Headquarters, U.S. Space Force

Space Weather Activity Highlights

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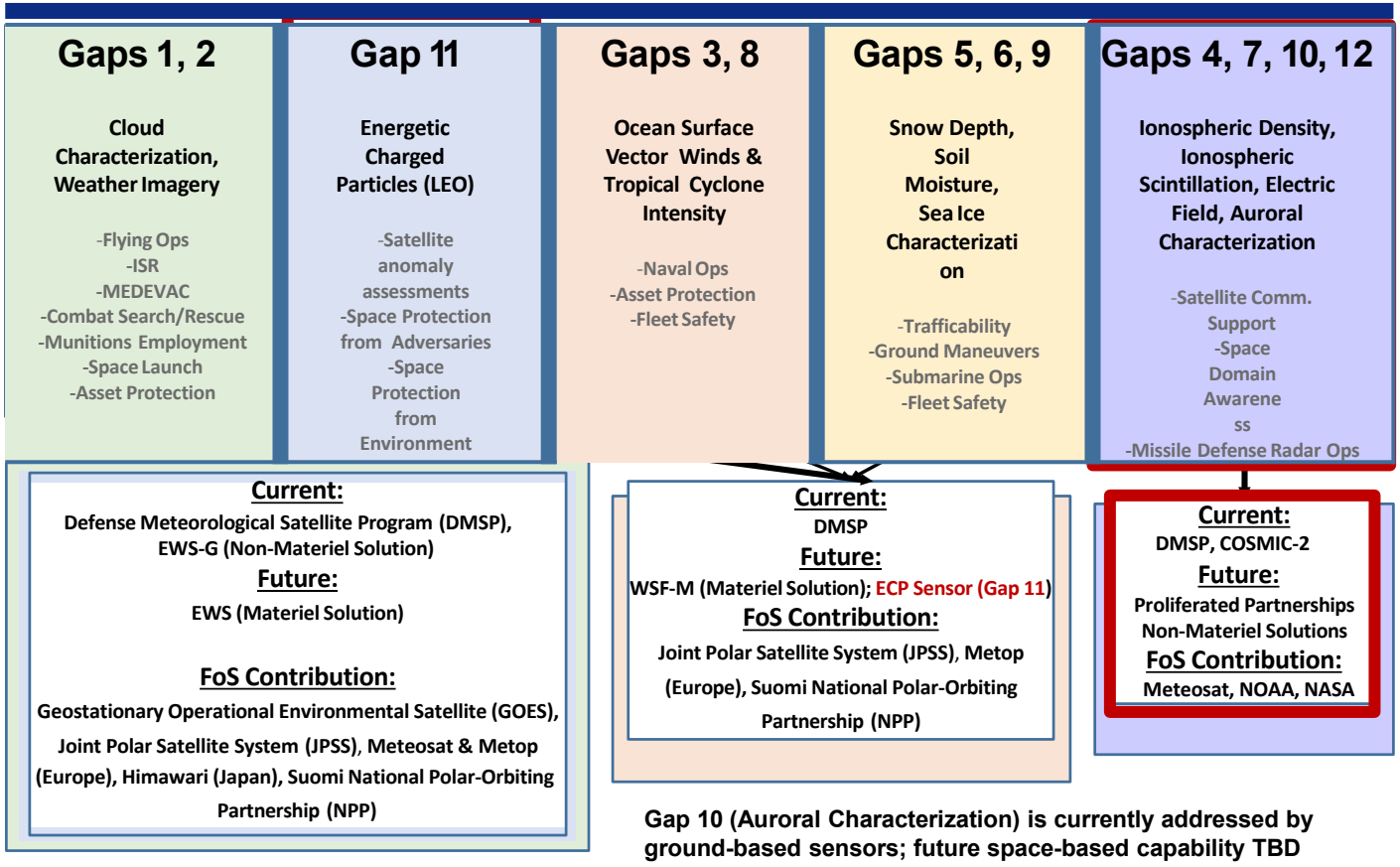
"Semper Supra"

USSF Highlights

- Flying out Defense Meteorological Satellite Program (DMSP) (space environment sensors no longer in high use)
- Fielding Energetic Charged Particle (ECP) sensors on some satellites, including Weather System Follow-on Microwave (WSF-M)
  - Exploring ideal coverage and sensor alternatives
- Operating and sustaining ground-based capabilities (Solar Electro-Optical Network (SEON); Ionospheric Ground Sensors (IGS))
  - Program ownership recently transferred from USAF to USSF
- Maximizing partnerships where possible to address DoD's space weather needs (per FY20 DAF Weather Enterprise Strategy)
  - *Just completed Space Weather Observations Partnership White Paper with NOAA in April 2023; should guide future work*
  - *White Paper noted interagency reliance on certain capabilities and suggested future partnership priorities—next step is following through to build out the "roadmap"*

Unclassified

Space-Based Environmental Monitoring (SBEM) Capability Gaps



Gap 10 (Auroral Characterization) is currently addressed by ground-based sensors; future space-based capability TBD

*Gaps related to space weather outlined in Red

SSAEM/COSMIC-2

- **Space Situational Awareness Environmental Monitoring (SSAEM) provides space weather data from COSMIC-2 (equatorial orbits) to DAF/Navy weather models, improving accuracy and assured ops for precision strike, PNT, SIGINT, and SAR operation**
  - COSMIC-2 developed and operated through US partnership with Taiwan's National Space Organization (NSPO)
- **SSAEM addresses three JROC-validated SBEM capability gaps:**
  - Ionospheric Density (#4)
  - Ionospheric Scintillation (#7)
  - Electric Field (#12)
- **COSMIC-2 mission life extended to FY28, enabling transition to Ops and Sustainment (O&S) in FY25**
  - RF Beacon fielding and solar maximum cycle upgrade activities to be completed prior to O&S transition

SWAFS/SET4D

- Space Domain Awareness Environmental Toolkit for Defense (SET4D) is a cloud-based software suite comprised of models and various assessment tools
  - Will utilize USSF Unified Data Library to pull the most current data available
  - Significant paradigm shift from legacy Space Weather Analysis and Forecast System (SWAFS)
  - SET4D is:
    - Direct to operators vs. web pull
    - Focused on impacts vs. environment
    - Tailored to specific operational systems, locations, frequencies and geometry vs. generic global characterizations
    - Primarily data driven impacts vs. model-driven

Wrap-up

- **Future USSF efforts will focus heavily on partnership opportunities, to include tech demos & potential commercial data**
- **Continue strong NOAA partnership—involve DoD stakeholders**
  - **Emphasis on operational requirements but interested in research also**
  - **Participate in or advocate for capabilities as situation dictates**
- **Ongoing analysis of mission needs, and alternatives for ECP, in-situ plasma, UV, and radio occultation (RO) data**