The 557th Weather Wing

2d Weather Squadron (2 WS) Mission Briefing

Lt Col Justin Erwin
Operations Officer

2 WS Mission

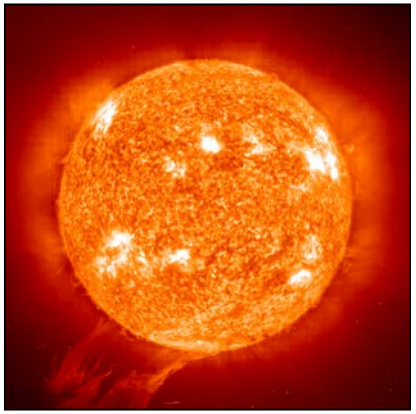
Delivers specialized airpower -- DoD-unique environmental capabilities -- to the Joint Force, Defense and Intelligence Community (IC) Agencies

Media

- AFN Weather Center

Intelligence (WXI)

- Global volcanic ash monitoring
- Global snow & ice analysis
- Hourly global cloud analysis & forecasts
- 24/7 Weather at TS/SCI enclave

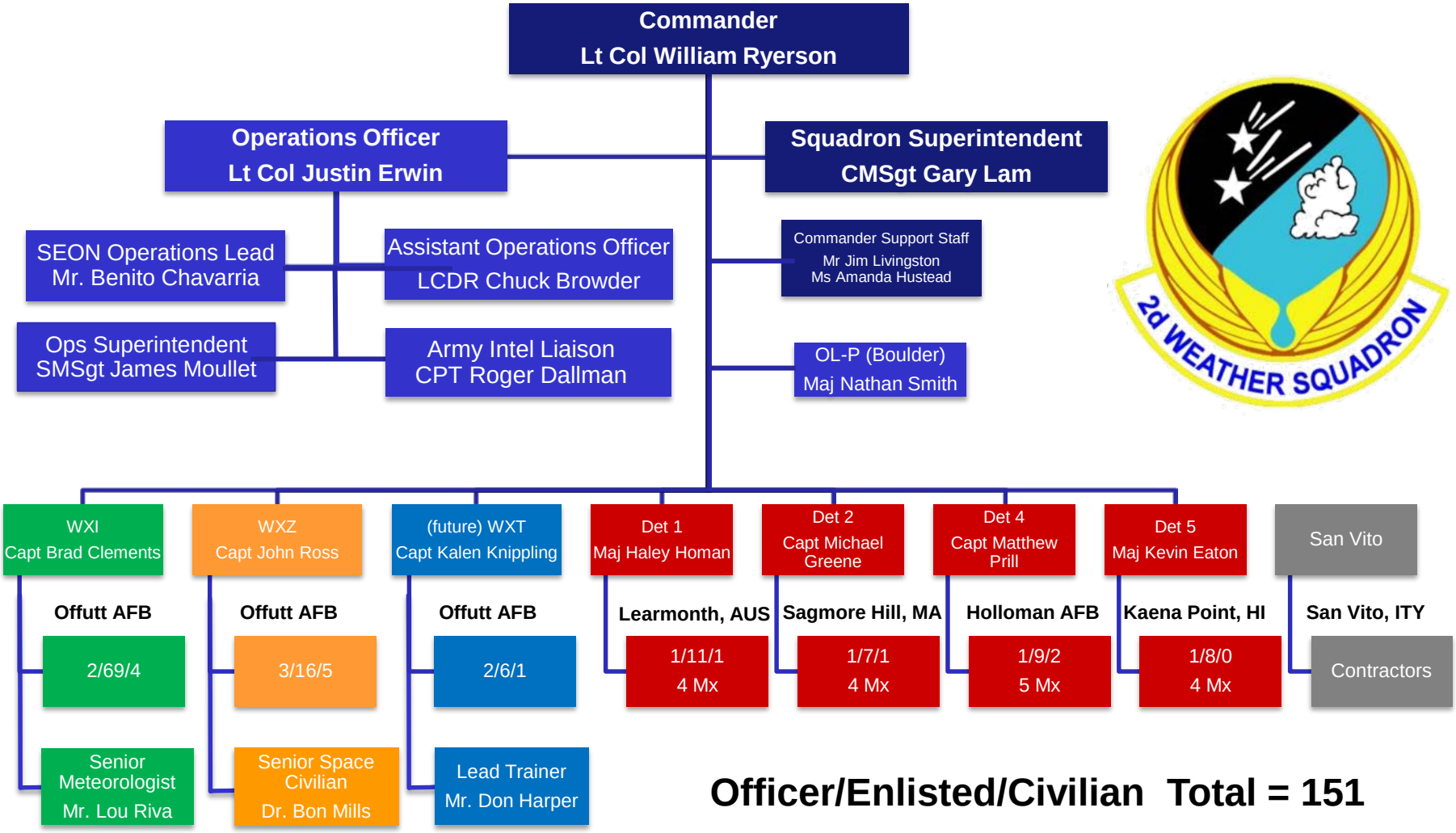


Space (WXZ)

- 24/7 Space Weather Operations Center (SpaceWOC)
- Global Solar Electro-Optical Network (SEON)
- Satellite Anomaly Assessments

Eight DoD-Unique Strategic Capabilities

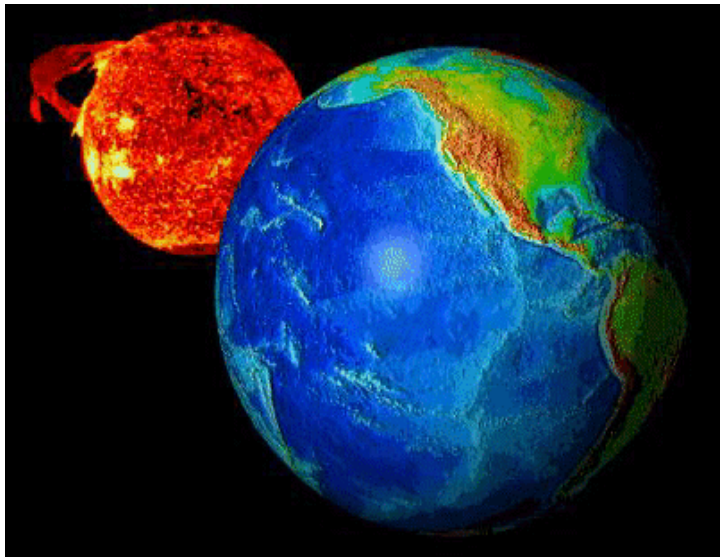
2 WS Structure



Officer/Enlisted/Civilian Total = 151

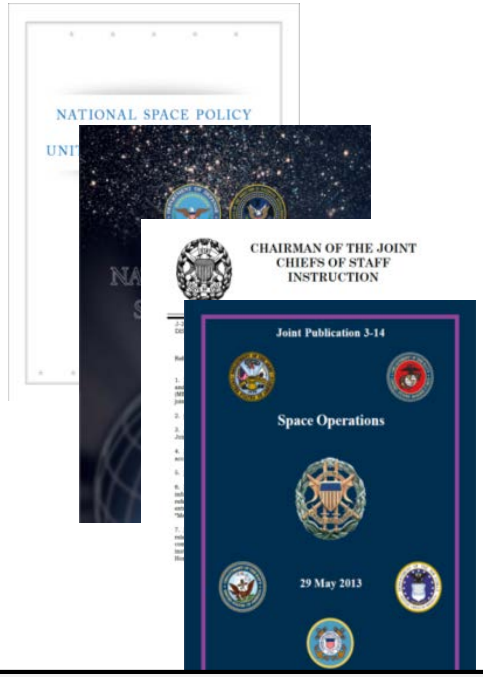
Space Weather Mission

- **Provide Mission-Tailored Analyses, Forecasts, and Warnings of system-impacting Space Weather to DoD Operators, Warfighters, and Decision-makers, and the Intelligence Community**
- **The DoD's only 24/7 Space Weather Operations Center (SpaceWOC)**
- **Three Primary Mission Areas:**
  - **Space Situational Awareness**
  - **Solar Event Forecasting/Warning**
  - **Anomaly Assessment Support**



The Mandate

"CSAF is responsible for space weather operations and capabilities in support of all elements of the DOD"
– CJCSI 3810.01E (May 2016)

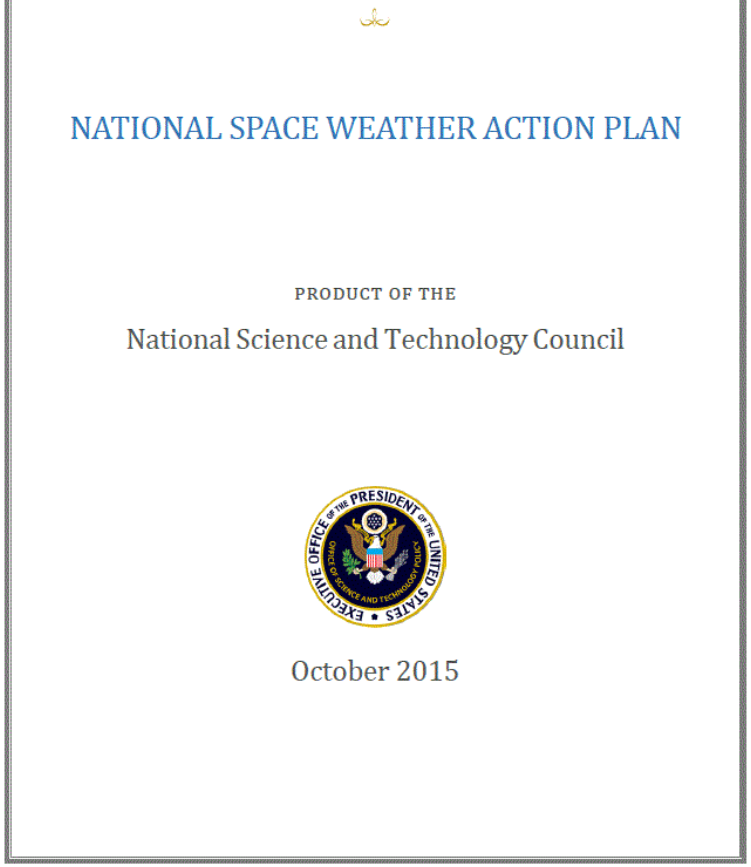


"AFWA [557 WW] is the POC for all DOD and IC space weather information"
– JP 3-14 (May 2013)


National Space Defense Center (NSDC)

"It is the sense of Congress that the SecDef should ensure the timely provision of operational space weather observations, analyses, forecasts, and other products to support the mission of the DOD including the provision of alerts and warnings for space weather phenomena that may affect weapons systems, military operations, or the defense of the United States."
– NDAA FY18

The Mandate Cont.

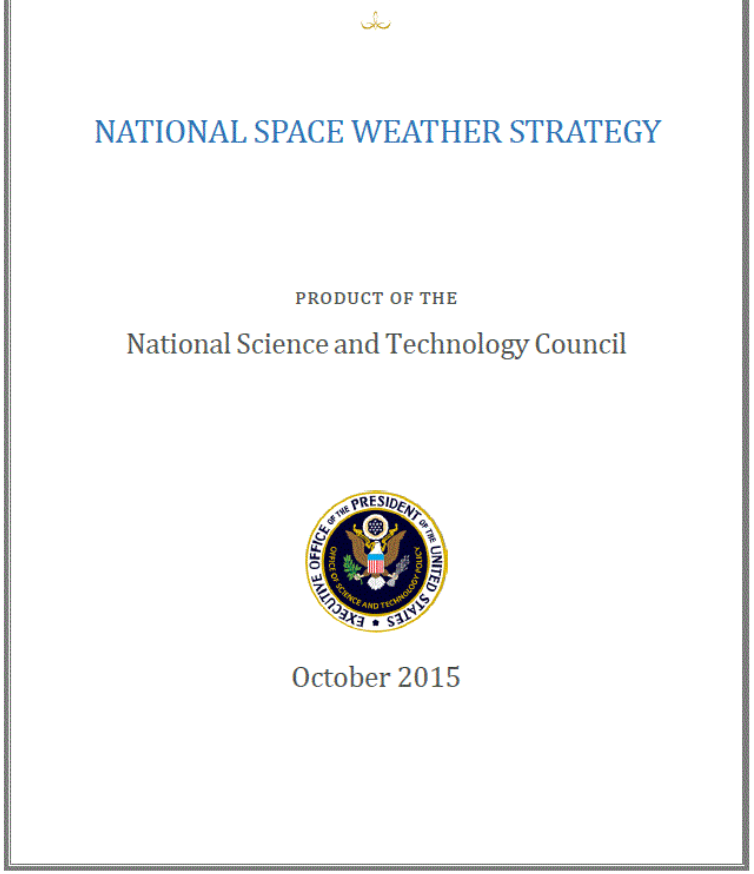


NATIONAL SPACE WEATHER ACTION PLAN

PRODUCT OF THE

National Science and Technology Council

October 2015



NATIONAL SPACE WEATHER STRATEGY

PRODUCT OF THE

National Science and Technology Council

October 2015

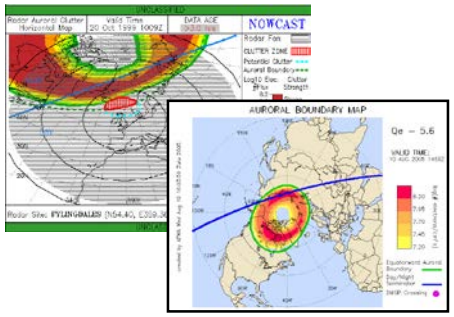
Roles / Responsibilities

- **2d Weather Squadron (incl SpaceWOC)**
  - **Performs Operations (collect & analyze data, predict environment, integrate with users)**
  - **Conducts operational- and tactical-level collaboration with other centers**

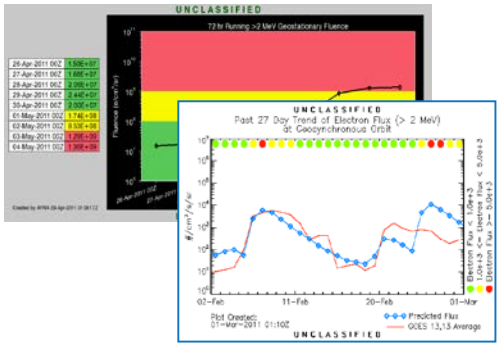
- **Air Staff (HQ USAF/A3W)**
  - **Sets policy**
  - **Develops strategy**
  - **Leads investment and research priorities**

Space Weather Users

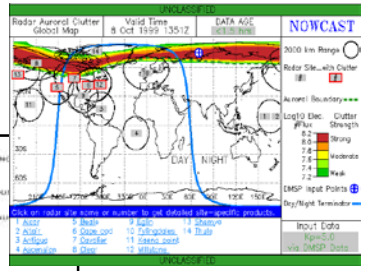
- **Air Force Space Command**
  - **Spacelift/Space Control/Space Ops**

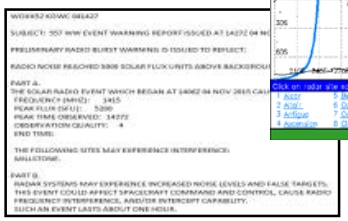


- **Joint Space Ops Center (JSpOC)**
  - **Space Situational Awareness**

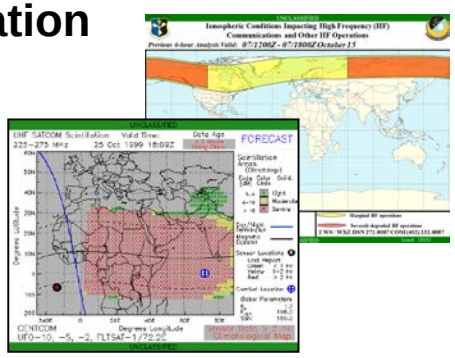


- **NORAD-NORTHCOM**
  - **Early Warning Radar**

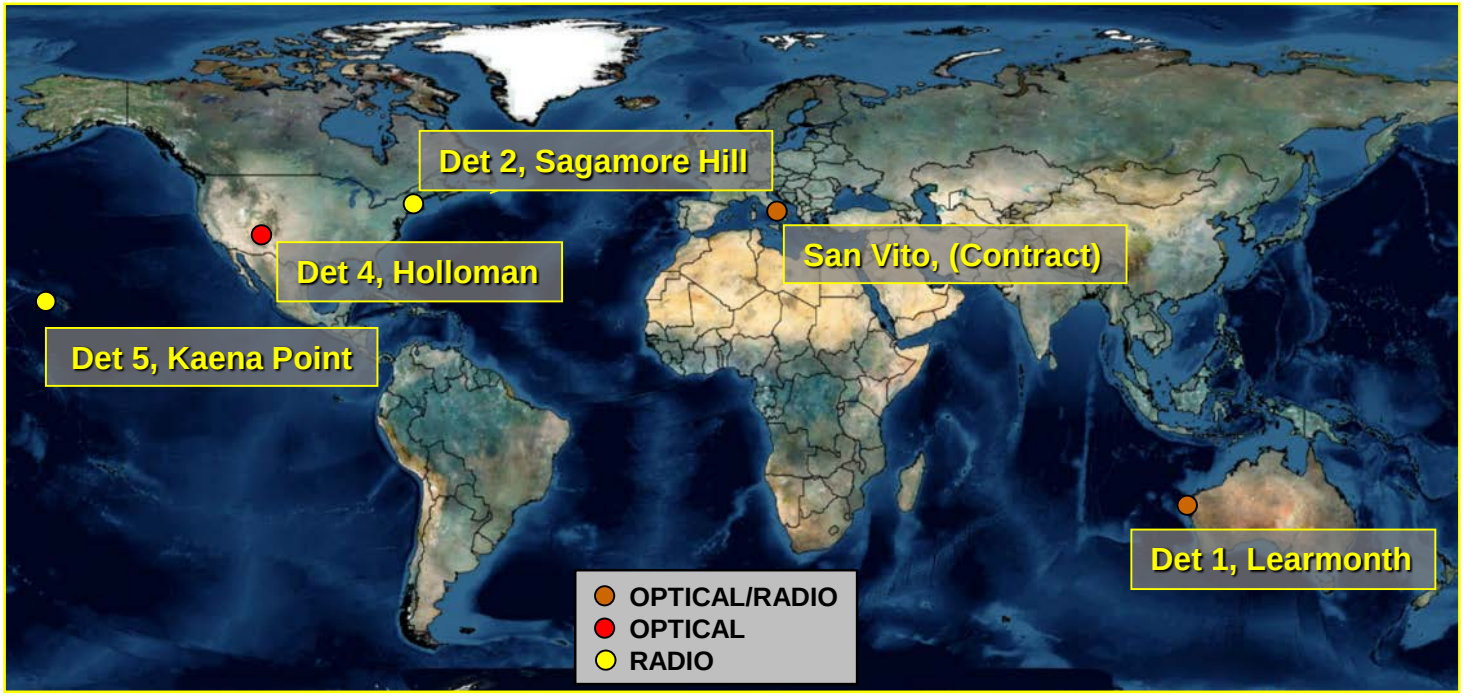




- **Sister Services & Combatant Commands**
  - **HF / UHF Communications**
  - **Scintillation**



2 WS Space Situational Awareness



- **Solar Electro-Optical Network (SEON)—Sunrise to Sunset Patrol**
  - **Monitor the Space Environment**
  - **Record and Analyze observed Data**
  - **Disseminate data to 557 WW and Space Weather Prediction Center (SWPC)**

Radio (RSTN)

Optical (SOON)

Space Weather Enterprise

- **557 WW Provides Space Environmental Situational Awareness to the DoD and National Security Community**

Available at all security enclaves

557 WW - SWPC Partnership

- **Data flows**

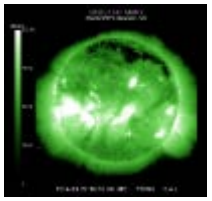
557 WW → SWPC

RSTN:
Radio Burst & Sweep Reports

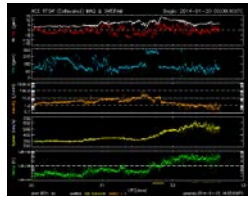
SOON:
Sunspot Analysis & Flare Location

External Space Weather Data Store (E-SWDS)

SWPC → 557 WW

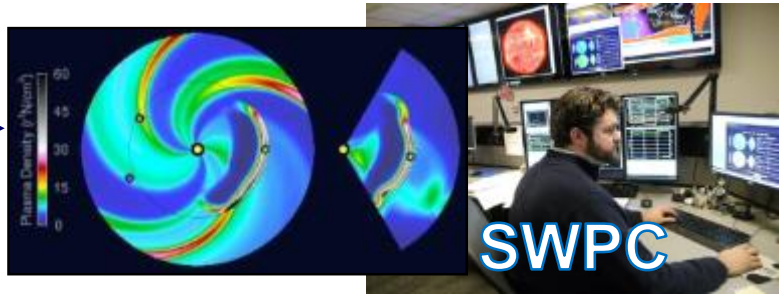


GOES:
X-Ray and Particle Data



ACE/DSCOVR:
Solar wind Data

- **Collaboration with 557 WW forecasters**



- **Joint Products with 557 WW**

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AXXX01 KWNP 220245
Joint USAF/NOAA Solar and Geophysical Activity Summary
SGAS Number 022 Issued at 0245Z on 22 Jan 2014
This report is compiled from data received at SWO on 2
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AXXX02 KWNP 220030
Joint USAF/NOAA Solar Region Summary
SRS Number 22 Issued at 0030Z on 22
Report compiled from data received at
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FXXX01 KWNP 212200
Joint USAF/NOAA Solar Geophysical Activity Report and Forecast
SDF Number 21 Issued at 2200Z on 21 Jan 2014
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Points of Contact

- **Operational- and Tactic-level Collaboration**
  - **Lt Col Bill Ryerson (Commander, 2d Weather Squadron)**
  - **Lt Col Justin Erwin (Operations Officer, 2d Weather Squadron)**

- **Policy, Strategy, Programmatic Collaboration**
  - **HQ USAF/A3W**

557th Weather Wing
Space Weather Data

- **Data Coverage Challenges & Mitigation**
  - Energetic Charged Particle (ECP) data from dozens (and growing) of in-orbit assets (e.g., GPS, commercial, classified platforms, etc.) are not readily available or not able to reach Wing due to inadequate infrastructure--outreach and data acquisition
  - Aging RSTN and SOON equipment prone to maintenance outages and do not leverage latest capabilities--refurbish and/or upgrade
  - NEXION and ISTO networks to measure ionosphere are sparse--field more sites, use oblique soundings, and commercial sources
  - Aging satellites (ACE, SOHO, STEREO) with no known replacements
- **Data Processing and Assimilation Challenges**
  - Insufficient classified processing & assimilation capability for ECP & ionospheric data from classified sources--infrastructure investment
- **Other Challenges**
  - Limited archive of space weather data
  - Very little international data sharing (even with allies)
  - Consideration of a “shared” standardized data set for verification and a “shared processing algorithm library”

Questions?

The sun never sets on the 2d Weather Squadron