

*Safeguarding Society through
Trusted Space Weather Observations and Actionable Information*



NOAA Space Weather

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Office of Space Weather Observations (SWO)

NOAA works end-to-end from observations to product generation, then forecasts, and then archive

NESDIS Office of Space Weather Observations (SWO)



SWO maintains and extends near-real time **space weather observations** from a range of different observing points, selected to most efficiently **provide comprehensive knowledge of the Sun and the near-Earth space environment**.

Space-Based Observation

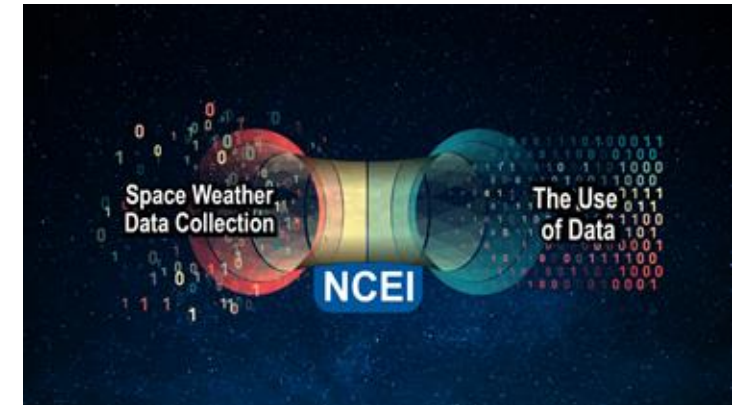
NWS Space Weather Prediction Center (SWPC)



SWPC protects national security and **infrastructure** by using the Sun and near-Earth space environmental observations to assess space weather hazards and deliver real-time space weather forecasts, watches, warnings, alerts, and data.

Modeling and Forecast

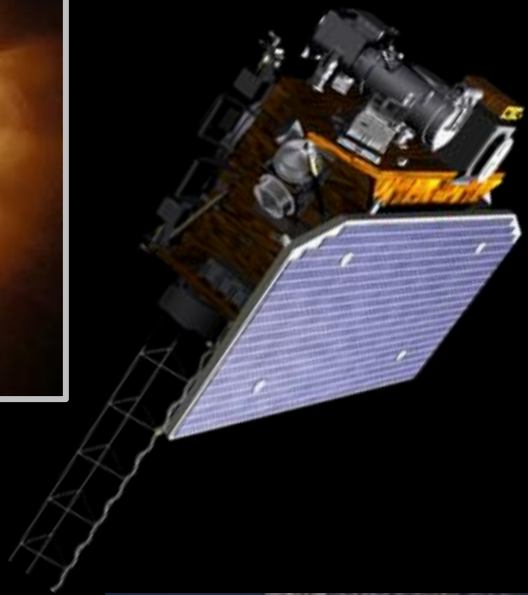
NESDIS National Centers for Environmental Information (NCEI)



NCEI ensures that data products are **accurate and useable** so that NOAA continues to gain value from its space weather observations. Research and public user access and independent analysis enhances our ability to understand and predict space weather events.

Product Development & Quality, Archive and Access

Office of Space Weather Observations (SWO)

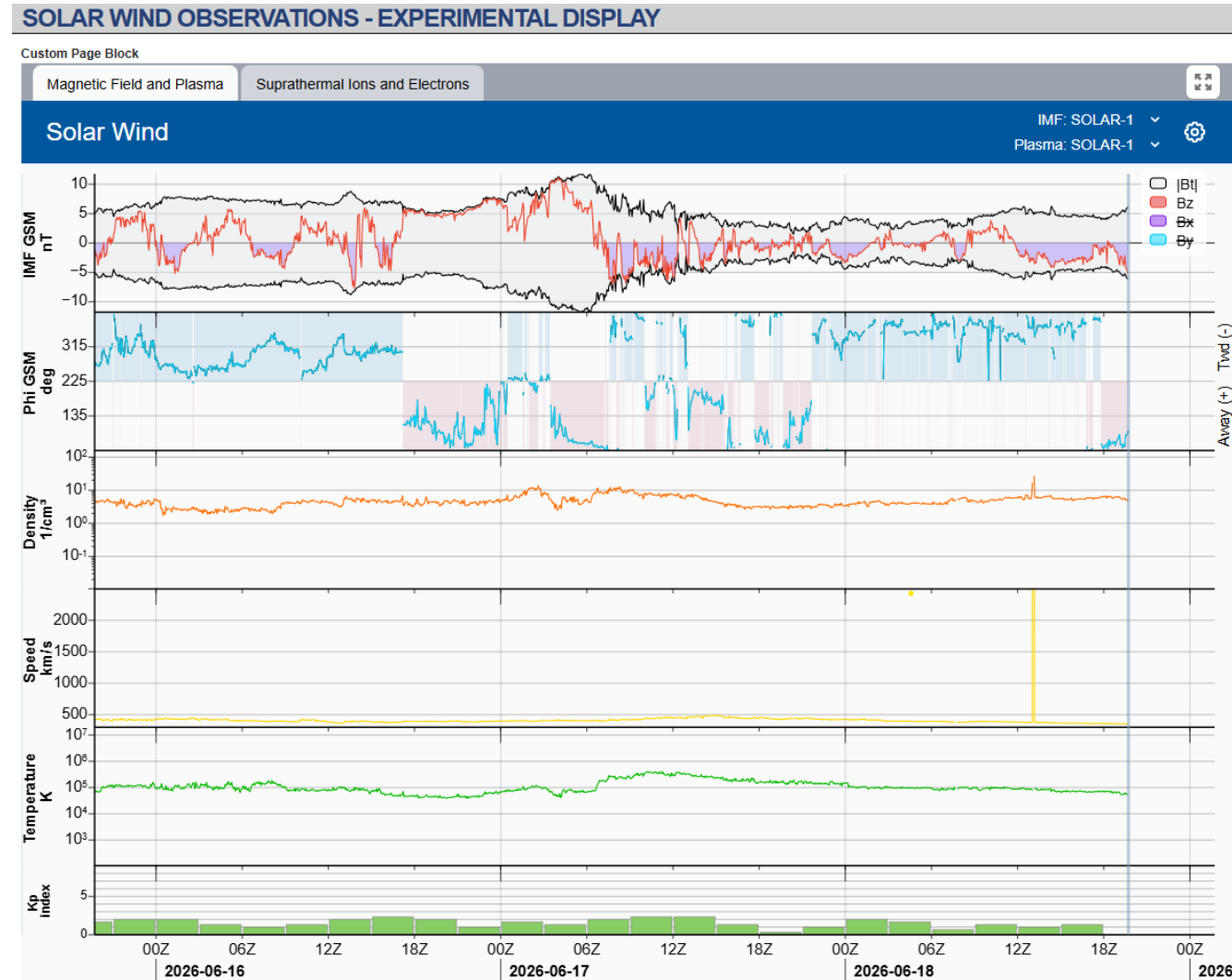


- Provide Trusted Space Weather Observations that Safeguard Society
- Develops and sustains critical satellite systems to monitor space weather and support National Security.
- Supplies precise observational data that enable timely forecasts and protective responses.
- Invests in cutting-edge technologies to fulfill mission requirements.



SOLAR-1 Status

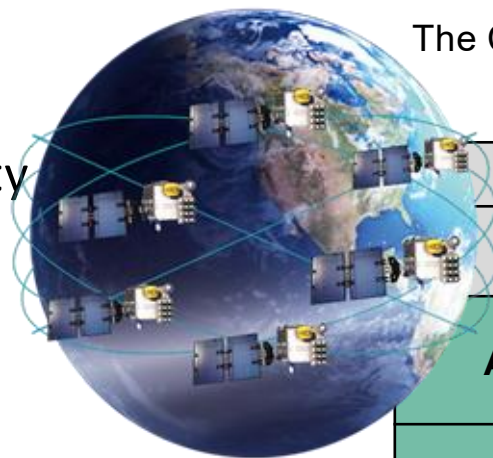
- NOAA's Space weather Observations at L1 to Advance Readiness 1 (SOLAR-1, formerly SWFO-L1) was launched on September 24, 2025.
- Declared operational on June 10, 2026.
- NOAA/SWPC uses SOLAR-1 as the primary L1 monitor and makes real-time solar wind plasma, B-field, and particle-flux data available on [the solar wind observations webpage](#).
- Coronagraph (CCOR-2) images are planned to be added before the end of June; FITS files have been released at [this webpage](#).
- NOAA/NCEI released archived B-field data at the [Space Weather Portal \(SPOT\)](#) and will be releasing other imaging and in situ data later in June.



COSMIC-2 Space Weather Data Products

FORMOSAT-7/COSMIC-2

- Achieved full operational capability on October 12, 2021



The C2 mission requirements include the following data products

TEC data:

<https://data.cosmic.ucar.edu/gnss-ro/cosmic2/nrt/level1b/>

EDP data:

<https://data.cosmic.ucar.edu/gnss-ro/cosmic2/provisional/spaceWeather/level2/>

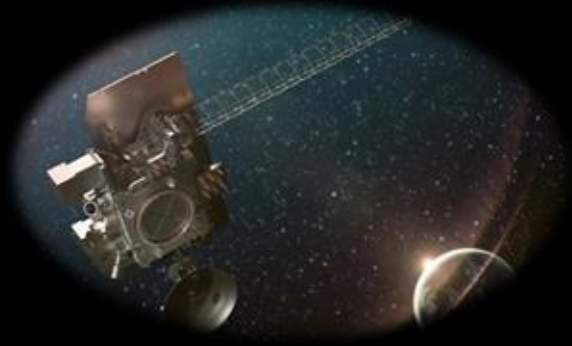
Scintillation/IVM data:

<https://data.cosmic.ucar.edu/gnss-ro/cosmic2/rapid/level2/>

COSMIC-2 Space Weather Products		
Product Name		Instrument
Absolute TEC	GPS	TGRS
	GLO	TGRS
Electron Density Profiles		TGRS
Scintillation Amplitude Index (S4)		TGRS
Scintillation Phase Index (σ_ϕ)		TGRS
Scintillation High-Rate Data		TGRS
Plasma In-situ Density		IVM
Plasma Drift		IVM
Plasma Composition and Temp		IVM

Operational products are absolute TEC and plasma in-situ density. Products shaded in green have been verified and released.

Ensuring Continuity of Critical Space Weather Observations



Operational Presence at L1 and L5

- SWO is proceeding with the development of SOLAR A and B missions
- ESA Vigil Mission - instrument exchanges between ESA and NOAA



Space Weather Observations from GEO

- SWO is exploring potential pathways to sustain observations that GOES-R Series currently provides

Space Weather Observations from LEO

- Leveraging Space Environment Monitor data from EUMETSAT Metop. Legacy NOAA POES decommissioned in 2025.
- Using commercial and international partner RO data for SWPC applications



Space Weather Prediction Center (SWPC)

The Nation's official source of space weather decision support services, forecast, watches, and warnings, and alerts

Provides 24x7 analysis and forecasting of space weather storms

Space Weather Watches and Warnings are based on the Space Weather Scales:

Geomagnetic Storms (G-scale)
(Magnetic field)

Solar Radiation Storms (S-scale)
(Energetic charged particles)

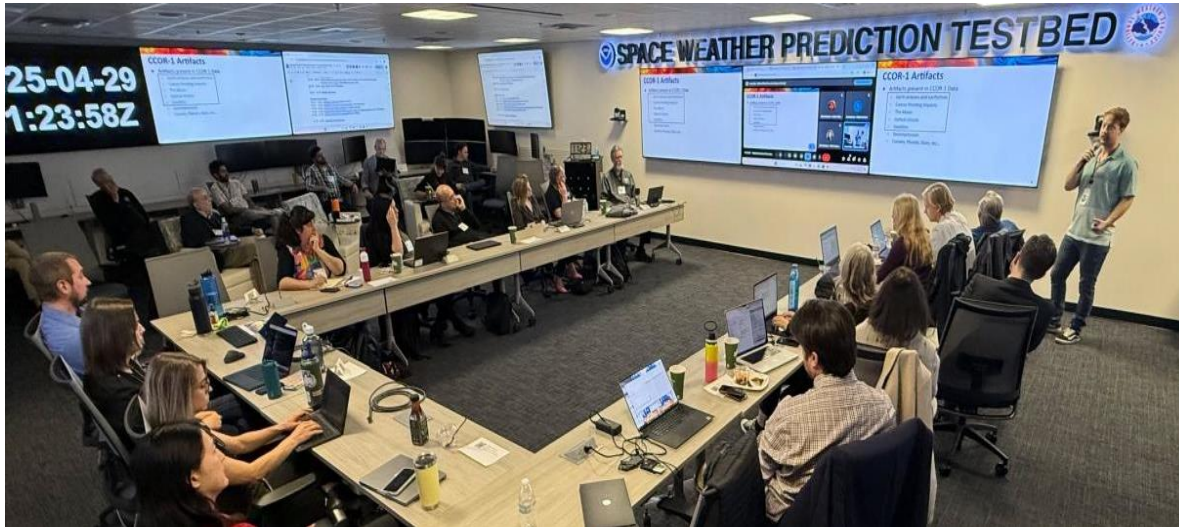
Radio Blackouts (R-scale)



Space Weather Prediction Testbed

Est.
2025

A collaborative operational environment where researchers, developers, forecasters, and end users evaluate and refine new capabilities in real world workflows, accelerating transition into operations and strengthening space weather products and services through direct feedback.

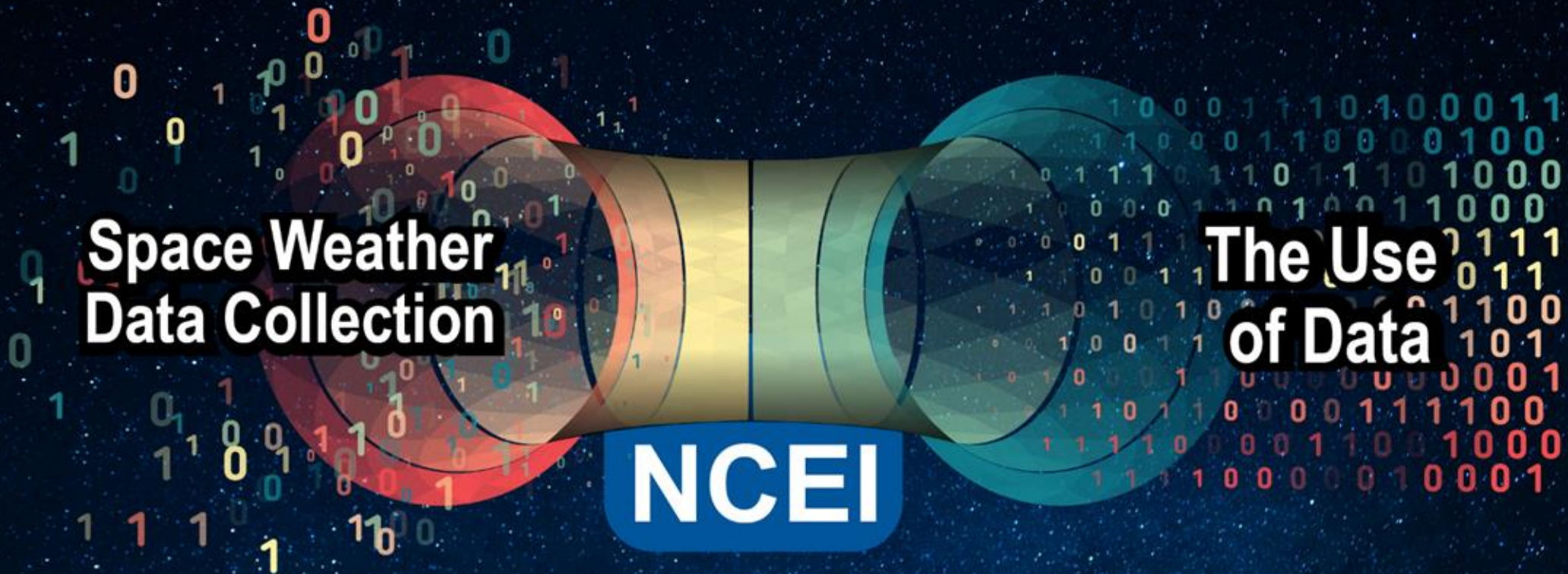


- GNSS User Engagement – May 21, 2025
- Artemis II Human Space Support Exercise - April/May 2025

<https://testbed.spaceweather.gov/>

NCEI: Connecting Observations to Outcomes

NCEI is the **interface** between space weather data collection and the use of the data.

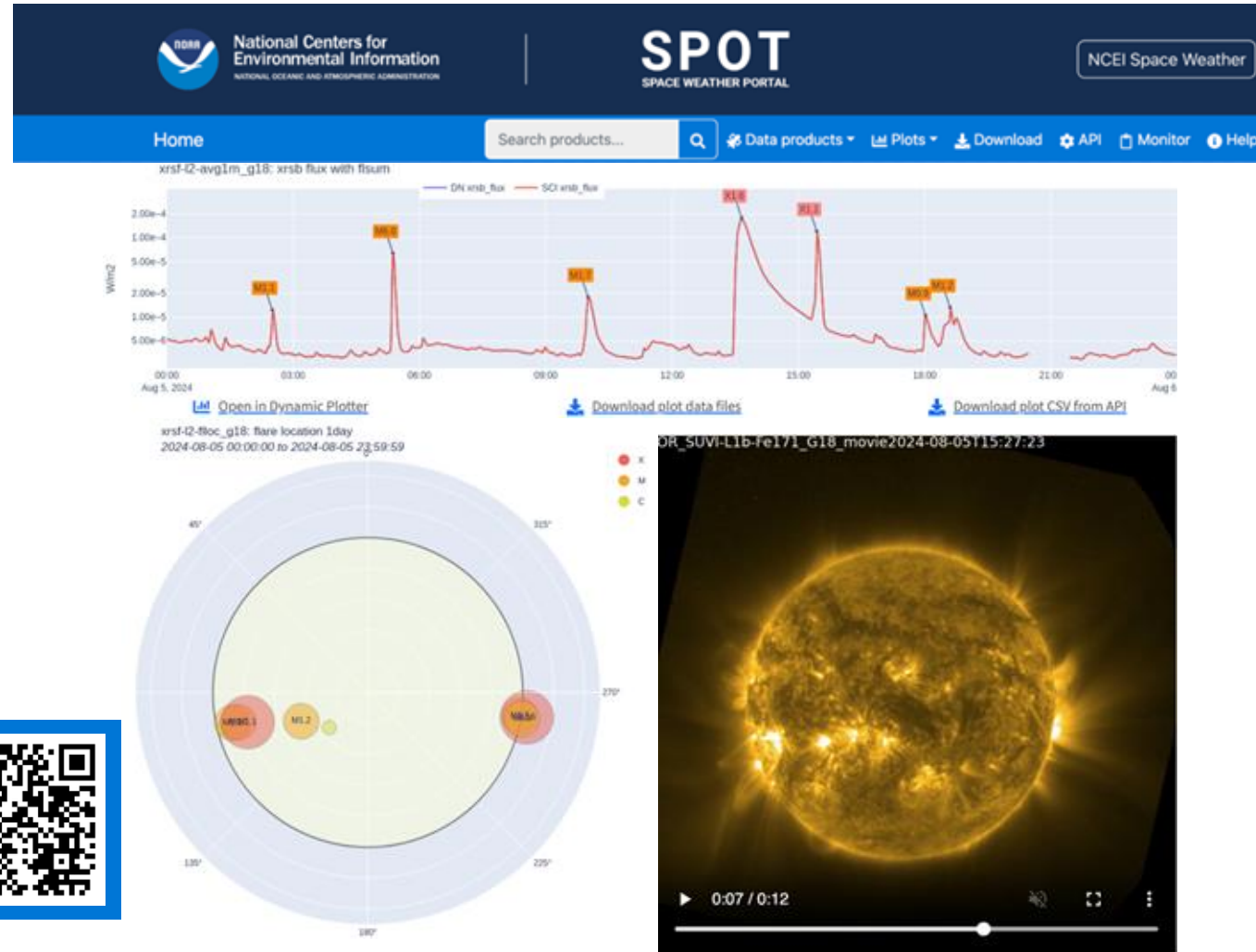


As the scientific SWx Subject Matter Experts, **NCEI ensures that data products are accurate and useable** so that NOAA gets value out of its SWx satellite programs and enhances our ability to predict SWx events.

Space Weather Portal - SPOT

- NCEI has developed SPOT, a cloud-native web portal, for NOAA non-real-time Space Weather data.
- Provides access to Retrospective and archived Operational data.
- Features:
 - Modern interface & data search
 - Quicklook plots and movies
 - Dynamic time-series plotting tool
 - RESTful API for time-series data

<https://www.ncei.noaa.gov/cloud-access/space-weather-portal>



NOAA Office of Education Opportunities

- Ernest F. Hollings Undergraduate Scholarship

- [Application](#) period: September 1 - January 31
- <https://www.noaa.gov/office-education/hollings-scholarship>



- William M. Lapenta Student Internship Program

- Applications for 2027 open on October 1, 2026
- <https://vlab.noaa.gov/web/lapenta-internship-program>



- Other NOAA Office of Education internship opportunities

- Student opportunity database with an option to filter for space weather related events, internships, and fellowships
- Timeline: rolling availability
- <https://www.noaa.gov/education/opportunities/students>



Thank You!

Video: 5 Things to Know about
Space Weather



bit.ly/swx-fivethings

SWO Website



bit.ly/noaa-swo

Space Weather Impacts Briefing



bit.ly/swx-impacts

CCOR-1: First Operational
Space-Based Coronagraph



bit.ly/30ZAc6h