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Third Annual Space Weather Community Operations Workshop: Building a Robust Space Weather Enterprise

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In an ever-evolving world, the space weather operational community is asking, "How can we best exchange real-time data to ensure quality space weather products for our users?" and "What are our industry's best practices for creating, distributing, storing, and archiving space weather data?" These questions were among those discussed at the Third Annual Space Weather Community Operations Workshop (SpWxCOW3) held at Park City, Utah, on 28–29 March 2013 (http://spaceweather.usu.edu/htm/space-weather-cow). Throughout the 2 day workshop, representatives of 13 organizations in the United States and Korea shared methods to improve data use and distribution together with lessons learned in operational problems. The attendees produced a workshop report accessible at http://spaceweather.usu.edu/files/uploads/SpWxCOW-Report_2013.pdf.

A network for exchanging large amounts of space weather real-time data has been difficult to build. Low data connection speeds, intermittent data outages, changes in output file formats, restrictive information technology policies at some institutions, poor quality of delivered data, and occasional corruptions of files have all take their toll in providing timely, accurate, and quality products for end users. The 2013 SpWxCOW addressed some best practices for providing real-time data. These included developing standard naming conventions for space weather parameters, using consistent metadata tags and formats for distributed data, using standardized self-describing metadata, and identifying within metadata whether the data are raw, partially processed, or final data. The establishment of a Wikipedia entry for operational space weather, with metadata definitions, was suggested as a way to make the practice of operational space weather more robust. This would allow a broad community the ability to rapidly converge on common metadata definitions and operational procedures.

Data storage challenges were also discussed. With the onset of terabyte storage capabilities, it was noted that space weather data can grow rapidly if not archived in a thoughtful manner. Best practices were proposed to avoid storing duplicate data, to use databases (preferably SQL) for rapid, specific access, and to use metadata pointers to describe data file locations.

Attendees at the 2013 SpWxCOW reported on operational procedures and problems in the context that learning from the mistakes of other organizations is often the best method for avoiding similar mistakes. The workshop highlighted a case study from a recent operations contract at one prominent company where best practices were summarized as follows: (a) maintaining and checking logs for database errors related to constraint violations; (b) following industry standards for coding, software, and testing; (c) using consistent filename conventions; (d) using version control of code to make changes recognizable; and (e) minimizing data format changes to avoid breaking end-user software.

An organizing committee was established for the 4th Annual Workshop to be held in March 2014, again in Park City, Utah. The 2013 Workshop was hosted by the Utah State University Space Weather Center in collaboration with six sponsoring organizations including American Commercial Space Weather Association (ACSWA),

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American Meteorological Society (AMS), NASA Goddard Space Flight Center Community Coordinated Modeling Center (CCMC), Space Infrastructure Foundation (SIF), NOAA National Weather Service Space Weather Prediction Center (SWPC), and the United States Geological Survey (USGS).

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