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# RA II WIGOS Project Newsletter

DEVELOPING SUPPORT FOR NATIONAL METEOROLOGICAL AND  
HYDROLOGICAL SERVICES IN SATELLITE DATA, PRODUCTS AND TRAINING

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## GEO-KOMPSAT-2A Successfully Launched

The Korea Meteorological Agency (KMA) launched its new generation geostationary meteorological satellite, GEO-KOMPSAT-2A (GK-2A) on at 21:37:07 UTC on 4 December 2018 from the Guiana Space Center in French Guiana using Ariane-5 launch vehicle (VA246).

The satellite successfully separated from the launch vehicle about 34 minutes after lift-off, and will fly unaided for around 10 days before settling into geostationary orbit.

The satellite is expected to start operation in July 2019 after the completion of in-orbit testing and checking of the overall

system including related ground facilities

GK-2A will be located at around 128.2 degrees east, and will observe the East Asia and Western Pacific regions as a successor to the current COMS satellite. GK-2A will feature a new imager with 16 bands as opposed to the 5 bands of the COMS Imager.

Full-disk imagery will be obtained every 10 minutes, and rapid scanning at 2-minute intervals will be conducted over several regions, one of which will be for targeted observation of tropical cyclones. The unit's horizontal resolution will also be double that of the COMS Imager. These significant improvements will bring unprecedented levels of performance in monitoring for tropical cyclones as well as rapidly devel-

oping cumulonimbus and volcanic ash clouds. (Dohyeong Kim, KMA)



Figure 1. GEO-KOMPSAT-2A successfully launched

## Report of the 9th Asia-Oceania Meteorological Satellite Conference (AOMSUC-9) and Training Events

The Ninth Asia/Oceania Meteorological Satellite Users' Conference (AOMSUC-9) was held in Bogor and Jakarta, Indonesia from 6-11 October 2018. AOMSUC-9 was hosted and sponsored by the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), and was co-sponsored through with on-site participation by the China Meteorological Administration (CMA), the Japan Meteorological Agency (JMA), the Korean Meteorological Administration (KMA), the Roshydromet and Roscosmos of the Russian Federation, the Australian Bureau of Meteorology (AuBoM), and the World Meteorological Organization (WMO).

AOMSUC-9 began with a two-day training event at the BMKG training facility in Bogor, Indonesia that brought together participants from WMO Regions II and V.

Including lecturers and attendees, 45 people from 30 countries participated in the

training event. The next three days of AOMSUC-9 were the Conference portion consisting of 62 oral and 57 poster presentations and was attended by over 234 people from 44 countries. The final day of the AOMSUC-9 was a smaller, focused meeting that was attended by 45 people from across WMO Regions II and V: "The Joint Meeting of RA II WIGOS Project and RA V Task Team on Satellite Utilization (TT-SU)" for RA II and RA V NMHSs.

### 1. AOMSUC-9 Training Session

The AOMSUC-9 Training Event was conducted at the Lecture Hall on the BMKG Indonesia Training Campus in Citeko, Bogor from the 6-7 October 2018. Including lecturers and attendees there were 45 participants to the Training Event. The audience was represented by participants from 30 countries including the list the countries here: Indonesia, Bhutan, Myanmar, Nepal, Micronesia, Kiribati, Samoa, Bahrain, Vietnam, Cambodia, Maldives, Laos, Sri Lanka, Thailand, Philippines, Malaysia, Brunei Darussalam, Timor Leste, Fiji, Papua New Guinea, Solomon Islands, Tonga,

Palau, Tuvalu, Vanuatu, Hongkong, Singapore, South Korea, China and Russia. The goal of the training session is to introduce RGB techniques to various meteorological applications particularly to trainers and meteorologists from NMHSs and related agencies of RA II and RA V member countries.

Satellite experts from some institutions contributed as instructors in this AOMSUC training session, i.e. Dr. James F.W. Purdom (CIRA Colorado University-USA), Mr. Yusuke Yogo, Mr. Yusuke Ioka and Dr.

Hiroshi Kunimatsu (Japan Meteorological Agency), Mr. Bodo Zeschke (Australian Bureau of Meteorology), Mr. Andersen Panjaitan and Ms. Ratih Prasetya (BMKG Indonesia), Dr. Kathleen Strabala and Ms. Jessica Braun (SSEC-University of Wisconsin, Madison-USA), Dr. Hyesook Park (Korea Meteorological Administration), and Dr. Wu Xuebao (China Meteorological Administration). There were forty-five invited-participants from Asia-Oceania countries attended this 2-days event.



**Figure 2.** Participants and Lecturers of the AOMSUC-9 Training Session in front of the BMKG Indonesia Training Campus in Citeko, Bogor.

## 2. AOMSUC-9 Conference

The Conference portion of AOMSUC-9 was divided into ten oral presentation sessions and one poster session set up in the coffee break area, which allowed for their viewing during break times as well as during a dedicated poster session. The ten oral presentation sessions covered the following topical areas:

1. Current and future meteorological satellite programs and user activities/plans within Asia/Oceania
2. Capacity building and training activities
3. Atmospheric parameters derived from satellite observations
4. Satellite Precipitation Measurements
5. Facilitation of data access and utilization
6. Application of satellite data for climate and environmental monitoring
7. Application of satellite data to weather analysis and disaster monitoring, now-casting and forecasting (Sessions 7A and 7B)
8. Application of satellite data to numerical weather prediction
9. Land surface and ocean parameters derived from satellite observations
10. Global Spaced-based Inter-Calibration System (GSICS)





**AOMSUC**



**Figure 3.** AOMSUC-9 Conference's Participants with DG of BMKG and ICSC Chair and Members

The conference was very successful in meeting its four major goals as set forth by Dr. Purdom in his welcoming remarks: 1) promoting satellite observations and highlighting their utility, with a focus on regional issues; 2) advancing satellite remote sensing science; 3) fostering the dialogue between satellite operators and the user community on current and future satellites; and, 4) engaging young scientists. It was evident throughout the conference that the new generation of geostationary and polar orbiting satellites are having a major impact across the globe – great scientific findings await us as we move forward with science and product development and new applications with these data: the satellite operators are meeting their commitment as we inaugurate this new era in the Space Based Component of the WMO Integrated Global Observing System (WIGOS).

In her opening statement, Director General of Indonesia Agency for Meteorology, Climatology and Geophysics, Prof. Dr. Dwikorita Karnawati mentioned that during 2017-2018 there are several typhoon events occurred around Indonesia region. It is then

realized that the utilization of satellite needs to be improved. Moreover, since deep convective events are often associated with mesoscale phenomena, higher resolution of meteorological satellite data is needed, in term of both spatial and temporal resolution. And for better weather prediction specially to monitor cumulonimbus cloud activities the lightning monitoring is also necessary. She expected that through this conference, amongst satellite community in Asia-Oceania would share experience and knowledge as well as new technology to strengthen cooperation between satellite provider and their data users, in order to sustain the resilient society.

The participants welcomed the efforts being undertaken to introduce and utilize an unprecedented stream of new data; it was agreed that this early coordination in the generation of new products and services and the preparation for their utilization by the worldwide user community must be actively sustained. It will be a significant undertaking for the operational space agencies in the coming years foster the dream of “full utilization.” These annual conferences of the

Asia/Oceania satellite community are an important part of that effort. At the end of AOMSUC-9, Dr. John LeMarshall announced that the Australia Bureau of Meteorology (BoM) looked forward to hosting AOMSUC-10 in Melbourne, Australia, from December 2-7, 2019, in a format like that used for previous AOMSUCs.

Presentations from the training event associated with AOMSUC-9 (Bogor, 6-7 October 2018) and the conference portion of AOMSUC-9 (Jakarta, 8-10 October) may be downloaded via the following link: <http://aomsuc9.bmkg.go.id/presentations/>

(Riris Adriyanto, BMKG)

## **Report of the Joint Meeting of RA II WIGOS Project and RA V TT-SU for RA II and RA V NMHSs**

The Joint Meeting of RA II WIGOS Project and RA V TT-SU for RA II and RA V National Meteorological and Hydrological Services (NMHSs) in Satellite Data, Products and Training was held in Jakarta, Indonesia, on 11 October 2018, attended by 45 representatives from 31 countries of RA II and RA V member, and representatives from EUMETSAT and WMO. There were several reports made during the meeting, include the following:



**Figure 4.** Joint Meeting of RA II and RA V conducted at BMKG Headquarter, Jakarta

### ***Accomplishments, current status and work plan of the RA II Project and the RA V Task Team [KMA, BMKG/BoM].***

Dohyeong Kim reported the support for the preparation of satellite data users in relation to the new generation of geostationary meteorological satellites, establishment of close coordination between the RA II WIGOS Project and the RA-V Task Team on Satellite Utilization, establishment of the new webpage of the RA II WIGOS Project (hosted by JMA), convening the series of Asia/Oceania Meteorological Satellite Users'

Conference (AOMSUC), conducting the trainings and questionnaires on the utilization of new generation of geostationary meteorological satellites through the AOMSUCs, and issuance of quarterly newsletters for RA II Members. Agnes Lane (BoM) noted the status of WMO RA-V Task Team – Satellite User (TT-SU) for gathering satellite user requirements and protocol for Himawari-8/-9 Request-drive Rapid Scan in WMO RA-II and RA V on 2018 activities.

***CGMS report to introduce the updated observing system baseline and contingency plan [WMO]***

Mikael Rattenborg (CGMS Secretariat) reported for revision of CGMS baseline and contingency planning. The CGMS Baseline enumerates the observations, measurements, and services that form the CGMS contribution to the space-based Global Observing System – includes Space Weather and is responding to end-user requirements expressed in WMO's Rolling Review of Requirements (RRR) and will strive to support the WMO Integrated Global Observing System (WIGOS) 2040 vision. And he also noted CGMS risk mitigation priorities and further response to WIGOS vision agreed at CMGS 2018.

***Introduction of the RA II / RA V 2018 survey [JMA, BoM]***

Hiroshi Kunitatsu (JMA) reported the WMO RA II and RA V 2018 Survey on the use of satellite data. The RA II and RA V 2018 Survey is consisted of 3 sections; Section 1: Access to Satellite Data and Products; Session 2; Use and Applications of Satellite Data and Products; Section 3; Education and Training. RA II Project co-coordinators and RA V TT-SU Lead have developed the questionnaire for the RA II and RA V 2018 survey, having several teleconferences. RA II Project coordinating group and RA V TT-SU members including EUMETSAT, NESDIS and WMO have been inquired their comments for the draft questionnaire. The RA II and RA V 2018 survey was developed and based on the results of the prior WMO/RA II/AOMSUC surveys. An initial inventory of available satellite data/products (provided by JMA and KMA) in RA II and RA V is compiled in accordance with CBS-15/Doc. 4.2(1) and

the inventory will be incorporated in the survey.

***Alignment of project activities for the training with WMO-CGMS Virtual Laboratory activities [WMO, BoM, KMA]***

Hye Sook Park (KMA) presented the virtual laboratory for education and training updates and plans. Training was offered in 5 of the WMO official languages plus Korean and Portuguese and Participants from all WMO Regional Associations were reached from VLMG-9 2018. And she also reported results of 9th VLMG meeting in 2018 and ways to increase reusing and adaptation of training materials. JungSic Yoon (KMA) reported on training activities conducted by KMA, and Bodo zeschke (BMTC/BoM) reported the joint Australia-BMKG Indonesia and Australia-Korea VLab Centres of Excellence Regional Focus Group meetings and exchange of subject experts between the Australia and Korea VLab Centres of Excellence, recognizing that this has previously occurred between Australia and BMKG Indonesia.

***SCOPE-Nowcasting and Space-based monitoring of weather and climate extremes demonstration project [WMO]***

Werner Balogh (WMO OBS/Space Programme) reviewed the workshop on Operational Space-based Weather and Climate Extremes Monitoring (SWCEM) was held in Geneva, Switzerland on 15-17 February, 2017. The Workshop provided for a dialogue amongst satellite operators, WMO Regional Climate Centres (RCCs), National Meteorological and Hydrological Services (NMHSs), and the science community to stimulate the utilization of space-based observation data and products for monitoring selected weather and climate

extremes (heavy rainfall and drought in particular) on a routine basis (“in operations”), in response to current and future user requirements.

### ***HimawariRequest [JMA, BoM]***

Hiroshi Kunimatsu reported for the status of the HimawariRequest Services. JMA launched a new international service “HimawariRequest”, in collaboration with the Australian Bureau of Meteorology (AuBoM). The service allows NMHS users in WMO RA II and RA V to request Himawari-8/9 Target Area observation covering a 1000 km x 1000 km area every 2.5 minutes.

### ***The Emergency Support Mechanism of FENGYUN Satellite (FY ESM) [CMA]***

Xuebao Wu (CMA) reported the Emergency Support Mechanism of FY Satellite. CMA announced “Emergency Support Mechanism for International Users of Fengyun Meteorological Satellites in Disaster Prevention and Mitigation” on April 24, 2018. To serve the countries along the “Belt and Road” in a timely manner. These countries may raise a request for the activation of the mechanism through their respective Permanent Representatives with WMO or their designated focal points.

Once the request is approved, CMA will command the on-duty FY satellite for frequent and targeted observations per 5-6 minutes over affected areas. The images and products will be transmitted to the requesting applicant through CMACast, internet and direct satellite broadcast reception

Key project activities for the period from 2017 to 2020 include; enhancing rapid scan benefit, identification of satellite-related requirements, online web meeting for

statistical analysis of RA II / RA V survey, the 2nd joint meeting of the RA II WIGOS Project and RA V TT-SU, and the issuance of quarterly newsletters is also continued.

The joint meeting was concluded with some action plans (please check [https://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/documents/joint\\_meeting\\_program\\_presentation/5.0.pdf](https://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/documents/joint_meeting_program_presentation/5.0.pdf))

(Riris Adriyanto, BMKG, and Dohyeong Kim, KMA)

### **The Bureau of Meteorology uses Himawari-8 Target Area Observations for severe weather**

The Bureau has been using JMA's satellite data for weather forecasts and warnings since 1977, when JMA launched their first geostationary satellite, GMS-1. Today, Himawari-8 provides the Bureau's forecasters with 16 channels of geostationary data, delivered at 10 minute intervals. The visible and infrared images and derived products are used by the Bureau's forecasters and NWP to deliver high quality forecast products for the Australian community.

As well as the full-disk 10 minute images, the Advanced Himawari Imager (AHI) on board Himawari-8 is capable of shorter interval regional observations called Target Area Observations, which cover a selected area of 1,000 x 1,000 km every 2.5 minutes. The observation is normally focused on an area of active volcanoes in the domain of the Tokyo Volcanic Ash Advisory Center (VAAC), and typhoons within the responsibility area of the Regional Specialized Meteorological Center (RSMC) Tokyo Typhoon Center.

At the Joint RA-II/RA-V workshop on WIGOS for Disaster Risk Reduction in 2015, JMA decided to develop a protocol under which the NMHSs in RA-II/V can request Target Area Observations covering their national area of interest for Disaster Risk

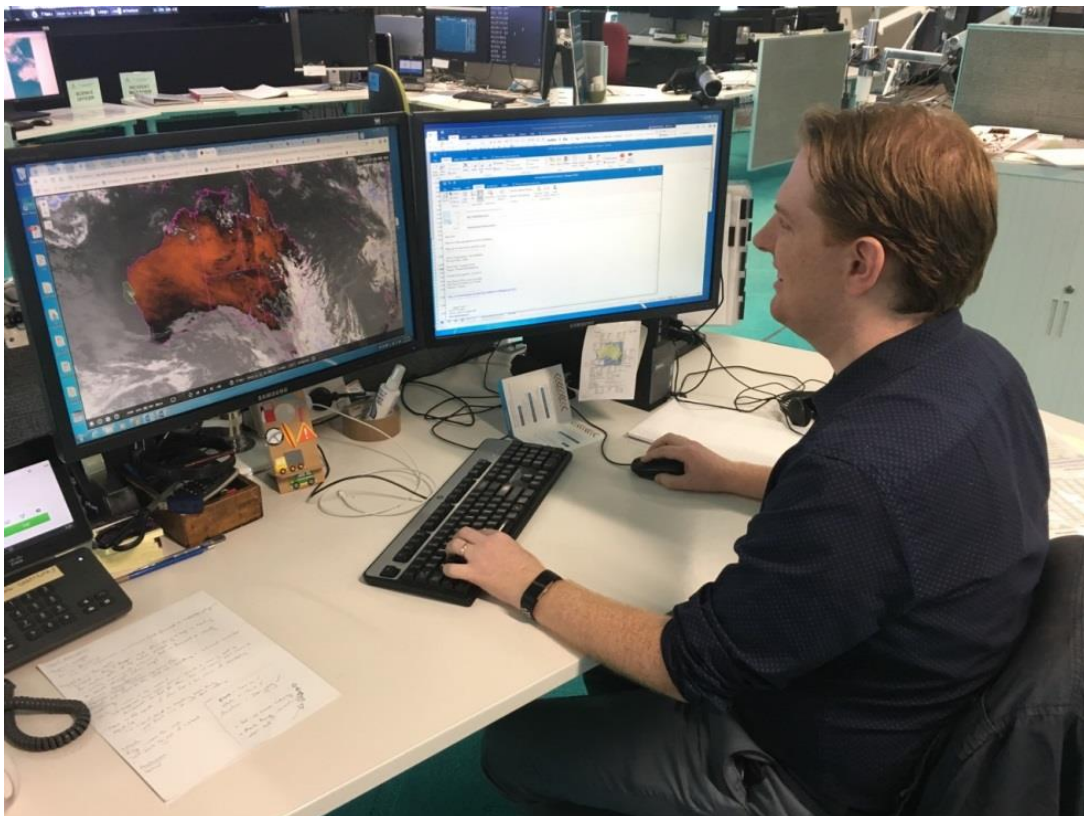


Reduction activities. JMA and the Bureau agreed that the Bureau shall make its own requests directly to the JMA, as well as act as a broker for requests from other RA V (South-West Pacific) nations. The service allowing NMHSs to request regional target area observations by Himawari-8/9 is named "HimawariRequest" and was officially launched in January 2018.

Six NMHSs in RA-V have registered for the HimawariRequest service, including the Bureau of Meteorology, Solomon Islands

Meteorological Service, Met Service of New Zealand, Malaysian Meteorological Department, Fiji Meteorological Service, and New Caledonia.

The Bureau's National Operations Centre submitted its first operational HimawariRequest on 15 October, during a severe weather event near Darwin. The high temporal-resolution data was valuable for monitoring the event and for the development of high quality forecasts and warnings on the day.



**Figure 5.** Operational forecaster Stephen Wood conducting a test of the HimawariRequest service with New Caledonia and JMA.

On 30 November 2018 the Bureau made its second request for the 2.5 minute Target Area Observations, to capture the devastating fires across the state of Queensland. Thousands of people were evacuated from their homes during the six-day emergency, with firefighters battling up to 200 bushfires. The Bureau of Meteorology observed record-breaking temperatures on Tuesday 27 November, including maximums of 43.9 degrees Celsius in Cooktown, 42.3C in Innisfail, and a November record of 41.7C at Townsville Airport. Proserpine recorded a

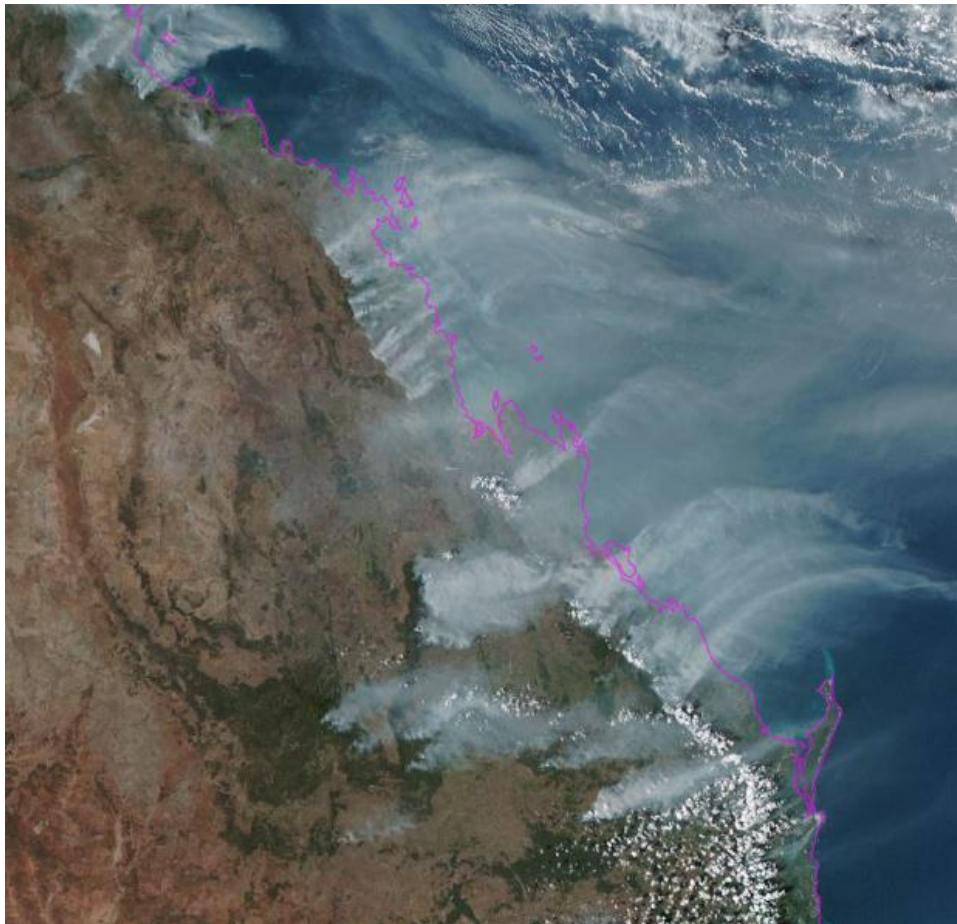
temperature of 44.9 degrees Celsius — 13 degrees higher than the November average. The high temperatures, low humidity and variable winds made it extremely difficult for firefighters. The Himawari Target Area Observations clearly showed the speed of the fires and the strong shear between the surface and higher level flow, which provided forecasters with valuable information to support the forecasts and warnings for this extreme and rare event.

(Agnes Lane, AuBoM)





**Figure 6.** The Finch Hatton fire front approaching Eungella Mountain Edge Escape in north Queensland. Around 110,000 hectares of Eungella National Park was destroyed and will take hundreds of years to recover. Image credit: Facebook: Eungella Mountain Edge Escape



**Figure 7.** Himawari-8 image showing the Queensland fires as they travelled inland with the sea-breeze on Friday 30 November 2018.

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## From the Co-editors

The co-editors invite contributions to the newsletter. Although it is assumed that the major contributors for the time being will be satellite operators, we also welcome articles (short contributions of less than a page are fine) from all RA II Members, regardless of whether they are registered with the WMO Secretariat as members of the WIGOS Project Coordinating Group. We look forward to receiving your contributions to the newsletter. (Dohyeong KIM, KMA, and Hiroshi KUNIMATSU, JMA)

## RA II WIGOS Project Home Page

[http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro\\_en\\_jma.html](http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro_en_jma.html)

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