+AK+HI	10 m	100 m	1 hPa		69
[-] Atmospheric Pressure: Profiles	nws-rawinsonde-RFMP-pressure surface-400mb	CONUS+AK+HI...	5 m	315 km	1.8 hPa	12 hr	
Atmospheric Pressure: Profiles	st-oar_arl - mercury studies: atmospheric pressure	CONUS+AK+HI	10 m	100 m	1 hPa		63
Atmospheric Pressure: Profiles	st-oar_nssl - hydrometeor type and content - atmospheric...	CONUS	50 m	100 m	1 hPa		63
Water Vapor: Profiles							
[-] Water Vapor: Profiles	nws-rawinsonde-RFMP-rh	CONUS+AK+HI...	5 m	315 km	5 %	12 hr	
Water Vapor: Profiles	st-oar_nssl - hydrometeor type and content - humidity	CONUS	50 m	100 m	5 %		69
Water Vapor: Profiles	st-oar_esrl/csd - water vapor	CONUS+AK+HI...	10 m	100 m	10 %	1 sec	55
Water Vapor: Profiles	st-oar_esrl/csd - water vapor mixing ratios	CONUS+AK+HI...	10 m	100 m	10 %	1 sec	55
Water Vapor: Surface							
[-] Water Vapor: Surface	nws-rawinsonde-RFMP-water vapor	CONUS+AK+HI...	5 m	315 km	5 %	12 hr	
Wind Profiles: Direction							
[-] Wind Profiles: Direction	nws-rawinsonde-RFMP-windd	CONUS+AK+HI...	5 m	315 km	5 deg	12 hr	
Wind Profiles: Direction	ct-awx - wind direction: profiles conus + ak & hi	CONUS+AK+HI	100 m	30 km	10 deg	3 hr	73
Wind Profiles: Direction	st-oar_nssl - hydrometeor type and content - wind direction	CONUS	50 m	100 m	10 deg		70
Wind Profiles: Direction	st-oar_arl - mercury studies: wind direction	CONUS+AK+HI	10 m	100 m	10 deg		69
Wind Profiles: Direction	st-oar_esrl/csd - wind direction	CONUS+AK+HI...	100 m	100 m	5 %	1 sec	38
Wind Profiles: Direction, Boundary Layer							
[-] Wind Profiles: Direction, Boundary Layer	nws-rawinsonde-RFMP-wind direction: boundary layer	CONUS+AK+HI...	5 m	315 km	5 deg	12 hr	
Wind Profiles: Direction, Boundary Layer	ct-awx - wind direction: boundary layer conus + ak & hi	CONUS+AK+HI	100 m	30 km	10 deg	3 hr	73
Wind Profiles: Speed							
[-] Wind Profiles: Speed	nws-rawinsonde-RFMP-wds	CONUS+AK+HI...	5 m	315 km	1 m/sec	12 hr	

What is the impact of the current Rawinsonde system?

- System is used directly by 260 different products and services across NOAA
- System ranks in the top 10 (out of over 700) data sources for NOAA
- System ranks in the top 5 data sources for NOAA's Weather Ready Nation Goal

Other Types of Questions

- What capabilities do future observing systems need to satisfy more requirements?
- Who uses my product and services and how impactful are my products to NOAA, NOAA's goals, mission service areas, etc.?
- Where do observing systems fall in a cost vs. benefit analysis?
- What are the relative impacts of Earth observing systems on NOAA, NOAA's goals, mission service areas, etc.?
- What is the impact of losing an Earth observing system on NOAA's ability to meet a requirement?



For More Information

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The End