July 7, 2016

# POLAR SATELLITES

## NOAA Faces Challenges and Uncertainties that Could Affect the Availability of Critical Weather Data

GAO Highlights

Highlights of GAO-16-773T, a testimony before the Subcommittee on Environment, Committee on Science, Space, and Technology, House of Representatives

## Why GAO Did This Study

Polar-orbiting satellites provide data that are essential to support weather observations and forecasts. NOAA is preparing to launch the second satellite in the JPSS program in March 2017, but a near-term gap in polar satellite coverage remains likely. Given the criticality of satellite data to weather forecasts and the potential impact of a satellite data gap, GAO added this area to its High-Risk List in 2013.

This statement addresses the status of the JPSS program and plans for future satellites, NOAA's efforts to depict and update satellite timelines, and the JPSS program's implementation of key information security protections. This statement is based on a May 2016 report on JPSS and a draft report on satellite timelines. To develop the draft report, GAO reviewed agency procedures for updating satellite timelines, compared timelines to best practices and agency documentation, and interviewed officials.

## What GAO Recommends

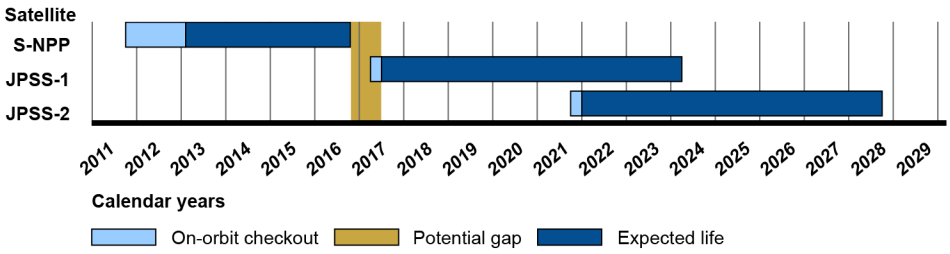
In its May 2016 report, GAO recommended that NOAA assess the costs and benefits of different launch decisions based on updated satellite life expectancies, and address deficiencies in its information security program. NOAA concurred with these recommendations. GAO's draft report includes recommendations to NOAA to improve the accuracy, consistency, and documentation supporting updates to satellite timelines, and to revise and finalize its draft policy governing timeline updates. This report is currently at the Department of Commerce for comment.

View GAO-16-773T. For more information, contact David A. Powner at (202) 512-9286 or pownerd@gao.gov

## What GAO Found

As highlighted in a May 2016 report, the National Oceanic and Atmospheric Administration's (NOAA) Joint Polar Satellite System (JPSS) program has continued to make progress in developing the JPSS-1 satellite for a March 2017 launch. However, the program has experienced technical challenges which have resulted in delays in interim milestones. In addition, NOAA faces the potential for a near-term gap in satellite coverage of 8 months before the JPSS-1 satellite is launched and completes post-launch testing (see figure). NOAA has also begun planning for future polar satellites. However, uncertainties remained on the best timing for launching these satellites, in part because of the potential for some satellites already in orbit to last longer. NOAA did not provide sufficient evidence that it had evaluated the costs and benefits of launch scenarios for these new satellites based on updated life expectancies. Until this occurs, NOAA may not make the most efficient use of investments in the polar satellite program.

**Timeline for a Potential Gap in Polar Satellite Data in the Afternoon Orbit**




Source: GAO analysis based on National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration data. | GAO-16-773T

Note: The afternoon orbit is one of three primary polar orbits providing needed coverage for numerical weather models.

As noted in a draft GAO report, NOAA publishes "flyout charts" depicting satellite timelines to support budget requests and appropriations discussions. The agency regularly updates its charts when key changes occur. However, the charts do not always accurately reflect data from other program documentation such as the latest satellite schedules or assessments of satellite availability. NOAA also has not consistently documented its justification for chart updates or depicted lifetimes for satellites beyond their design life, and has not finalized a policy for updating its charts. As a result, the information NOAA provides Congress on the flyout charts is not as accurate as it needs to be, which could result in less-than-optimal decisions.

GAO reported in May 2016 that, although NOAA has established information security policies in key areas recommended by guidance, the JPSS program has not yet fully implemented them. Specifically, while the program has implemented multiple relevant security controls, it has not yet fully implemented almost half of the recommended security controls, did not have all of the information it needed when assessing security controls, and has not addressed key vulnerabilities in a timely manner. Furthermore, NOAA has experienced 10 key information security incidents related to the JPSS ground system, including incidents regarding unauthorized access to web servers and computers. Until NOAA addresses these weaknesses, the JPSS ground system remains at high risk of compromise.