Satellite User Preparedness
Ensuring the preparedness of users to the new generation of satellites
by WMO

Presented to CGMS-41 plenary session, agenda item [C.5]

based on WMO Briefing to Side Event at 65th Executive Council, 17 May 2013
Ensuring user preparedness

Satellites widely used by WMO Members in support of weather, climate, water applications

New generation of geostationary meteorological satellites to enter operations in 2015-2018, including:

- Himawari-8 (JMA)
- FY-4 (CMA)
- GOES-R (NOAA)
- GEO-KOMPSAT-2 (KMA)
- MTG (EUMETSAT)
Opportunities and Risks

- **Opportunities**
  - Capabilities improve (e.g., sampling rate, spatial resolution, spectral channels)
  - Leading to more accurate and timely forecasts
  - New products
  - Improved service levels

- **Risks**
  - Data rates increase drastically, by factors of 10-100
  - Data formats will change
  - Data delivery mechanisms will change
  - Operational services are dependent on current spacecraft

- Affecting all WMO Regions
Guidance by WMO

  - “operational users [NMHSs] to establish user readiness projects 5 years prior to launch”
  - “satellite operators to assist users in introduction of new data streams into operations”
    - Technical / programmatic information
    - Format specification, test datasets, prototype products
    - Parallel operation / parallel dissemination
    - Training

Deficiencies in preparing users

- Many Members report they are insufficiently prepared to the new generation of meteorological satellites

Source: WMO 2012 Satellite User Survey - 227 responses from 95 countries
Briefings by CGMS members on user preparation:
- JMA (Himawari-8/9)
- NOAA (GOES-R, NPP)
- EUMETSAT
- CMA (FY-4)

Briefing by Australian Bureau of Meteorology
- User perspective

Overview of User Preparedness

- Two areas of preparedness
  - New capability or
  - Improved capability over what already exists

- Continuity of service provision
  - Critical path, maintaining services across the transition
  - Legacy products and services

- Maximising value of service
  - Additional investment
  - New products and services
Australian Bureau of Meteorology Perspective

- Two major transition exercises
  - 2003 – transition from GMS-5 – GOES-9
    - SVISSR to GVAR
    - Need to maintain continuity of service
      - Forecasters
      - Products and website
    - Ingest and processing systems tested
    - Products migrated to new satellite
  
  - 2005 – transition from GOES-9 – MTSAT-1R
    - GVAR to HRIT
Satellite Data Value Chain

Different stages in the chain cover different activities and require a range of organisational capabilities.

Data Acquisition
- Direct readout
  - GTS
  - WIS
- Internet

Processing and Product Generation
- Direct applications
- Research and Development
- Geolocation and Calibration

Data Delivery
- Data Comms
- Visualisation

Data Utilisation
- Weather and Warnings
- Data Assimilation
- End users
Satellite Data Value Chain

- Different stages in the chain require different preparatory activities

**Data Reception**
- Launch schedules
- Signal characteristics
- Dissemination mechanisms
- Synthetic data
- Pre-operational data
- Documentation

**Processing and Product Generation**
- Synthetic data
- Spectral response functions
- Algorithms
- Pre-operational data
- Software
- Training

**Data Delivery**
- Pre-operational data
- Agreed exchange formats
- Parallel operations
- Training
- Proxy data
- Synthetic data
- Pre-operational data
- Product descriptions

**Data Utilisation**
Way forward

- Development of user preparedness plans necessary
  - CGMS-40 WMO-WP-13
  - R40.03: “Satellite operators and trainers to take note of the new “CBS Guideline for ensuring user readiness for new generation satellites” and plan appropriate projects to ensure user readiness”

- Briefing at WMO Exec Council May 2013
  - Operators are making good progress in addressing this issue
    - e.g. JMA activities re Himawari-8
    - GOES-R Proving Ground

- Information may be hard to find for some users
  - Want to ensure users are empowered to make decisions
**Requested Action**

- Agencies are requested to nominate focal points for a "task team" to prepare an online 'user guide' to be published on the WMO website.

- Designed as a one-stop shop for information on receiving systems, proxy datasets, and training material.

- Users can use this information to:
  - Effectively plan their own activities to adjust to changes
  - Minimise service delivery risk associated with transition to new systems
4th Asia-Oceania Meteorological Satellite Users Conference

- 9-11 October 2013
  - Hosted by the Bureau of Meteorology in Melbourne
- Side event 7-8 October
  - Focus on user preparedness for next generation GEO
Thank you for your attention

www.wmo.int/sat
Background Material
Guidelines on user readiness for new satellite systems, adopted by CBS in Sept 2012 (Summary)

- Information/training of prospective users
  - User conferences and workshops on new capabilities
  - Portals providing instrument specifications, data formats
  - Proxy data sets, tools and demonstration products
  - Guidance on receiving hardware/software
  - Training material and training events

- System operation
  - Some overlap period of old/new satellites
  - Some overlap of old/new dissemination systems
  - Satellite-independent dissemination system (e.g. GEONETCast)

- User organizations
  - Set up a user readiness project (e.g. ~5 years) prior to launch
  - Networking through online collaboration

Education and Training
Capacity building

A network of 13 Centres of Excellence sponsored by 8 satellite operators

- To provide training on meteorological and environmental satellite systems, data, products and applications;
- To foster research and the development of applications for societal benefit at the local level by the National Met Services.
- To assist NMSs in preparing for new generation satellites

http://vlab.wmo.int
Online resources maintained by WMO Space Programme: http://www.wmo.int/sat

OSCAR
Satellite capabilities
wmo.int/oscar

Data Access,
Preprocessing Software,
Analysis Tools

Product Access Guide
(under development)
WMO Space Programme Activities

Observations
- Space-based architecture: Observation requirements/gap analysis
- Missions, instruments, orbits
- Instrument calibration
- Validated, sustained, QC'd, documented products

Products
- Cross-cutting
- Space-based architecture: Observation requirements/gap analysis
- Missions, instruments, orbits
- Instrument calibration
- Validated, sustained, QC'd, documented products

Training & Awareness
- Training (Virtual Lab)
- Information (Website)
- Regional projects

Dissemination & Access
- Data services: content, timeliness, standardization
- Tools
Space Programme Governance

Congress

8 Technical Commissions

Executive Council

6 Regional Associations

Commission for Basic Systems (CBS)

Consultative Meeting (CM)

High Level Oversight

Technical Lead

Space Programme

OPAG-IOS

OPAG-ISS

ET-SUP

ET-SAT

ET-EGOS

RA I

RA II

RA III