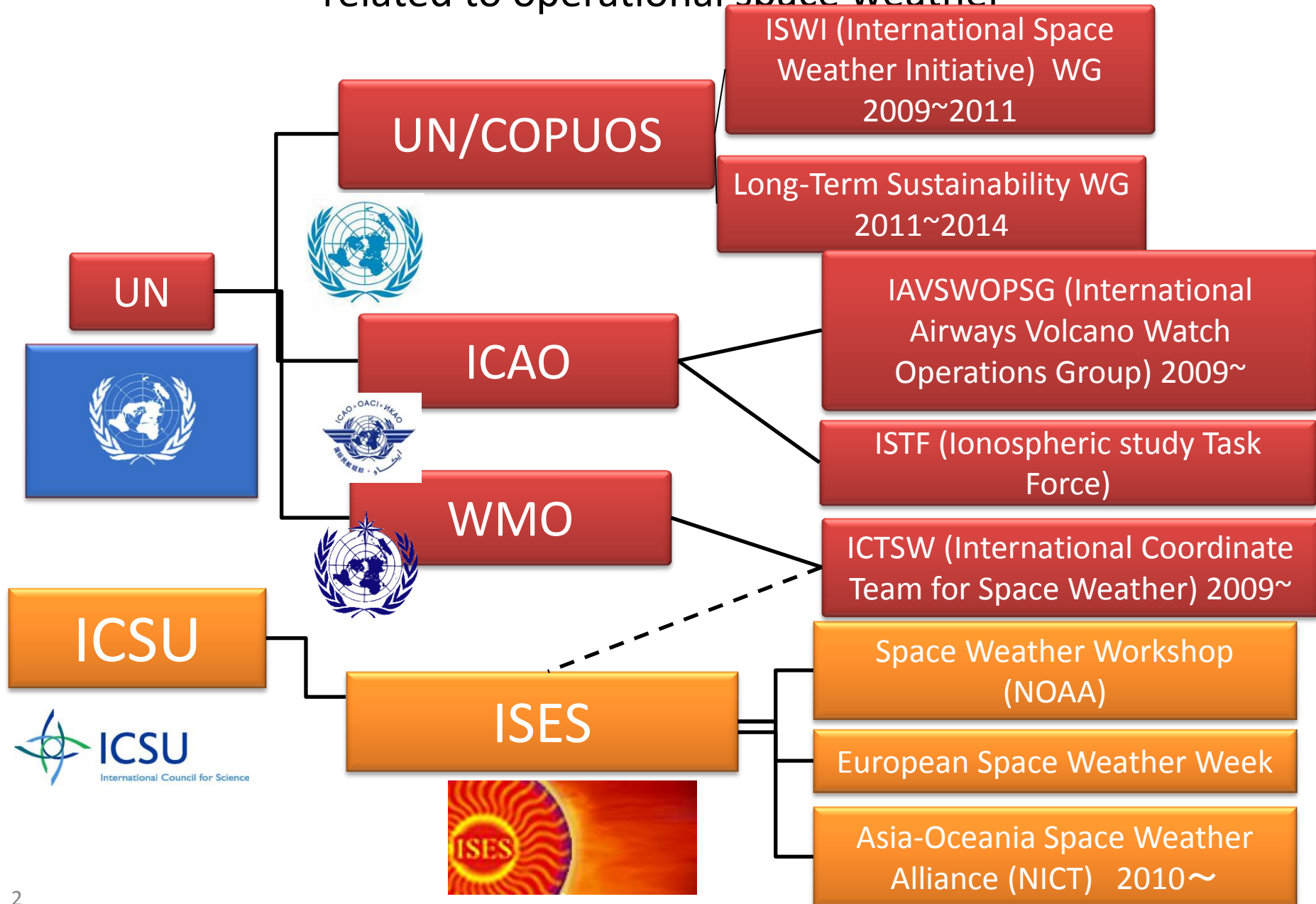


# Space Weather Report about discussions in the MET group

Mamoru Ishii

National Institute of Information and  
Communications Technology

# International /regional organizations related to operational space weather



# Discussion of Space Weather Information to Aviation in ICAO

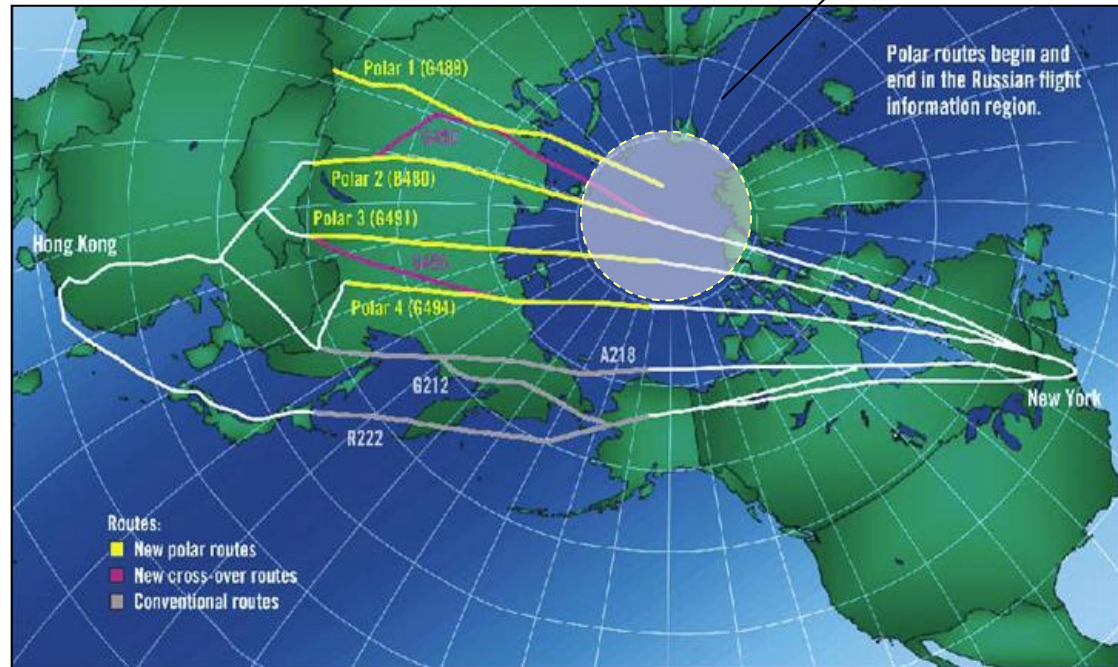
## Improvement of Annex 3 to include Space Weather Information for safety with

- Telecommunications
- Satellite Positioning
- Radiation exposure

HF is the only communication method in this region

ISTF/4: The influence of equatorial event should be more emphasized in the ConOps.

Courtesy of draft ConOps of Space Weather



# IAVWOPSG/8 Feb. 17-20, 2014 Melbourne, Australia



# IAVWOPSG/8 Feb. 17-20, 2014

## Melbourne, Australia

- Discussion of ConOps and Manual
  - No about SARPs
- With regard to a draft concept of operations for the provision of space weather information in support of international air navigation, the group reviewed the information contained in a report presented by the United Kingdom as the Rapporteur on Conclusion 7/40 b). The group noted that the ad-hoc group had received, from IAVWOPSG members, over 100 comments on the draft version 2.2 of the concept of operations.
- Additionally, substantive comments were received from an Inter-Programme Coordination Team on Space Weather (ICTSW) of WMO.
- Therefore, after a further round of comments on a new version which incorporated all the comments received (version 2.3), the ad-hoc group prepared version 3.0 for the consideration by the IAVWOPSG. IFALPA and Japan on behalf of the Asia-Pacific Ionospheric Studies Task Force (APAC-ISTF) provided the group with additional comments and information that were duly noted.



# How many center do we need for ICAO space weather ?

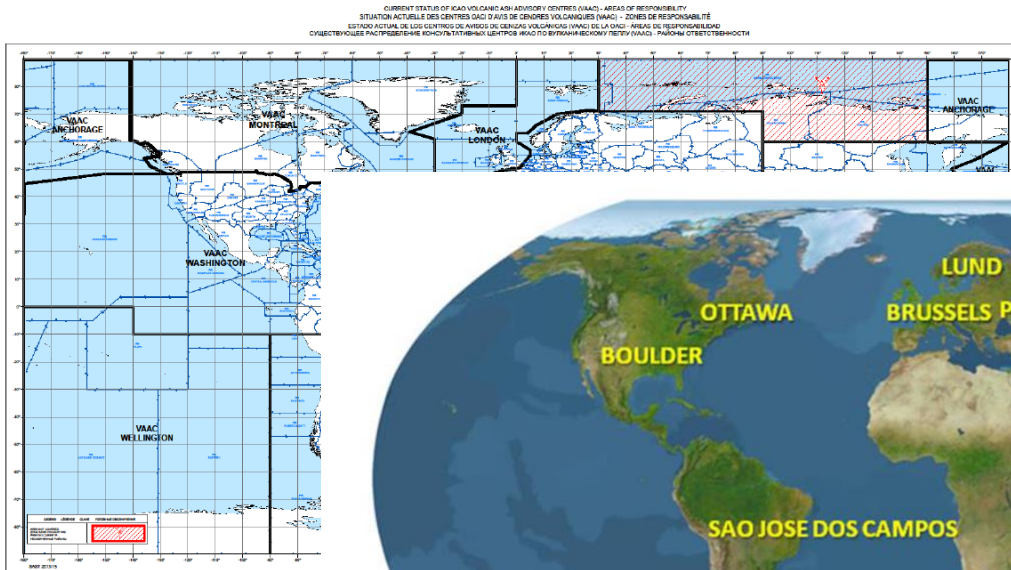


Figure 1. Current status of ICAO VAACs



Figure 3: The ISES Regional Warning Centres (note the newest RWC in Treffen, Austria is not shown)

Figure 2. Areas of responsibility for the seven TCACs

# Suggestion from US in IAVWOPSG



IAVWOPSG/8-IP/6  
24/1/14

## INTERNATIONAL AIRWAYS VOLCANO WATCH OPERATIONS GROUP

### 2.6 Two centre structure

2.6.1 Space weather information pertaining to large scale space weather events, as defined in the proposed Standards and Recommended Practices (SARPs), can be provided by two global centres, with support from observations made worldwide. Two global centres augmented by a number of regional centres could support both the large scale and the localized international needs for space weather services.

#### SPACE WEATHER CENTRE CONCEPT

(Presented by the United States)

#### SUMMARY

This paper examines the structure of today's regional and global providers of meteorological information for international air navigation services as potential models for space weather services.

# ICAO/Met July 9-16, 2014

## ICAO HQ, Montreal, Canada

### Agenda Item 2 (continued)

- States/International organizations
  - Batch 3 (Block 1 - general)
    - WP: 24, 16, 13, 32
    - IP: 10, 11, 19, 21, 23, 27, 29, 30
  - Batch 4 (Block 1 - WAFS)
    - WP: 20
    - IP: 13

### Agenda Item 2 (continued)

- States/International organizations
  - Batch 3 (Block 1 - general)
    - WP: 24, 16, 13, 32
    - IP: 10, 11, 19, 21, 23, 27, 29, 30
  - Batch 4 (Block 1 - WAFS)
    - WP: 20
    - IP: 13



# ICAO/Met July 9-16, 2014

## ICAO HQ, Montreal, Canada

- 2.2.10 Taking into account the advice of WMO, including the WMO Inter-Programme Coordination Team on Space Weather (ICTSW) and others concerned, the Committee was of the view that space weather information services which serve international air navigation should be organized through the establishment of **an optimal number of global centres** (for solar radiation storms and solar flares, as well as for geomagnetic storms and ionospheric disturbances at the predictive stage) **augmented by an optimal number of regional centres** (for geomagnetic storms and ionospheric disturbances at the observation stage). The Committee agreed that the roles, requirements and capabilities of the global and regional centres (together with the appropriate number of centres) **had not been fully elaborated**. The Committee agreed therefore that **further consideration should be given to the aforementioned**, including the development of a process for the designation of global and regional centres, their governance (including cost recovery for provision of service and competency standards) and duration of mandate.
- 2.2.11 In view of the foregoing, the Committee agreed **to not include the draft initial provisions mentioned above in the draft Amendment 77 to Annex 3** (addressed under agenda item 5.1) in view of the need for the further development of service requirements and capabilities and any additional related guidance material.

# UN/COPUOS Feb.2-5, 2015

## VIC, Vienna, Austria







## Future steps

- Nomination by ICAO of global centres and by PIRGs of regional centres;
- Inclusion of SW requirements in Amendment 78 (Nov 2018) to ICAO Annex 3 – *Meteorological Service for International Air Navigation*;
- Development of appropriate guidance material;
- Implementation of SW provisions; and,
- Monitoring of SW information provision to ensure that it continues to meet evolving operational requirements

