Vol. 3 No. 2, April 2012

RA II Pilot Project Newsletter

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

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The Third Asia/Oceania Meteorological Satellite Users' Conference

The Korea Meteorological Administration (KMA) and The National Meteorological Satellite Center (NMSC) are pleased to announce the Third Asia/Oceania Meteorological Satellite Users' Conference to take place from 9 to 12 October, 2012 in Jeju Island, Korea.

http://nmsc.kma.go.kr/html/homepage/contents/aomsuc/main.html

Background

The COMS (Communication, Ocean and Meteorological Satellite), the first geostationary weather satellite of Korea was launched in June 2010, and the KMA provides 16 baseline products including information on Asian dust, sea surface temperature and land surface temperature over the East Asian Region. These products help improving day to day weather forecasting and the performance of NWP models for weather analysis and forecast.

Now, the Republic of Korea, China, Europe, India, Japan, the Russian Federation and the United States all operational meteorological and climate monitoring satellites over Asia and

Oceania, as part of the Global Observing System (GOS) promoted by the World Meteorological Organization (WMO), which contributes to the Global Earth Observation System of Systems (GEOSS) coordinated by the Group on Earth Observations (GEO).

Objectives

To further enhance the exchanges on application techniques among satellite data users in Asia/Oceania as well as to advance satellite observation technologies and to promote synergetic development related to meteorological satellites in this region, the Third Asia/Oceania Meteorological Satellite Users' Conference will be held in Jeju Island, Korea.

Conference Topics

- Current and future meteorological satellite programs
- Facilitation of data access and utilization
- Atmospheric parameters derived from satellite observations
- Application of satellite data to weather analysis and disaster monitoring
- Application of satellite data to numerical weather prediction
- Application of satellite data to climate and environmental monitoring
- Land surface and ocean parameters derived from satellite observations
- Capacity building and training activities

Local Organization Committee

Korea Meteorological Administration (KMA)
61 16-Gil, Yeouidaebang-ro, Dongjak-gu,
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http://www.kma.go.kr/

National Meteorological Satellite Center (NMSC) / KMA
64-18 Guam-Gil, Gwanghyewon-myeon,
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http://nmsc.kma.go.kr/

Conference History

1st conference
1 to 2 November, 2010
Beijing, China
Hosted by the China Meteorological Administration (CMA)
http://satellite.cma.gov.cn/conference/index.html

2nd conference
6 to 9 December, 2011
Tokyo, Japan
Hosted by the Japan Meteorological Agency (JMA)
http://mscweb.kishou.go.jp/second/index.htm

(Tae-Hyeong Oh, KMA)

The Regional High Profile Training Event

WMO and the Korea Meteorological Administration (KMA) are planning to host the RA II Pilot Project Virtual Laboratory (VLab) Training Event prior to the Third Asia/Oceania Meteorological Satellite Users' Conference from 4 to 6 October, 2012 in Jincheon, Korea. Dr's James F.W. Purdom and W. Paul Menzel will be featured lectures/trainers at this event.

Training Event Topics

- The WMO Space Program, WMO Virtual Laboratory (VL) function and benefits, and basic satellite orbits and applications areas
- CMA, JMA and KMA satellite status and plans, including a focus on data and product availability and access
- Lecture on satellite data utilization topic from Beijing and Nanjing, Melbourne, IPWG and Jincheon, and regional interest such as tropical storms and hurricanes
- Lecture and exercise on choosing satellite spectral bands and their application for land, ocean and atmospheric applications

- Lecture on application of satellite data for analysing and nowcasting convection

(Tae-Hyeong Oh, KMA)

The 2nd Meeting of the Coordinating Group of the RA II Pilot Project

The Korea Meteorological Administration (KMA), with the cooperation of the Japan Meteorological Agency (JMA), is planning to hold a "2nd Meeting of the Coordinating Group of the RA II Pilot Project to Develop Support for NMHSs in Satellite Data, Products and Training", 8th October 2012 in Jeju-Island, Korea and to host with the 3rd Asia/Oceania Meteorological Satellite Users' Conference. This meeting is for efficient implementation of Third-phase Action Plan, particularly identification of requirements from RA II Members and alignment of pilot project activities with Virtual Lab activities to optimize assistance to NMHSs in RA II. The main focus of meeting is to facilitate the timely provision of satellite-related information by satellite operator to users, i.e., NMHSs in RA II, especially developing countries including Least Developed Countries (LDCs) and share training materials to enhance the capacity building for both international and internal usages, avoiding duplication of efforts of other ongoing activities such as the Virtual Laboratory (VLab) of CGMS.

Third-phase Action Plan (31 August, 2011)

(1) Continuative Issuance of Quarterly Newsletter for RA II Members
(2) Enhancement of Pilot Project Web Pages on the WMO Space Programme(WMOSP) website hosted by WMOSP
(3) Enhancement of a mailing list for RA II Members and another one for Coordinating Group members
(4) Identification of requirements from RA II Members
(5) Alignment of pilot project activities with Virtual Lab activities to optimize assistance to NMHSs in RA II
(6) Creation of the fourth-phase working plan

(Dohyeong Kim, KMA)

Preliminary Report on RA II Pilot Project Web Questionnaire

1. INTRODUCTION

The First Coordinating Group Meeting for the Pilot Project which was held at JMA HQs in Tokyo, February 2011, and the meeting concluded that demands from NMHS users for more reliable and user-friendly satellite-derived information for the mitigation and prevention of disasters has been increasing. Accordingly, the major focus of the initiative is to facilitate the timely provision of satellite-derived information by satellite operators to users.

As agreed in the meeting, RA II Pilot Project conducted a web-based questionnaire (RA II questionnaire) in the third phase of RA II Pilot Project. The questionnaire is almost same as that of WMO Space Programme (WMO questionnaire; see http://www.wmo.int/pages/prog/sat/Questionnaire/Questionnaire.html), and its purpose is to monitor the availability and use of existing satellite data and products and to identify any associated difficulties or limiting factors in RA II.

2. PARTICIPATION AND NOTE

The total number of responses received was 19, originating from 35 WMO Members in RA II.

3. ACCESS TO SATELLITE DATA – Questionnaire Section 1

Questions 1 to 3 were intended to identify those Members who do not routinely obtain satellite data and to enquire about the reasons for this fact.

One indicated that they do not obtain satellite data from any source having no plans to obtain data in the next two years due to the financial difficulties.

3.1 Data Access Trends – Question 4

Question 4 requested information about the extent to which access to satellite data and/or products has changed over the two-year period 2010-2011. Table 1a shows the responses. Two members responded that there's slight decrease in data access while it was zero on the previous WMO questionnaire (Table 1b).

Table 1a - Data access trends - RA II questionnaire (2010-2011)

Significant increase in data access	Slight increase in data access	No significant change in data access	Slight decrease in data access	Significant decrease in data access
4	9	3	2	0

Table 1b - Data access trends in RA II- WMO questionnaire (2008-2009)

Significant increase in data access	Slight increase in data access	No significant change in data access	Slight decrease in data access	Significant decrease in data access
6	12	3	0	0

3.2 Data Reception Mechanisms and Data access by satellite name – Question 5

The use of the different data reception mechanisms has been analyzed with respect to satellites and satellite types. Table 2 shows the responses on each satellite. Digital data disseminated via satellites and digital data obtained from the internet were the most popular mechanism of data reception, and it was recognized that analogue data obtained from the internet was also the popular mechanism. Data derived from other satellites such as TOMS, ASCAT, FY2E, RADARSAT, Aura and CALIPSO were also named up, and those data were received via satellites, from a third party data provider and obtained from the Internet.

Table 2 – Data reception mechanisms and Data access by satellite name

Satellite Type[1]	Satellite Name	1 Digital data disseminated via the satellite itself	2 Digital data disseminated via another satellite	3 Digital data received from a third party data provider	4 Digital data obtained from the Internet	5 Analogue data[2] disseminated via the satellite itself	6 Analogue data2 disseminated via another satellite	7 Analogue data2 received from a third party	8 Analogue data2 obtained from the Internet	9 Data received via the GTS (incl. RMDCN)	Total	Percentage
I	METEOSAT (0)	1	4	1	2	0	0	0	1	1	10	53
	METEOSAT (9.5E)	1	2	0	0	0	0	0	0	1	4	21
	METEOSAT (57.5E)	0	3	1	1	0	0	1	1	1	8	42
	GOES-E (75W)	0	1	0	1	0	0	0	2	1	5	26
	GOES-W (135W)	0	1	0	1	0	0	0	1	1	4	21
	GOES-SA (60W)	0	1	0	0	0	0	0	1	0	2	11
	MTSAT-2 (145E)	5	2	0	5	0	0	0	1	1	14	74

[1] Satellite Types: I= operational geostationary satellite, II= operational low earth orbit satellite, III= Research and Development and other environmental (low earth orbit) satellites. [(2)]In this context analogue data refers to data rendered in a map or chart, suitable only for qualitative (i.e. display) purposes rather than for quantitative (i.e. data processing) purposes.

[2] In this context analogue data refers to data rendered in a map or chart, suitable only for qualitative (i.e. display) purposes rather than for quantitative (i.e. data processing) purposes.

	FY-2C (105E)	4	2	0	1	0	0	0	0	1	8	42
	FY-2D (86.5E)	0	3	0	1	0	0	0	0	0	4	21
	INSAT-3 (93.5E)	1	0	0	0	0	0	0	1	0	2	11
	KALPANA-1 (74E)	2	0	0	0	0	0	0	1	0	3	16
II	NOAA series	6	3	0	4	0	0	1	1	2	17	89
	METOP series	3	1	0	2	0	0	0	0	1	7	37
	FY-1, FY-3 series	2	2	0	1	0	0	0	0	0	5	26
III	ERS series	0	0	0	0	0	0	0	0	0	0	0
	DMSP series	0	0	0	3	0	0	0	0	2	5	26
	SPOT series	0	0	0	0	0	0	0	0	0	0	0
	ENVISAT	0	0	0	2	0	0	0	0	0	2	11
	Quikscat	0	0	1	1	0	0	0	1	0	3	16
	Terra / Aqua	2	2	1	3	0	0	0	1	1	10	53
	TRMM	0	0	1	2	0	0	0	1	0	4	21
	JASON series	0	0	0	1	0	0	0	0	1	2	11
	ALOS	0	0	1	0	0	0	0	0	0	1	5
	CBERS series	0	0	0	0	0	0	0	0	0	0	0
Total		32	30	7	38	0	0	2	14	15	138	

3.3 Satellites which Members do not access but would like to receive

Question 5 gave Members the opportunity of indicating which satellites data they did not access but would like to receive. Table 3 shows the total responses. As recognized in the WMO questionnaire, it was recognized that there was a strong need for the data from Research and Development and other environmental satellites, especially TRMM. Data from NPP was also requested.

Table 3 – Satellites that Members do not receive but would like to receive

Satellite Type1	Satellite Name	Total Responses
I	METEOSAT (57.5E)	3
	FY-2C (105E)	3
	FY-2D (86.5E)	4
	INSAT-3 (93.5E)	4
	KALPANA-1 (74E)	3
II	NOAA series	4
	METOP series	4
	FY-1, FY-3 series	3
III	ERS series	1
	DMSP series	2
	SPOT series	1
	ENVISAT	3
	Quikscat	5
	Terra / Aqua	5
	TRMM	8
	JASON series	3
	ALOS	1
	CBERS series	1

4. USE OF SATELLITE DATA AND PRODUCTS – Questionnaire Section 2

4.1 Data processing and usage – Question 6

Question 6 invited Members to describe which satellite data/product types are currently in use and to qualify this by describing whether they are produced in their country or elsewhere and also whether they are used in NWP models. Table 4 shows numbers of responses. When focused on Atmospheric Motion Vectors and precipitation products on level 2 / level 3 data, the numbers of the use of products produced elsewhere were larger than those of products generated locally. These products were also used in NWP model, and it can be said that a stronger product processing capability is needed. Other products, such as aerosol optical depth, hill-fire (temperature anomaly), fog, mist and low-level clouds, icing, deep convection and Chlorophyll concentration were also reported as the products "produced in your country," and ozone total column data and long-wave outgoing data were reported as the products "produced elsewhere."

Table 4 – Data processing and usage

	Data / product used	Produced in your country	Produced elsewhere	Used in NWP model
Level 1 data	Image data rendered graphically	11	7	2
	Imager data (VIS, IR, Microwave) used quantitatively	8	7	4
	Sounder data	7	4	3
	Other level 1 data	1	2	0
Level 2 / level 3 data	Atmospheric Motion Vectors	3	10	6
	Temperature / humidity profiles	7	5	6
	Cloud products	7	6	3
	Sea surface / oceanographic products	6	6	4
	Land surface products	7	5	1
	Precipitation products	4	8	5
	Other level 2 / level 3 products	2	4	0

4.2 Distribution to Other Users – Question 7

Question 7 sought to identify if Members are routinely make satellite data and products available to other users. A total of 11 responses indicated that data *are* being distributed to others and seven responded that they *are not*.

4.3 Limiting Factors in the Use of Satellite Data and Products – Question 8

Question 8 asked Members to identify the primary limiting factors influencing the usage of satellite data and products. Table 5a shows the responses. Compared to the previous WMO questionnaire (Table 5b), technical difficulties was still a strong limiting factor. There was a comment that it is not clear to know 1) where the needed data is, 2) how to

get them and 3) where to contact. It was also reported that there is not enough long-term consistency of satellite data.

Table 5a – Limiting Factors in data usage - RA II questionnaire (2010-2011)

No significant limiting factors	Insufficient knowledge	Technical difficulties	Financial difficulties	The availability, quality or accuracy	Other reasons
5	9	13	7	2	2

Table 5b – Limiting Factors in data usage in RA II - WMO questionnaire (2008-2009)

No significant limiting factors	Insufficient knowledge	Technical difficulties	Financial difficulties	The availability, quality or accuracy	Other reasons
5	11	15	11	4	2

5. APPLICATIONS OF SATELLITE DATA AND PRODUCTS – Questionnaire Section 3

Question 10 sought to establish which geophysical parameters, derived from satellite data, are "the most important" for Members and which might be considered as "required but not available."

Table 7 summarized the number of responses for what parameters were considered as the most important of the available parameters. Parameters were ranked by popularity. Parameter "Dust" was not ranked in top 30 in the previous WMO questionnaire, however, it ranked in the forth in this RA II questionnaire. It can be said that monitoring dust is highly interested in RA II.

5.1 Most important of the available parameters – Question 10

Table 7 – Most important parameters for each application area

Ranking	Previous WMO Ranking (All Region)	Most important of the available parameters	Nowcasting & VSRF	Synoptic meteorology	Global and regional NWP data assimilation	Aeronautical meteorology	Marine meteorology and oceanography	Agricultural meteorology	Hydrology	Atmospheric chemistry	Climatology and climate change	Environmental applications	Disaster monitoring and Security	Research applications	Public Weather Services (PWS)	Total
1	1	Cloud imagery	8	9	1	4	2	1	3	0	0	0	4	4	9	45
2	2	Cloud cover	8	7	0	5	0	0	0	1	1	2	0	1	2	27
3	4	Cloud type	5	7	0	6	0	0	1	0	1	0	1	1	1	23
4		Dust	4	2	0	3	0	0	0	0	0	2	4	1	4	20
5	5	Cloud Top Temperature	3	6	0	3	1	0	1	0	0	0	1	2	2	19
6	6	Sea surface temperature	0	1	0	1	7	0	0	0	3	1	0	3	0	16
7	11	Cloud top height	3	3	0	4	1	0	1	0	0	0	0	1	1	14
8	3	Precipitation rate	2	1	0	3	0	0	2	1	0	0	1	0	3	13
9	16=	Precipitation index	3	1	0	0	0	1	1	0	1	0	1	0	1	9
9	8=	Temperature Profile	0	1	2	1	0	1	1	1	0	0	0	2	0	9
9	12	Wind profile	0	1	2	2	1	0	0	0	1	1	0	1	0	9
12	19=	Rain profile	0	1	1	0	0	1	1	0	0	0	2	1	1	8

12	24=	Volcanic ash	0	0	0	1	0	0	0	0	0	2	3	1	1	8
14	19=	Aerosol total column	0	0	0	0	0	0	0	1	2	4	0	0	0	7
14	23	Wind speed over sea surface	0	1	1	0	3	0	0	0	0	0	1	0	1	7
16	14	Atmospheric Instability Index	2	1	0	0	0	0	1	0	0	1	0	0	0	5
16	10	Land surface temperature	1	1	0	0	0	0	0	0	1	1	0	0	1	5
16		Long-wave outgoing rad. TOA	0	0	0	0	0	0	0	0	4	0	0	1	0	5
16	8=	Wind vector over sea surface	0	0	1	0	2	0	0	0	0	0	1	0	1	5
20	7	Fires	0	0	0	0	0	0	0	0	0	3	1	0	0	4
20	26	Sea-ice cover	0	0	0	0	2	0	0	0	1	0	1	0	0	4
20		Smoke	0	1	1	0	0	0	0	0	0	1	1	0	0	4
23	28=	Cloud base height	1	0	0	2	0	0	0	0	0	0	0	0	0	3
23		Land surface features	0	1	0	0	0	1	0	0	1	0	0	0	0	3
23	15	Norm. Diff. Veg. Index (NDVI)	0	0	0	0	0	3	0	0	0	0	0	0	0	3
23	21=	Ozone profile	0	0	0	0	0	0	0	1	0	2	0	0	0	3
23	21=	Ozone total column	0	0	0	0	0	0	0	2	1	0	0	0	0	3
23		Ocean colour	0	0	0	0	1	0	0	0	0	0	1	1	0	3
23		Significant wave height	0	0	0	0	2	0	0	0	0	0	0	0	1	3
23	13	Snow cover	0	0	0	0	0	0	1	0	2	0	0	0	0	3
23	16=	Soil moisture	0	0	0	0	0	2	0	0	0	0	0	1	0	3
23	18	Specific humidity profile	0	1	1	0	0	1	0	0	0	0	0	0	0	3
23	28=	Sounder radiances	0	0	3	0	0	0	0	0	0	0	0	0	0	3
23		Chlorophyll concentration	0	1	0	1	0	0	0	0	0	1	0	0	0	3
35		Sea-ice surface temperature	0	0	1	0	1	0	0	0	0	0	0	0	0	2
35		Sea Level / Sea Surface Height	0	0	0	0	1	0	0	0	1	0	0	0	0	2
35	27	Imager radiances	0	0	2	0	0	0	0	0	0	0	0	0	0	2
38		Cloud water profile	0	0	0	0	0	0	1	0	0	0	0	0	0	1
38	30	Land cover	0	0	1	0	0	0	0	0	0	0	0	0	0	1
38		Leaf Area Index (LAI)	0	0	0	0	0	1	0	0	0	0	0	0	0	1
38		Salinity	0	0	0	0	1	0	0	0	0	0	0	0	0	1
38		Short-wave irradiance at surface	0	0	0	0	0	1	0	0	0	0	0	0	0	1
38	24=	Vegetation Type	0	0	0	0	0	1	0	0	0	0	0	0	0	1
38		Atmospheric Motion Vector	0	0	1	0	0	0	0	0	0	0	0	0	0	1
38		Outgoing longwave radiation	0	0	0	0	0	0	0	0	1	0	0	0	0	1
38		Crustal movement	0	0	0	0	0	0	0	0	0	0	0	1	0	1
		Apparent Thermal Inertia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cloud ice total column	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cloud water total column	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Height of tropopause	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Icebergs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Long-wave surf. emissivity	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Ocean currents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Short-wave outgoing rad. TOA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Snow melting conditions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Specific humidity total column	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Trace gases	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tropopause temperature	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Wave period/direction/spectrum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		LW incoming surface radiation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Lightning detection	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Sea-ice type	0	0	0	0	0	0	0	0	0	0	0	0	0	0

5.2 Required but not available parameters – Question 10

Table 8 summarized the number of responses. Parameters were ranked by popularity. While Parameter “Ocean currents” was not ranked in the previous WMO questionnaire, it was

ranked in the third in RA II questionnaire. It seems that atmosphere-ocean interaction is getting an interest from RA II Members.

Ranking	Previous WMO Ranking (All Region)	Most required but not available parameters	Nowcasting & VSRF	Synoptic meteorology	Global and regional NWP data assimilation	Aeronautical meteorology	Marine meteorology and oceanography	Agricultural meteorology	Hydrology	Atmospheric chemistry	Climatology and climate change	Environmental applications	Disaster monitoring and Security	Research applications	Public Weather Services (PWS)	Total
1	1	Precipitation rate	7	3	1	3	0	1	8	0	1	0	3	0	6	33
2	2	Lightning detection	2	1	1	4	0	0	0	0	0	0	3	0	2	13
3	12	Cloud water profile	3	2	2	2	0	0	1	0	0	0	1	0	1	12
3		Ocean currents	0	0	0	0	8	0	0	0	0	0	0	3	1	12
5	7	Atmospheric Instability Index	5	3	1	1	0	0	1	0	0	0	0	0	0	11
6	15=	Vegetation Type	0	0	0	0	0	6	0	0	1	0	0	3	0	10
6	3	Wind profile	2	3	3	2	0	0	0	0	0	0	0	0	0	10
8	8	Rain profile	1	1	0	0	0	1	4	0	0	0	0	0	1	8
8	4	Soil moisture	0	0	0	0	0	4	1	0	1	0	0	2	0	8
10	10=	Ozone profile	0	0	0	0	0	0	0	3	0	3	0	0	1	7
10	13	Significant wave height	2	0	1	0	4	0	0	0	0	0	0	0	0	7
10	5	Temperature Profile	1	1	1	0	0	0	0	0	2	0	0	1	1	7
13	23=	Ozone total column	0	0	0	0	0	0	0	2	0	3	0	0	1	6
13	10=	Precipitation index	1	1	0	0	0	0	3	0	0	0	0	0	1	6
15	14	Aerosol total column	1	0	1	0	0	0	0	2	0	1	0	0	0	5
15	6	Cloud base height	1	1	0	2	0	0	0	0	1	0	0	0	0	5
15		Land surface temperature	0	0	1	0	0	3	0	0	0	0	0	0	1	5
15		Norm. Diff. Veg. Index (NDVI)	0	0	0	0	0	3	0	0	1	0	0	0	1	5
15	20=	Salinity	0	0	0	0	3	0	0	0	1	0	0	1	0	5
15	20=	Sea Level / Sea Surface Height	0	0	0	0	2	0	1	0	0	0	1	1	0	5
15	15=	Snow melting conditions	1	0	0	0	0	0	3	0	0	0	1	0	0	5
22	18=	Cloud top height	1	1	0	2	0	0	0	0	0	0	0	0	0	4
22		Cloud type	1	1	0	1	0	0	1	0	0	0	0	0	0	4
22	18=	Fires	0	0	0	0	0	0	0	0	0	0	3	0	1	4
22		Sea surface temperature	0	0	0	0	2	0	0	0	2	0	0	0	0	4
22		Wind vector over sea surface	0	0	0	0	2	0	0	0	1	0	1	0	0	4
22	20=	Dust	0	0	0	0	0	0	0	0	0	1	2	1	0	4
22		Smoke	1	0	0	0	0	0	0	1	0	1	1	0	0	4
29		Cloud water total column	0	0	2	0	0	0	1	0	0	0	0	0	0	3
29		Snow cover	0	0	1	0	0	0	1	0	1	0	0	0	0	3
29	9	Specific humidity profile	1	1	1	0	0	0	0	0	0	0	0	0	0	3
29		Specific humidity total column	0	1	0	0	0	0	1	0	0	0	0	1	0	3
29	23=	Trace gases	0	0	0	0	0	0	0	2	1	0	0	0	0	3
29		Wind speed over sea surface	0	0	0	1	2	0	0	0	0	0	0	0	0	3
29		Volcanic ash	0	0	0	1	0	0	0	0	0	1	1	0	0	3
36		Height of tropopause	0	1	0	1	0	0	0	0	0	0	0	0	0	2
36		Land surface features	0	0	0	0	0	0	0	0	0	1	0	1	0	2
36		Ocean colour	0	0	0	0	2	0	0	0	0	0	0	0	0	2
36		Sea-ice cover	0	0	0	0	1	0	0	0	1	0	0	0	0	2
36		Tropopause temperature	0	1	0	0	0	0	0	0	1	0	0	0	0	2

36		Wave period/direction/spectrum	0	0	0	0	2	0	0	0	0	0	0	0	0	2
42		Cloud ice total column	0	1	0	0	0	0	0	0	0	0	0	0	0	1
42		Cloud imagery	0	1	0	0	0	0	0	0	0	0	0	0	0	1
42		Icebergs	0	0	0	0	0	0	0	0	1	0	0	0	0	1
42	17	Leaf Area Index (LAI)	0	0	0	0	0	1	0	0	0	0	0	0	0	1
42		Long-wave surf. emissivity	0	0	0	0	0	0	0	0	0	1	0	0	0	1
42		Long-wave outgoing rad. TOA	0	0	0	0	0	0	0	0	0	1	0	0	0	1
42		Sea-ice surface temperature	0	0	0	0	0	0	0	0	0	0	1	0	0	1
42		Short-wave outgoing rad. TOA	0	0	0	0	0	1	0	0	0	0	0	0	0	1
42		Short-wave irradiance at surface	0	0	0	0	0	1	0	0	0	0	0	0	0	1
42		Sea-ice type	0	0	0	0	1	0	0	0	0	0	0	0	0	1
42		Sounder radiances	0	0	0	0	0	0	0	0	0	0	0	1	0	1
		Apparent Thermal Inertia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cloud cover	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cloud Top Temperature	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Land cover	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		LW incoming surface radiation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Imager radiances	0	0	0	0	0	0	0	0	0	0	0	0	0	0

6. TRAINING IN SATELLITE METEOROLOGY - Questionnaire Section 4

6.1 Training – Question 11

Question 11 requested information on the number of staff trained in satellite meteorology. Table 9a shows the Number of staff trained by institution. The total response stayed almost the same as previous WMO questionnaire (Table 9b).

Table 9a – Training - RA II questionnaire (2010-2011)

	RTC	WMO (other than RTC)	University / Industry	Internal	Bilateral agreement with other WMO Member	Other	Total staff trained
Total	30	29	66	734	5	0	864

Table 9b – Training in RA II - WMO questionnaire (2008-2009)

	RTC	WMO (other than RTC)	University / Industry	Internal	Bilateral agreement with other WMO Member	Other	Total staff trained
Total	20	31	79	767	8	20	925

6.2 Number of staff trained by skill – Question 11

Table 10a shows number of staff trained by skill. There was a significant drop in software development skill compared to the number in the previous WMO questionnaire (Table 10b).

Table 10 a – Number of staff trained by skill - RA II questionnaire (2010-2011)

	Equipment operation & maintenance	Software development	Physical basis for remote sensing	Satellite image interpretation	Other
Total	138	91	144	491	0

Table 10 b – Number of staff trained by skill in RA II- WMO questionnaire (2008-2009)

	Equipment operation & maintenance	Software development	Physical basis for remote sensing	Satellite image interpretation	Other
Total	168	161	171	425	0

6.3 Training Methods – Question 11

Table 11 shows the relative popularity of the three primary methods of delivering training. Classroom based presentations were most popular method of training.

Table 11 – Training Methods

Skill	Classroom based presentations	Computer Assisted Learning (CAL)	Distance learning	Other
Equipment operation & maintenance	7	3	1	0
Software development	6	3	1	0
Physical basis for remote sensing	7	3	2	0
Satellite image interpretation	12	4	2	0
Other	0	0	0	0
Total	32	13	6	0

6.4 Virtual Laboratory Usage Report – Question 12 and 13

Question 12 and 13 asked Members if they aware of the Virtual Laboratory (VLab) and use its facilities for education and training. 12 members responded they are *aware* of the VLab and six responded they *are not*, and seven members responded they *use* VLab to support training activities and 11 members responded they *do not use* it. The number of awareness was larger than that of usage, and this result remained almost unchanged compared to that in the previous WMO questionnaire. Promotion of the VLab is still needed. However, there could be the limiting factors such that internet environment has not developed enough yet.

6.5 Changes in Education and Training – Question 15

Question 15 addressed the changes in education and training over the period of the questionnaire. Table 12a shows extent to which education and training in satellite meteorology changed. Compared to the previous WMO questionnaire (Table 13b), one Member responded that there was significant decrease. It was reported that to enhance capacity building in application of satellite meteorology and satellite technology, a large scale of training is required to improve the present situation. The support of E-learning in satellite meteorology by WMO and the regular training were also required. It was strongly recognized that cultivating the human resource is the most important thing.

Table 12a – Changes in Education - RA II questionnaire (2010-2011)

Significant increase in staff training	Slight increase in staff training	No significant change in staff training	Slight decrease in staff training	Significant decrease in staff training
1	6	10	0	1

Table 12b – Changes in Education in RA II - WMO questionnaire (2008-2009)

Significant increase in staff training	Slight increase in staff training	No significant change in staff training	Slight decrease in staff training	Significant decrease in staff training
2	8	12	0	0

6 ADDITIONAL INFORMATION – Questionnaire Section 5

7.1 Methods of Releasing Satellite Images to the Public – Question 16

Question 16 sought to identify how satellite images are released to the public. Table 13 shows that through website and through televisions were the popular ways to release satellite images, and some Members responded that these were also available via mobile platforms.

Table 13 - Methods of releasing satellite images

through televisions	through newspapers	through website of meteorological organization	others
11	5	15	4

8 SUMMARY OF KEY FINDINGS

- 19 out of 35 members in RA II responded to this questionnaire.
- Two members responded that there's slight decrease in data access.
- Digital data disseminated via satellites and digital data obtained from the internet were the most popular mechanism of data reception, and it was recognized that analogue data obtained from the internet was also the popular mechanism.
- There was a strong need for the data from Research and Development and other environmental satellites, especially TRMM. Data from NPP was also requested.
- A stronger product processing capability is needed.
- It can be said that monitoring dust is highly interested in RA II and it seems that atmosphere-ocean interaction is getting an interest from RA II Members.
- A large scale of training, the support of E-learning in satellite meteorology by WMO and the regular training were required.

9 AFTERWORD

This report is the preliminary report of RA II Pilot Project Web Questionnaire, conducted in the third phase. The final report will be released in the next Coordinating Group meeting.

RA II Pilot Project is planning to conduct the questionnaire every year. The question items could be changed to see more about the needs in RA II.

(Keiko YAMAMOTO, JMA)

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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 Dohyeong KIM, 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:
ra2pp_sat@googlegroups.com

RA II Pilot Project Home Page

http://www.wmo.int/pages/porg/sat/ra2pilotproject-intro_en.php

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