Assessing the Impacts of Observations

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Amanda Mitchell (IAI), Scott Smith (ISS), Lewis McCulloch (IAI)

Technology, Planning, & Integration for Observation (TPIO)

Office of Projects, Planning, & Analysis (OPPA)

NOAA Satellite and Information Service (NESDIS)

Assessing the Impacts of Observations

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

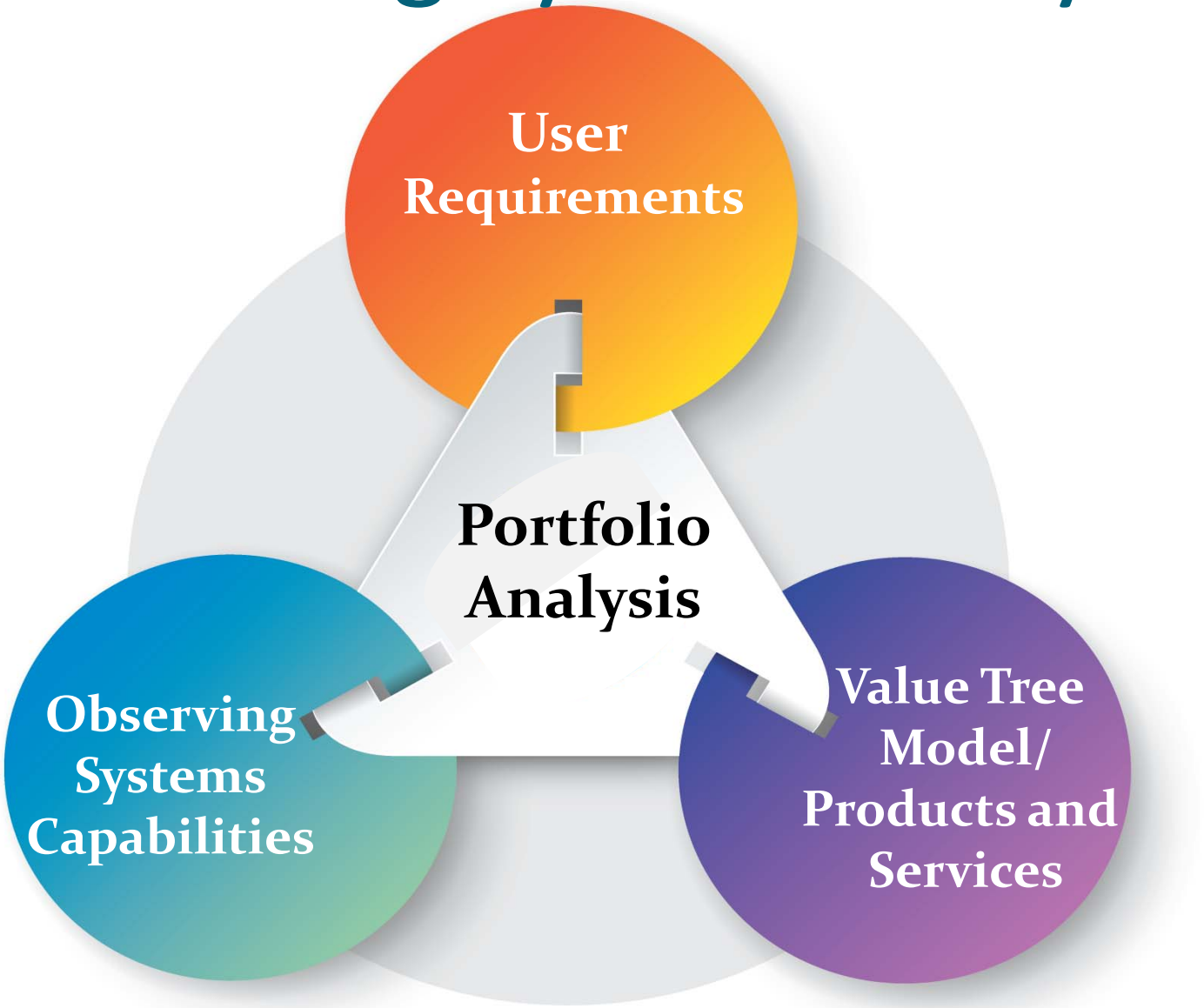
Who do we support?

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

Ongoing support includes:

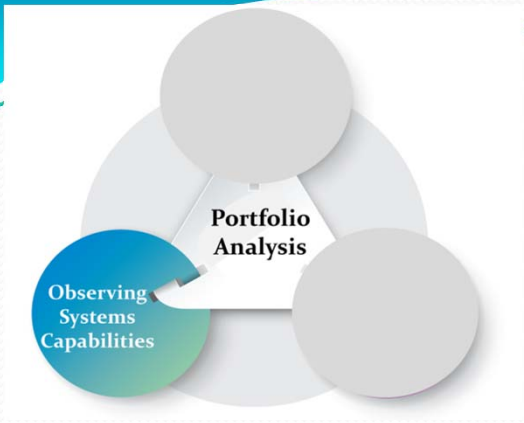
- The Earth Observation Assessment with the Office of Science and Technology Policy (OSTP)
- The Future Weather Satellite Architecture with the National Satellite and Information Service (NESDIS)
- The Fleet Force Recapitalization Architecture with the Office of Marine and Aviation Operations (OMAO)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

Observing System Analysis



User Requirements

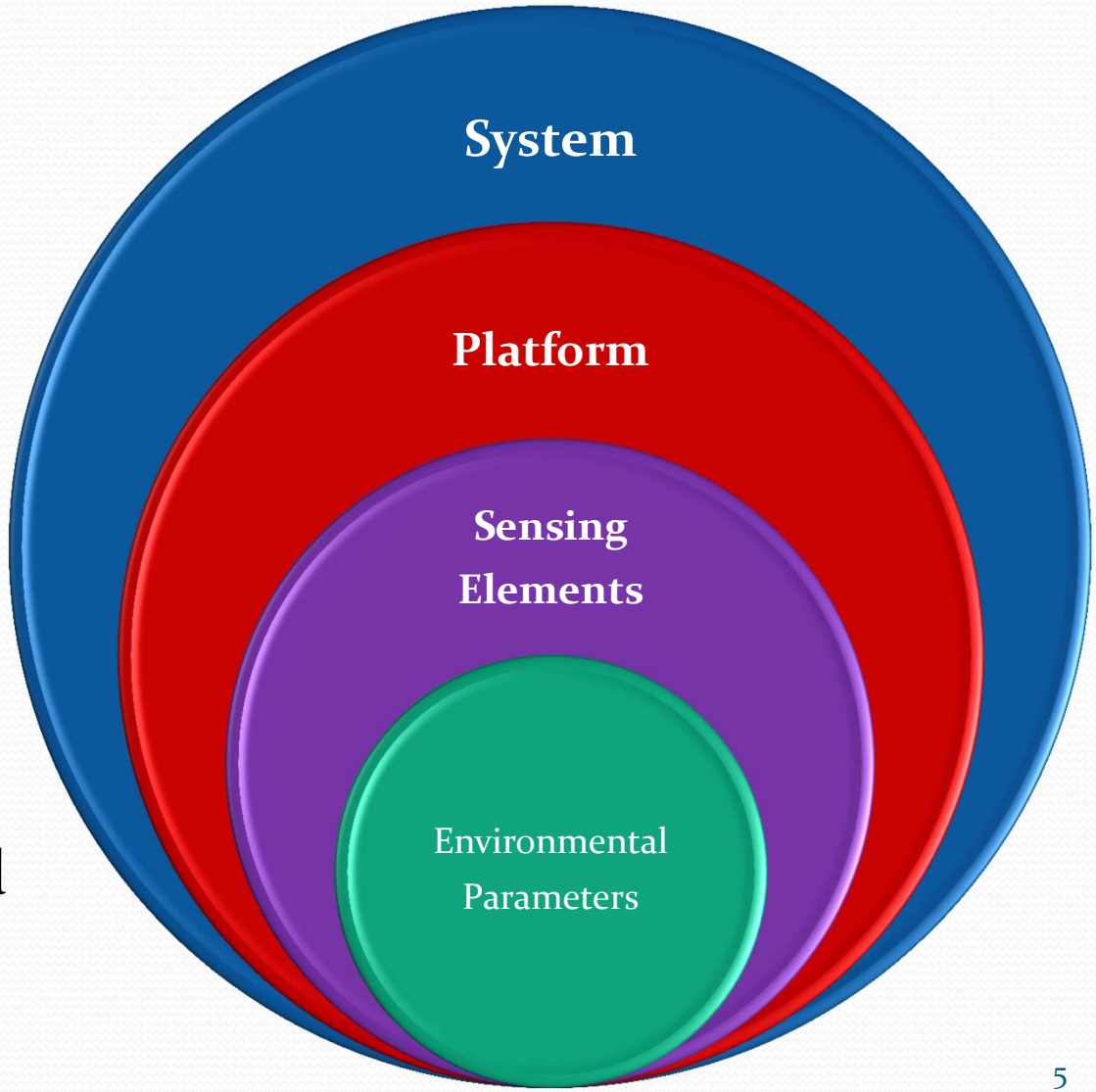
- Documented, validated user needs of environmental parameters
- Required to produce specific products and services
- Captured **independently** from observing technologies
  - Important so that they can be assessed against current or expected observing capabilities



Observing Capabilities

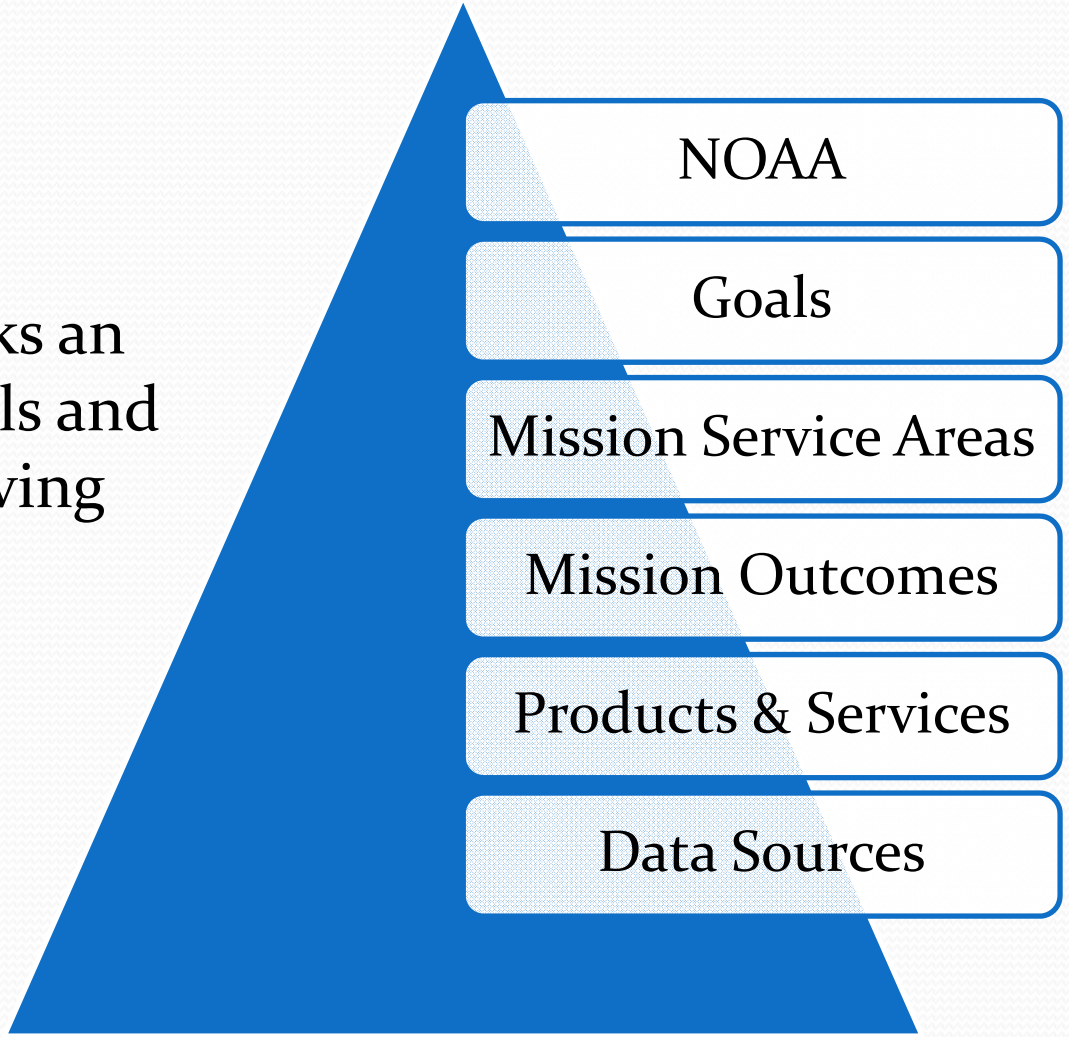
- Includes current and potential observing systems, platforms, and sensing elements

- The focus is on the environmental measurements provided by the system

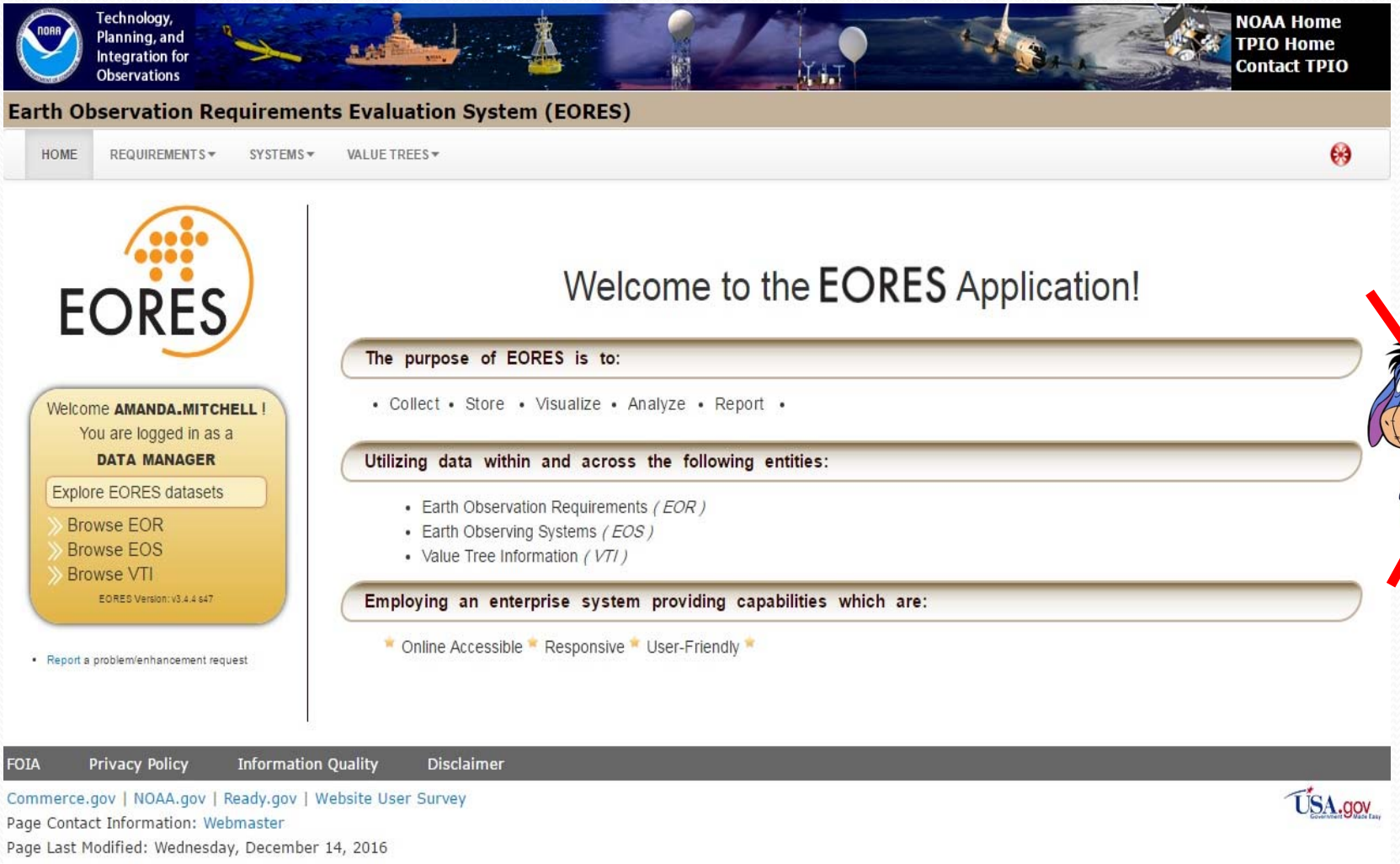


Value Tree Model

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



Database & Interface



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

Edit

System Name: Radiosonde Frequency Migration Project (RFMP)

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:

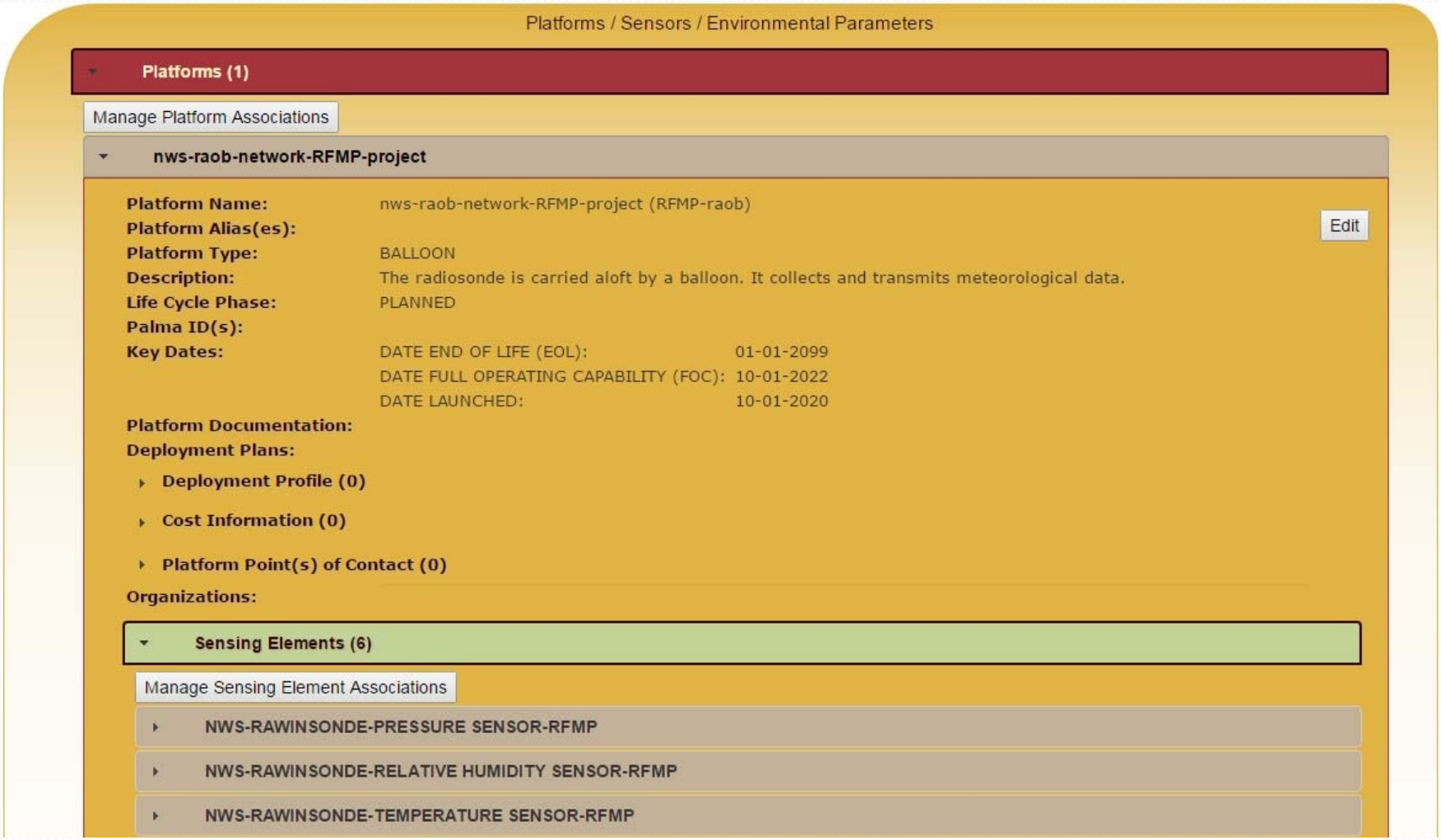
OSC Baseline Id Number:

▸ **Observing System Point(s) of Contact (0)**

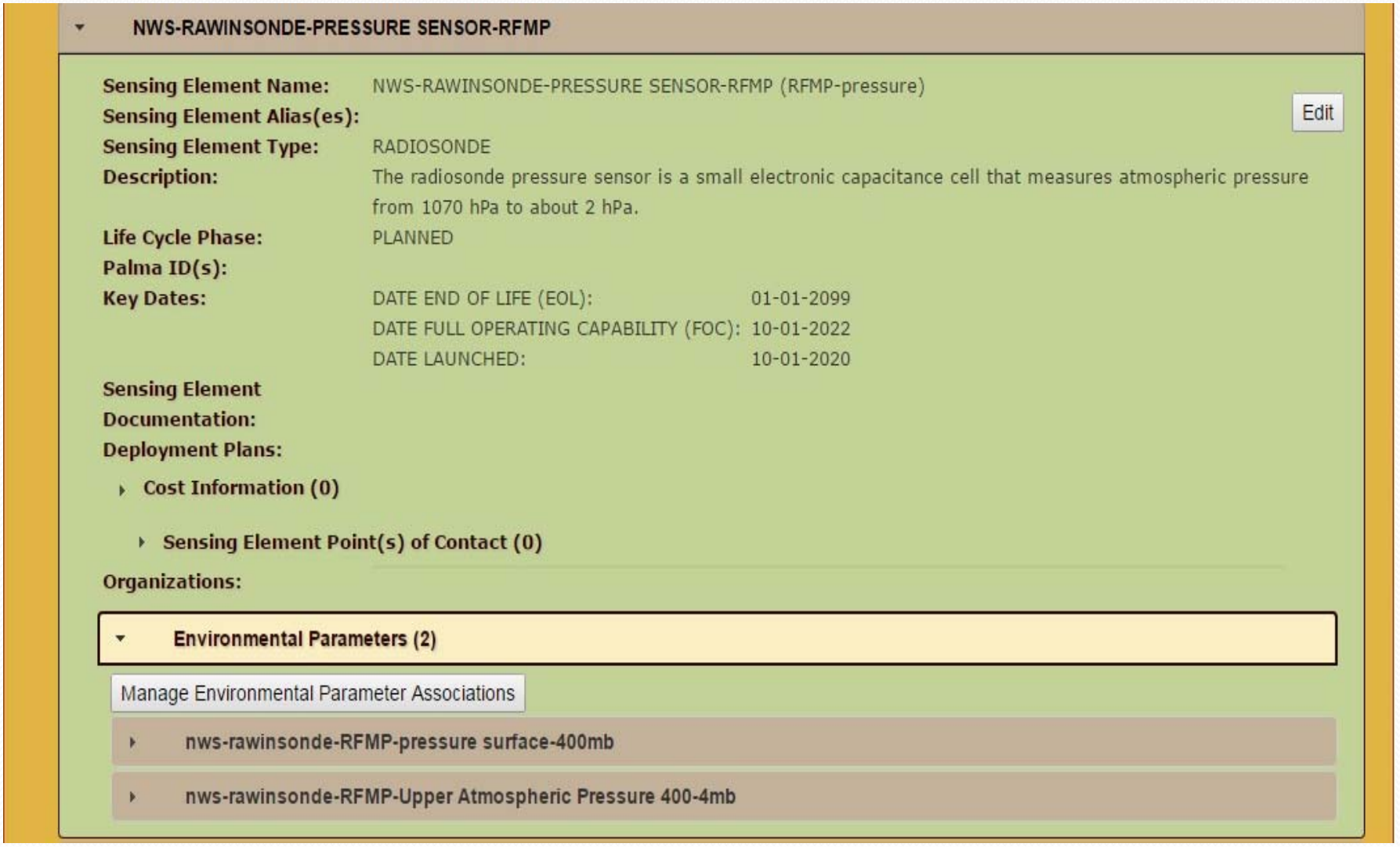
Organizations:

- *ACQUIRING ORGANIZATION (1)*
  - *U.S. FEDERAL GOVERNMENT AGENCY (1)*
    - *DOC (Department of Commerce) (1)*
      - *NOAA (National Oceanic and Atmospheric Administration) (1)*
        - ☑ *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
Edit
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

Sensing Element



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

GCMD

- 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 Validation Level**	2 - Validated with operational documentation.
	Horizontal Resolution Validation Level	2 - Validated with operational documentation.
	Measurement Accuracy Validation Level	2 - Validated with operational documentation.
	Requirement Validation Level	2 - Validated with operational documentation.
	Sampling Interval Validation Level	2 - Validated with operational documentation.
	Vertical Resolution Validation Level	2 - Validated with operational documentation.
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

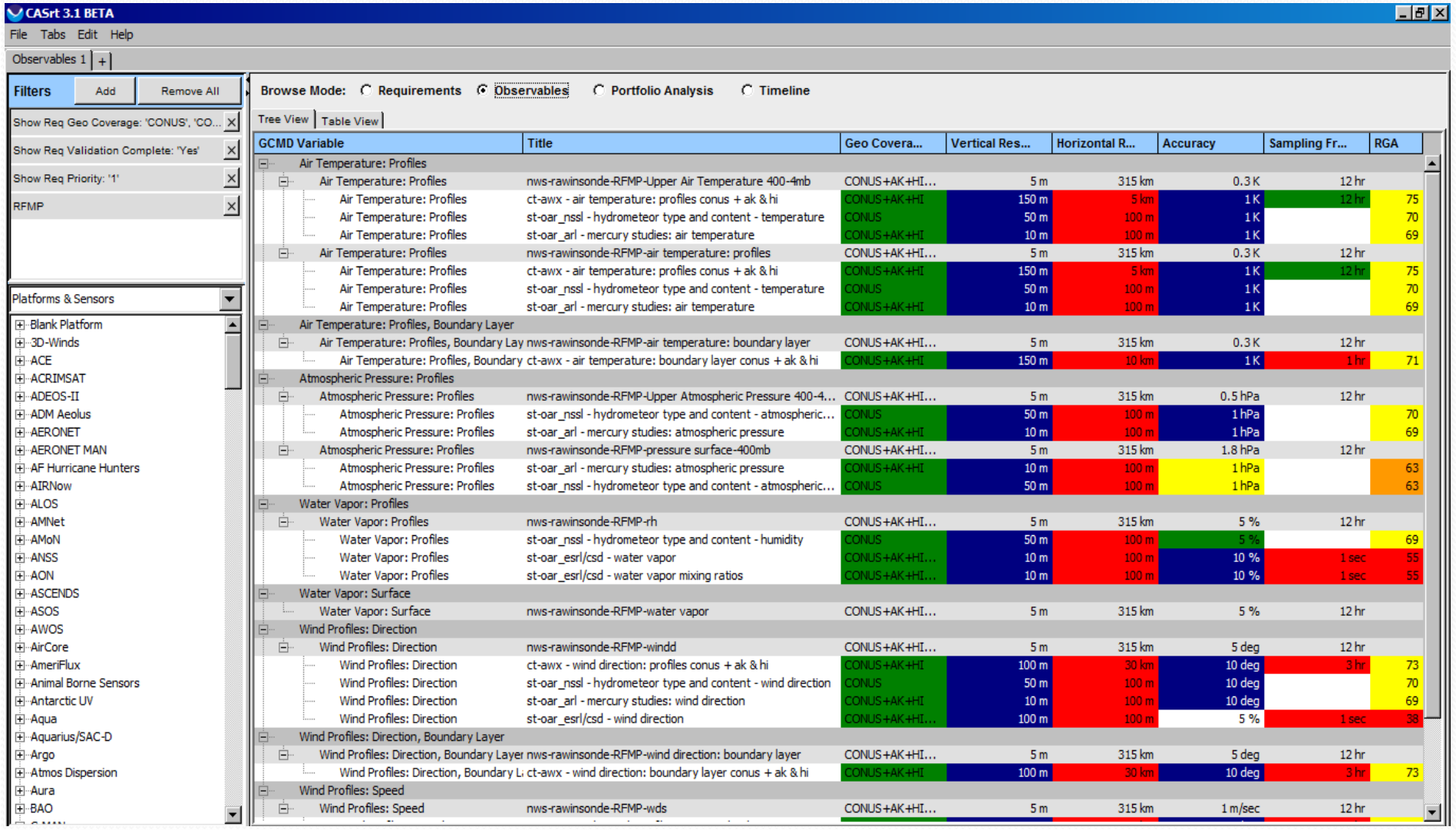
GCMD

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



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

Please contact Eric Miller (eric.miller@noaa.gov)

TPIO Website: https://nosc.noaa.gov/tpio/

Authors:

Amanda Mitchell (amanda.mitchell@noaa.gov)

Lewis McCulloch (lewis.mcculloch@noaa.gov)

Scott Smith (scott.smith@noaa.gov)

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