

4 MANAGEMENT ISSUES

Each of the cooperating agencies in the National Space Weather Program (NSWP) has national responsibilities and opportunities that engage with, and are influenced by, the space environment of Earth. By coming together under the umbrella of the National Space Weather Program Council (NSWPC) in OFCM, these agencies expect to leverage their individual expertise, resources, and Federal responsibilities to aid the overall national effort.

The NSWP has accomplished a significant number of important national objectives in the past decade with its current status as a confederation of agencies. Nevertheless, the Assessment Committee has identified a number of important management issues related to the program as a whole, as well as to individual agencies. Addressing these issues will enhance the effectiveness of the national effort. The Assessment Committee recognizes that implementing many of the recommendations in this report will require new resources.

4.1 NSWP Structure

The current arrangement of the NSWP as a loose confederation of agencies has made it difficult for the program to achieve the type of operational coordination that is essential to provide the national leadership needed for addressing the key space weather issues in the civil, governmental, and national security arenas. Although individual agencies' roles and responsibilities may be understood and agreed upon within the NSWPC, execution of those roles and responsibilities is problematic without specific assignments of agency fiscal responsibilities by the Office of Management and Budget (OMB) and Congress. Expenditures within each agency toward NSWP strategic objectives must compete for funding with the myriad of other agency programs and commitments. In an environment of fiscal constraints, NSWP objectives often are underfunded or unfunded. If each agency were required to allocate the funding to fulfill its NSWP role and were required to monitor/report its progress toward successful execution of its role, the NSWP would be much stronger than it is presently and better postured for continued success in meeting the Nation's space weather needs.

Finding 4.1. Organizational Matters. The NSWP is an outstanding example of a Federal government program in which a significant number of executive branch agencies have important national interests and where the individual agencies have natural areas of experience and expertise. However, the program management organization under the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM)—namely, the National Space Weather Program Council (NSWPC)—needs to be strengthened and needs to take a more active role in the execution of its overarching responsibility to ensure that the NSWP can move forward in achieving its goals. Without further strengthening of the NSWPC as an interagency integrated program, the chances of meeting the challenging national needs in space weather will be greatly diminished.

The following recommendations (with subsequent discussions) are offered as mechanisms to address what the Assessment Committee considers to be management deficiencies in the NSWP.

Recommendation 4.1.1. Oversight for the NSWP should be established in the Executive Office of the President, as is currently done for several other critical cross-agency activities of the Federal government. Policy and technical implementation aspects should be coordinated under the aegis of a space-knowledgeable staff member in the Office of Science and Technology Policy (OSTP). Budgetary coordination and review for the NSWP agencies should be carried out under a designated examiner in the Office of Management and Budget (OMB).

The Earth's space environment is one of the very few issues that affect virtually all aspects of the U.S. Government and American society, yet it is seldom recognized as such a broadly encompassing matter. For this reason, the agencies that are concerned with space weather have been slow to coordinate space weather programs and funding. While the NSWP has been an effective forum for identifying what needs to be done, it has had no power to translate this understanding into U.S. Government policy. Suitable oversight, reporting, review, and fiscal coordination at the presidential level will help assure that agencies work together efficiently and that budgetary allocations are adequate to meet national space weather needs.

Recommendation 4.1.2. The NSWPC Chair should review the council's membership and consider additional membership to increase the visibility of the program's fiscal and other challenges and to increase support for overcoming those challenges. The NSWPC should review and update its now 10-year-old charter to describe clearly its oversight responsibilities. These should include, but not be limited to, the authority to: (1) address and resolve interagency issues, concerns, and questions; (2) reprioritize and leverage existing resources to meet changing needs and requirements; (3) approve priorities and new requirements as appropriate and take coordinated action to obtain the needed resources through each agency's budgetary process; (4) identify resources needed to achieve established objectives; and (5) coordinate and leverage individual organizational efforts and resources and ensure the effective exchange of information.

A primary example of the failure to translate needs into government action is the limited remaining operational life (as discussed in chapter 3) of the interplanetary monitoring satellite, the Advanced Composition Explorer (ACE), which is located between Earth and the Sun at the L1 Lagrange point. All agencies acknowledged to the Assessment Committee that continuity of this capability is essential to maintaining critical U.S. monitoring data, as well as to conducting the research needed to develop new, comprehensive models of the space environment. While all participating agencies in the NSWP understand and acknowledge the importance of this capability, none are able to budget a near-term replacement/augmentation of ACE. The Assessment Committee notes that this situation is somewhat analogous to past inability of the Federal Government to provide continuity of multispectral land remote sensing capabilities (LANDSAT). The remedy for the latter situation required top-level Administration coordination and direction.

The Assessment Committee believes that substantially more awareness of the NSWP is needed within the staffs of OMB and OSTP. The Executive Branch must be fully apprised of the national need for improving space weather forecast capabilities. A first agenda item for OSTP/OMB oversight would be to assign responsibilities and funding for the development of a comprehensive ACE L1 follow-on program. The NRC's Decadal Strategy in Solar and Space Physics recommended that NOAA be principally responsible for an L1 follow-on solar monitoring spacecraft (NRC 2002).

Without additional leverage or Executive Office attention, the Assessment Committee believes that it is likely that critical national data collection systems, such as the comprehensive solar monitor at L1, will cease to exist. While the United States might be able to obtain some relevant data from other nations (China is currently planning such a mission), there could be lapses in coverage at times, including times of international tension. Solar event and solar wind warning data are critical to DOD operations, NASA human exploration, and a host of commercial and other space services. To depend on other nations, or simply to do without such data, could have serious negative consequences on many important national programs and activities.

Recommendation 4.1.3. A joint working group should be established for all cooperating NSWP agencies similar to that described in the NASA/NOAA Congressional Directive (2006 NASA Reauthorization Bill H.R. 3070, Section 306) and with similar reporting requirements.

Within the 2006 NASA Reauthorization Bill, specific Congressional guidance was given to both NASA and NOAA to form a joint working group and to report annually to the House of Representatives and the Senate on how U.S. Earth science programs will be coordinated in the upcoming year. The Assessment Committee believes that a similar type of oversight could be beneficial for the NSWP. The committee further believes that such "directed coordination," should leverage the existing OFCM and NSWP infrastructure (the NSWPC and the Committee for Space Weather).

Recommendation 4.1.4. A full-time space weather expert should be appointed as Executive Secretary to the Committee for Space Weather under the NSWPC.

Implementation of recommendation 4.1.4 will ensure that stakeholder agencies are contributing to the NSWP as specified in the strategic and the implementation plans. It will ensure that NSWPC directions are consistent with the program's strategic and implementation plans. Ensuring that guidance and strategic planning are accomplished across the participating agencies for critical national space weather infrastructure would be an essential responsibility of this position. This person/position would be the primary interface between the NSWPC and the Director of a new Joint Center for Space Weather Research to Operations (see recommendation 4.1.7 below).

Funding of this position could come from contributions from all stakeholder agencies. Currently, all agencies within the NSWPC and the Committee for Space Weather participate on, at most, a "part-time as available" basis.

Recommendation 4.1.5. The NSWPC should direct that a new NSWP Strategic Plan be written that takes into account the successes and the limitations achieved under the current plan, changes that have occurred in technologies susceptible to space weather, and advances made in scientific understanding.

The NSWP Strategic Plan is more than a decade old. A new visionary plan should take into account the many developments and changes that have occurred over this time in science and applications, as well as in the management of the NSWP.

Recommendation 4.1.6. The NSWPC should direct that a new NSWP Implementation Plan be written following a new strategic plan.

The latest NSWP Implementation Plan is more than 5 years old. A new plan should use the new visionary perspective of the new strategic plan and point the way forward for the program.

Recommendation 4.1.7. The NSWPC should create a joint, cross-agency, space weather organization, the “Center for Space Weather Research to Operations.”

Currently, seven Federal agency organizations are involved in some aspect of the NSWP objectives as defined in the program’s current strategic and implementation plans. However, no single organization has a specific charge to further the NSWP strategic objectives or can ensure that work toward NSWP objectives is progressing and well managed, especially work toward objectives critical to operations. A core of full-time personnel working toward and managing efforts toward the NSWP strategic goal of research to operations (research, modeling, operations, education) would benefit all agencies, and would significantly increase the effectiveness of the NSWP. This would result in an enhanced ability to maintain the Nation’s most critical space weather-sensitive operational systems and to keep its citizens safe.

4.2 NSWP Agencies

This section addresses three management-related issues for the agencies in the NSWP. These issues target concerns that primarily affect the research community.

NSF and NASA provide the main funding resources for extramural research (i.e., research that is not conducted within a Federal entity; primarily academic research). While the solar and solar-terrestrial programs in NASA have a unified leadership within that agency, the management of the corresponding programs within NSF is currently divided between two directorates.

Finding 4.2. The current management structure of the NSF solar and solar-terrestrial research programs does not always operate optimally to foster basic solar and solar-terrestrial research or the links from this research to space weather.

Recommendation 4.2.1. The solar and solar-terrestrial program elements of the NSF should be managed as one, possibly division-level, program so as to have a unified overview of both the basic research and space weather elements.

The Decadal Research Strategy recommended that both NASA and NSF fund bridged faculty positions at universities to bring solar and space physics into the academic curriculum, commensurate with the national resources that are being devoted to these research endeavors. This was to be accomplished through a peer review process (NRC 2002, pp. 35, 148-49).

Finding 4.3. While the NSF has implemented a program to support bridged positions for academic faculty in solar and space physics, NASA has yet to address this recommendation of the National Research Council's Decadal Research Strategy in Solar and Space Physics.

Recommendation 4.3.1. NASA should institute a bridged faculty program in solar and space physics.

Such a program would be of substantial benefit for NASA's solar and space physics missions, for university education, for transferring knowledge gained from NASA's program to the public, and for the NSWP. Such a program would be a small resource expenditure in comparison to the current levels of NASA programs in this field.

At times in the past, some programs and offices under the DOD and NOAA sponsored extramural research (primarily academic research) in solar and solar-terrestrial physics at funding levels considerably above those at present. That level of research support enabled close interactions between in-house laboratories and the outside community of researchers and helped to develop analysis tools and models in support of space weather applications.

Finding 4.4. The continuing decline in the resources available to the DOD and NOAA for contracting peer-reviewed research, both targeted and strategic, to the extramural community, especially the academic community, means that the interactions and interchanges between the government and nongovernmental sectors in space weather are far from optimized.

Recommendation 4.4.1. Resources should be restored to the operational agencies to allow greater extramural research inputs. NOAA and the DOD should thereby provide competitive peer-reviewed funding for contributions from the nongovernmental sector to space weather program research elements.

The Assessment Committee believes that the NSWP could be significantly strengthened nationally if the participating agencies engaged needed expertise wherever it exists in the Nation's talent pool.

