NOAA in the next decade: The Space Weather Program

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In recent years, space weather phenomena have become the focus of increasing government actions due to their wide-ranging impacts and the growth in the utilization of near-Earth space. NOAA has made long-term investments in observing and predicting space weather and has initiated planning for a Space Weather Program (SWX) that will be implemented alongside the next generation of its geostationary-orbit (GEO) and low-earth-orbit (LEO) programs. The new program exemplifies NOAA's commitment to the provision of critical imagery and measurements delivered to the National Weather Service and other partners. Key SWX capabilities include solar imagery in UV, X-ray, and visible wavelengths as well as in situ solar wind measurements. These capabilities provide continuity to the ongoing Space Weather Follow On (SWFO) Program whose platforms are scheduled for launch in 2024. Furthermore, the Program will evaluate and develop plans for magnetospheric particle and magnetic-field measurements from geostationary and off-equatorial orbits, and ionospheric/thermospheric imagery and in situ measurements. In addition to dedicated satellites for operational space weather observations, planning will evaluate hosting selected instruments on NOAA's existing GEO and LEO programs. It is expected that modeling and prediction capabilities will be enhanced with the advent of data assimilation-capable numerical space weather prediction models and with the development of cloud computing services. In this way the SWX seeks to provide continuation for NOAA's Program of Record 2025, while developing a realistic mission architecture based on recent internal and collaborative evaluations of space programs, notably the NOAA Satellite Observing System Architecture (NSOSA) study. The agency is building on these earlier mission concepts by including several nascent large-scale priorities: provision of services to the burgeoning LEO satellite fleet; support to space exploration such as NASA's initiatives for the Moon and Mars; and the strategic growth of commercial space. In this complex and exciting program, the agency will continue its long-term partnerships with agencies such as NASA, branches of the DOD, NSF, and USGS, and a number of national and international partnerships.

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