

Headquarters U.S. Air Force

Integrity - Service - Excellence

Department of Defense Space Weather



U.S. AIR FORCE

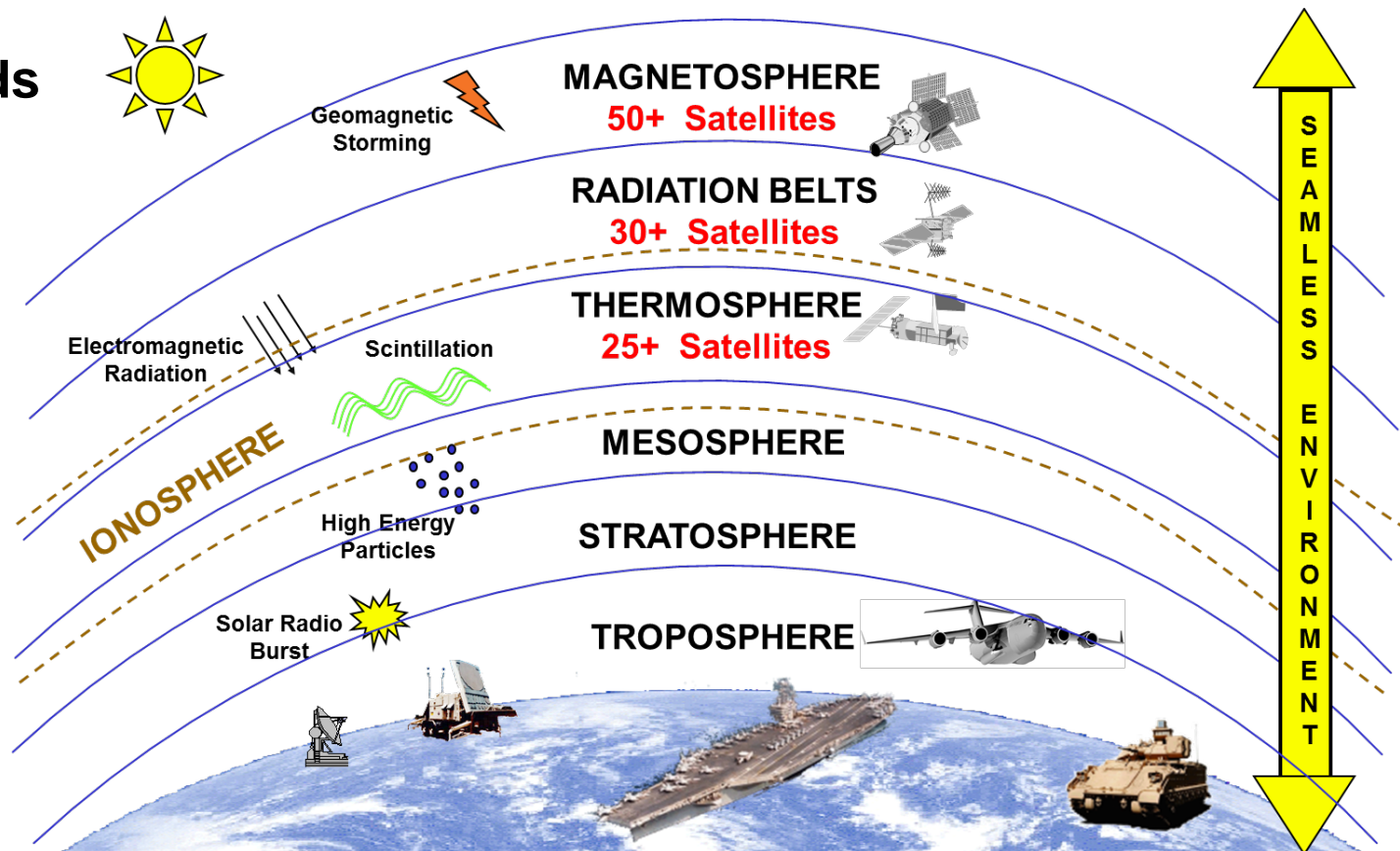
**Lt Col Jose Harris
United States Air Force
Directorate of Weather
12 May 2015**



Overview

U.S. AIR FORCE

- DoD space weather mission
- Operations
- Priority needs



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DoD Space Weather Mission

U.S. AIR FORCE

Space Weather Analysis and Forecast System (SWAFS)

- Modeling (GAIM, MSFM, et al.)
- Automated analysis and production
- Verified and adjusted by forecasters

Analyses, forecasts, and warnings

- Tailored products
- Space weather events
- Space weather impacts

- Systems
- People
- Anomaly assessments
- Satellites
- Communications

- Joint Space Operations Center
- Tailors SpaceWOC products
- Data driven effects models

AXXX51 KGWC 311215
MAGNETOMETER ANALYSIS FOR 31/1200
HOURLY MAX GAMMA DEFLECTIONS/K INDICES

| | 03-06 | 04-07 | 05-08 | 06-09 | 07-10 | 08-11 | 09-12 |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| MEANOOK | 9/0 | 16/0 | 25/0 | 39/1 | 43/1 | 28/0 | 35/1 |
| SITKA | 10/0 | 12/0 | 24/1 | 24/1 | 34/1 | 25/1 | 42/1 |
| OTTAWA | 8/0 | 12/1 | 17/1 | 18/1 | 32/2 | 32/2 | 31/2 |
| SAINT JOHNS | 9/0 | 12/1 | 13/1 | 18/1 | 26/2 | 27/2 | 22/2 |
| NEWPORT | 5/0 | 10/0 | 12/0 | 24/1 | 26/2 | 23/1 | 26/2 |
| FREDERICKSBURG | 7/0 | 11/1 | 12/1 | 16/1 | 20/2 | 20/2 | 23/2 |
| BOULDER | 5/0 | 10/0 | 11/0 | 19/1 | 19/1 | 19/1 | 26/2 |
| HARTLAND | 13/1 | 15/1 | 13/1 | 17/2 | 24/2 | 40/4 | 41/4 |
| FRESNO | 5/0 | 8/0 | 9/0 | 19/2 | 19/2 | 19/2 | 20/2 |

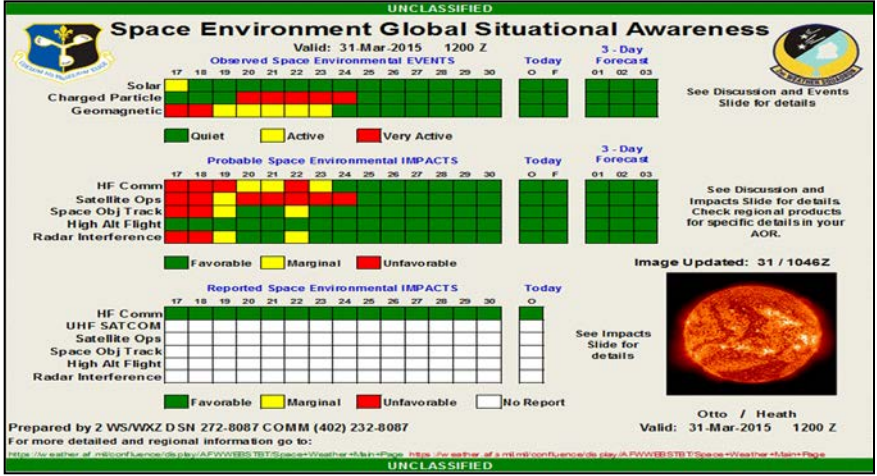
| | 03-06 | 04-07 | 05-08 | 06-09 | 07-10 | 08-11 | 09-12 |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 3-HOUR AP | 2 | 3 | 5 | 7 | 9 | 9 | 9 |
| 3-HOUR KP | 0P | 1M | 1P | 2Z | 2P | 2P | 2P |
| 12-HOUR AP | ** | ** | ** | ** | ** | ** | ** |
| 24-HOUR AP | 8 | 6 | 6 | 9 | 7 | 7 | 9 |

#SYNOPTIC VALUE ESTIMATED FROM AVAILABLE DATA

| | 05-06 | 06-07 | 07-08 | 08-09 | 09-10 | 10-11 | 11-12 |
|-----------|-------|-------|-------|-------|-------|-------|-------|
| 1-HOUR KP | ** | ** | ** | ** | ** | ** | ** |

| | 03-06 | 04-07 | 05-08 | 06-09 | 07-10 | 08-11 | 09-12 |
|---------------|-------|-------|-------|-------|-------|-------|-------|
| RUN 3-HOUR AP | 2 | 3 | 5 | 7 | 9 | 9 | 9 |
| RUN 3-HOUR KP | 0P | 1M | 1P | 2Z | 2P | 2P | 2P |

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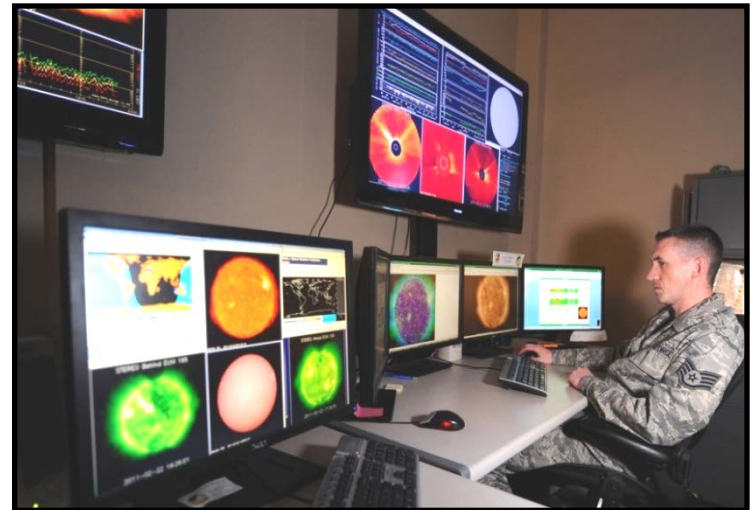
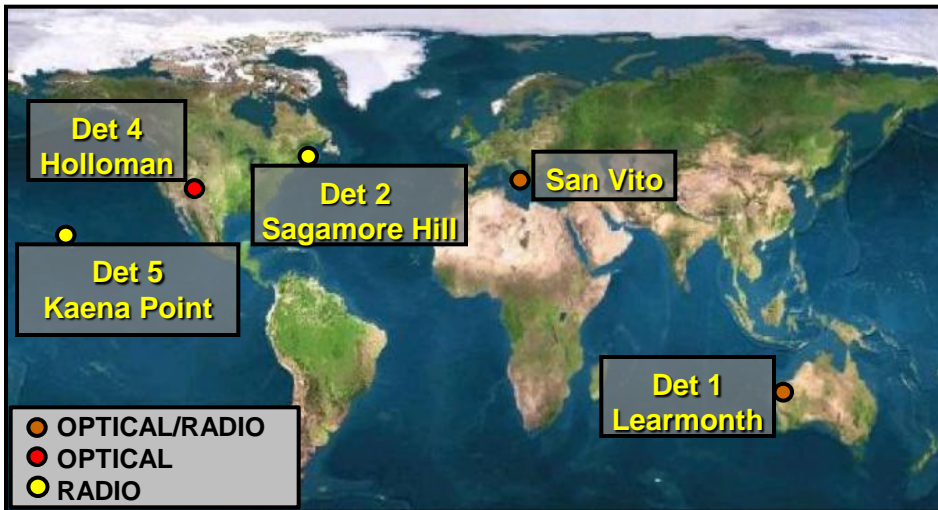




DoD Space Weather Operations

U.S. AIR FORCE

- **557th Weather Wing (formerly known as AFWA)**
 - Unclassified and classified support
 - Next Generation Ionosonde (NEXION)
 - Ionospheric Scintillation and TEC Observatory (ISTO)
- **2nd Weather Squadron detachments provide observations 24/7**
 - Solar radio sweeps and bursts
 - Solar optical phenomena and magnetic features
- **Space Weather Operations Center (SpaceWOC)**



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Priorities

U.S. AIR FORCE

■ Near Term

■ Next Generation Ionosonde

- 10 sites fielded
- 26 total sites planned
- ISTO - 10 sites fielded
- Space-based sensors

■ Longer Term

- Scintillation effects
 - UHF SATCOM
 - Radar
 - GPS
- EDP
- TEC
- Radar auroral clutter
- Magnetosphere models

