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RA II Pilot Project Newsletter

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

Contents of this issue

	Page
✧ Launch of the RA II Pilot Project Web Page	1
✧ Update of MTSAT Real-Time Imagery on the JMA/MSM Website	2
✧ Switchover of Meteorological Observing Function from MTSAT-1R to MTSAT-2	3
✧ Sentinel Asia - Disaster Management Support in the Asia-Pacific Region	3
✧ Members of the Coordinating Group	8
✧ From the Co-editors	9

Launch of the RA II Pilot Project Web Page

A web page of the RA-II Pilot Project for the development of support for National Meteorological and Hydrological Services (NMHSs) in the areas of satellite data, products and training was launched on the WMO Space Programme Website.

(<http://www.wmo.int/pages/prog/sat/RAII-PilotProject.html>)

As initial content, the page includes:

- Project background and mission
- Newsletter archives

More content will be added to the website, including information on access to satellite imagery, data, products and training. Plans are also under way for an online resource called the RA-II Pilot Project Questionnaire relating to the availability and use of satellite data and products.

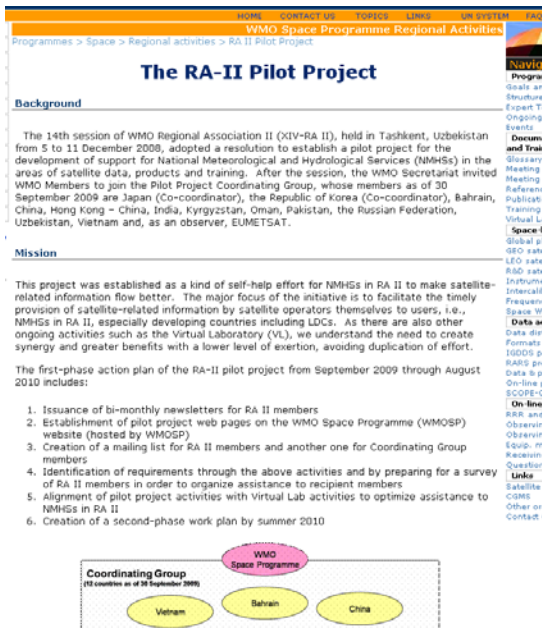


Figure 1. The RA-II Pilot Project web page on the WMOSP's website

Update of MTSAT Real-Time Imagery on the JMA/MSC Website

The Meteorological Satellite Center of the Japan Meteorological Agency (JMA/MSC) updated its web page showing MTSAT real-time imagery for various specified areas in RA-II regions.

The following three sets of imagery covering East Asia have been added:

- High-Resolution Asia 1 (100°E, 17°N -- 111°E, 8°N)
- High-Resolution Asia 2 (80°E, 32°N -- 92°E, 24°N)
- High-Resolution Asia 3 (84°E, 28°N -- 95°E, 119°E)

In addition, the following six sets of imagery covering the Pacific region were already available:

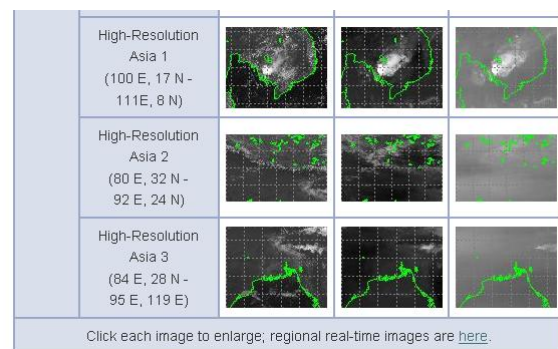
- Pacific Islands 1 (130°E, 25°N -- 165°E, 5°S)
- Pacific Islands 2 (155°E, 20°N -- 175°W, 5°S)
- Pacific Islands 3 (140°E, 0 -- 160°W, 25°S)
- Pacific Islands 4

(172°E, 9°S -- 167°W, 26°S)

- Pacific Islands 5 (156°E, 9°S -- 178°E, 26°S)
- Pacific Islands 6 (149°E, 1°S -- 178°E, 26°S)

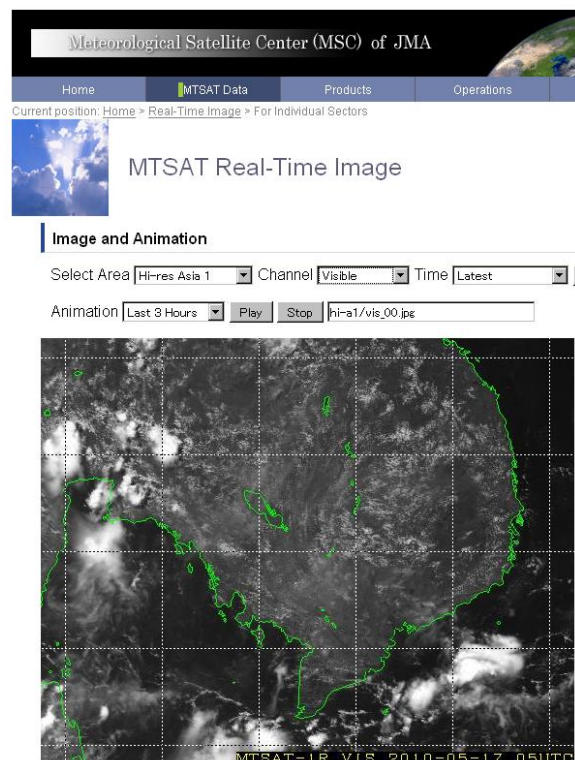
JMA/MSC can also provide additional imagery for other RA-II regions on request.

(a) High-Resolution Asia Imagery (catalogue)



(http://mscweb.kishou.go.jp/sat_dat/index.htm)

(b) Real-Time Imagery and Animation



(http://mscweb.kishou.go.jp/sat_dat/img/reg/sat_img.htm)

Figure 2. MTSAT real-time imagery on the MSC website

(Akihiro SHIMIZU, JMA)

Switchover of Meteorological Observing Function from MTSAT-1R to MTSAT-2

The Japan Meteorological Agency (JMA) has been operating a meteorological mission to observe the earth from space using the MTSAT-1R geostationary satellite since 28 June 2005. Since the service period of MTSAT-1R's earth imaging sensor will reach the end of its five-year design lifetime this summer, JMA plans to switch the observing function over to MTSAT-2 as outlined below.

1. Date and time of switchover

MTSAT-2 observing images will be provided from 03 UTC on 1 July 2010.

2. MTSAT-2 observation

MTSAT-2's sensor captures earth images using one visible and four infrared channels in the same way as MTSAT-1R's. The observation timetable of MTSAT-2 will consist of alternative full-disk and half-disk observations in the same way as that of MTSAT-1R.

3. Imagery data

The center of imagery data provided by the HRIT dissemination service for MDUS will be changed in accordance with the satellite position. The center of MTSAT-2 HRIT imagery data will therefore be the MTSAT-2 position at 145°E, while that of MTSAT-1R data is the MTSAT-1R position at 140°E. With respect to the LRIT dissemination service for SDUS, MTSAT-2 imagery data will be provided with the same map projection as those of MTSAT-1R. Full-disk visible imagery data of LRIT will be additionally disseminated concurrently with the switchover.

4. Data dissemination service

MTSAT-1R will continue to perform HRIT and LRIT dissemination services after the switchover. Accordingly, MDUS and SDUS will be able to receive MTSAT-2 imagery data

without adjusting the direction of their antennas.

5. Meteorological standby by MTSAT-1R

In the event of abnormalities with MTSAT-2 or the need for maintenance of the satellite or its ground system, MTSAT-1R will be brought back into operation after the switchover.

6. DCS operation

MTSAT-1R will continuously operate the Data Collection System (DCS) to collect environmental data from Data Collection Platforms (DCPs).

As for details, please refer to the MSC website; http://mcsweb.kishou.go.jp/notice/Himawari7_e.htm

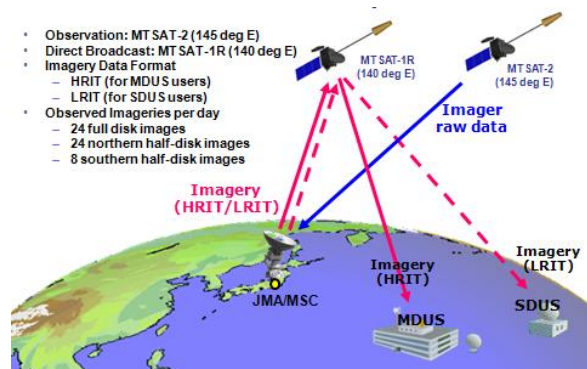


Figure 3. Imagery Observation/Direct Broadcast Configurations by MTSAT-1R/2 after July 2010

(Yoshihiko TAHARA, JMA)

Sentinel Asia—Disaster Management Support in the Asia-Pacific Region

1 Sentinel Asia Initiative

SA is a voluntary and best-efforts-basis initiative led by the Asia-Pacific Regional Space Agency Forum (APRSAP). Its goal is to share disaster information in near real time across the Asia-Pacific region, using primarily a Web-GIS platform. Its architecture is designed to operate initially as an Internet-based, node-distributed information distribution backbone, eventually distributing

relevant satellite and in situ spatial information on multiple hazards in the Asia-Pacific region.

A systematic approach for the implementation of this dissemination system was adopted as follows:

- Step 1: Implementation of the Sentinel Asia data dissemination system as a pilot project, to showcase the value and impact of the technology using standard Internet dissemination systems (2006-2007).
- Step 2: Expansion of the dissemination system with new satellite communication systems, and enhancement of activities based on experiences in Step 1 and new requirements (2008-2012).
- Step 3: Establishment of a comprehensive disaster management support system (2013 onwards).

SA Step 1 has achieved its overall goals. The Sentinel Asia website has operated since October 2006. It has served as a good demonstrator project to share disaster-related information obtained by several Earth observation satellites, such as the Advanced Land Observing Satellite (ALOS), the Indian Remote Sensing (IRS) Satellites, the Multi-functional Transport Satellite-1 Replacement (MTSAT-1R), Terra, and Aqua. It has also demonstrated recent advances in web-mapping technologies and ICT systems.

1.1 Framework

SA is promoted with cooperation among the space community (APRSAF), the international community (UN ESCAP, UN OOSA, ASEAN, Asian Institute of Technology (AIT), and so on), and the disaster management community (Asian Disaster Reduction Center (ADRC) and its member countries). To support the implementation of the SA project, a Joint Project Team (JPT) was organized. Membership in the JPT is open to all APRSAF

member countries, disaster prevention organizations, and regional or international organizations that are prepared to contribute their experiences and technical capabilities and wish to participate in technical aspects of disaster information sharing activities.

1.2 Activities

The main activities of SA are as follows:

- Emergency observation in case of major disasters by Earth observation satellites via observation requests of JPT and ADRC members
- Working group (WG) activities focusing on specific disasters, such as wildfires, floods, and glacier lake outburst flood (GLOF)
- Capacity building for utilization of satellite images and human resources development for disaster management

SA Step 1 operations have been running since October 2006, with the opening of the website (<https://sentinel.tksc.jaxa.jp>). JPT consists of 56 organizations from 22 countries and 9 international organizations at the time of writing. The Japan Aerospace Exploration Agency (JAXA) is a secretariat of the JPT.

SA Step 2 was initiated in 2008, the concept of which is shown in Figure 4. SA Step 1 will be enhanced and expanded as follows:

Participation of Various Satellites

In addition to Step 1's Earth observation satellites, namely, ALOS of JAXA, MTSAT-1R of Japan Meteorological Agency (JMA), and IRS of the Indian Space Research Organization (ISRO), new Earth observation satellites have joined. These include the Korean Multi-purpose Satellite (KOMPSAT-1) of the Korea Aerospace Research Institute (KARI), the Thai Earth Observation System (THEOS) of the Geo-Informatics and Space Technology Development Agency (GISTDA), and communications satellites such as the

Wideband Internetworking Engineering Test and Demonstration Satellite (WINDS) of JAXA.

Improvement of Accessibility to Information

In addition to data sharing via the Internet in Step 1, information transmission to facilitate access to disaster-related information through various means, including demonstration of the use of new-generation communication satellite, such as WINDS, are introduced, as shown in Figure 5.

Value-added Information

A new framework of satellite data analysis is being organized to provide analyzed images and easily comprehensible interpretations from images. The AIT, ADRC, the Center for Remote Imaging, Sensing and Processing (CRISP, The National University of Singapore), and the Central Asian Institute of Applied Geosciences (CAIAG) of Kyrgyz, among others, are expected to join the framework.

2 Meteorological and Hydrological Information provided by Sentinel Asia

Some examples of information provided by the SA, related to meteorological and hydrological matters, are as follows.

2.1 Flood Monitoring

Emergency Observation

In case of major flood disasters, emergency observation by Earth observation satellites via observation requests of JPT and ADRC members is conducted. Inundated areas by flood are identified by data analysis; for example, see Figure 6.

Global Flood Watch

Under cooperation with the Dartmouth Flood Observatory of Dartmouth College, global flood information, linked with "Satellite River Watch," is provided.

2.2 MTSAT-1R Cloud Imagery and Hotspot Monitoring

Under the framework of Sentinel Asia, the JMA is providing MTSAT-1R data to JAXA. JAXA has been processing the data and providing cloud imagery on the SA Web-GIS since September 2007. In addition to that, hotspots extracted from infrared data of MTSAT-1R during the nighttime are provided by JAXA. MTSAT-1R provides basic hourly imagery covering the full Earth disk once every hour on the hour, and in addition, northern or southern hemisphere imagery every hour on the half-hour. An example is shown in Figure 7.

2.3 Precipitation Map

GFAS

Global satellite-based daily rainfall maps and heavy rainfall identification are displayed on the SA Web-GIS, which are provided by the International Flood Network (IFNet) and Global Flood Alert System (GFAS) based on NASA-3B42RT.

GSMaP

Global satellite-based hourly/10-km-grid rainfall mapping based on microwave imagery is displayed on the SA Web-GIS. JAXA and ICHARM/PWRI are jointly developing and validating its prototype system based on the JST-CREST GSMaP.

2.4 Long-term Precipitation Monitoring

SA provides long-term accumulated precipitation map (maximum 100 days) based on GFAS daily precipitation data. This might suggest drought information; for example, see Figure 8.

Kazuya Kaku (Japan Aerospace Exploration Agency (JAXA))

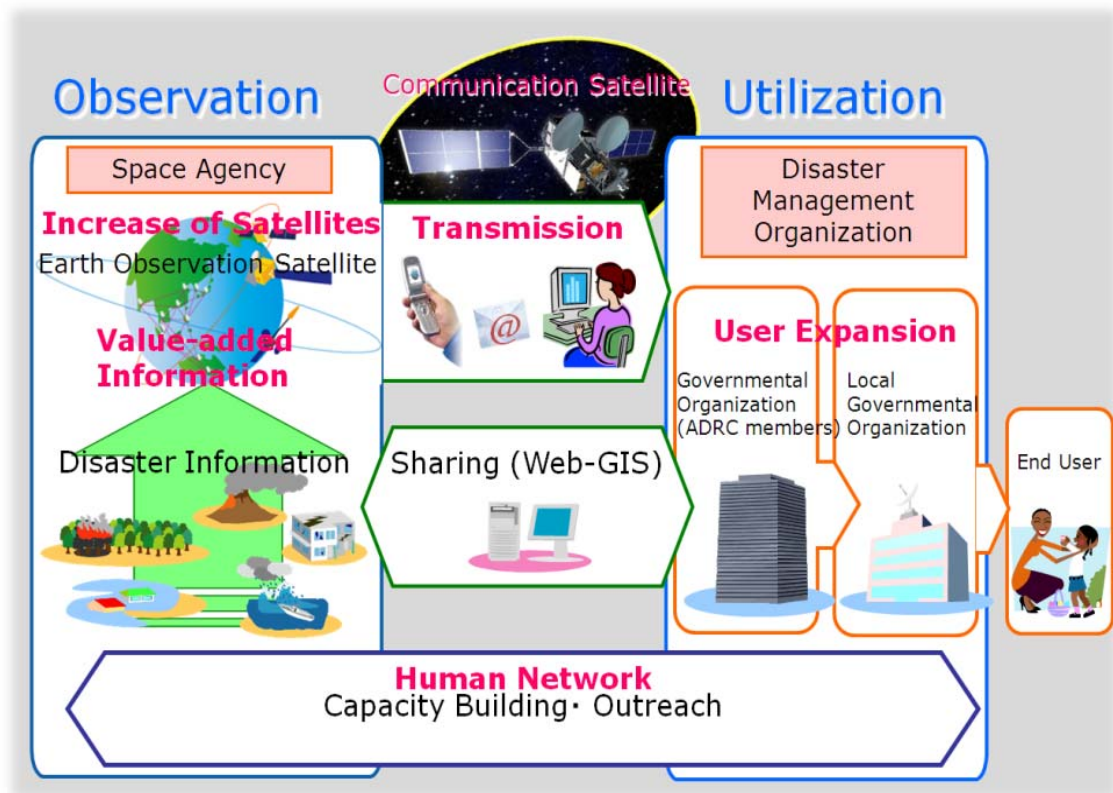


Figure 4. Concept of Sentinel Asia Step 2. The point of SA Step 2 is shown in red: making value-added information from satellite imagery, transmitting the information to users using a communication satellite as well as sharing the information by Internet in Step 1, and expanding the number of users. Finally, these activities are supported by human network.

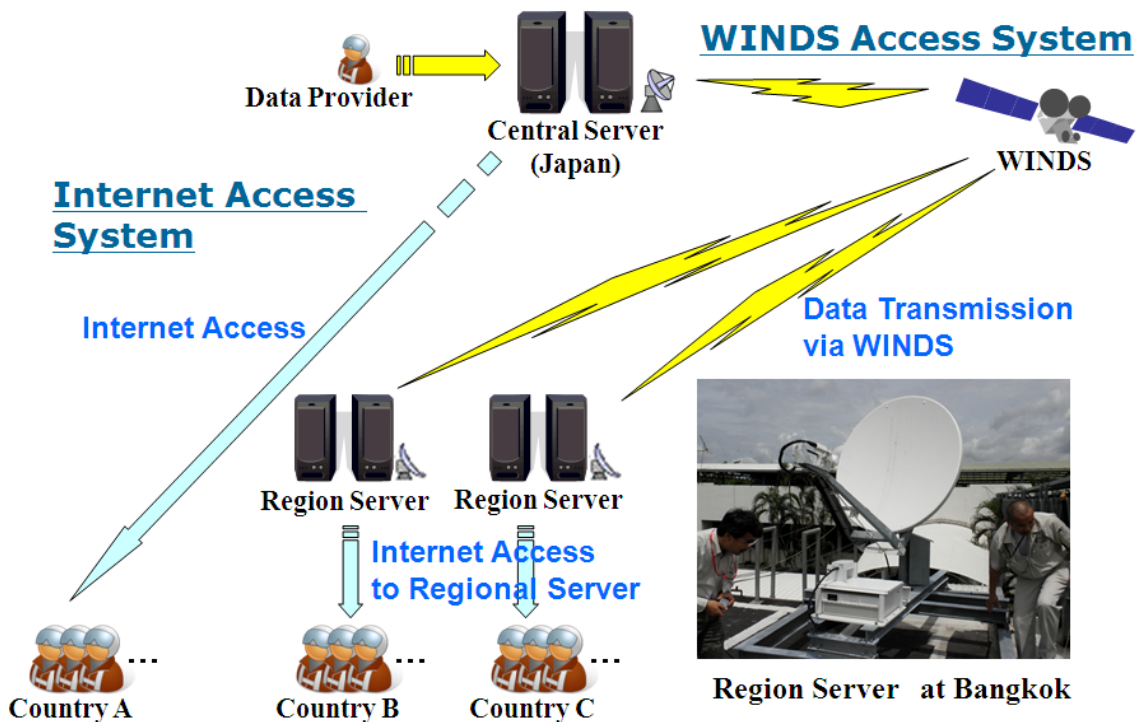


Figure 5. Information transmission using WINDS. Data in central server in Japan are transmitted to region servers in Asian countries using WINDS, where it is hard to access the central server.

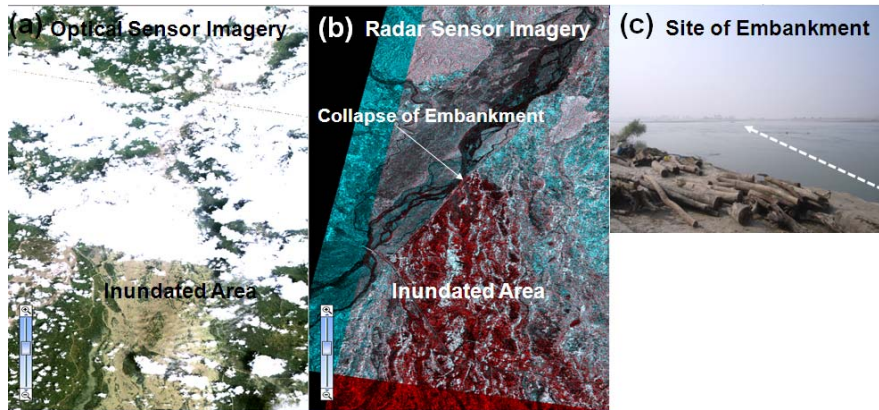


Figure 6. Flood in Nepal caused by collapse of embankment in August 2008. (a) is imagery of AVNIR-2 (optical sensor), and (b) is imagery of PALSAR (radar sensor) on board ALOS. Inundated area is shown in red in (b). (c) is a photo taken in December 2008, which shows the area of collapsed bank with approximately 2-3 km in length.

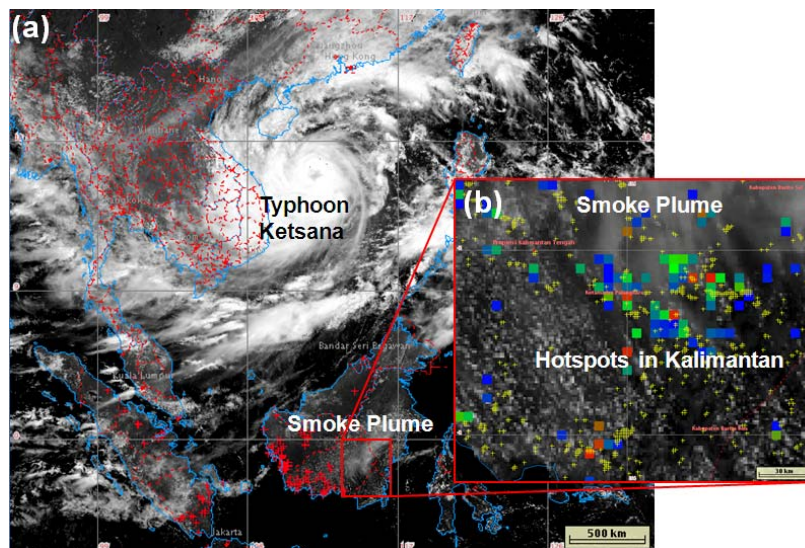


Figure 7. Typhoon Ketsana and wildfires in Kalimantan is September 2009. (a) is imagery of MTSAT-1R, showing typhoon Ketsana in Vietnam and wildfires in Indonesia. (b) is hotspots detected by MTSAT-1R infrared data, with confidence level is shown by: (Low Confidence) (High Confidence).

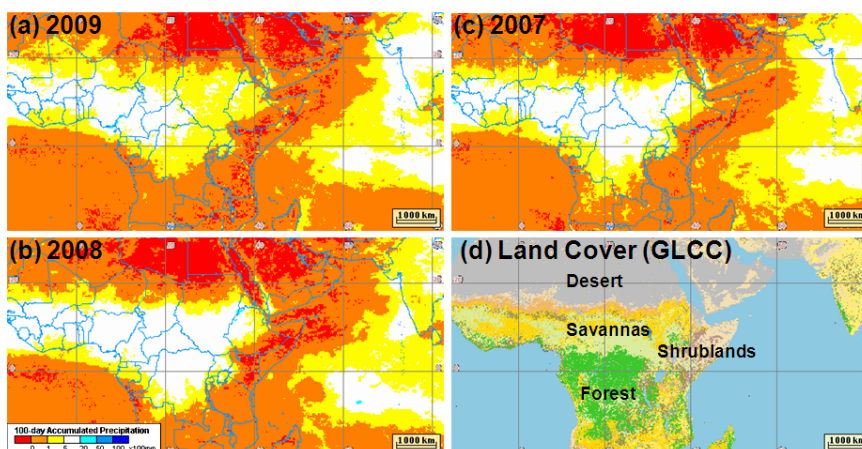


Figure 8. Long-term accumulated precipitation for 100 days, from 23 June to 30 September, in Africa. (a) is a map in 2009; (b), 2008; (c), 2007. (d) is land cover data of the Global Land Cover Characterization (GLCC) provided by the United States Geological Survey (USGS). (a) shows that yellow area (less than 500 mm per 100 days) is expanded in 2009, compared to 2008 and 2007

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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 Pilot Project Coordinating Group. We look forward to receiving your contributions to the newsletter.

(Toshiyuki KURINO, JMA, and Jae-Gwang WON, KMA)

RA II Pilot Project Mailing Lists

Two mailing lists for discussion on the pilot project will soon be set up using the Google Groups service, and will be implemented either through the Google Groups web interface or by e-mail.

One list is for Pilot Project Coordinating Group members who are already registered with the WMO's Regional Office for Asia and the South-West Pacific.

Group name: ra2pp_sat_cg

Group home page:

http://groups.google.com/group/ra2pp_sat_cg

Group email address:

ra2pp_sat_cg@googlegroups.com

The other list is for RA II Members in general.

Group name: ra2pp_sat

Group home page:

http://groups.google.com/group/ra2pp_sat

Group email address:

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