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IN FOCUS

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NOAA's Commercial Data Program: Background and Considerations for Congress

Since 1970, the National Oceanic and Atmospheric Administration (NOAA) has operated satellites to collect environmental and weather data from space. With the rapid growth of the U.S. commercial space industry, both Congress and various Administrations (e.g., the 2010 and 2020 National Space Policies) have directed federal agencies (e.g., NOAA, National Aeronautics and Space Administration [NASA], Department of Defense) to purchase and use U.S. commercial space capabilities and services (to the maximum extent practical) and to prioritize partnerships with the commercial space industry (when cost-effective) to meet government requirements. In addition to the potential cost-effectiveness of commercial hosts and data buys, commercial providers may be able to develop services faster than federal agencies' historical approaches to mission development. Faster development can help meet increasing NOAA and other user demand for commercial space data.

This In Focus provides an overview of NOAA's Commercial Data Program, including the agency's purchase and use of commercial space data, proposed changes to the program, and considerations for Congress.

Commercial Data Program

NOAA's Office of Space Commerce (OSC), which serves as the entry point for commercial space providers to engage with NOAA, has established principles and a strategic plan for commercial data buys. OSC also operates NOAA's Commercial Data Program, which manages the acquisition, ingestion, use, and dissemination of commercially sourced satellite data. The Commercial Data Program has two components: the Commercial Weather Data Pilot (CWDP) program and the Commercial Data Purchase Program (CDPP).

Commercial Weather Data Pilot Program

In FY2016 appropriations report language, Congress directed NOAA "to assess the potential viability of commercial weather data in [NOAA's] weather modeling and forecasting" through at least one CWDP. It appropriated $3 million to NOAA to "purchase, evaluate, and calibrate available data" (**Table 1**). The Weather Research and Forecasting Innovation Act of 2017 (WRFIA; P.L. 115-25) codified the CWDP program, requiring the NOAA Administrator to "publish data and metadata standards and specifications for space-based commercial weather data" (15 U.S.C. §8532(c)(1)).

In 2020, Congress passed the Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow (PROSWIFT) Act (P.L. 116-181), which authorized the NOAA Administrator to establish a pilot program "to enter into contracts with one or more entities in the commercial space weather sector for the provision of ... space weather data" (51 U.S.C. §60607).

The CWDP program has evaluated several types of data in its pilot studies, including Global Navigation Satellite System (GNSS) Radio Occultation (RO) data, microwave sensor data, space weather data, and GNSS reflectometry. For example, in 2016-2018 and 2018-2020, NOAA conducted two rounds of CWDP studies focused on GNSS RO data, which can be used to determine atmospheric temperature, humidity, and pressure, important components of weather forecasting models. Through these pilot studies, NOAA identified that GNSS RO data had the potential to support the agency's operational weather forecasting and climate modeling endeavors.

If NOAA's assessment of a CWDP demonstrates, among other factors, that the data add value to NOAA's weather forecasts, WRFIA authorizes the NOAA Administrator (also known as the Under Secretary of Commerce for Oceans and Atmosphere) to "where appropriate, cost-effective, and feasible, obtain commercial weather data from private sector providers" (15 U.S.C. §8532(c)(2)(B))

Table 1. Enacted Appropriations for the NOAA Commercial Data Program, FY2016-FY2024
(in millions of dollars, nominal)

FY	16	17	18	19	20	21	22	23	24
CWDP	$3	$5	$6	$6	$3	n/a	$5	$5	n/a
CDPP	—	—	—	—	$5	n/a	$12	$22	n/a
Total	$3	$5	$6	$6	$8	$12	$17	$27	$27.5

Source: CRS, from explanatory statements accompanying appropriations laws. FY2020 amount from S.Rept. 116-127, which was adopted by reference in the explanatory statement accompanying Division B of P.L. 116-93.

Notes: CWDP = Commercial Weather Data Pilot program; CDPP = Commercial Data Purchase Program; n/a = not applicable. NOAA initiated the CDPP and Congress first funded the purchase of "commercial weather data" in FY2020. FY2021 and FY2024 explanatory statements do not provide a breakdown of amounts between CWDP and CDPP.

Commercial Data Purchase Program

Starting in 2020, successful CWDP studies have led to commercial data purchases via CDPP. Congress appropriated $5 million for FY2020 "to initiate commercial purchase of radio occultation [RO] data for operational use" (**Table 1**).

In 2020, after releasing a request for proposals seeking to "enter into one or more contracts to purchase near-real-time satellite-based RO data from commercial vendors," NOAA awarded its first commercial data buy contracts (for a total of $23 million) to Spire Global (San Francisco, CA) and GeoOptics (Pasadena, CA) for two years. NOAA began using purchased commercial RO data in operational weather forecasts on May 20, 2021.

Weather Research and Forecasting Innovation Reauthorization Act of 2023

Congress continues to propose policies related to NOAA's assessment and purchase of commercial weather data, as well as other kinds of commercial data, from satellites and other sources. For example, if enacted, Title III of the Weather Research and Forecasting Innovation Reauthorization Act of 2023 (H.R. 6093 in the 118th Congress) would amend WRFIA and provide NOAA greater authority to obtain commercial data for weather and environmental forecasting and modeling. The following selected sections of Title III of H.R. 6093 address commercial data.

Section 301 would codify the Commercial Data Program. In addition, it would broaden the program to require the NOAA Administrator to acquire "satellite, ground-based, airborne, or marine-based in situ, remote sensing, or crowd-sourced data and services for operational use relating to weather and environmental forecasting and modeling," while ensuring the program coordinates, collaborates, and ensures access to data across the agency. The NOAA Administrator would be required to "publish data, metadata, and service standards and specifications," among other requirements, for the acquired observation services and data listed above. The NOAA Administrator also would have to maintain existing intra-agency and advisory councils and establish an ombudsman position to implement council recommendations and liaise with commercial data and service providers, among other things. To accomplish this section, the bill would authorize to NOAA appropriations of $100 million for each of FY2024 through FY2028.

Section 302 would codify a new Commercial Data Pilot Program under the Commercial Data Program and would require acquired data to meet the standards and specifications identified in Section 301, among other requirements. Of the authorized appropriations described in Section 301, not less than 15% would go to the CDPP.

Section 303 would direct NOAA, to the greatest extent possible, to enter into year-long or multiyear contracts; to partner and contract with multiple observation service and data providers; to partner with private sector entities; and to reduce duplication between NOAA, NASA, and other federal departments and agencies.

Section 304 would direct the NOAA Administrator to establish open data standards and data infrastructure and, to the greatest extent possible, to make weather data purchased through the Commercial Data Program or shared by international government partners accessible to the U.S. weather enterprise.

Considerations for Congress

Commercial data providers, NOAA, and other stakeholders have expressed concerns with the Commercial Data Program since its inception. Concerns have centered on the following topics.

Frequency of Solicitations. Initially, NOAA canvassed the commercial sector by issuing requests for information "typically every 2 to 3 years or as indicated by changing markets or technologies." In FY2023, Congress noted that such a schedule "may have the unintended consequence of limiting new partnerships with the quickly evolving commercial sector" and directed the agency to conduct solicitations on an annual or more frequent basis.

Contract Lengths. Some providers state that short-term (less than one-year) contracts make it "almost impossible" to invest in satellites and continue product development. NOAA has countered that long-term contracts could be detrimental to companies seeking to enter the market and could lead to a single-vendor marketplace. H.R. 6093 would direct NOAA to enter into year-long or multiyear contracts.

Uncertain Market. NOAA reportedly has concerns that it is unclear whether "there is a cost benefit to using private data, in part because the relatively small number of competitors ... has made it challenging to determine a steady market price." For example, the only major companies with GNSS RO capability are Spire Global, GeoOptics, and PlanetiQ. Some providers have noted that it has been "tricky to get people to invest when [the provider] didn't know if there would actually be a market for the product once [they] built it."

Types of Commercial Data Available. NOAA continues to identify other kinds of commercial weather data for the CWDP program but, beyond GNSS RO, has not identified data that meets its operational needs and is appropriate for purchase under CDPP. Some stakeholders remain optimistic about the potential application of commercial microwave and electro-optical/infrared data to weather and environment forecasting.

Inclusion of Other Types of Commercial Data. Some Members of Congress have proposed the expansion of the Commercial Data Program to include data acquired via commercial aircraft, commercial and research ships, and by other means for operational use (e.g., §§§111, 113, and 301

of H.R. 6093 and §801(d) of H.R. 3560 in the 118th Congress).

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