



# Overview of NOAA's Commercial Weather Data Pilot

*Dr. Karen St. Germain*

*Director*

*NOAA/NESDIS*

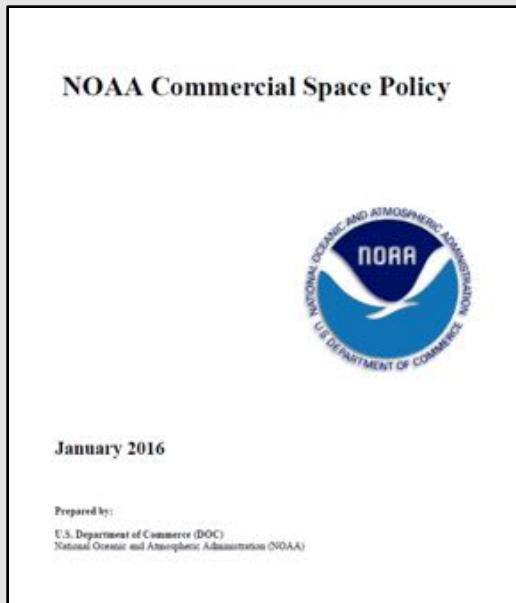
*Office of System Architecture and Advanced Planning (OSAAP)*

IROWG-6 Meeting

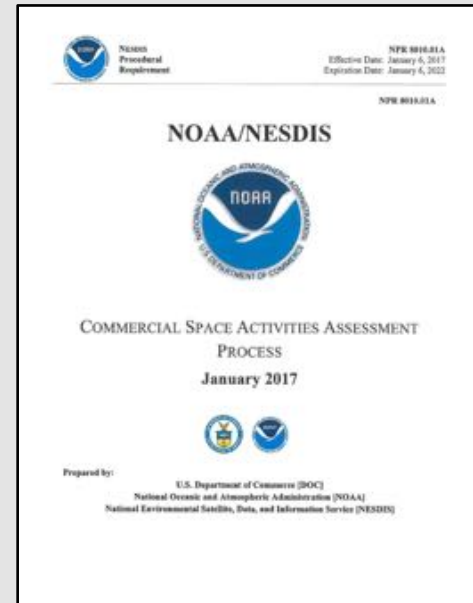
21 September 2017



# NOAA Policy Framework



“NOAA will explore and, where appropriate, **pursue demonstration projects** to validate the viability of assimilating commercially provided environmental data and data products into NOAA meteorological models and add value to the forecast.”



“NESDIS will issue one or more solicitations...for NOAA to **acquire and evaluate on-orbit observations from commercial sources**, where industry has or will establish on-orbit capabilities that were identified by NOAA as promising option(s)...”



# Recent Guidance

## **Weather Research and Forecasting Innovation Act of 2017 discusses several NOAA commercial space activities**

- Develop a strategy to enable the procurement of quality commercial weather data
- Pilot Program
  - Publish standards for space-based commercial weather data
  - Within 90 days, enter into at least one pilot contract with one or more private sector entities capable of providing data that meet published standards
  - Within 3 years, assess data's ability to meet standards and its impact to weather models
  - \$6M per year authorized FY2017-FY2020
- If pilot demonstrates data can meet published standards, where appropriate, cost-effective, and feasible, obtain commercial weather data from private sector providers
- Continue to meet international meteorological agreements, including WMO Resolution 40
- Avoid unnecessary duplication between public and private sources of data

## **FY 2018 President's Budget**

- Commercial Weather Data Pilot funded at \$3M FY 2018-FY 2022

# CWDP Round 1 Evaluation

- CWDP initiated with \$3M in FY 2016
- NOAA identified radio occultation (RO) as initial data set for evaluation
- Roles:
  - NCAR/UCAR performing data processing and initial quality evaluation
  - Joint Center for Satellite Data Assimilation performing data validation and NWP model impact assessment
- Requirements set to enable maximum participation:
  - Requested 3-6 months of data in specified format
  - No minimum requirement for occultations per day, distribution of occultations around the globe, or secure real time data delivery
- Round 1 activities addressed processes for contract writing and initial evaluation
  - Round 1 does not address NESDIS processes for IT security, data rights and distribution, real time data ingest





# CWDP Round 1 Lessons Learned

While Round 1 is still underway, NOAA is already incorporating lessons learned into planning for Round 2 and beyond.

- Having data in advance is critical to prepare for data processing
- Vendors must state risks to their proposal
- Need verification and validation of requirements
- More communication needed between vendors and NOAA/NOAA's CWDP partners during data delivery and analysis
- NOAA must state specific requirements
- Some vendors would prefer that NOAA purchase processed data products rather than lower level data

# CWDP Round 2

## Overview:

CWDP Round 2 seeks to: extend the purchase of RO data from commercial vendors; perform a more comprehensive assessment of the value of commercial RO data; and develop NOAA systems readiness for future purchases of operational weather data from commercial sources.

This progress toward an operational data purchase is seen in three aspects of Round 2:

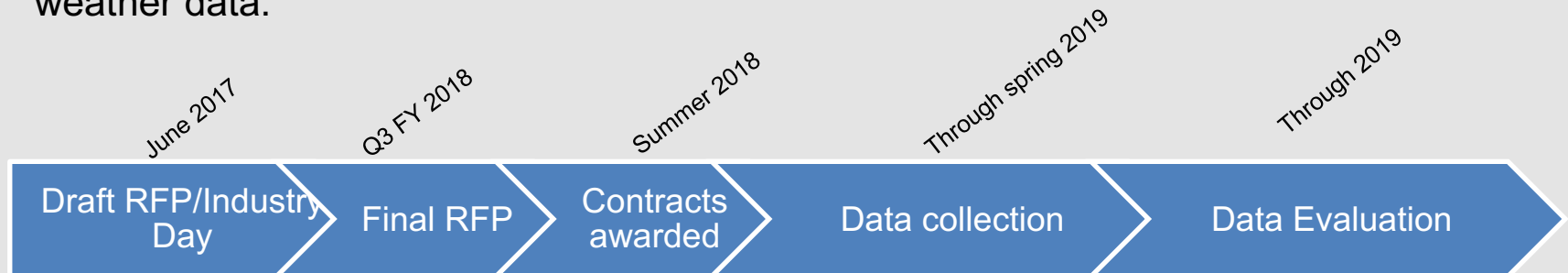
- Comprehensiveness of data requested and performance of seasonal impact assessment
- Increased emphasis on vendor validation approaches, a key enabler for level 2+ data purchase
- Operational features of data requested such as security, timeliness, and availability

Commercial Data Purchase Procedure	Round 1	Round 2
Contract Writing	X	X
Data quality assessment	X	X
Secure data ingest		X
Numerical weather prediction impact assessment		X
Data rights negotiation		X
Data archive		X
Operational attributes		X

# CWDP Round 2

## Round 2 budget and schedule:

- NOAA will use FY 2016 funds recouped from Round 1 contract modifications and FY 2017 funds (\$5M) to execute Round 2
- Round 2 draft RFP released in May 2017
- Industry Day held in June 2017
- Based on the results of the June Industry Day discussions and additional market research, NOAA has determined that releasing an RFP in FY2017 is not in the best interests of the Government or the CWDP.
- NOAA anticipates releasing the Round 2 RFP early third quarter of FY2018.
- NOAA continues to pursue internal system readiness for future purchases of operational weather data.





# Round 1/Round 2 Spec Comparison

Requirement	Round #1 (RFQ)	Round #2 (Draft RFP)
Data latency	Minimum monthly deliveries required.	Minimum weekly deliveries required; options for vendors to demonstrate low-latency downlink and processing.
Data Rights and Sharing	Only within entities performing specific CWDP analysis.	Rights for non-operational analysis and retention, and sharing with U.S. agencies and international partners.
Radio Occultation data	No minimum amount required. Specific periods of consecutive data, open loop required.	<p>≥500 RO per 24 hrs, up to 6 months total consecutive data.</p> <p>≥1 RO covering ≥90% of all 500km<sup>2</sup> surface areas, repeated every 15 days. [TBR]</p>
Ionospheric data	Not requested.	POD data able to derive Total Electron Content (TEC); options for electron density, S4 and $\sigma\Phi$ derived product files.
Concurrent RO/POD/Attitude data	Attitude data required, and closed-loop POD corresponding to RO dataset.	POD and attitude data concurrent with RO data required; minimum 50% POD duty-cycle and 60 minute arcs required.
GNSS Tracking data	No requirement on tracking data quality. Dual-frequency required.	Requires 4 GNSS satellites in Field of View during POD, 95% of the time.
Derived bending angles and profiles	Not requested.	Requested as an option. Onboard clock steering information required, to ensure accurate angle/profile derivation.





# Key Challenges

Key challenges will continue to emerge, including those below, as NOAA continues to engage an evolving commercial sector.

- Price point stability/volatility, competition, and market demands
- Data licensing and tension between commercial interests at different points in the value chain
- Impact to partnerships, data sharing arrangements, and R&D
- Operational stability of data and user readiness
- Interagency coordination
- Validation lifecycle



# Next Steps

- Execute Commercial Weather Data Pilot Round 2, with results possible in 2020
- The Weather Research and Forecasting Innovation Act authorizes continuation of the Pilot through 2020, which is supported by the FY 2018 President's Budget
- Per the NESDIS Process, NESDIS plans to continue to canvass the commercial sector for available data sets that can meet NOAA mission needs
  - Broad RFI in 2017 to inform Pilot beyond 2018
- The NOAA Satellite Observing System Architecture Study is underway now to determine the NOAA observing system architecture 2030-2050
  - Systematically considering commercial capabilities as a potential part of future architectures, along with NOAA programs of record and international partner missions
  - Future pilots will be guided by the results of this study

Thank you

