SWC

Space Weather Council

UPDATE TO SPACE WEATHER ROUNDTABLE

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*** All opinions expressed are my own

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Updates from the Space Weather Council (SWC)

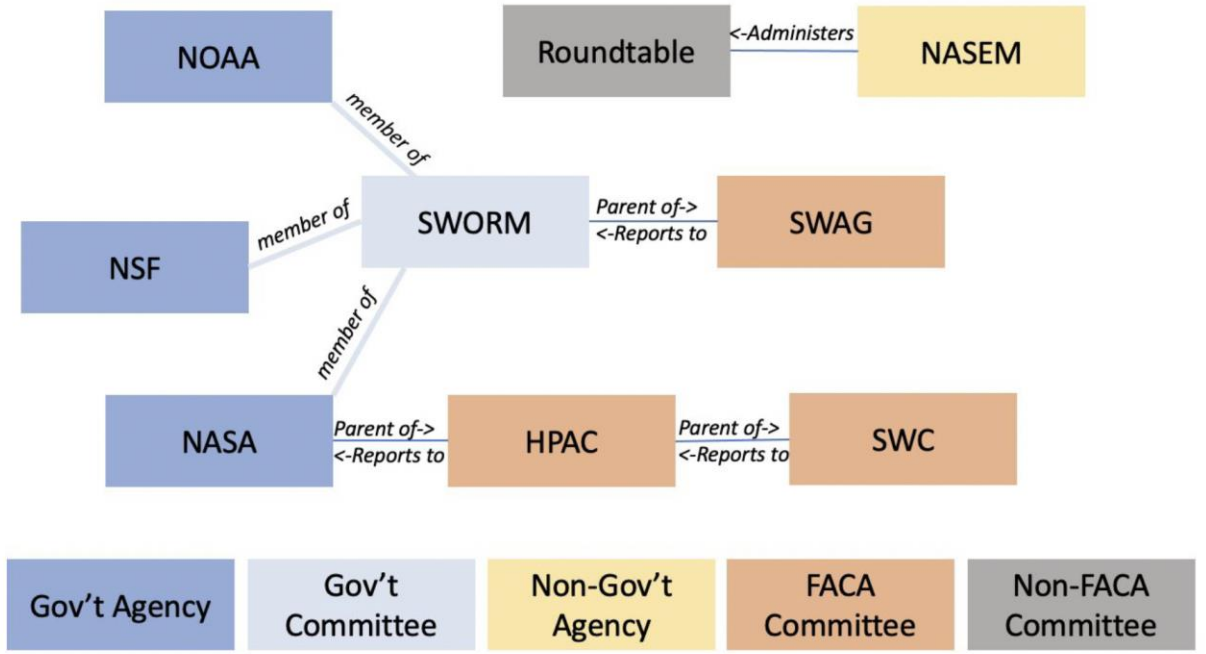
- SWC acts as a community-based forum to coordinate community input and provide advice to NASA HPD via HPAC
- SWC is a FACA subcommittee to HPAC, and is responsive to actions levied by its parent organization
  - SWC Chair: Nicole Duncan
  - SWC Designated Federal Officer: Kelly Korreck
  - SWC Members: Janet Green, Michele Cash, Angelos Vourlidas, Piyush Mehta, Ron Turner, Alexa Halford, Paul O'Brien, Dan Baker and Sage Andorka

- **The HPAC provided the SWC four tasks in August of 2022**. The SWC convened with invited speakers and discussed these tasks in August 2022 and May 2023. This report is the result of those sessions and represents the consensus of the Council.

Task 1: Coordination between SWx groups

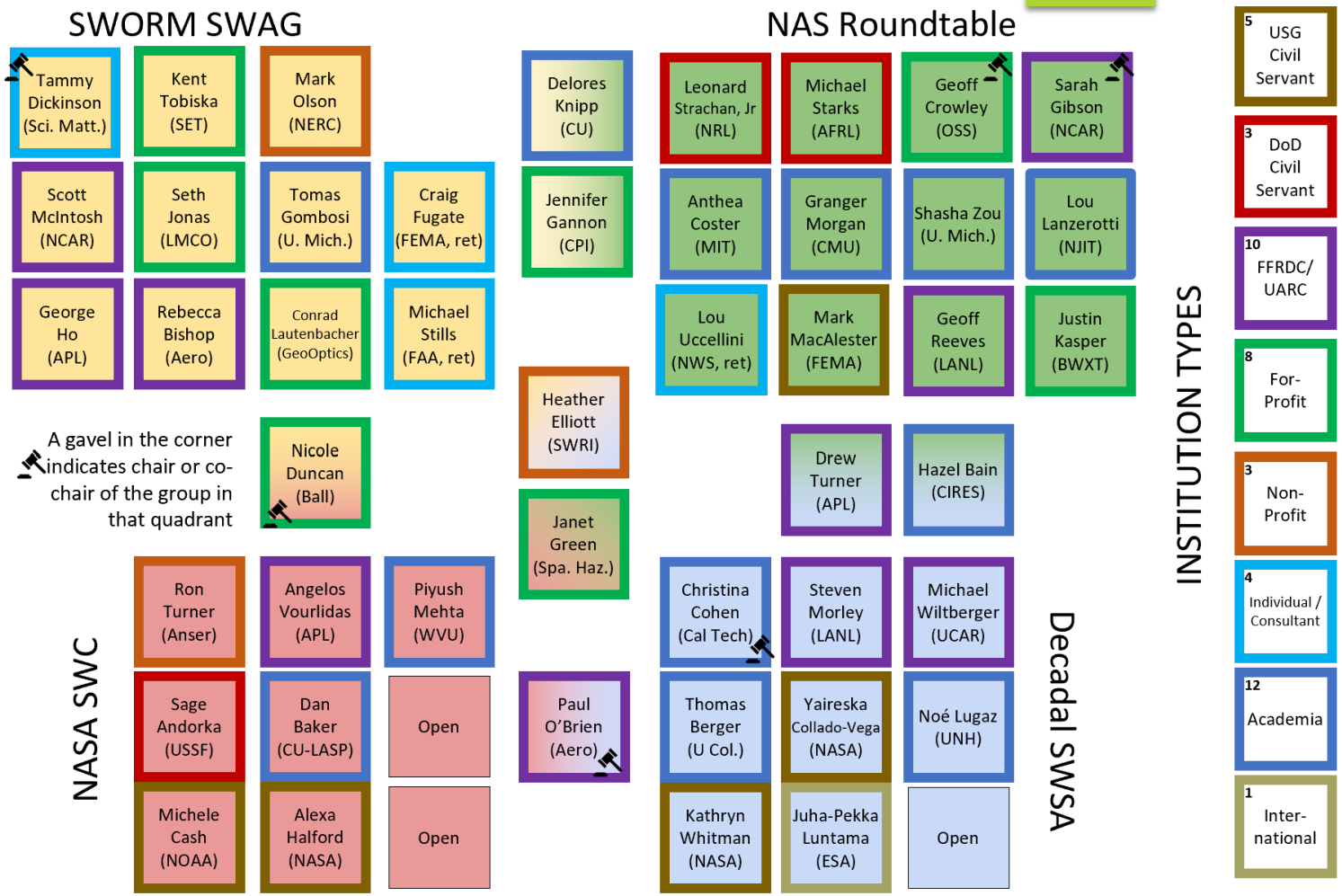
- **SWC is advised to research the activities of SWORM and SWAG, identify overlaps and gaps, and determine how SWC can complement and leverage ongoing efforts**, with specific relevance to the interests of the NASA Heliophysics Division.
  - This may include researching reports on the committee websites; attending their public meetings; organizing a meeting of committee chairs and staff; and defining how the role of the SWC can complement the work of these existing committees.

Flow chart depiction how the groups interact



Overview of Committees

- Including Decadal Space Weather panel
- Updated for current membership
- SWC provided a summary of highlights from SWAG, SWORM and Roundtable to HPAC



Task 1 Response

- SWC views successful coordination and communication between the groups as an opportunity to address the greater national/international space weather needs and ensure a strong and effective global Space Weather Enterprise

- Coordination between the groups has been successfully achieved with regular tag-ups between the leads, invitations to present and participate in each others meetings, and overlapping members within the groups sharing ideas.

- SWC will improve coordination by:
  - Sharing the specific tasks assigned by the HPAC with the other groups when they are received
  - Asking other groups to notify the SWC when they address topics specifically related to NASA

Task 2: Space Weather Gap Analysis

- Of specific interest to the HPD and HPAC is an analysis of the gaps in space weather fundamental science, modeling and impacts. **Gap analysis studies have been performed by different agencies within the last decade, and a summary review of this material is of importance for HPD future plans.**
  - Specifically, the HPD supports development of a range of instruments at different technology readiness levels. Up-to-date understanding of knowledge gaps will assure that HPD can make an informed decision in prioritizing development of certain technologies, instruments, and models.

- Reviewed NASA Space Weather Gap Analysis, NASEM Phase I & II Space Weather Workshops.

Task 2 Recommendations

- Explore approaches to quantify the return-on-investment from filling a gap.

- There has not been a gap analysis which considers the needs of space weather analysts in support of human exploration (Task 3 focus). SWC identified the urgent need for a comprehensive SEP gap-filler analysis (especially with the Artemis program underway).

- Consider undertaking a modeling gap analysis. Two important gaps identified:
  a. Long-term, multi-event historical reanalysis – valuable tool for extreme values and for model validation.
  b. Extreme events cannot be modeled with the routine models – dedicated models for extreme events are needed.

Task 3: ARTEMIS and Space Biology

- The SWC is advised to address the NASA's Artemis and space biology programs to determine the potential to extend our knowledge with lunar focused space weather measurements and studies.

Task 3 Recommendations

- Continue and enhance collaborations across NASA directorates, NASA centers, agencies, and countries for Artemis.
  - It is unclear, however, who takes responsibility once commercial crewed missions begin. This may be a discussion for SWAG.
- Include, pursue, explore, and leverage SWx instrument opportunities on board Artemis infrastructure and opportunistic platforms as these arise.
- Explore and pursue areas where NASA can share cost, reduce risks and perform enabling tasks (such as anomaly resolution) more effectively with the addition of space weather assets.
- Encourage existing missions and modeling efforts to provide their data and capabilities to the Moon2Mars Space Environment office (and others) to perform validation.

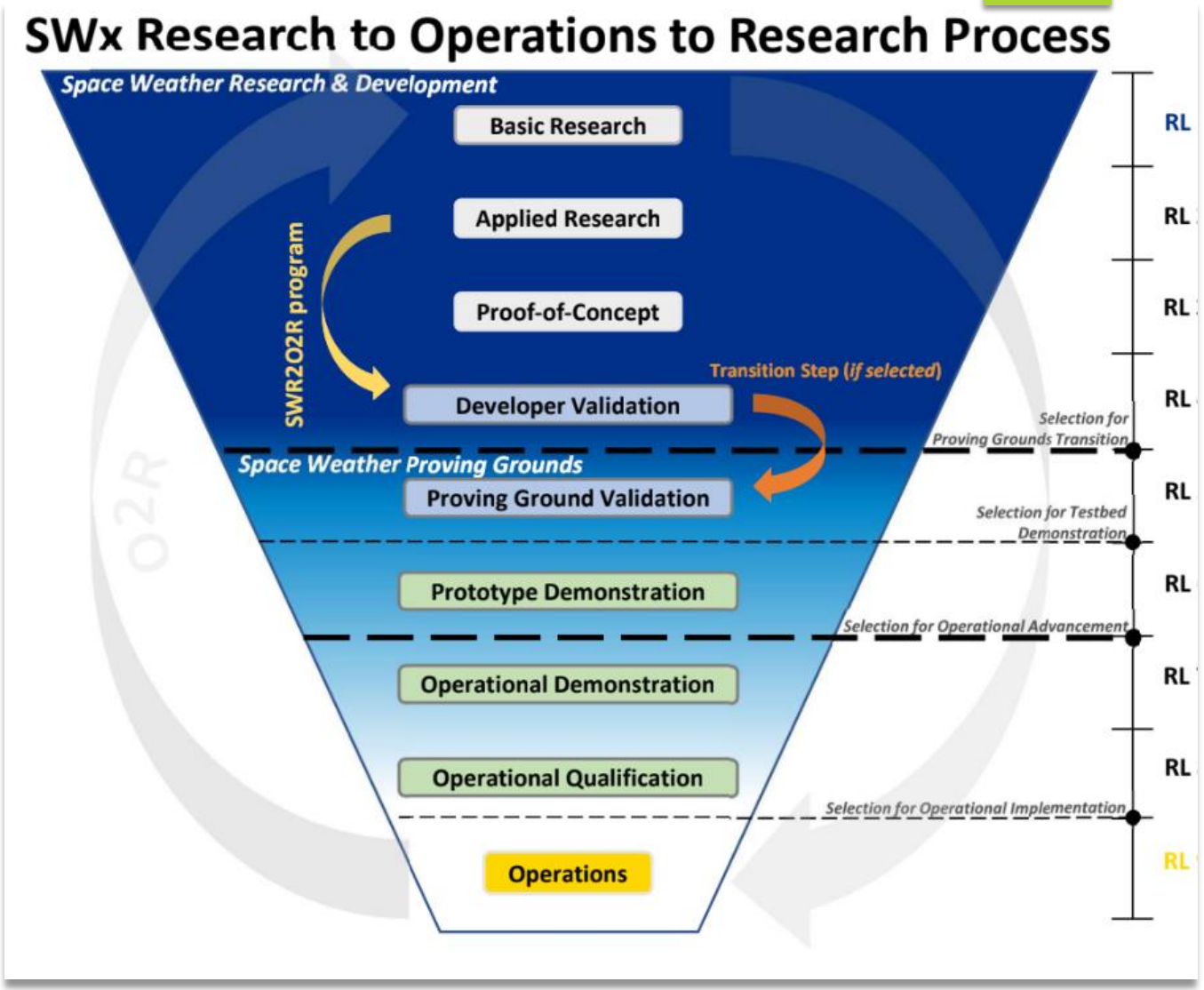
Task 4: Coordination between agencies

- The SWC is advised to work on the development of **specific suggestions for interagency NASA-NOAA-NSF-DoD cooperation** in order to maximize return on investment in research infrastructure supported by agencies. Specific examples include development of suggestions about better coordination between NASA and NOAA supported space-based instruments and NSF-supported ground-based infrastructure, data fusion from multiple instruments, data assimilation efforts, etc.

Task 4: Extensive R2O2R discussion

- Examined inter-agency coordination in SWSA AOs and decisions

- Recommended for consideration
  - Intentionality of overall lifecycle
  - Transparency on the process for selecting capabilities for transition
  - Improved definition of the transition process, especially as regards maturity at handoff to the receiving (operational) organization
  - Enhanced Funding
  - Defining and expanding role of non-government providers and users in framework



Task 4 Response: Roles & Responsibilities

- Investigate developing a single location to collect current and historical interagency space weather data.
  - Also highlighted in NASA Space Weather Gap Analysis and SWAG Report
- Explore the Unified Data Library as a pathway to obtain DoD data.
- Develop a comprehensive contact list of international partners including roles and responsibilities.
- Request to HPAC for future work:
  - Explore NASA-NSF collaboration opportunities, including the new NSF Technology Innovation and Partnerships (TIP) program, the Decadal Survey's output, and joint funding

Thank you

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