



Report in Brief

March 13, 2023

Background

The National Oceanic and Atmospheric Administration's (NOAA's) National Environmental Satellite, Data, and Information Service (NESDIS) acquires and operates Earth and space weather observation satellites for the nation. NOAA's Space Weather Follow-On (SWFO) program will provide essential solar observations and space weather measurements that support the National Weather Service Space Weather Prediction Center's forecasting mission.

Space weather describes the conditions of the space environment due to solar activity. Solar activity can damage satellite electronics, reduce global positioning system accuracy, and increase astronauts' and airline flights' exposure to radiation. It can also cause variations in the Earth's magnetic field that can disrupt electric power grids. The two primary space weather phenomena that the Space Weather Follow-On to Lagrange Point 1 (SWFO-LI) mission will monitor are solar wind and coronal mass ejections (CMEs). Satellites currently observing space weather at Lagrange Point 1 are nearing the end of their lives. Lagrange Point 1 is an orbit location approximately 1 million miles from Earth.

The SWFO-LI mission will replace the operational capabilities of three satellites at Lagrange Point 1, continuing measurements of the solar wind and CME imagery. NOAA directed that SWFO-LI would fly as a rideshare (a method of launching multiple satellites into orbit on a single launch vehicle) on the launch vehicle of the Interstellar Mapping and Acceleration Probe (IMAP), a National Aeronautics and Space Administration (NASA) research mission. The Department considers the SWFO-LI mission as a critical, high-profile effort.

Why We Did This Review

Our audit objective was to identify SWFO program challenges that may affect cost, schedule, or overall mission performance and assess the extent to which NOAA is addressing them.

National Oceanic and Atmospheric Administration

Space Weather Follow-On (SWFO) Program: Rideshare Schedule Presents Challenges and Lack of Backup Option Warrants NOAA Attention

OIG-23-015-A

WHAT WE FOUND

We found the following:

- I. SWFO-LI should have launch contingency options commensurate with its role as a critical, high-profile national mission.
- II. The SWFO program should improve its lessons learned processes.
- III. The SWFO program should improve its contract oversight.
- IV. NOAA should update space weather requirements in accordance with validation criteria.

WHAT WE RECOMMEND

We recommend that the NOAA Deputy Under Secretary for Operations ensure that the Assistant Administrator for Satellite and Information Services does the following:

1. Work with the NASA Science Mission Directorate Associate Administrator to determine if an agreement for contingent launch schedule flexibility is feasible for the SWFO-LI mission if IMAP or SWFO-LI are unable to meet launch timing.
2. Coordinate with the Director, National Weather Service, to update the Space Weather – Geomagnetic Storm Warning Gap Mitigation Plan for Space-Based Observations (June 2020) to reflect current contingencies.

We recommend that the NOAA Deputy Under Secretary for Operations ensure that NESDIS does the following:

3. Ensure that the SWFO program updates its plans for lessons learned and conducts appropriate learning sessions.

We recommend that the NOAA Deputy Under Secretary for Operations direct NESDIS to do the following:

4. Ensure the SWFO Ground Project Quality Assurance Surveillance Plan defines sufficient criteria and frequency of surveillance to provide adequate government oversight of contractor performance.
5. Assess the program control activities defined in the SWFO Program Plan to incorporate controls that provide reasonable assurance of timely management reviews of process changes.

We recommend that the NOAA Deputy Under Secretary for Operations do the following:

6. Direct the National Weather Service to work with the Office of Observations and the Space Weather Prediction Center to either update the validation documents in the Space Weather Observational User Requirements Document consistent with level 2 validation criteria or amend the validation levels of requirements to reflect the cited documentation.