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RA II WIGOS Project Newsletter

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

Contents of this issue

HimawariCast and HimawariCloud service started

The next-generation geostationary meteorological satellite of the Japan Meteorological Agency (JMA), Himawari-8, will begin operation in the middle of 2015. JMA will distribute multi-band, high-frequency and high-resolution data from the satellite in two ways. One is the HimawariCast service, by which primary sets of imagery will be disseminated for operational meteorological services via a communication satellite. The other is the HimawariCloud service, by which full sets of imagery will be delivered to National Meteorological and Hydrological Services (NMHSs) via an Internet cloud service.

HimawariCast

JMA started the HimawariCast service on 29 January 2015. Service provision currently involves the dissemination of operational MTSAT-2 imagery at 30/60-minute intervals in full-disk HRIT/LRIT files. HRIT files are distributed for all five of MTSAT-2's bands.

Once Himawari-8 becomes operational in mid-2015, imagery from the satellite will be provided every 10 minutes under the service, and the number of bands for HRIT files will be increased from 5 to 14 (out of Himawari-8's 16 bands). These multi-band and high-frequency

observation data are expected to support the timely creation of RGB products and contribute to disaster risk reduction in the East Asia and Western Pacific regions.

JMA also disseminates meteorological data and products in Satellite Animation and Interactive Diagnosis (SATAID) format, including numerical weather predictions and observational data. The Agency's SATAID software enables the superimposition of these data and products onto satellite imagery.

Up-to-date information including specifications of related receiving equipment is available at:

http://www.data.jma.go.jp/mscweb/en/himawari89/himawari_cast/himawari_cast.html

HimawariCloud

JMA is just about to begin operation of its HimawariCloud service with distribution of Himawari-8 in-orbit-test imagery.

Under the service, Himawari Standard Data from all 16 bands of Himawari-8 will be distributed with the finest spatial resolution available. True-color images composed of data from three visible bands in Portable Network Graphics (PNG) format and target-area images in Network Common Data Form (NetCDF) will also be distributed. NMHSs in the coverage area of Himawari-8 can access the service and download these data using an HTTP 1.1 client such as a Web browser or a Wget command.

The following web page provides technical information on how to access/download data and other matters:

http://www.data.jma.go.jp/mscweb/en/himawari89/cloud_service/cloud_service.html

(Yukihiro Kumagai, JMA)

Announcement of the Sixth Asia/Oceania Meteorological Satellite Users' Conference (AOMSUC-6)

The Japan Meteorological Agency (JMA) is pleased to announce that the Sixth Asia/Oceania Meteorological Satellite Users' Conference (AOMSUC-6) will be held from 9 to 13 November 2015 in Tokyo, Japan. A special session on Himawari-8's status and related application is planned as part of the event, which takes place in a year that marks the start of a new era in the history of meteorological satellites with the advent of Himawari-8. Satellite users and operators in the Asia and Oceania regions are invited to attend. The latest information and the initial announcement of the conference are provided on the following web pages:

http://www.jma-net.go.jp/msc/en/aomsuc6/

http://www.jma-net.go.jp/msc/en/aomsuc6/1stannounce.html

Dates and location

9 – 13 November 2015, Tokyo, Japan

Agenda

(a) Current and future meteorological satellite programs
(b) Facilitation of data access and utilization
(c) Atmospheric parameters derived from satellite observations
(d) Application of satellite data to weather analysis and disaster monitoring
(e) Application of satellite data to numerical weather prediction
(f) Application of satellite data to climate and environmental monitoring
(g) Land surface and ocean parameters derived from satellite observations
(h) Capacity building and training activities
(i) Himawari-8 status and related application

Call for Papers

Individuals whose professional fields relate to the above themes and who wish to present at the conference are invited to register. The registration form can be downloaded from the above web pages.

The form should include author information, title, abstract and presentation type (verbal or poster), and should be e-mailed to Mr Kotaro Bessho of the Local Organizing Committee at aomsuc-6@dpc.kishou.go.jp.

The conference will be in English. Abstracts should be no longer than one page

(A4). Multiple authors are kindly asked to coordinate a single response. To register more than one author, fill out and submit a form for each.

The deadline for submission is 31 July 2015.

Conference fee: none

Abstracts will be reviewed for inclusion in the conference program. Authors may be asked to switch verbal presentations to poster presentations, or vice versa, if this is considered more appropriate. Selected authors will be notified via e-mail around August 2015, and their abstracts will be posted on the website.

Training Event

A two-day training event to run in conjunction with AOMSUC-6 will be held for representatives from National Meteorological and Hydrological Services (NMHSs) in the Asia and Oceania regions. Areas to be addressed will include:

(a) RGB composite products
(b) Himawari-8 data acquisition and application

Third Meeting of the Coordinating Group of the RA II WIGOS Project

The Third Meeting of the Coordinating Group of the RA II WIGOS Project will be held in conjunction with AOMSUC-6. The attendance of the Coordinating Group members listed on page 7 of this newsletter is requested.

(Yukihiro Kumagai, JMA)

Social Benefits from the Meteorological Satellite of KMA

Satellite Program of KMA

It has been more than 40 years since KMA utilized the satellite image for weather forecast, starting with the satellite image via APT receiving system in 1970. About 10 years later, Japanese GMS-1 data were transferred via fax. Satellite data from USA, Japan, and European Union has played a key role in advancing weather forecast. And satellite-based information became inevitable components in weather services of KMA. In 2003, COMS (communication, ocean and meteorological satellite) program as R&D was started. COMS is the first multi-purpose geostationary satellite for Korea in the application of Meteorology, Ocean and Communication. COMS has meteorological mission for continuous meteorological Observation to support weather forecasting and early detection of severe weather phenomena.

For the advanced satellite data utilization and services, KMA still receives data from many other countries, mainly from US, such as NOAA series and Terra/Aqua, from neighboring countries, Japan, China and even from European Union. KMA has processed all the images to get a societally meaningful data, which could be understood by the public.

The bunch of satellite information is practically utilized by many sectors within KMA. For the modern weather forecast, NWP is one of the most important techniques, and the satellite data assimilation is very crucial for the NWP model performance. NMSC/KMA is supporting KMA's NWP group with top priority, and the collaboration showed quite promising results by now. Of course improved temporal resolution of COMS images help the daily forecast and severe weather warning tasks. And the various meteorological products from COMS and other satellites are actively utilized for the aviation, climate, ocean, hydrology sectors.

Through the success of COMS, the GEO-KOMPSAT-2 (GK-2) program is ongoing and is planning to be launched in early 2018.

Benefits of Meteorological Satellite in Korea

The general process to get national R&D fund in Republic of Korea is that each line ministry submits mid-term fiscal plan to Ministry of Strategy and Finance (MOSF). And MOSF notifies line ministries budget premise

and expenditure ceiling, and each line ministry prepares budget details and submits to the MOSF. A program exceeding 30 billion KRW (~ 30 million US dollar) needs special feasibility test including policy appropriateness technological feasibility and economic feasibility. Finally MOSF reviews and compiles the administration's budget and submits to the National Assembly, and National Assembly reviews and approves the budget in early December.

As for the societal benefit agenda of satellite program, long-term space program should be considered in the context of National Science and Technology Plan to enforce the policy's feasibility. And the policy feasibility can be also checked out by the correspondence to higher plan and/or directions of the plan. The report also includes the risk management plan and stepwise milestones and budget availability. Technology feasibility focuses on the concreteness of goals and the range of impacts on industry and feasibility of management plan. Finally technologies themselves are not ultimate goals but values and job creations are the most important aspects in the near future.

Considering the social Benefit of GK-2 program, the total cost of the program was summed up to 700 million US dollar, and each participating ministry has their share of the total budget. Meteorological Sensor gave two main directions of benefit: Reducing social cost and increasing in social benefit. The additional benefits were relatively small in number but trials to detailed surveying processes resulted in the persuading the benefit of meteorological satellite image.

KMA reviewed the average casualties due to severe weather in Korea for ten years. 1070.8 was the estimated death for 10 years. 0.174 is potential decrease rate in death rate due to early warning. 0.082 is the contribution of satellite image to weather forecast. So the value means more than 15 people's lives could be saved with the meteorological satellite in Korea. In this way, we could calculate the 280.93 million dollar in decrease in property loss due to the natural disaster prevention. Considering the frequencies of delay and cancelations of aircraft based on Korea, we got the number of 0.92 million dollars for 10 years.

Social benefits due to increase in accuracy of forecasting were estimated to be about 200 million dollars and weather information and derived services were counted to be 7.12 million dollars. More than 130 million dollars were estimated from the realms of weather application industries. Additional Benefits for sales and logistics, ship building, finance insurance and re-insurance, and aerospace business were also calculated.

Evaluation of the above cost estimation was supported by the better performance of GK-2A AMI compared with COMS. It will be planned to have four times as high as COMS in spatial resolution and temporal resolution. Spectral resolution will expand from 5 channels to 16 channels, 52 different products will be provided. In brief, the expectation of better services helps the validity of economic feasibility of GK-2A satellite.

For the ocean sensor, cost reduction in survey and observation were estimated to be 6.8 million dollars. Prevention and monitoring for oil spill and red tides were also counted. Each stage, reduction rates were obtained from the previous research and studies. Ocean satellite B/C ratio is less than one but Meteorological satellite B/C ration is 1.137, as disaster prevention factors were counted better.

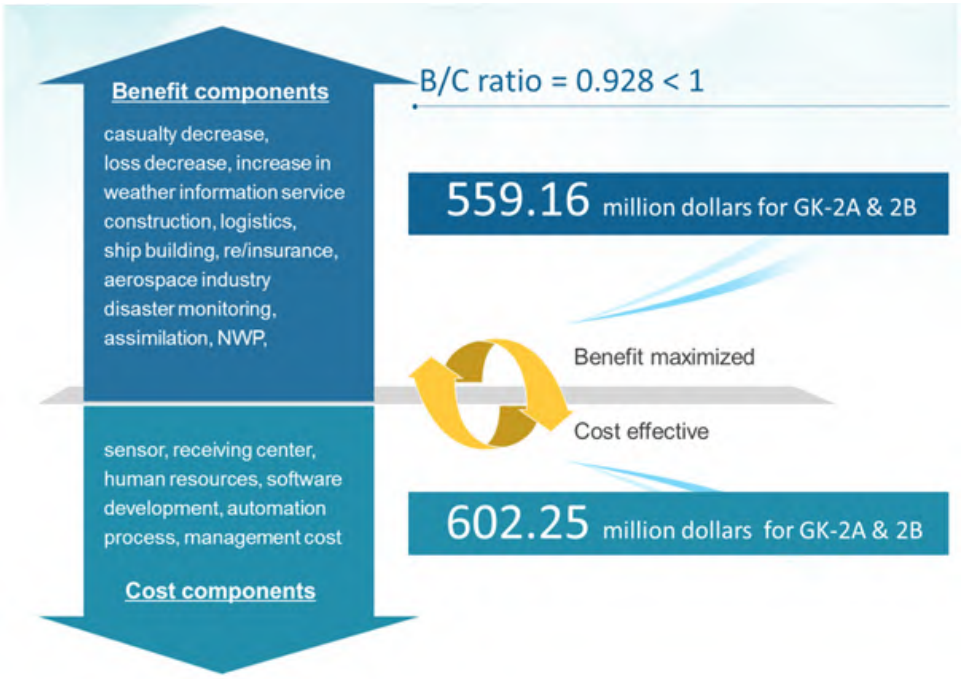
Summary

The countable and measurable B/C ratio was 0.928 for GK-2 program which was extracted only from the economic areas within the Republic of Korea. The best way to higher B/C ratio is to make benefit elements larger and more tangible and to decrease the cost component. As of the world economic crisis and todays tax payers get harder and harder to persuade, it should've been made efforts to keep the meteorological satellite program continue by cooperating and sharing data

within and among the countries.

- For the last 40 years, satellite imagery for meteorological purposes has contributed to society. Korea has obtained the benefit from US, Europe, Japan, and China satellites but started to develop its own satellite and share data with countries in the region.
- To persuade budget decision makers in Korea, three areas were reviewed: policy appropriateness, technical feasibilities and economic feasibilities. Due to its difficulties to calculate B/C ratio, objective statistics were introduced.
- Utilization of meteorological satellite outputs can be extended in the context of space program. Qualitative benefits should be considered together, such as human capacity building, software development, meteorological knowledge improvement, and international cooperation enhancement.
- GK-2 program is under development. And Korean Government will share the benefits with other countries.

(KMA/NMSC)



JMA's AMV products for Himawari-8/9

AMV is one of the most important meteorological satellite products in NWP. For example, Bormann et al. (2012) showed that AMVs from satellites have a positive impact on forecast skill in the ECMWF data assimilation system. JMA has developed a new algorithm for Himawari-8/9 AMVs (Shimoji 2014) based on an optimal estimation method for full exploitation of satellite data. Improvement from the current operational algorithm (Oyama 2010) will result in the computation of wind vectors with high spatial resolution based on the tracking of smaller cloud patterns. Figure 1 shows a comparison of MTSAT observation data AMVs produced with the current operational algorithm and the new algorithm for Himawari-8/9. Wind vectors with the new algorithm (Quality Indicator (QI) > 80) (Holmlund et al. 1998) are seen in the figure over wide areas where none are produced with the current version. As with CSR, the AMV product will be provided in Binary Universal Form for data Representation (BUFR) via the Global Telecommunication System (GTS).

(Kazuki Shimoji, JMA/MSC)

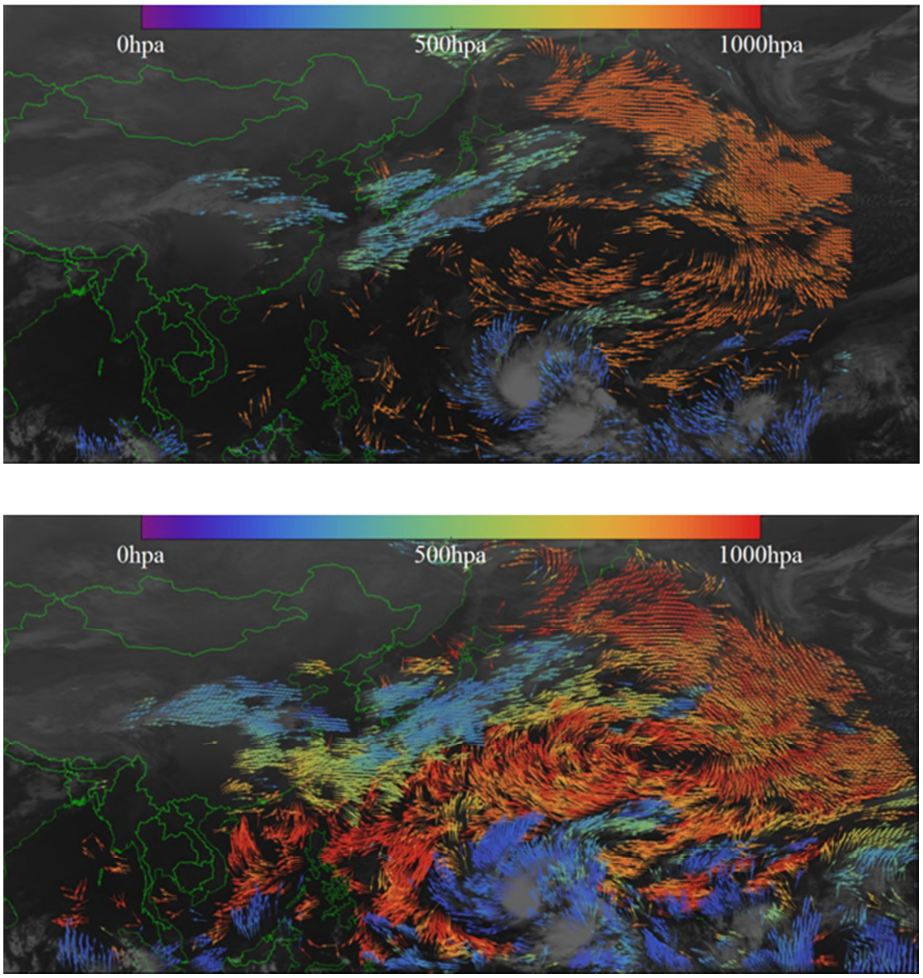


Fig. 1　MTSAT IR wind vectors (QI > 80) retrieved with
(upper) the current operational MTSAT-AMV algorithm and with
(lower) the Himawari-8/9 AMV algorithm
for 00 UTC on 02 March 2014. Warm colors correspond to low-level wind and cold colors to high-level wind.

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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 Tomoo OHNO, JMA*)

RA II WIGOS Project Home Page

http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro_en_jma.html
It has just been moved!

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(Editor-in-chief of this issue: Tomoo Ohno)