

# Collaboration Between Government and Commercial Space Weather Information Providers

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Many systems and situations require up-to-date space weather information. These include navigation systems in cars, boats, and commercial freight; the specific location information needed for construction and oil drilling; communications; airline navigation; avionics systems; and passengers and personnel on polar airline flights. Thus, as the world's industries become increasingly more reliant on satellite data and more vulnerable to space weather conditions, new collaborations will have to be formed between commercial providers of space weather information and the government scientists who monitor space weather.

To tackle this issue, a meeting of the Commercial Space Weather Interest Group (CSWIG) and the NOAA Space Weather Prediction Center (SWPC; formerly the NOAA Space Environment Center) was held to discuss opportunities for further joint development and collaboration between commercial providers and SWPC. The meeting, held on 27 June 2007 at NOAA SWPC in Boulder, Colorado, was coordinated by CSWIG and was open to all interested parties, including those who wished to hear sessions by phone.

Thomas Bogdan, director of SWPC, opened the meeting stating that the commercial providers and SWPC were convening at a historic moment, just as the space weather enterprise—including space tourism, commercial satellites, and commercial aviation—is opening up to new customers who are reliant on space weather information. He mentioned that many people do not know that they are or will be in need of space weather information; rather, they will wake up with a surprise in 2012 at solar maximum when a solar flare shorts out their gadgets, requiring them or the companies that service them to seek help from new products and warnings.

Bogdan stated that in the current era of constrained budgets, SWPC requires key partnerships to function effectively so as to coordinate and leverage SWPC capabilities. Thus, SWPC may need to move away from certain activities in or-

der to address the growing needs of new customers. He acknowledged that commercial providers stand ready to fill any gaps and ensure continuity of products and services. Bogdan emphasized that SWPC personnel present at the meeting were seeking to understand what products and services the commercial providers wanted and the financial and operational impacts on the SWPC if certain products were emphasized or discontinued.

John Kappenman, of Metatech Corporation and chair of CSWIG, discussed the importance of growing the commercial sector for space weather into a thriving industry, citing the National Space Weather Program assessment report ([http://www.nswp.gov/nswp\\_acreport0706.pdf](http://www.nswp.gov/nswp_acreport0706.pdf)) commissioned by the Office of the Federal Coordinator for Meteorology. He stressed that commercial providers, because they are running a business, focus on their investments and whether infrastructure exists to support these investments. Thus, the reliability, promptness, lack of latency, high cadence, and validation of spacecraft data, such as those from the Geostationary Operational Environmental Satellites (GOES) series and the Advanced Composition Explorer (ACE), as well as ground-based data, such as from magnetometer networks and the Continuously Operating Reference Stations (CORS), are “musts” for commercial providers in order that they can expand their own capabilities. Further, Kappenman emphasized that commercial providers must know what SWPC considers its “core” versus “noncore” capabilities, so that steps can be taken to ensure continuity of data given to the commercial space weather providers should the SWPC choose to cut programs.

To address this, Terry Onsager, of SWPC, presented SWPC's priorities for future activities, new data and models, data sources, possible data products, and models considered for transition to operational use in the SWPC forecast center. This was followed by discussions on nonexclusive licensing; data provision by NOAA SWPC, the National Geophysical Data Center (NGDC), or the National Geodetic Survey

(NGS); access to the SWPC Data Management System; identification of necessary legal documents that could enable the implementation of agreed upon topics; and outsourcing to commercial providers the noncore capabilities.

Devrie Intriligator, of Carmel Research Center, recommended that SWPC provide a dedicated server outside the SWPC firewall for CSWIG to provide commercial suppliers of space weather data with minimum latency and high-reliability GOES, ACE, ground magnetometer, and CORS data, as well as the important SWPC model outputs (e.g., Wang-Sheeley-Arge). She suggested that the data server could be set up on a temporary basis, with the understanding that it would be a prototype or proof of concept. Bogdan commented, saying that SWPC would need to discuss the request with the National Weather Service. Intriligator also noted that a CSWIG member company had staff knowledgeable of SWPC data, computers, and processes;

it could implement within 3 months a prototype server for minimal funds that would have minimal impact on SWPC resources.

Kent Tobiska, of Space Environment Technologies, discussed outsourcing of SWPC noncore activities, commercial nonexclusive use of SWPC model code, and the expansion of commercial provider capabilities in conjunction with SWPC. Kappenman emphasized the importance of setting up a process where these meeting discussions would continue on a regular basis, and Bogdan suggested meetings take place twice a year, by teleconference if necessary.

A Google group was set up (<http://groups.google.com/group/cswig/>) to aid in the ongoing discussions that this meeting generated. Participants at the workshop agreed that such meetings were valuable and affirmed that SWPC and the CSWIG continue to work together to grow a viable commercial space weather industry.