Space and Missile Systems Center

Defense Weather Systems Directorate (SMC/WM)

American Meteorology Society CONFERENCE

Program Status of DoD Weather Satellites

8 January 2013

Col Scott C. Larrimore,
Director
Defense Weather Systems Directorate (DWSD)

DWSD Mission Overview

Mission:

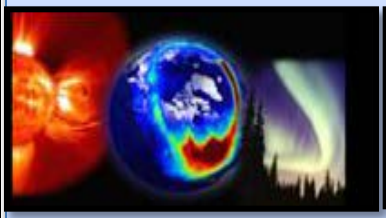
Develop, acquire, field and sustain affordable space and terrestrial weather systems to meet Department of Defense requirements

Weather Satellites

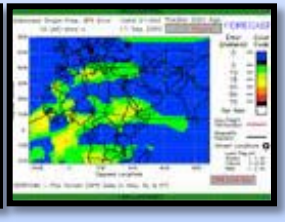
DMSP

Weather System Follow-on

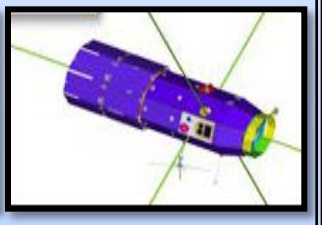
Space Weather



SSAEM



SWAFS



C/NOFS

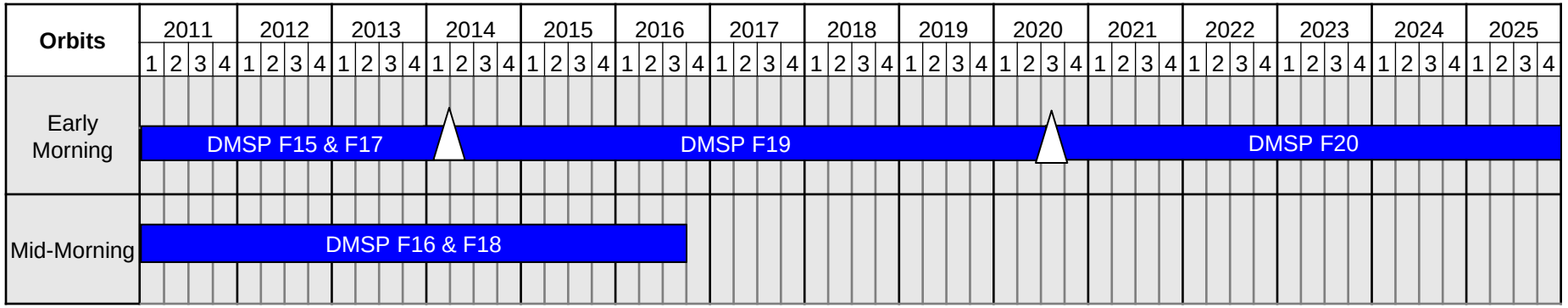
Weather Weapons

Air Force Weather Weapons Systems (AFWWS)

VISION: Be the provider of the most effective and affordable space and terrestrial weather systems

Defense Meteorological Satellite Program (DMSP)

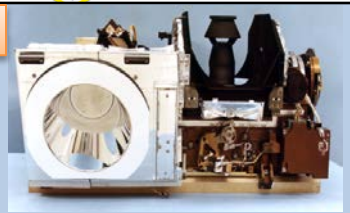
- DMSP continues to meet mission requirements
  - F13 - F18 continue to supply operational weather data to AFWA
- F19 launch date ~ CY 1Q 2014
- As a result of DWSS cancellation, AF will evolve to single plane constellation
  - F19 launch will bring DMSP to single-orbit configuration
  - Preserves DMSP capability into next decade
- Tech refresh for ground command and control system

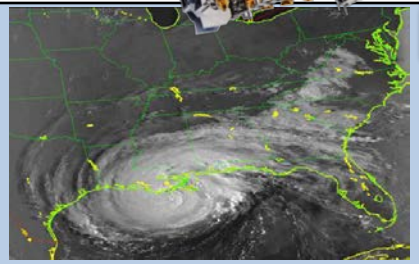


DMSP
Sensors & Products

SPACE AND MISSILE SYSTEMS CENTER

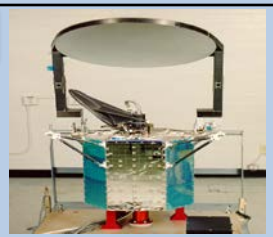
OLS

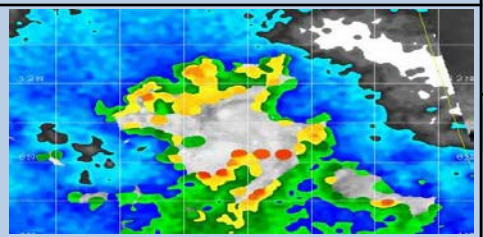




Provides visible and infrared cloud data

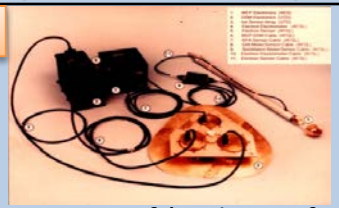
SSMIS

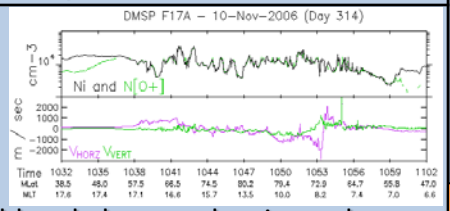




Detects precipitation, surface temperature, and soil moisture

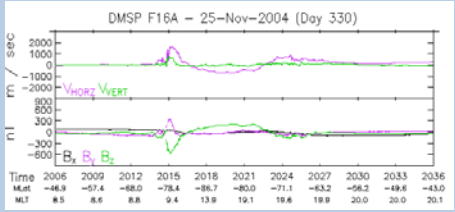
SSI/ES-3





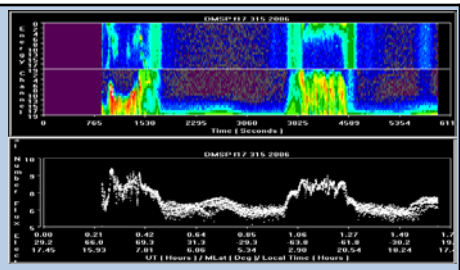
Measures the spacecraft's electric field and electron density and scintillation in the upper atmosphere

SSM



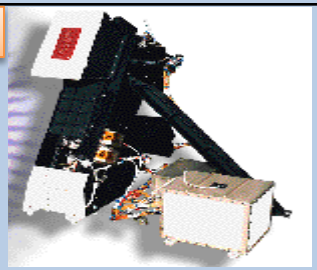
Measures disturbances in the earth's magnetic field

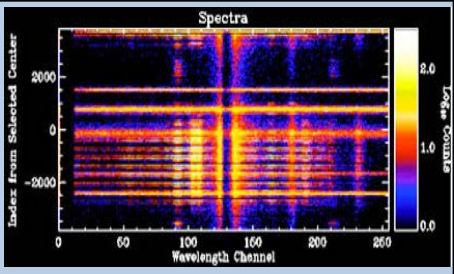
SSJ/5



Analyzes electrons and ions entering the upper atmosphere which produce the auroral display

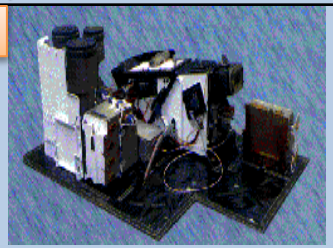
SSULI

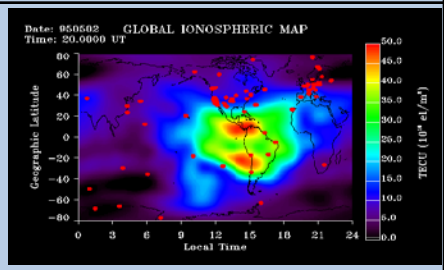




Profiles of natural airglow from atoms, molecules, and ions in the upper atmosphere

SSUSI



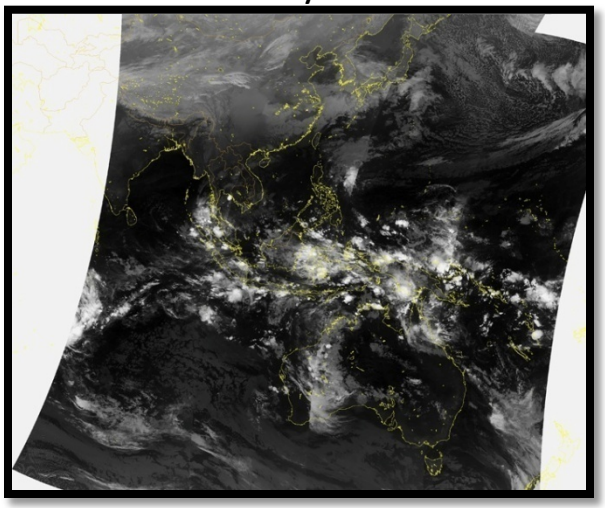


Electron density profiles ,electron/ion density, neutral density, auroral imaging

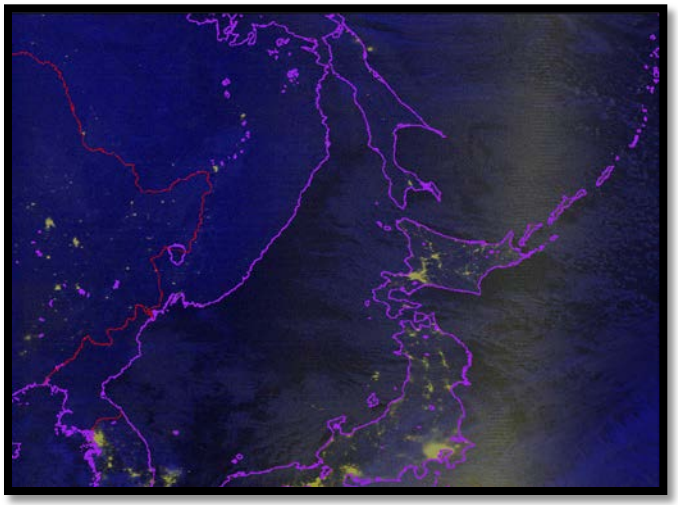
DMSP Sensors Provide All Weather Terrestrial & Space Weather Capabilities

DMSP at McMurdo Site

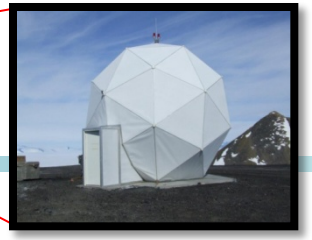
- DMSP satellites operated by NOAA from NSOF in Suitland, MD
- McMurdo site reduces DMSP stored mission data latency to ~25 minutes from ~55 minutes
- 2 Dual use antennas – S and Ka bands (JPSS & DMSP)
- DMSP fine resolution OLS cloud imagery data increase from 35% /rev to ~100% /rev global
- Antarctica Treaty: collected data is posted near-real time to public website



Mercator gridded mosaic of F17's
OLS visible and infrared data from Day 3
of McMurdo Ops -
4 revs of data daily for JPSS SAT support



Second McMurdo Pass from F17 of
Stored Data Smooth on 26 January 2012
Half Orbit over China, Korea and Japan



Weather System Follow-On Activities

- Congress directed DWSS termination; AF & DoD executing decision
  - ✓ Issued contract termination to NGAS, April 2012
  - ✓ Existing hardware inventory being assessed for disposition or possible re-use
  - ✓ Transitioned DMSP operational control to Air Force
- Weather System Follow-On Capability Requirements (METOC ICD)
  - ✓ Capability requirements approved by Joint Requirements Oversight Council (JROC) on 15 Jun 12
- $125M Congressional Add for Weather System Follow-on Activities
  - ✓ BAA released 8 Jun 12; significant number of responses across all focus areas
  - ✓ 67 white papers in house; 61 have been adjudicated, 18 accepted, 43 rejected
- Materiel Development Decision (MDD): Completed on 5 Oct 12
  - – Acquisition Decision Memorandum (ADM) on 24 Oct 12
- Analysis of Alternatives (AoA) started on 10 Oct 12
  - – Air Force will lead execution of the AoA with support and participation by the Joint community
  - – Focus on military utility and affordability
  - – AoA results expected to be brief by summer 2013

WSF Anticipated Missions

Chronological Order

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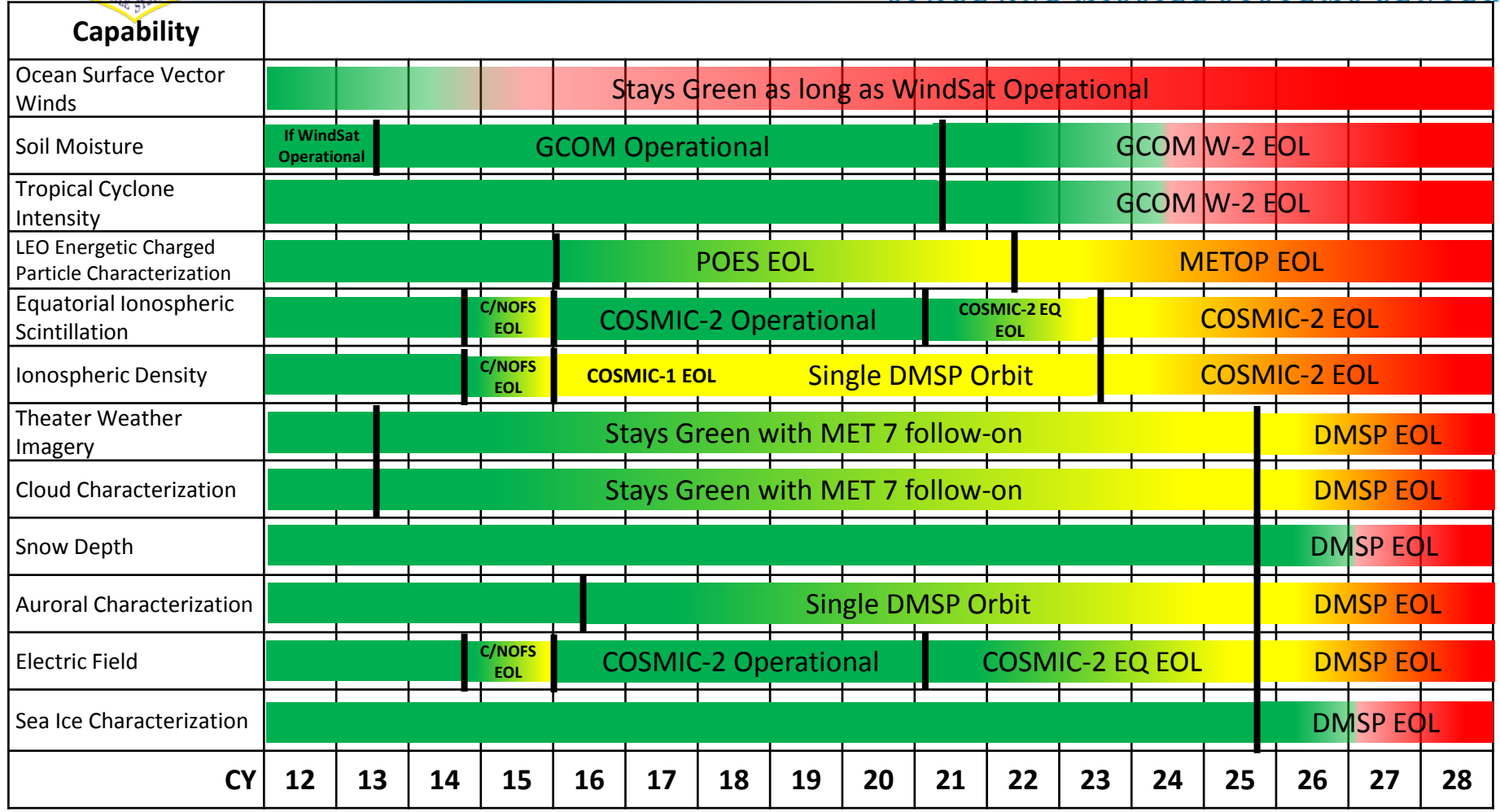
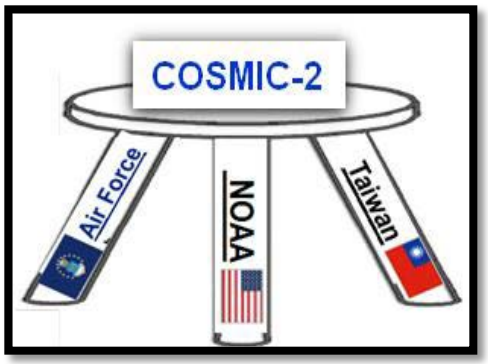
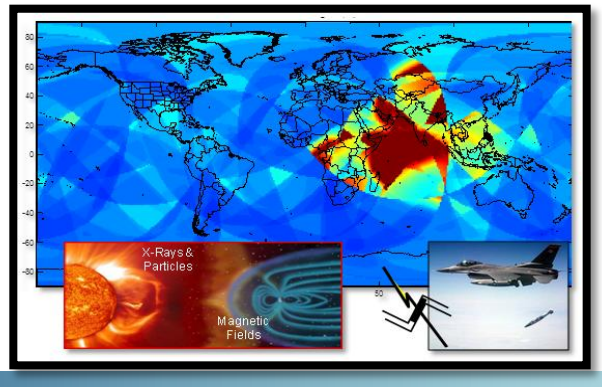


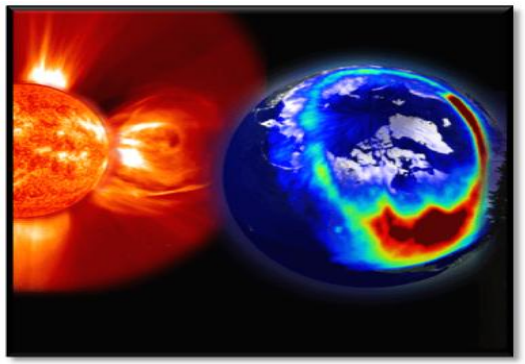
Need - Near-term | Need – Mid-term | Need – Long-term | Programmed EOL, or Operational Start

Space Weather

- Meets three JROC approved CAT A requirements
- Space Situational Awareness and Environmental Monitoring (SSAEM)
  - Collects ionospheric and Space Weather data to forecast impact on communication, navigation and monitoring systems
  - Part of an interagency & international partnership for affordability and collaboration (COSMIC-II)
    - AF: sensors and launch
    - NOAA: ground system
    - Taiwan: spacecraft (FORMOSAT-7)
    - National Space Policy (28 Jun 10): “Strengthen Interagency Partnerships” and “Strengthen U.S. Space Leadership thru International Cooperation”
- Space Weather Hosted sensors opportunities
  - In addition to COSMIC-2 exploring Iridium NEXT hosted opportunities
- Technology development for weather CubeSat options
- C/NOFS is a pathfinder for SSAEM







Director's Summary

- DMSP primary satellites are operational, but with single orbit planned
  - Several secondary satellites available
  - F19 launch campaign on track
  - Developing storage and reconstitution plan for F20 Launch in FY20
- Implementing SSAEM on COSMIC-2
  - Investigating additional rideshare opportunities
- Weather follow-on system risk reduction activities ongoing
  - BAAs reduce technical and programmatic risk for follow-on
  - Supporting pre-acquisition planning and AoA analysis
- Looking to collaborate on data collection with civil & international partners