

REPORT FROM THE INTER-PROGRAMME COORDINATION TEAM ON SPACE WEATHER

In response to CGMS action 38.04

The sixteenth World Meteorological Congress (Cg-XVI) noted that a coordinated effort by WMO Members was needed to address the observing and service requirements to protect against the global hazards of Space Weather. It invited the WMO Space Programme, in coordination with the Inter-programme Coordination Team on Space Weather and with the support of the relevant technical commissions, to develop near-term and far-term action plans, including education and training, and work with the WMO Regional Associations to implement a coordinated strategy for Space Weather.

The Inter-Programme Coordination Team on Space Weather (ICTSW) is now an active team within WMO with the goal of facilitating international coordination of space weather observations, products, and services. This goal is achieved by increasing global awareness of space weather impacts, advocating for improved observations, coordinating data and services, creating partnerships to share responsibilities, and encouraging research.

Current activities include documenting space weather observing requirements, identifying high-priority gaps, and delivering coordinated information on products and services delivered by space weather centres around the globe on a WMO-sponsored web portal. Long-term goals include encouraging the high-level coordination of satellite-based assets for space weather to ensure that high-priority gaps are addressed in a cost-effective manner through shared capabilities, and supporting data exchange and dissemination through the WMO Information System

Recommendation proposed:

CGMS satellite operators are encouraged to work with the ICTSW to coordinate the planning and utilization of space weather observations.

REPORT FROM THE INTER-PROGRAMME COORDINATION TEAM ON SPACE WEATHER

1 INTRODUCTION

The Inter-Programme Coordination Team on Space Weather (ICTSW) is now an active team within the WMO Space Programme with oversight by both the Commission for Basic Systems (CBS) and the Commission for Aeronautical Meteorology (CAeM). Current members have been nominated by Australia, Belgium, Brazil, Canada, China, Colombia, Ethiopia, Finland, Japan, Republic of Korea, Russian Federation, United Kingdom, United States of America, and by the following international organizations: European Space Agency (ESA), International Civil Aviation Organization (ICAO), International Space Environment Service (ISES), International Telecommunications Union (ITU), United Nations Office for Outer Space Affairs (OOSA), and WMO.

The ICTSW was officially formed in May, 2010. The overarching goal of the ICTSW is to facilitate international coordination of space weather observations, products, and services, building on the respective experiences of ISES and of WMO and in partnership with other relevant organizations. The ICTSW carries out its activities in accordance with the following Terms of Reference defined by CBS and CAeM:

- (a) Standardization and enhancement of space weather data exchange and delivery through the WMO Information System (WIS);
- (b) Harmonized definition of end-products and services, including e.g. quality assurance guidelines and emergency warning procedures, in interaction with aviation and other major application sectors;
- (c) Integration of space weather observations, through review of space- and surface-based observation requirements, harmonization of sensor specifications, monitoring plans for space weather observation;
- (d) Encouraging the dialogue between the research and operational space weather communities.

2 OUTCOME OF THE SIXTEENTH WORLD METEOROLOGICAL CONGRESS

Being informed of the conclusions of a side-event on "Global preparedness for Space Weather hazards" held on 17 May 2011, the sixteenth World Meteorological Congress (Cg-XVI) noted that a coordinated effort by WMO Members was needed to address the observing and service requirements to protect against the global hazards of Space Weather. It invited the WMO Space Programme, in coordination with the Inter-programme Coordination Team on Space Weather and with the support of the relevant technical commissions, to develop near-term and far-term action plans, including education and training, and work with the WMO Regional Associations to implement a coordinated strategy for Space Weather.

Congress furthermore recognized Space Weather coordination as one of the components of the WMO Space Programme.

3 CURRENT ACTIVITIES AND FUTURE PLANS

3.1 Space Weather Observing Requirements

A first version of space weather observing requirements was submitted in May, 2011 to the WMO Expert Team on Evolution of Global Observing Systems (ET-EGOS) as part of the Rolling Requirements Review (RRR) process. These requirements can be viewed at: www.wmo-sat.info/db, under the application name "Space Weather." The ICTSW will next be conducting a first assessment of the unmet needs and drafting a Statement of Guidance to address the highest priority gaps in capabilities.

3.2 Web Portal and Demonstration Site

The WMO Secretariat is developing a web-based access to space weather product information. The effort aims to facilitate the coordination of international space weather products and to enhance their visibility and usage. Building on the assets of ISES, the ICTSW will strive to harmonize the definition of end products and services, including assessments of quality, and will identify opportunities to coordinate services in response to high priority needs, such as support to global aviation through the International Civil Aviation Organization (ICAO).

Two outcomes are envisioned for this effort. First, through the development of a Space Weather Product Portal, products that meet minimum requirements will be organized to allow convenient discovery and access. Global and regional products will be identified according to impact and usage categories, such as ionospheric disturbances, geomagnetic disturbances, radiation environment, and solar conditions.

A second outcome is the development of the Space Weather Demonstration Site. The purpose of this site is to enhance the usage of a few specific products by providing easy access and product-specific training. The Initial Operating Capability for the Demonstration Site is targeted for the end of 2011, and is planned to include multi-language training and access to global products that could serve a worldwide user base.

3.3 Long-Range Plans

It is recognized that vulnerability to space weather is increasing as we become more reliant on advanced technology. Furthermore, a framework of ground-based and space-based observations is already in place which could be extended, and actions to improve space weather capabilities are being taken today by industries and governments around the globe. To build on this foundation, near-term and long-term action plans are being developed to coordinate and to advance our space weather capabilities.

One important area where coordination would be beneficial is the planning of satellite-based observing assets. To further this goal, it is felt necessary to conduct a high-level monitoring and evaluation of satellite-based assets for space weather and to develop a coordinated planning to ensure that high-priority gaps are addressed in a cost-effective manner through shared capabilities. A growing number of nations now have or are planning space weather instrumentation on operational and research satellites. At the same time, however, there are key gaps in our planned observing capabilities, and

many of the existing data streams are not coordinated for maximum effectiveness. It is expected that CGMS and ICTSW will work together to coordinate the planning and utilization of space weather observations.

4 CONCLUSIONS

Space weather is a global challenge requiring coordinated global preparedness. The threats of space weather are certain to increase, both in the near term as solar maximum approaches and in the far term as our dependence on technologies impacted by space weather continues to expand. The existing network of observing systems and service centres provides a framework on which we can efficiently expand our capabilities to safeguard our vulnerable infrastructure.

CGMS is encouraged to support the long-range planning and coordination of satellite-based space weather measurements.