

Introduction to NOAA Space Weather

Dr. Elsayed Talaat, Director, Office of Space Weather Observations (SWO)
National Environmental Satellite, Data, and Information Service (NESDIS)

Clinton Wallace, Director, Space Weather Prediction Center (SWPC)
National Weather Service (NWS)

Tiffany Atkinson, Weather Portfolio Advisor (A), Office of the Chief
Financial Officer, Office of Oceanic and Atmospheric Research (OAR)



Introductions

NOAA

NESDIS

NWS

OAR



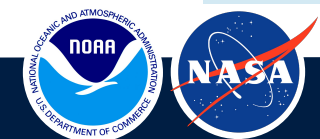
Dr. Elsayed Talaat
Space Weather
Observations



Clinton Wallace
Space Weather
Prediction Center



Tiffany Atkinson
Weather Research &
Development Policy



Three Agents of Space Weather

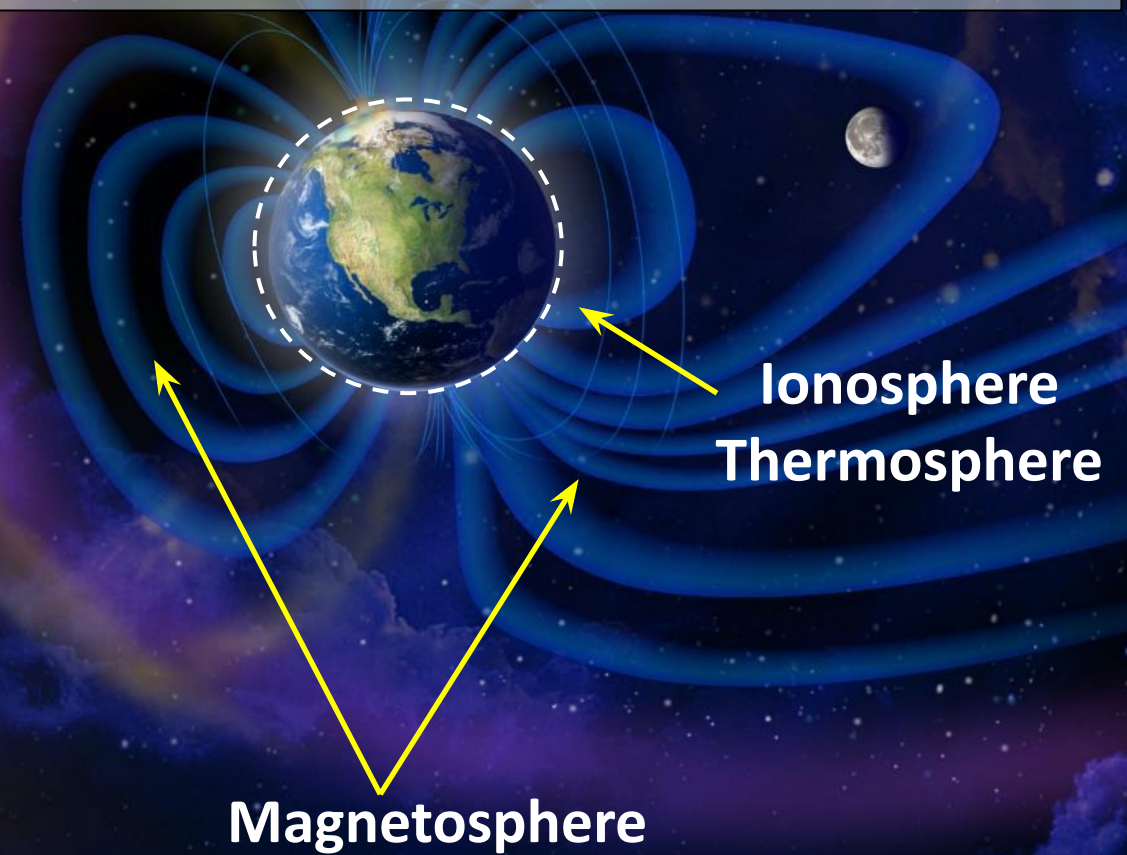
Space weather refers to the variable conditions on the Sun and in space that can influence performance and reliability of space and ground-based technological systems, and endanger life or health.

*Electromagnetic
Radiation
(R-scale)*

*Energetic
Charged Particles
(S-scale)*

*Magnetic Field
(Magnetized Plasma)
(G-scale)*

93 Million Miles from Sun to Earth



**Ionosphere
Thermosphere**

Magnetosphere

Space weather impacts infrastructure and activities vital to national security and the U.S. economy

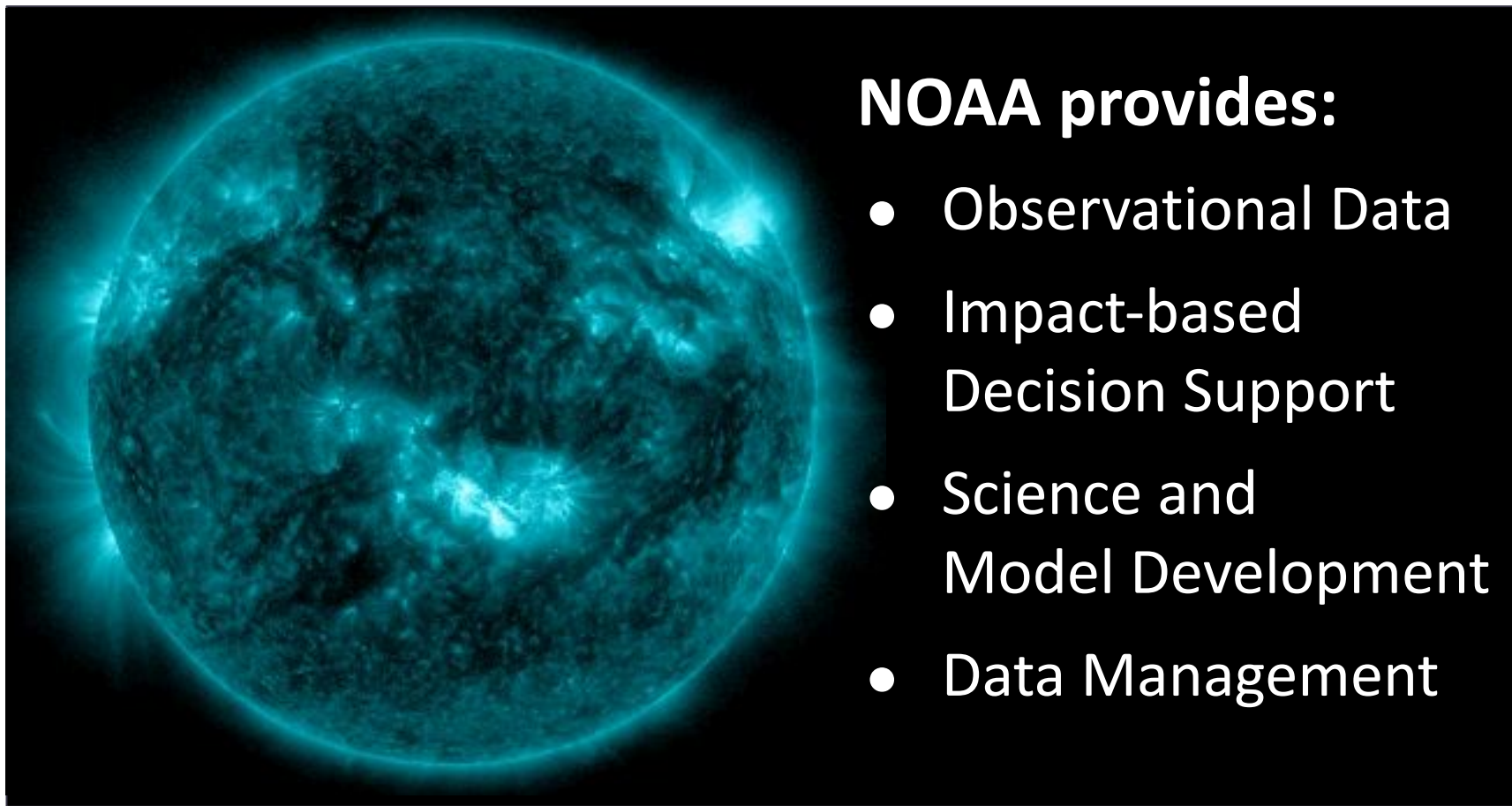
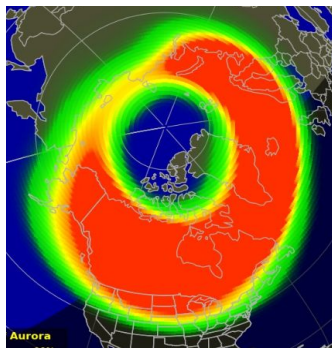
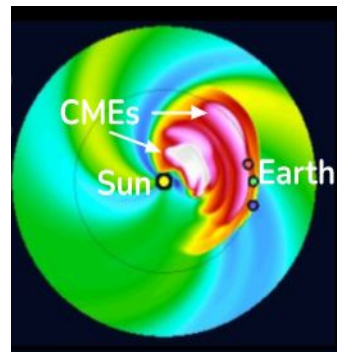
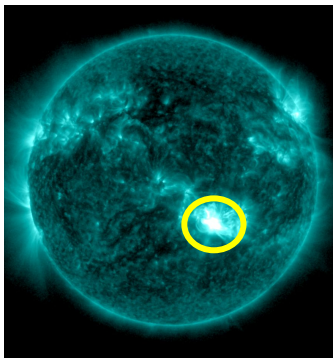


Space weather-induced blackout of the electric grid in North America (potential damages totaling over \$1 trillion): *Daily* domestic economic loss in the U.S. equal to **\$41.5 billion**, plus an additional **\$7 billion** loss through the international supply chain.



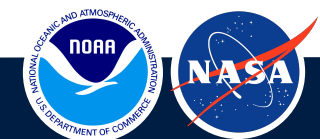
NOAA's Space Weather Mission - PROSWIFT Act Public Law 116-181

Safeguarding Society with Actionable Space Weather Information



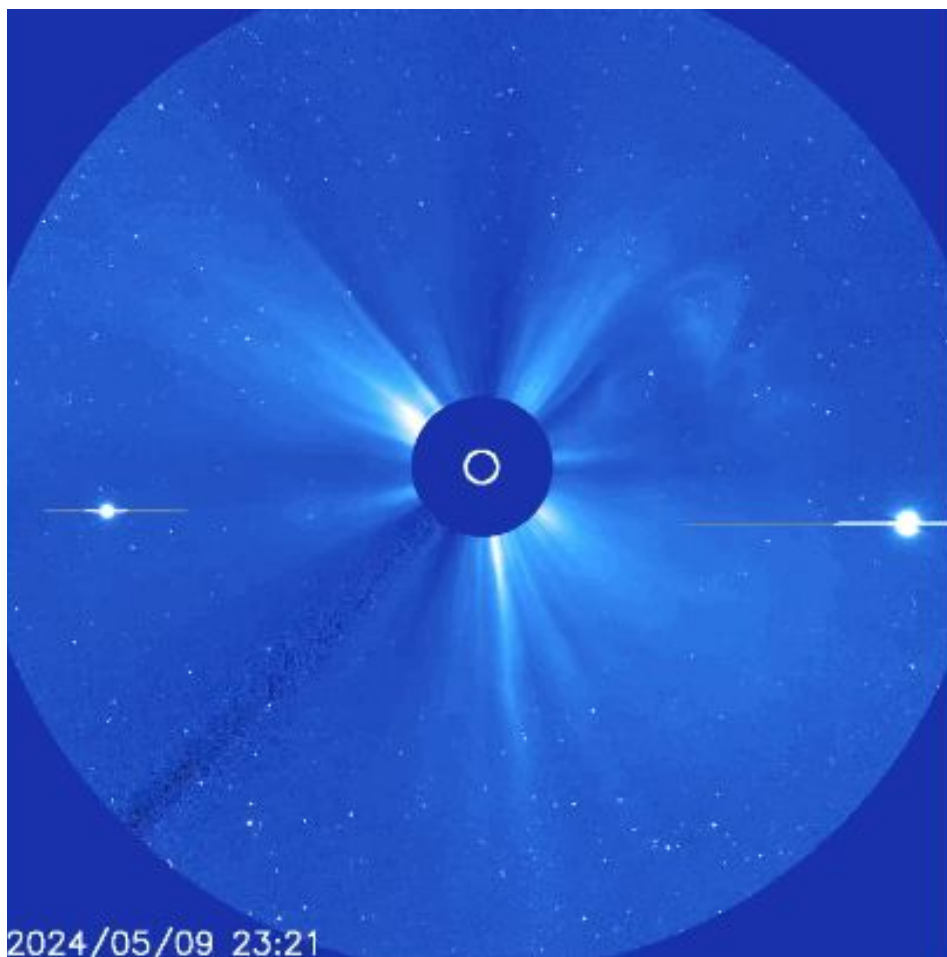
NOAA provides:

- Observational Data
- Impact-based Decision Support
- Science and Model Development
- Data Management





Space Weather in the News: May 7-15, 2024



2024/05/09 23:21

Image credit: NASA SOHO/LASCO



G5 Conditions Observed

Updated
2024-May-10
1930 EDT

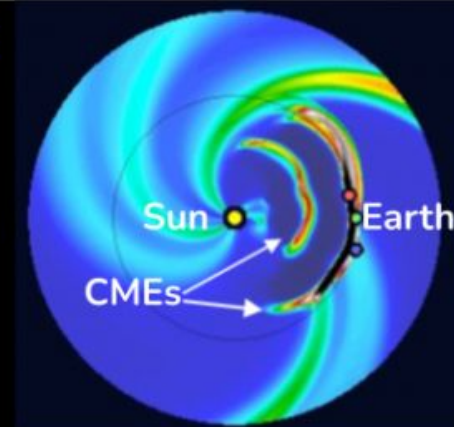
WHAT: First Observed G5 Since October 2003

KEY MESSAGES: **EXTREME (G5)** conditions reached Earth at 6:54 pm EDT. Geomagnetic storming is likely to persist through the weekend as several additional Earth-directed Coronal Mass Ejections (CMEs) are in transit.

IMPACTS: HF/VHF/UHF communications, GPS, power grids, spacecraft, satellite navigation, and other technologies may be affected. *Critical infrastructure operators have been notified.*

CONTEXT: The last Extreme (G5) event occurred with the Halloween Storms in October 2003. That event resulted in power outages in Sweden and damaged transformers in South Africa.

CAUSE: The source has mostly been a large, complex sunspot cluster (NOAA Region 3664) that is 17 times the diameter of Earth. Additional activity from this Region is still expected.



2024-05-10 15:22:00 UTC

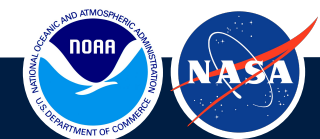


National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Safeguarding Society with Actionable Space Weather Information

Space Weather Prediction Center,
Boulder, CO

Image credit: NOAA/SWPC





NOAA's Space Weather Vision ...

A Space Weather-Ready Nation



New and improved capabilities



A robust space weather workforce



Enhanced collaboration and partnerships across the broader space weather community