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INTER-PROGRAMME EXPERT TEAM ON SATELLITE UTILIZATION AND
PRODUCTS

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CHALLENGES IN SATELLITE PRODUCTS UTILIZATION AND DISSEMINATION IN SOUTH- WEST PACIFIC REGION

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Summary and Purpose of Document

This paper provides brief updates on satellite products utilization for operational purposes and current web-based dissemination in RA V region.

ACTION PROPOSED

The fourth session is invited to note the information contained in the document.

DISCUSSION

Introduction

RA V Task Team on Satellite Utilization's objective is to identify and document the needs for satellite observations and derived products for RA-V members. The TT-SU aims to deliver a regional set of requirements for satellite data and products required by RA-V members, to fulfil their national/international roles in support of weather forecasts and warnings. Based on an agreed set of requirements, data providers will work with data users to meet the requirements, through ongoing leadership by the Task Team.

1. Status of regional satellite data reception in Southwest Pacific

With regard to the new generation satellite data access of Himawari-8, several RA V member countries with adequate telecommunication infrastructure already have access to its full-resolution data through HimawariCloud dissemination system. It includes Australia, Indonesia, Malaysia, Singapore, Philippines, Brunei Darussalam, New Zealand, and some other members.

To mitigate challenges in massive data volumes of HimawariCloud and limited bandwidth in the region particularly SIDSs, JMA as Himawari-8 satellite operator has provided dissemination solution with HimawariCast DVB-S system to receive Himawari-8 satellite data with lower resolution. Internet access with a satellite-based distribution system using commercial telecommunication satellite and low-cost Digital Video Broadcasting – Satellite (DVB-S) reception technology has been used. Successful implementation of HimawariCast installation project initiated by Japan Meteorological Agency and the World Meteorological Organization in 7 NMHSs of Pacific Islands Countries (Federated States of Micronesia, Kiribati, Palau, Papua New Guinea, Samoa, Tonga and Tuvalu) have been contributing the region users' readiness to new meteorological satellite generation.

2. Satellite data and products dissemination practices by Member Countries

In general, the use of satellite data by countries in the RA V region is primarily for short-term weather prediction purposes. Still relatively few member countries are able to reprocess the satellite data provided through HimawariCloud into derived products with data processing systems designed by their own local experts. Australia, Indonesia and New Zealand are examples of countries that have implemented in-house satellite data processing.

In addition to basic products, some satellite-derived products have been produced for meteorological services in several technically advanced member countries, including: IR-enhanced, WV-enhanced, natural colour, RGBs, convective cloud detection, cloud types, rainfall potential, hotspot detection, and many others.

Generally, web-based products dissemination is the primary method of satellite data delivery by some NMHSs (see Table 1). So far Australia is the only RA V member country that has presented an interactive and dynamic web to display weather satellite imagery.

Out of 23 (twenty-three) RA V member countries, some country's NMHSs still rely on satellite imagery end products from satellite providers or other NMHS with only basic products. Therefore, it needs continuous efforts to improve the NMHSs staff's ability to use various advanced products which now can be retrieved from new generation satellite data.

Table 1. Web-based satellite data products by RA V Member Countries

No	Country	Satellite products web address (NMHSs)	Remarks
1	Australia	www.bom.gov.au/australia/satellite/satview.bom.gov.au	Himawari
2	Brunei Darussalam	www.bruneiweather.com.bn/weather	Himawari
3	Cook Islands	www.met.gov.ck/southern-cook-image.html	GOES-W (source: NOAA)
4	Fiji	http://www.met.gov.fj/satellite.php www.goes.noaa.gov/sohemi/sohemiloops/shfiji.html	Himawari (JMA, NOAA)
5	Indonesia	http://www.bmkg.go.id/satelit/ http://satelit.bmkg.go.id/BMKG/	Himawari, MODIS, GSMaP
6	Kiribati	http://met.gov.ki/en/ob/satellite-images http://www.goes.noaa.gov/sohemi/sohemiloops/shwkiribati.html	Himawari (source: NOAA server)
7	Malaysia	www.met.gov.my	Himawari
8	Federated States of Micronesia	N/A	
9	New Zealand	www.metservice.com/maps-radar/satellite/tasman-sea-nz-infrared	Himawari
10	Niue	N/A	
11	Papua New Guinea	http://www.pngmet.gov.pg/	Himawari
12	Philippines	www1.pagasa.dost.gov.ph/index.php/satellite-images#himawari www1.pagasa.dost.gov.ph/index.php/satellite-images#coms-ri	Himawari, COMS
13	Samoa	http://www.samet.gov.ws/ http://www.goes.noaa.gov/sohemi/sohemiloops/shirgmscol.html	Source: NOAA
14	Singapore	http://www.weather.gov.sg/weather-satellite-geo-stationary/ http://www.weather.gov.sg/weather-satellite-polar-orbiting/	Himawari, NOAA
15	Solomon Islands	http://www.met.gov.sb/satellite-animation-for-solomon-islands http://sharaku.eorc.jaxa.jp/GSMaP_NOW/solomon.htm	Himawari, GSMaP (Link provided by JAXA)
16	Timor Leste	N/A	
17	Tonga	http://www.data.jma.go.jp/mscweb/data/himawari/sat_img.php?area=pi4 http://sharaku.eorc.jaxa.jp/GSMaP_NOW/tonga.htm	JMA and JAXA
18	Tuvalu	N/A	
19	UK of Great Britain and Northern Ireland	https://www.metoffice.gov.uk/public/weather/world-satellite/#?tab=satImg&map=regionallR	Himawari, Meteosat, GOES-E, GOES-W
20	USA	http://www.prh.noaa.gov/hnl/pages/satellite.php	Himawari, GOES-E, GOES-W
21	Vanuatu	http://www.vmgd.gov.vu/vmgd/index.php/forecast-division/maps-and-charts/latest-satellite-image	Himawari
22	French Polynesia	http://www.meteo.pf/observation.php	Himawari, GOES
23	New Caledonia	http://www.meteo.nc/nouvelle-caledonie/observations/images-satellite	Himawari, GOES

3. Optimizing satellite data use for operations

- In practice in short-term weather prediction operations, most NMHSs in the region still use mainly geostationary satellite data only. Meanwhile, the availability of new generation of polar-orbit satellite data such as NPP, MetOp and others has not been explored as a complement to geostationary satellite data such as meteorological agencies in developed countries.
- GSMP data from JAXA has now begun to be used operationally in several member countries to support rainfall monitoring, among others by Indonesia, Tonga and Solomon Islands. Although based on preliminary evaluation of GSMP rainfall estimates is still somewhat underestimate for terrestrial areas, it is helpful enough to monitor rain in areas where there are few surface observation networks. Some efforts to calibrate GSMP data are being explored by JAXA and BMKG in the near future using raingauge data as well as weather radar data in Indonesia
- Challenges of incorporating the LEO satellite data freely provided online (a very effective resource for training events) into the forecasting process. In addition, user training through various means (face-to-face or remotely) is very important in consideration of the variety of satellite products and applications available today.
- Bureau of Meteorology Training Center (BMTTC) has been consistently promoting knowledge sharing between RA V forecasters via regular Monthly Regional Focus Group discussions (RFGs) on satellite interpretation and analysis, hosted remotely by Melbourne VLab Centre of Excellence. The materials of the past RFGs are also provided in their website, also various important references and link to online resources on satellite.

4. Regional initiatives to improve satellite data use

- A protocol for event-driven rapid scanning has been developed within the RA II WIGOS Project in collaboration with the RA V Task Team on Satellite Utilization and to be start in 2018.
- There is plan for regional satellite user survey which will be circulated to the satellite users in 2018 under the coordination of JMA, KMA and BoM.
- The satellite-based climate extreme monitoring pilot project to be initiated soon for SE-Asia and Southwest Pacific regions under the WMO Space Programme with support from major satellite data providers will explore of valuable information from satellite remote sensing data provided for climatological communities in all WMO regions, and particularly for those with sparse density of surface meteorological observation.

5. Future directions

- Develop an inventory of national capabilities in terms of (i) data access, (ii) data processing capabilities, and (iii) trained staff in using and interpreting satellite data and products;
 - Document existing regional requirements for products relevant for DRR (e.g. convective systems, tropical cyclones, and volcanic ash);
 - Broadening membership in the RA V TT-SU through WMO nomination letter, and focussed meeting during AOMSUC-9 in October 2018.
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