September 2013

POLAR WEATHER SATELLITES

NOAA Identified Ways to Mitigate Data Gaps, but Contingency Plans and Schedules Require Further Attention

GAO Highlights

Highlights of GAO-13-676, a report to the Committee on Science, Space, and Technology, House of Representatives

Why GAO Did This Study

NOAA established the JPSS program in 2010 to replace aging polar satellites and provide critical environmental data used in forecasting weather and measuring variations in climate. However, program officials anticipate a gap in satellite data between the time that the S-NPP satellite reaches the end of its life and the JPSS-1 satellite becomes operational (see graphic). Given the criticality of satellite data to weather forecasts, the likelihood of a significant satellite data gap, and the potential impact of a gap on the health and safety of the U.S. population and economy, GAO added this issue to its High Risk List in 2013.

GAO was asked to review the JPSS program because of the importance of polar satellite data. GAO's objectives were to (1) evaluate NOAA's progress in sustaining the continuity of NOAA's polar-orbiting satellite system through S-NPP and JPSS satellites; (2) evaluate the quality of NOAA's program schedule; and (3) assess NOAA's plans to address potential gaps in polar satellite data. To do so, GAO analyzed program management status reports, milestone reviews, and schedule data; examined polar gap contingency plans; and interviewed agency and contractor officials.

What GAO Recommends

GAO is recommending NOAA develop a mechanism to track the usage of its satellite products, establish a complete integrated master schedule, address weaknesses in component schedules, and address shortfalls in polar satellite gap contingency plans. NOAA concurred with GAO's recommendations and identified steps it is taking to implement them.

View GAO-13-676. For more information, contact Dave Powner at (202) 512-9286 or pownerd@gao.gov.

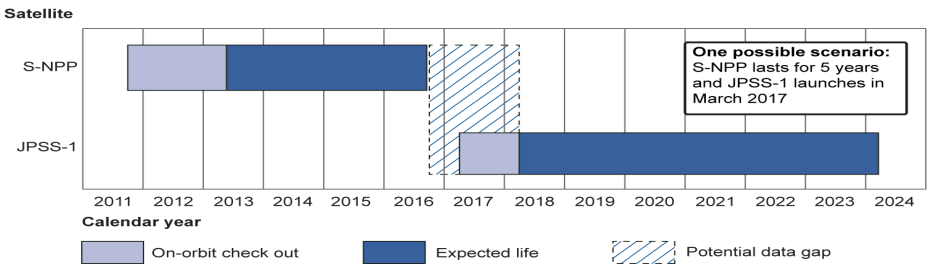
What GAO Found

The National Oceanic and Atmospheric Administration (NOAA) has made noteworthy progress on the Joint Polar Satellite System (JPSS) program by delivering data from its first satellite—the Suomi National Polar-orbiting Partnership (S-NPP)—to weather forecasters, completing significant instrument development for the next satellite (called JPSS-1), and reducing the program's life cycle cost estimate from $12.9 billion to $11.3 billion by refocusing on weather products. However, key challenges remain. Specifically, S-NPP has not yet achieved full operational capability because the program is behind schedule in validating the readiness of satellite products. Also, the program does not track whether key users are using its products or if the products meet the users' needs. In addition, issues with the JPSS ground system schedules have delayed the delivery of key system capabilities. Until the program addresses these challenges, it may continue to experience delays in delivering actionable S-NPP data to system users and in meeting JPSS-1 development schedules.

A program's success depends in part on having an integrated master schedule that defines when and how long work will occur and how activities are related to each other; however, the JPSS program office does not yet have a complete integrated master schedule and weaknesses exist in component schedules. Specifically, the program established an integrated master schedule in June 2013 and is reporting a 70 percent confidence level in the JPSS-1 launch date. However, about one-third of the program schedule is missing information needed to establish the sequence in which activities occur. In addition, selected component schedules supporting the JPSS-1 satellite have weaknesses including schedule constraints that have not been justified. Until the program completes its integrated schedule and addresses weaknesses in component schedules, it will lack the information needed to effectively monitor development progress and have less assurance of meeting the planned JPSS-1 launch date.

While NOAA developed a mitigation plan to address a potential 14 to 18 month gap in afternoon polar satellite data in October 2012 and subsequently identified additional alternatives for addressing potential gaps, it has not yet established a comprehensive contingency plan. Specifically, NOAA has not yet revised its mitigation plan to include the new alternatives, and the plan lacks several key elements, such as triggers for when to take key actions and detailed procedures for implementing them. Until NOAA establishes a comprehensive plan, it may not be sufficiently prepared to mitigate anticipated gaps in polar satellite coverage.

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



Source: GAO analysis of NOAA data.