

# FCMSSR

(Federal Committee for Meteorological Services and Supporting Research)

***Dr. Kathryn Sullivan***  
***FCMSSR Chair***

**April 19, 2016**

# Agenda

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- **10 Minutes – Introduction (Dr. Sullivan)**
- **20 Minutes – Action Item Review/FCMSSR Charter Discussion (OFCM)**
- **15 Minutes – Federal Coordinator's Assessment / Outlook (Dr. Schulz)**
- **20 Minutes – Space Weather Coordination (Dr. Uccellini)**
- **15 Minutes – ESPC Organization Alignment (TBD)**
- **30 Minutes – Open Discussion (All)**
- **10 Minutes – Wrap-Up (Dr. Sullivan)**

# Meeting Roadmap

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- **Introduction (Dr. Sullivan)**
- **Action Item Review (OFCM)**

# FCMSSR Action Items

AI #	Responsible Office	Text	Status	Due Date
2015-1.1	ICMSSR	ICMSSR will develop a concise framework <b>to include a method for cost-benefit analytics</b> which will help guide the acquisition of meteorological data and observing systems to include use of commercial and foreign sources.	Open	11/15/2015
2015-1.2	ICMSSR	Evaluate the status of MPAR and prepare options for developing a whole of government radar capability to meet terminal and long-range weather and surveillance operational requirements and research needs.	Open	11/15/2015
2015-1.3	ICMSSR	ICMSSR will provide a short list of issues, including a summary from the Pre-FCMSSR meeting (May 11, 2015) meeting, for FCMSSR consideration.	Closed	11/1/2015
2015-1.4	OFCM	OFCM will schedule the next FCMSSR meeting for Nov/Dec 2015 and propose dates for semiannual meetings during 2016.	Closed	10/1/2015

# FCMSSR Charter

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- FCMSSR Charter was sent to the ICMSSR on Feb 26, 2016
  - All recommended changes were incorporated
- The Charter was sent to DOC General Counsel and all FCMSSR members on April 1, 2016 for review
- Feedback recommends an additional paragraph:

FCMSSR will: ...

3. e. Direct OFCM to prepare the Federal Plan for Meteorological Services and Supporting Research with budgetary information provided by the FCMSSR member agencies and submit this plan to OMB annually. OFCM will use the Federal Coordinating Infrastructure established by FCMSSR to facilitate coordination of the Federal plan and other activities as needed.

# Meeting Roadmap (Continued)

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- **Issues and Considerations of the Federal Stakeholders**
  - **Federal Coordinator's Assessment / Outlook (Dr. Schulz)**
  - **Space Weather Coordination (Dr. Uccellini)**

**Highlight the National Space Weather Strategy and Space Weather Action Plan goals, and the work of the Space Weather Operations, Research and Mitigation Task Force. This briefing has been developed and coordinated with the Assistant Director for Space Weather, OSTP.**
  - **ESPC Organization Alignment (TBD)**

**Discussion on the role of FCMSSR and OFCM supporting the National Earth System Prediction Capability**

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# ***OFCM Vision 2016-2017***

***Meeting 2016-1***

***Bill Schulz  
Federal Coordinator***

**April 19, 2016**

# Approach

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- A *Proposed* Way Ahead
- Presented for FCMSSR review and comment
- Combination snapshot, strategic vision, and near-term goals
- OFCM priorities will be those that are FCMSSR/ICMSSR approved or directed
- Outline:
  - Mission
  - Structure
  - Procedures
  - Priorities, Goals and Expected Outcomes



# Mission

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OFCM is a service organization.

Our customers are the agencies comprising the Federal Weather Enterprise (FWE).

Our main product is sustained coordination efforts on cross-agency issues.

# Mission (expanded)

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- **Coordinate**
  - Facilitate the exchange of information, plans and concerns among the Federal Weather Enterprise to help the nation get the most out of the approximately \$5.3B spent annually on meteorological services and supporting research.
- **Advise**
  - Provide strategic and operational views of interagency federal weather efforts in order to support related decisions at high levels.
- **Plan**
  - Produce and maintain foundational meteorological documents including:
    - Federal Plan for Meteorological Services and Supporting Research
    - Federal Meteorological Handbooks
    - National Hurricane Operations Plan
    - Others as directed

# Structure (resources)

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- Personnel
  - Five science and technical FTE's
  - 3 science/technical FTE vacancies
  - 1 full time contractor, additional part-time hours
- Funding (non government salaries)
  - ~ \$400K annually
  - Bulk (~\$300K) from DoD, DoE
  - (Infrastructure and FTE salaries supplied by NOAA)
- Personnel goal: Fill 2 vacancies in FY2017, one in FY2018.
  - FY17
    - Physical Scientist: Modeling and Climate
    - Project Management Specialist: Publications and Reports Management
  - FY18
    - Physical Scientist: Deputy Director/Research Coordinator
- Funding goal: Expand the investor pool

# Structure (coordination)

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Committee for Climate Monitoring and Services (INACTIVE)

Committee for Cooperative Research (INACTIVE)

Committee for Observing Systems and Services (INACTIVE)

**Working Group for Multifunction Phased Array Radar**

**Working Group for Meteorological Codes**

Committee for Space Weather (INACTIVE)

**Working Group for the Space Weather Enterprise Forum**

Committee for Aviation Research and Services (INACTIVE)

**Working Group for Volcanic Ash**

**Committee for Operational Environmental Satellites**

**Satellite Telemetry Interagency Working Group**

**Committee for Operational Processing Centers**

**Working Group for Cooperative Support and Backup**

**Working Group for Observational Data**

**Other:**

**Working Group for Hurricane and Winter Storms Operations**

**Working Group for Wildland Fire Weather**

**Working Group for Interdepartmental Hurricane Conference**

**Working Group for Atmospheric Transport and Diffusion**

# Procedural Guidelines

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- Coordination is a target-rich environment
- Engage where we can add value, not bureaucracy
- Value looks like:
  - Financial incentives
  - Complex problem solving
  - Political support
  - Professional development
  - Uncertainty reduction
  - Complying with legal/policy mandates

# Procedural Guidelines - COORDINATING

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- Engage on committees (ICMSSR and OSTP organizations)
- Maintain contacts with extra-government agencies (AMS, AGU, NAS, Academia)
- Look to engage on strategic issues-
  - Improving forecasts
  - Increasing utility of meteorological information
  - Ensuring continuity of observation quality and sources
  - Facilitating data exchange and availability
  - Supporting sustainability of the FWE

# Procedural Guidelines - ADVISING

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- On selected (directed) topics with long (years+) lead times, present a horizontal view of the often disparate elements of a complex issue involving multiple agencies. Address elements such as:
  - Technical obstacles
  - Procurement sequencing requirements
  - Timeline discrepancies
    - Research and development
    - Testing and Evaluation
    - Deployment
  - Maintenance and sustainability expectations
  - Notional concept of operations
  - Funding sources and availability/expiration/contingencies
  - Expected benefits or capabilities
  - Expected costs
- Present a high level preliminary overview; 9 to 18 months to complete depending on the issue
- Intended to provide executive/senior agency (including OMB) leadership with solid background; help to manage expectations and enable more informed strategic planning and budgeting
- Example issues: Follow-on sensor development, modeling coordination

# Procedural Guidelines - PLANNING

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The Office, in collaboration with experts from various agencies, authors the following:

- Federal Plan for Meteorological Services and Supporting Research
  - Fulfills PL 87-843 direction for preparation of an annual report showing the totality of government expenditures on meteorological services.
  - Under OMB delegation, OFCM collects budget data from agencies.
- Federal Meteorological Handbooks
  - Currently 5 in use (FMH 1,2,3,11 and 12)
  - Goal: updated as technology and procedural changes required.
- National Hurricane Operations Plan (Reviewed annually at TCORF)
- Additional plans and reports as required



# Priorities from around the FWE

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- From meetings over the last two months, several common interests emerge among the FWE agencies:
  - Multi-purpose radar CONOPS
  - FMH updates
  - Determining the economic value of forecast improvements
  - Access to (and interpretation of) world wide meteorological data
  - Space based sensor data sharing
  - Coordinated approaches to modeling

# CY2016 Goals

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- OFCM internal:
  - Improve OFCM web page
  - Hire into two of the three vacancies
    - Project management specialist (publications)
    - Physical Scientist; Numerical Modeling and Climate
  - Increase non-NOAA representation in office
- **FWE issues:**
  - **Clear ICMSSR/FCMSSR action items**
  - **Update foundational documents**
  - **Convene radar CONOPS working group**
  - **Support SWORM Task Force as requested**
  - **Publish FMH update plan**
  - **Engage groups involved in unified modeling efforts (e.g. ESPC)**

# CY2017 Goals

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- OFCM internal:
  - Hire into third vacancy (Deputy Director/Research Coordinator)
  - Identify additional non-NOAA funding sources
- **FWE issues:**
  - **Publish radar CONOPS advisory document**
  - **Publish first analytic report (issue TBD)**
  - **Reactivate the Committee for Cooperative Research**
  - **Initiate study on economic value of forecast improvements**
  - **TCORF Action Item: Coordinate an effort to establish an interagency process sanctioned by FCMSSR to define observational requirements to support tropical cyclone forecasting.**

# Searching for Metrics

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- Annual spending within the FWE vs. number of cooperative efforts and improvements
- Publication updates
- Reports issued
- Action items taken/completed at committee and working group meetings
- Web traffic
- Conference attendees (e.g. TCORF)

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## **OFCM – Three things to end on:**

- **Service Organization**
- **Cross-agency view**
- **Appreciative of FCMSSR/ICMSSR prioritization guidance, personnel support, and funding**

# Meeting Roadmap (Continued)

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- **Issues and Considerations of the Federal Stakeholders**
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**Highlight the National Space Weather Strategy and Space Weather Action Plan goals, and the work of the Space Weather Operations, Research and Mitigation Task Force. This briefing has been developed and coordinated with the Assistant Director for Space Weather, OSTP.**
  - **ESPC Organization Alignment (TBD)**

Discussion on the role of FCMSSR and OFCM supporting the National Earth System Prediction Capability

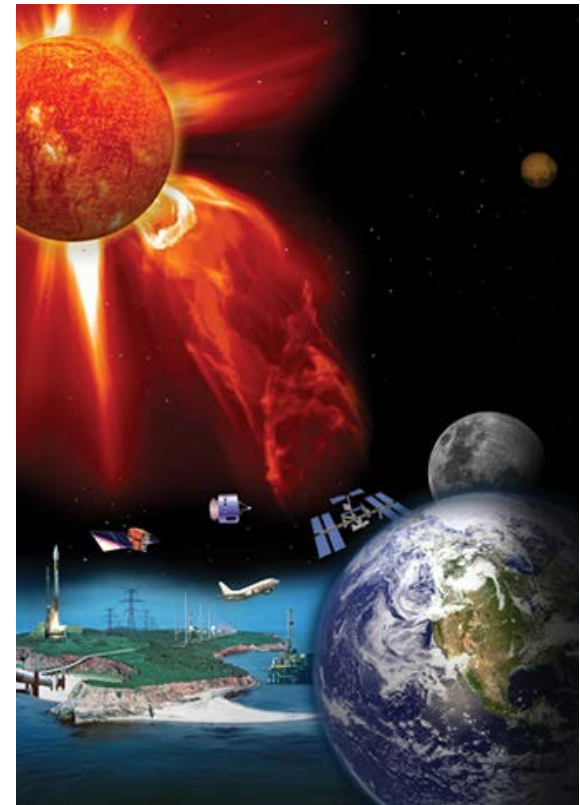
# Space Weather Coordination

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Dr. Louis W. Uccellini

- NOAA Assistant Administrator for Weather Services
- Co-Chair for SWORM Task Force

Briefing to the FCMSSR  
April 19, 2016



# Outline

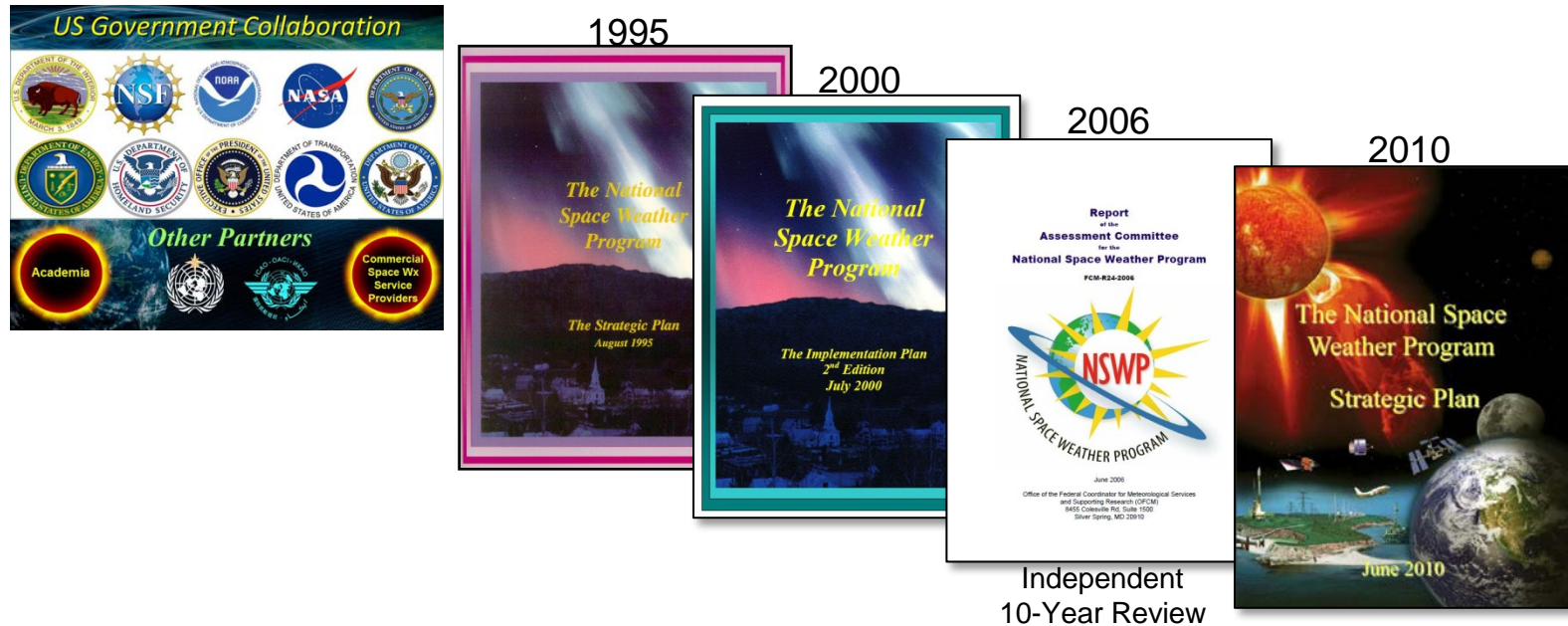
## Overview

- **A Bit of Space Weather History**
- **Space Weather Operations, Research, Mitigation (SWORM)**
- **Way Forward**

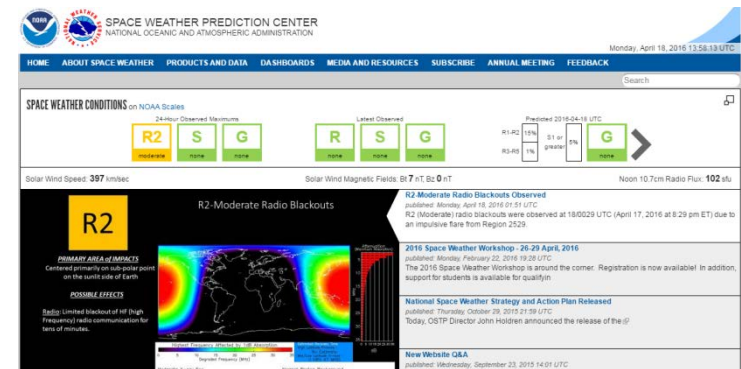




# The Space Weather Landscape Prior to SWORM



- 1995 - ~2010 National Space Weather Program (NSWP) outlines inter-agency interactions
- 2005 - Conversion of the Space Environment Center to a 24x7 Space Weather Prediction Center
- 2010 and 2013: Congressional, OSTP, and NRC Direction to clarify organizational roles and other space weather activities



# Congressional Direction, National Research Council Recommendation, OSTP Leadership

## NASA Authorization Act of 2010 (Sec. 809)

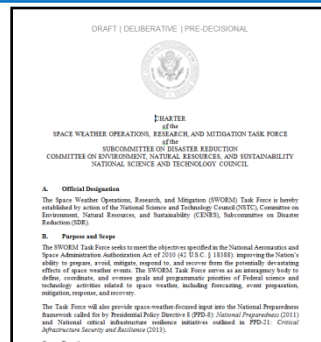
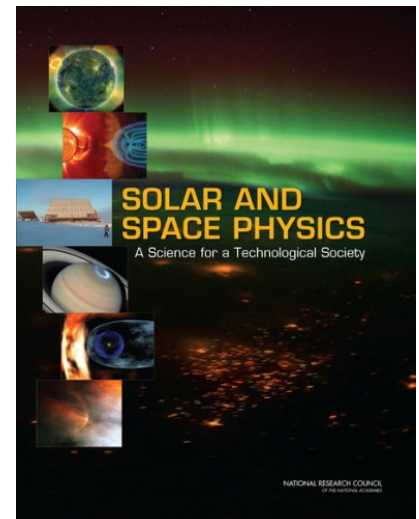
ACTION REQUIRED.—**The Director of OSTP shall:**

- (1) improve the Nation's ability to prepare, avoid, mitigate, respond to, and recover from potentially devastating impacts of space weather events;
- (2) **coordinate the operational activities of the NSWP** Council members
- (3) submit a report to the appropriate committees of Congress that details the current and future data sources, both space- and ground-based, that are necessary for space weather forecasting (**NSWP provided the report through OSTP in response**)

## National Research Council Decadal Survey 2013

“The survey committee recommends ... **the NSWP should be rechartered under the auspices of the NSTC** and should include the active participation of the OSTP and OMB.”

## OSTP Charters the SWORM Task Force Nov 2014

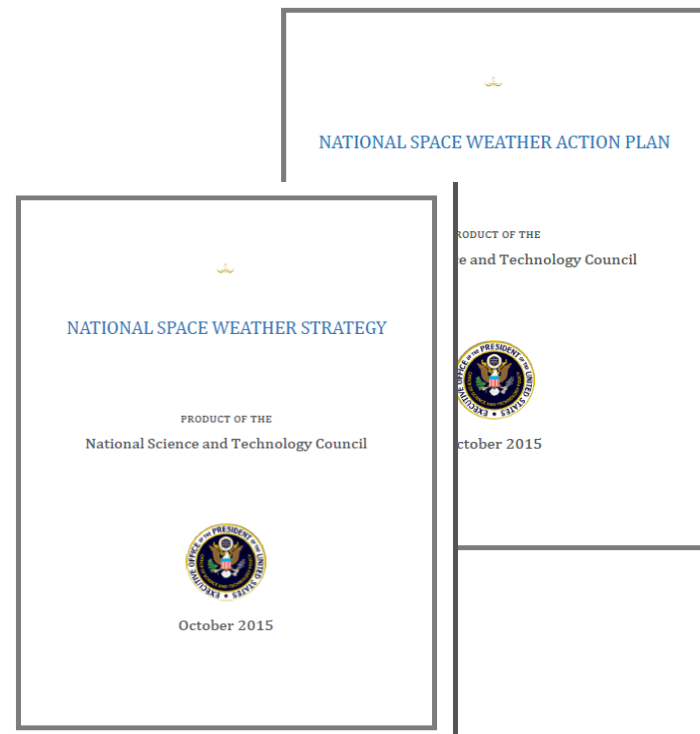


# National Space Weather Strategy

Nov 2014 – Space Weather Operations, Research, and Mitigation (SWORM) Task Force is established by the NSTC including all the participants of the NSWP with additional emphasis on disaster reduction and mitigation.

Tasked to develop:

- National Space Weather Strategy (NSWS)
- Space Weather Action Plan (SWAP)



*...Released on 29 October 2015*

# National Space Weather Strategy – Structure

Draft strategy articulates six high-level goals

1. Establish Benchmarks for Space Weather Events
2. Enhance Response and Recovery Capabilities
3. Improve Protection and Mitigation Efforts
4. Improve Assessment, Modeling, and Prediction of Impacts on Critical Infrastructure
5. Improve Space Weather Services through Advancing Understanding and Forecasting (*R2O/O2R, Observations*)
6. Increase International Cooperation



# Space Weather Action Plan

A Space Weather Action Plan (SWAP) is also being developed that will establish a process to implement the National Space Weather Strategy

- Strategy must have an accompanying roadmap (action plan) to be successful
- The SWAP will establish specific activities with implementation timelines, detailed actions, and specific agency assignments



# SWORM National Strategy

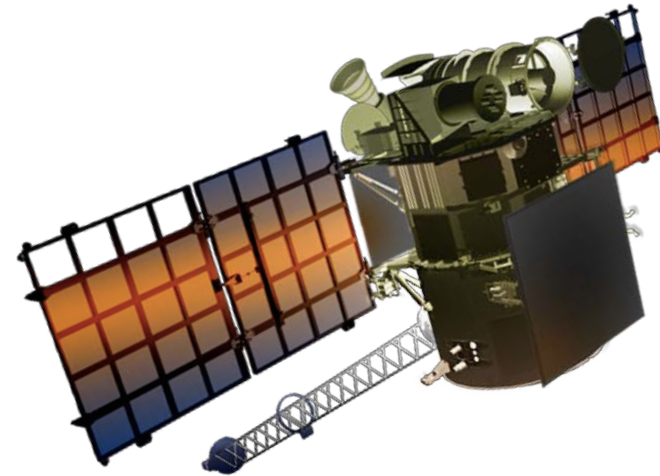
## Critical Observations

### *Ground-based*

- Global Oscillations Network Group (GONG)
- USAF Solar Electro-Optical Network (SEON)
- Continuously Operating Reference Stations (CORS)
- USGS magnetometer network
- Neutron Monitor Network

### *Space-based*

- DSCOVR at L1
- GOES-R at Geosynch
- COSMIC-2 in LEO
- *Coronagraphs at L1 and L5*





# SWORM National Strategy

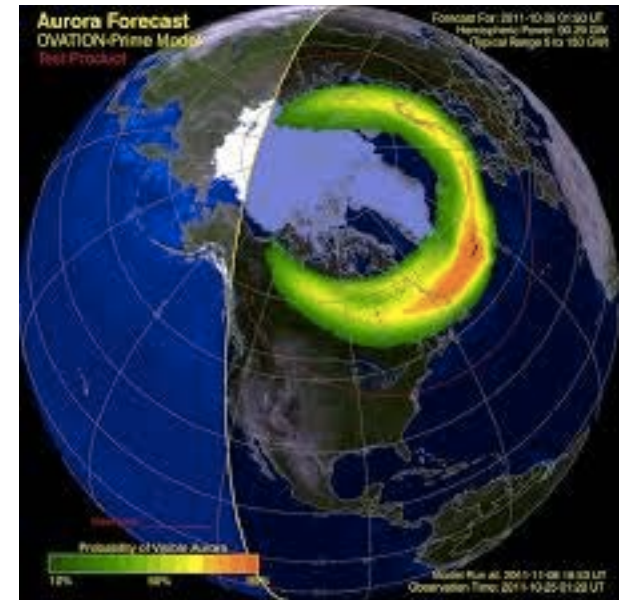
## Improved Forecast (Modeling)

### *Currently Operational*

- WSA/Enlil
- D-region Absorption Profile (D-RAP)
- N. American TEC profiles (NATEC)
- OVATION Aurora

### *Upcoming*

- Whole Earth Model (WAM)
- Integrated Dynamic of Earth's Atmos (IDEA)
- U. Michigan "Geospace"
- E-field model



# Geomagnetic Storm Prediction – Current Forecast Processes

## GLOBAL Specification and Prediction

### 1. Geomagnetic Storm Watch

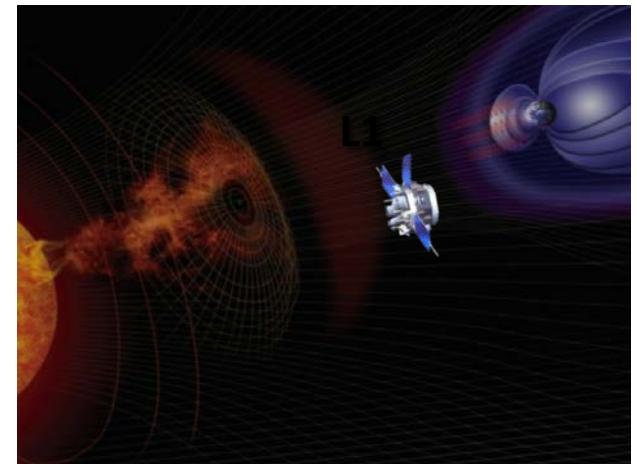
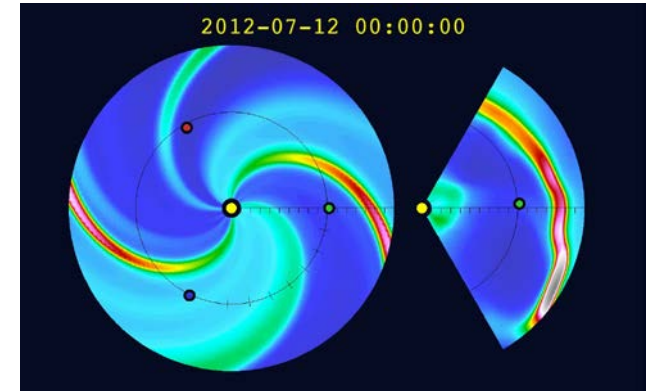
- Issued upon detection of Earth-directed CME and WSA-Enlil model run
  - **1-3 day forecast**

### 2. Geomagnetic Storm Warning

- Issued upon detection at the ACE spacecraft at the L1 Lagrange point (soon to be DSCOVR)
  - **15-50 minutes before impacting Earth**

### 3. Geomagnetic Storm Alert

- Issued when geomagnetic storm is detected on USGS and international partner magnetometers
  - **Current condition**
  - **Informs key decisions for mitigation**





# SWORM Subcommittee (Proposed)

2016: Pending approval, the NSTC will establish the SWORM Subcommittee to continue the work of the SWORM Task Force

- Would execute and regularly update the NSWS and SWAP

## NATIONAL SCIENCE AND TECHNOLOGY COUNCIL (NSTC)

COMMITTEE ON ENVIRONMENT, NATURAL RESOURCES, AND SUSTAINABILITY (CENRS) Tamara Dickinson (OSTP), Kathryn Sullivan (NOAA), Glenn Paulson (EPA)		
AQRS: Air Quality Research (SC)	SWORM: Space Weather Operations, Research and Mitigation (SC)	SOST: Ocean Science & Technology (SC)
CSMSC: Critical & Strategic Mineral Supply Chains (SC)	SDR: Disaster Reduction (SC)	SWAQ: Water Availability & Quality (SC)
IARPC: Interagency Arctic Research Policy Committee (IWG)	SES: Ecological Services (SC)	T&R: Toxics & Risk (SC)
ISTS: Integration of Science and Technology for Sustainability (TF)	SGCR: Global Change Research (SC)	USGEO: U.S. Group on Earth Observations (SC)

COMMITTEE ON HOMELAND & NATIONAL SECURITY (CHNS) Patricia Falcone (OTSP), Alan Shaffer (DoD), Tara O'Toole (DHS)		
BDRD: Biological Defense Research & Development (SC)	ISC: Infrastructure (SC)	SOS-CBRNE Standards (SC)
CDRD: Chemical Defense Research and Development (SC)	NDRD: Nuclear Defense Research & Development (SC)	TISTI: Topics in International Science, Technology and Innovation (SC)
D-IED: Domestic IEDs (SC)	FSLFI: Federal Security Laboratory Facilities and Infrastructure (IWG)	

COMMITTEE ON SCIENCE (CoS) Francis Collins (NIH), Philip Rubin (OSTP), Cora Marrett (NSF)		
IWGN: Neuroscience (IWG)*	PSSC: Physical Science (SC)	LSSC: Life Science (SC)*
Social, Behavioral, and Economic Science (SC)		

COMMITTEE ON STEM EDUCATION (CoSTEM)* John Holdren (OSTP), Cora Marrett (NSF)	
FC-STEM: Federal Coordination in STEM Education (TF)	

COMMITTEE ON TECHNOLOGY (CoT) Thomas Kallil (OSTP)		
ASTS: Aeronautics Science & Technology (SC)	AMS: Advanced Manufacturing (SC)*	SG: Smart Grid (SC)
BidM: Biometrics & Identity Management (SC)	DGT: Digital Game Technologies (IWG)	SMGI: Material Genome Initiative (SC)
P2I: Privacy (SC)	NITRD: Network and Information Technology R&D (SC)*	SoS: Standards (SC)
GIG: Global Internet Governance (SC)	NSET: Nanoscale Science Engineering & Technology (SC)*	
H2FC: Hydrogen & Fuel Cells (IWG)		



# Proposed OFCM Role in SWORM

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SWORM Action plan is the way forward for space weather operations, prediction, and mitigation in the U.S. and world-wide

OFCM is proposed to support SWORM efforts by:

- Retain a focus area on Space Weather and be prepared to support SWORM efforts going forward
- Continue to organize and conduct the Space Weather Enterprise Forum (SWEF) annually as directed by ICMSSR with funding support from the member agencies.



# Meeting Roadmap (Continued)

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- **Issues and Considerations of the Federal Stakeholders**

- **Federal Coordinator's Assessment / Outlook (Dr. Schulz)**

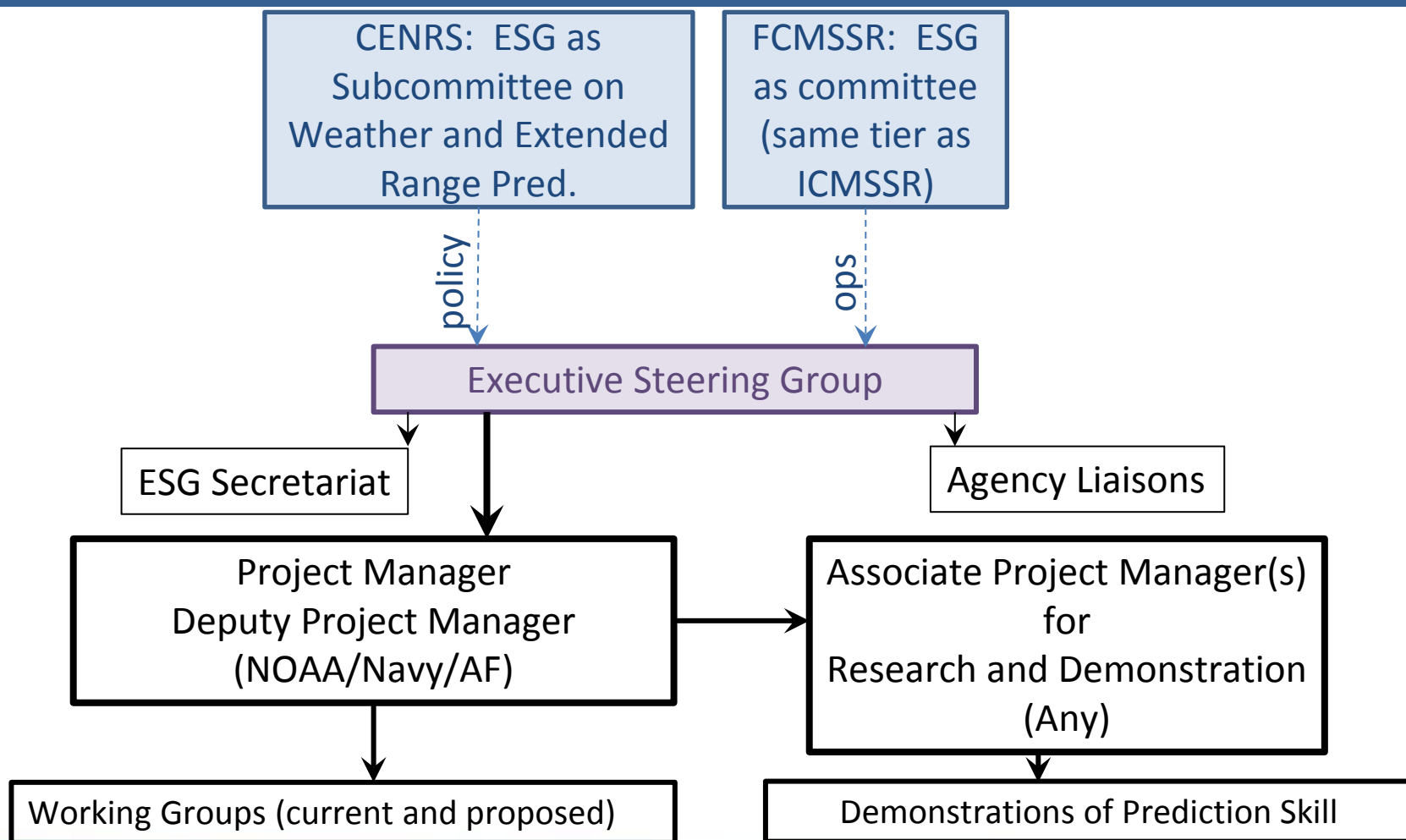
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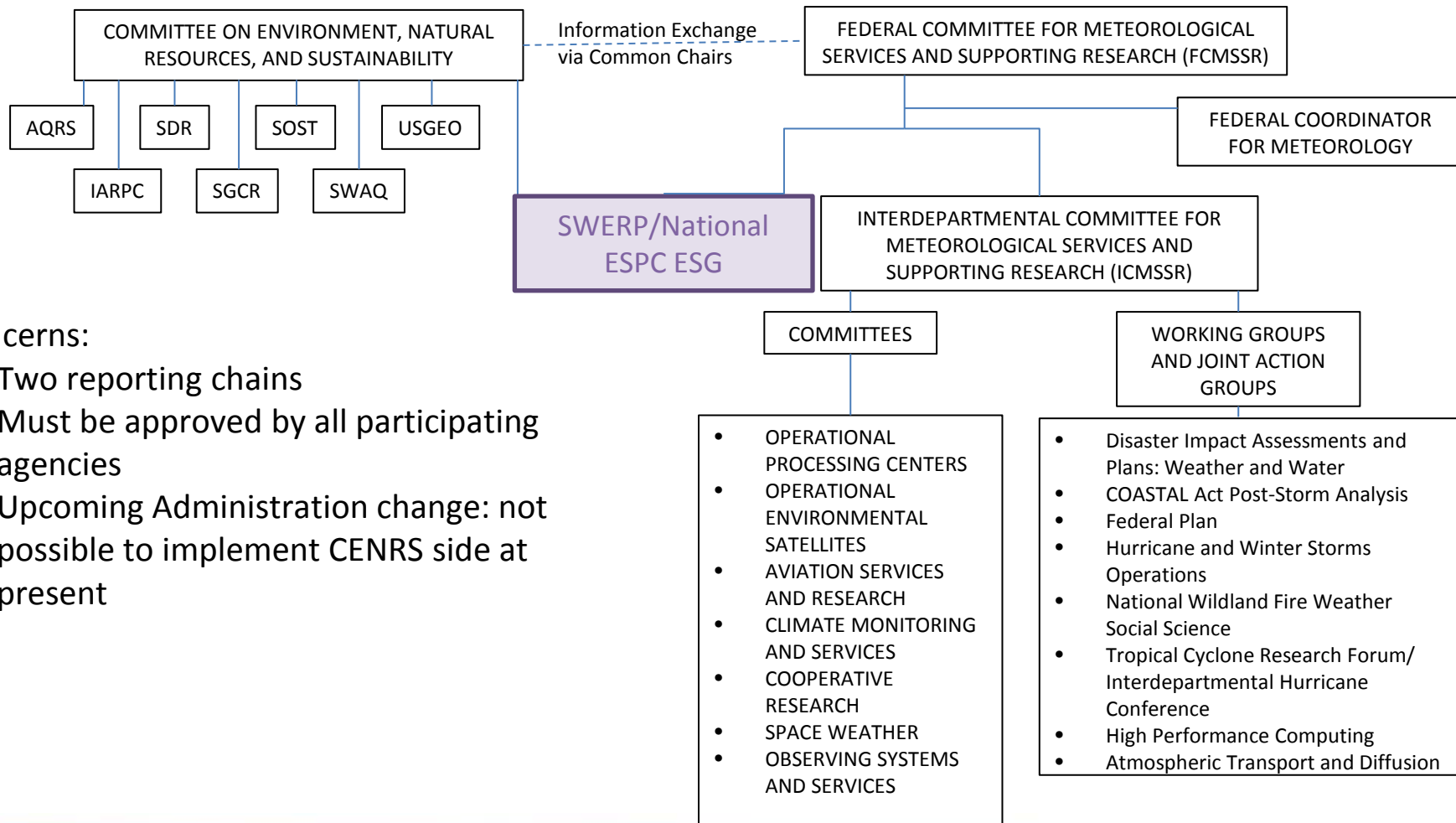
- **ESPC Organization Alignment (TBD)**

**Discussion on the role of FCMSSR and OFCM supporting the National Earth System Prediction Capability**

# Proposed Optimal National ESPC Organizational Chart (viewed from the inside)



# Proposed Optimal CENRS/FCMSSR/ESG Organizational Chart (viewed from the outside)



## Concerns:

- Two reporting chains
- Must be approved by all participating agencies
- Upcoming Administration change: not possible to implement CENRS side at present

# Meeting Roadmap (Continued)

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- **Open Discussion (All)**
- **Wrap-Up (Dr. Sullivan)**

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# Discussion

