

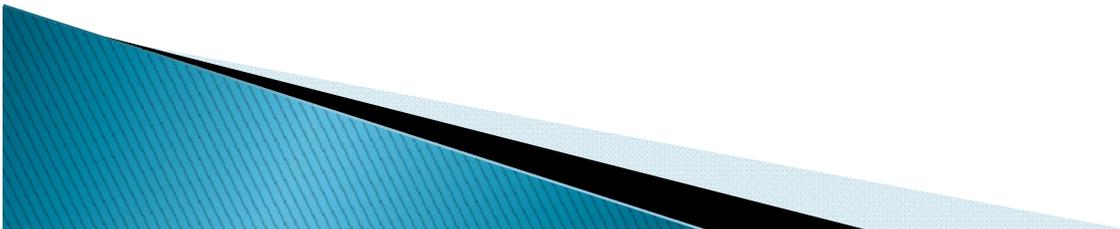
Status of the Global Change Observation Mission (GCOM)



Keizo Nakagawa
GCOM Project Team, JAXA
January 8th, 2013

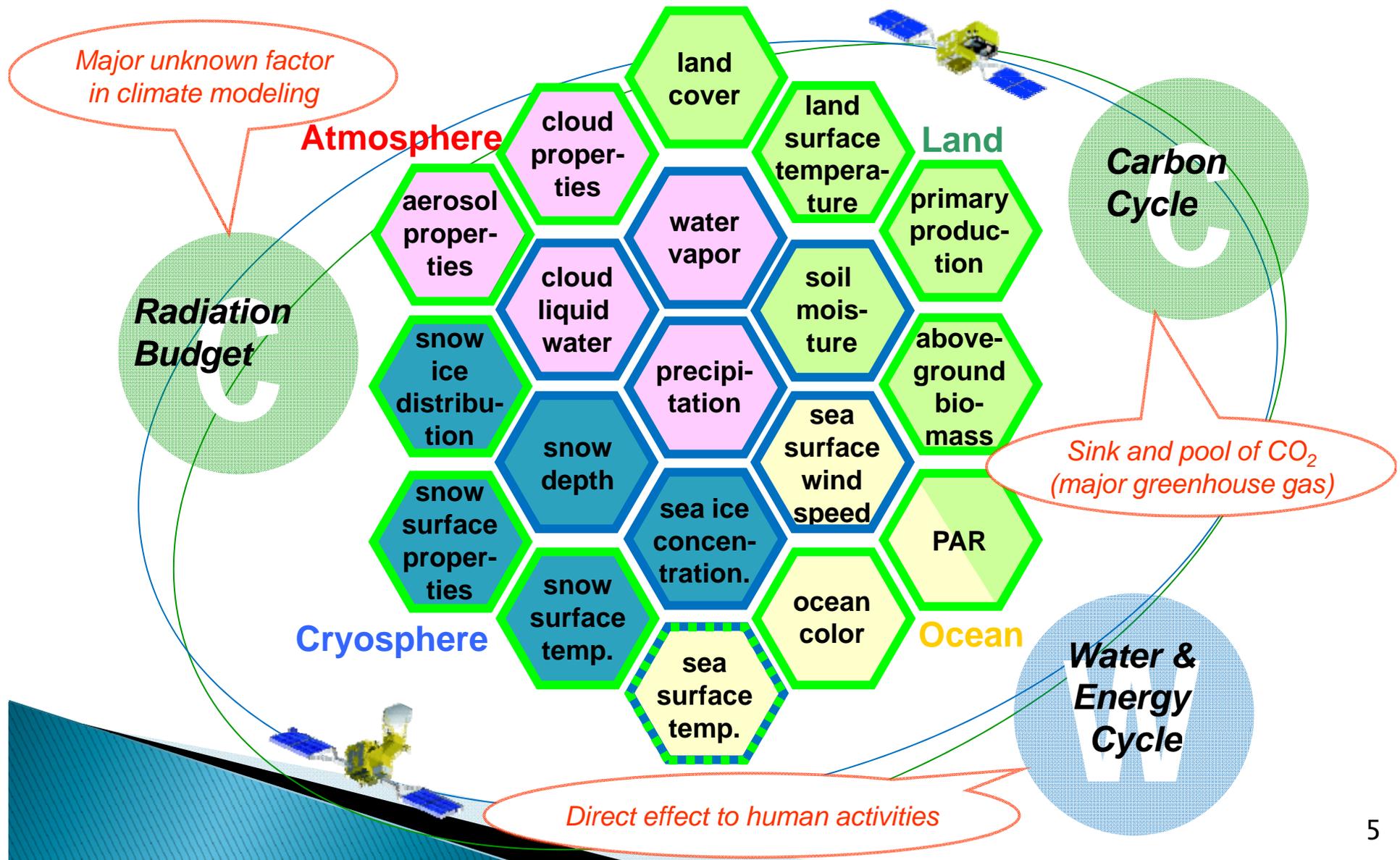
Contents

- ▶ GCOM mission and design
- ▶ Status of GCOM-W1
- ▶ Status of GCOM-C1
- ▶ Conclusion



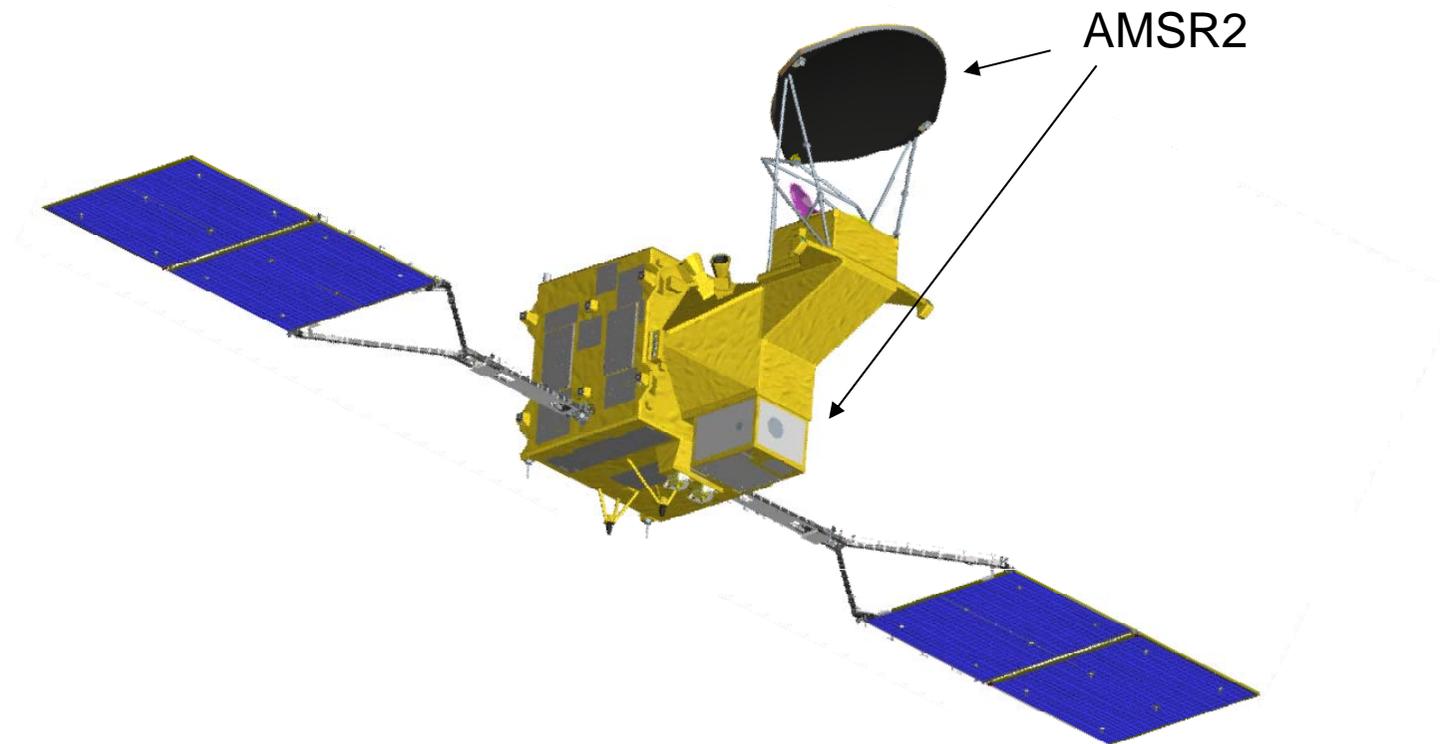
GCOM mission and design

GCOM Geophysical Products



GCOM-W1

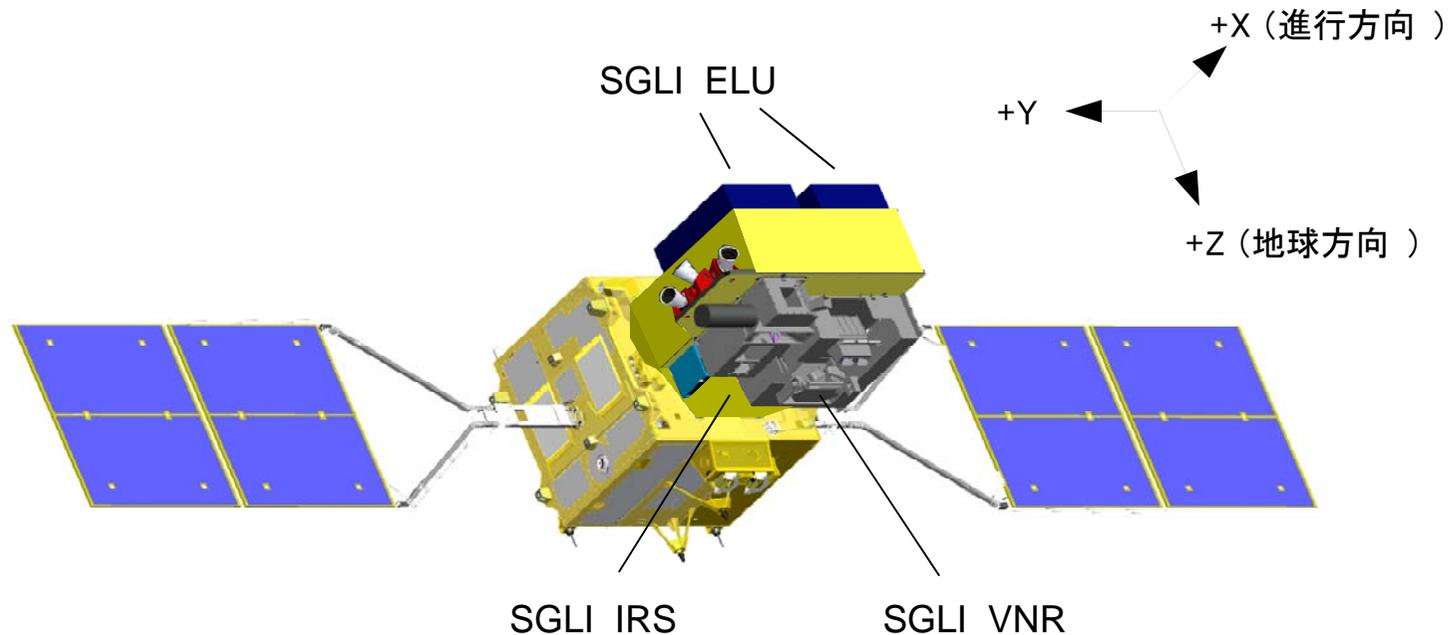
- ▶ GCOM-W1 in-orbit configuration
 - AMSR2*: Multi frequency and dual polarized passive microwave radiometer



*AMSR2: Advanced Microwave Scanning Radiometer-2

GCOM-C1

- GCOM-C1 in-orbit configuration
 - SGLI*: Multi-band imaging radiometers which consist of VNR** and IRS***.



*SGLI : Second Generation Global Imager
**VNR : Visible and Near-Infrared Radiometer
***IRS : Infrared Scanner

GCOM satellite system design

	GCOM-W1	GCOM-C1
Orbit	Sun synchronous orbit (A-Train orbit) Altitude : 699.6km (on Equator) Inclination : 98.2° Local sun time : 13:30±15min	Sun synchronous orbit Altitude : 798km (on Equator) Inclination : 98.6° Local sun time : 10:30±15 min
Life	5 years	5 years
Launch	May 18, 2012 by H-IIA Rocket	JFY 2015 by H-IIA Rocket
Satellite scale	5.1m (X) × 17.5m (Y) × 3.4m (Z) (on-orbit)	4.6m (X) × 16.3m (Y) × 2.8m (Z) (on orbit)
Satellite mass	1991kg	2067kg
Power generation	More than 3880W (EOL)	More than 4000W (EOL)

The design of bus system is common between GCOM-W1 and GCOM-C1.

GCOM instrument characteristics

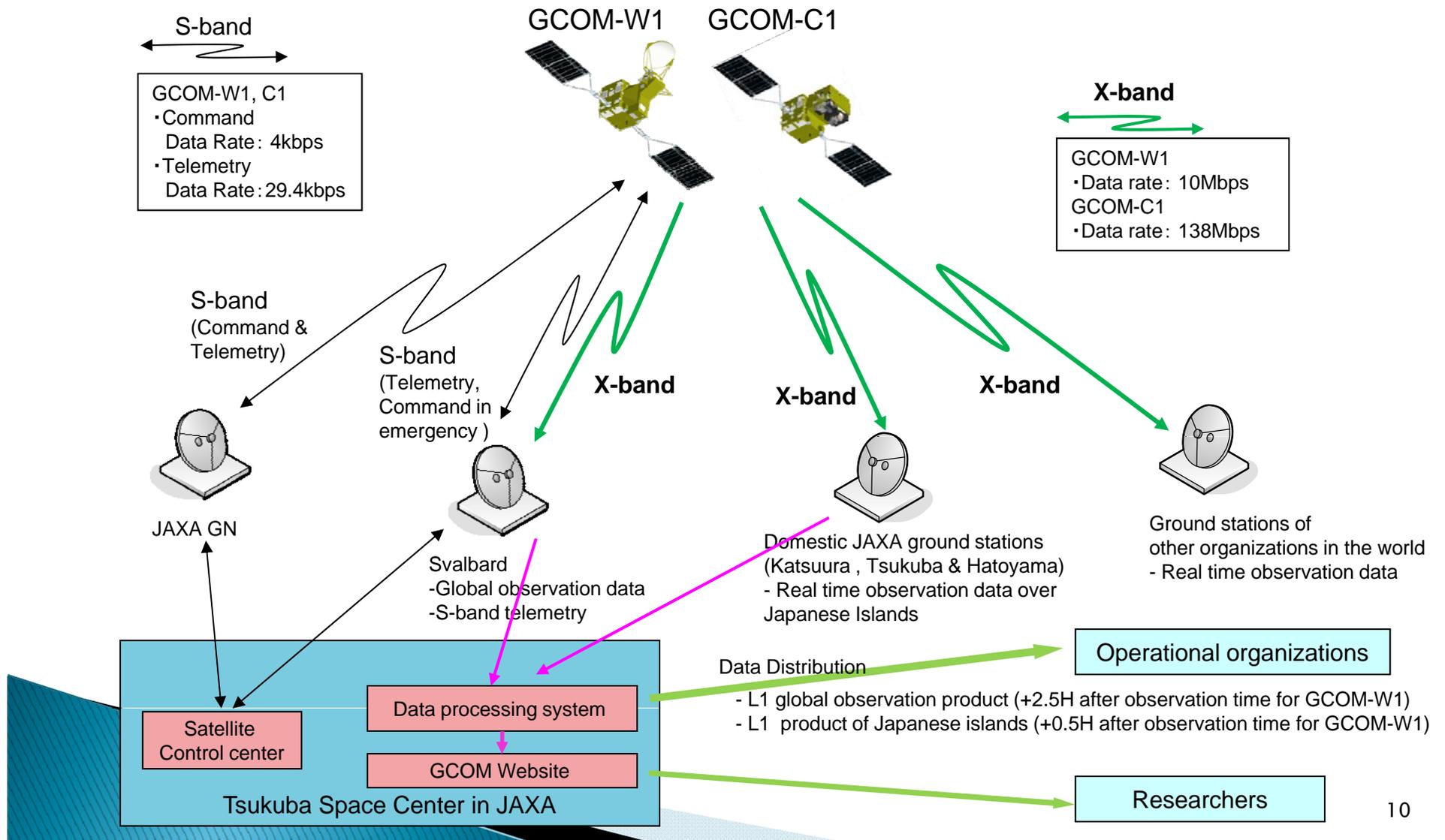
AMSR2

AMSR2 Channel Set				
Center Freq. [GHz]	Band width [MHz]	Polarization	Beam width [deg] (Ground res. [km])	Sampling interval [km]
6.925/7.3	350	V and H	1.8 (35 x 62)	10
			1.7 (34 x 58)	
10.65	100		1.2 (24 x 42)	
18.7	200		0.65 (14 x 22)	
23.8	400		0.75 (15 x 26)	
36.5	1000		0.35 (7 x 12)	
89.0	3000		0.15 (3 x 5)	5

SGLI

SGLI channels					
CH	λ	$\Delta\lambda$	L_{std}	L_{max}	IFOV
	VN, PL, SW: nm T: μm		VNR, SWI: $\text{W}/\text{m}^2/\text{sr}/\mu\text{m}$ T: Kelvin		m
VN1	380	10	60	210	250/1000
VN2	412	10	75	250	250/1000
VN3	443	10	64	400	250/1000
VN4	490	10	53	120	250/1000
VN5	530	20	41	350	250/1000
VN6	565	20	33	90	250/1000
VN7	673.5	20	23	62	250/1000
VN8			25	210	250/1000
VN9	763	12	40	350	250/1000
VN10	868.5	20	8	30	250/1000
VN11			30	300	250/1000
PL1	673.5	20	25	250	1000
PL2	868.5	20	30	300	1000
SW1	1050	20	57	248	1000
SW2	1380	20	8	103	1000
SW3	1630	200	3	50	250/1000
SW4	2210	50	1.9	20	1000
T1	10.8	0.74	300	340	500/1000
T2	12.0	0.74	300	340	500/1000

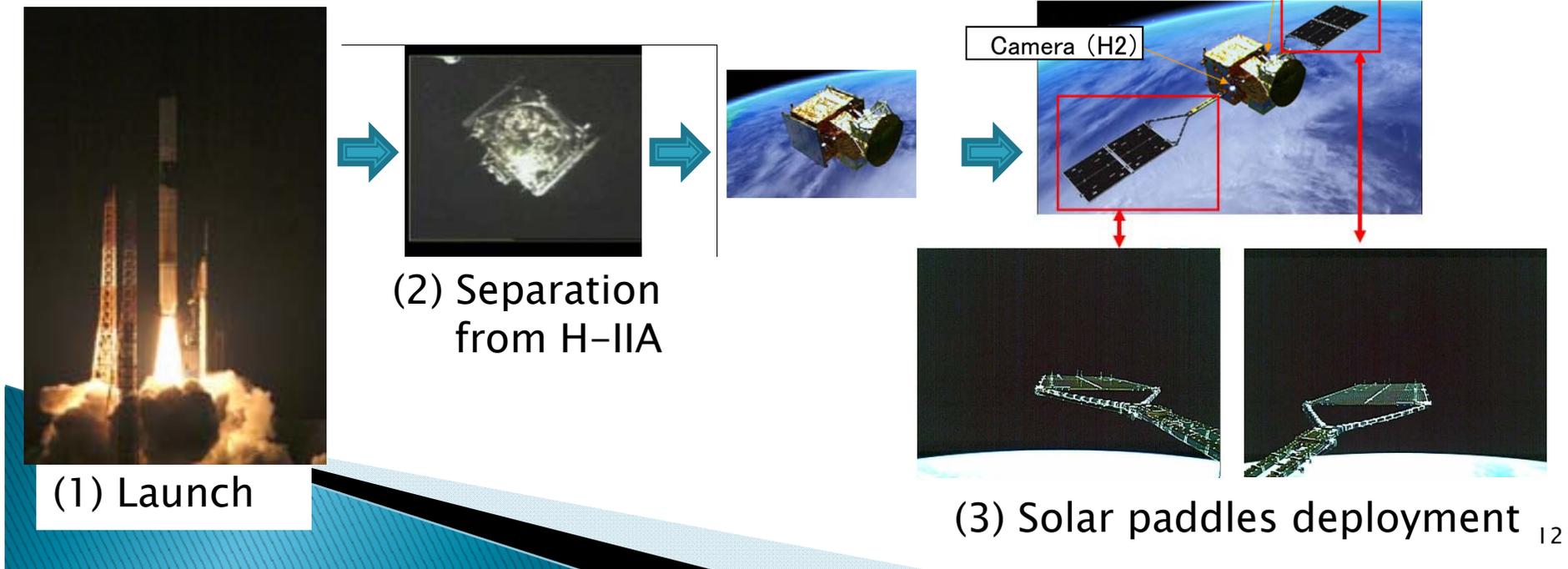
GCOM operational concept



Status of GCOM-W1

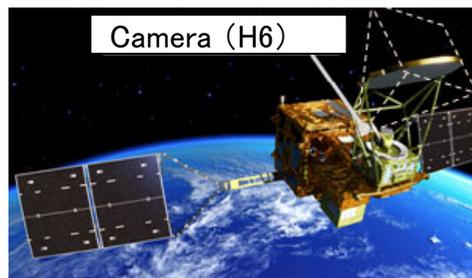
GCOM-W1 launch

- (1) 16:39, May 17th (UT), 2012: GCOM-W1 was launched at Tanegashima-island.
- (2) 17:02 (UT): Separated from H-IIA Rocket.
- (3) 17:05 (UT): Deployed solar paddles.



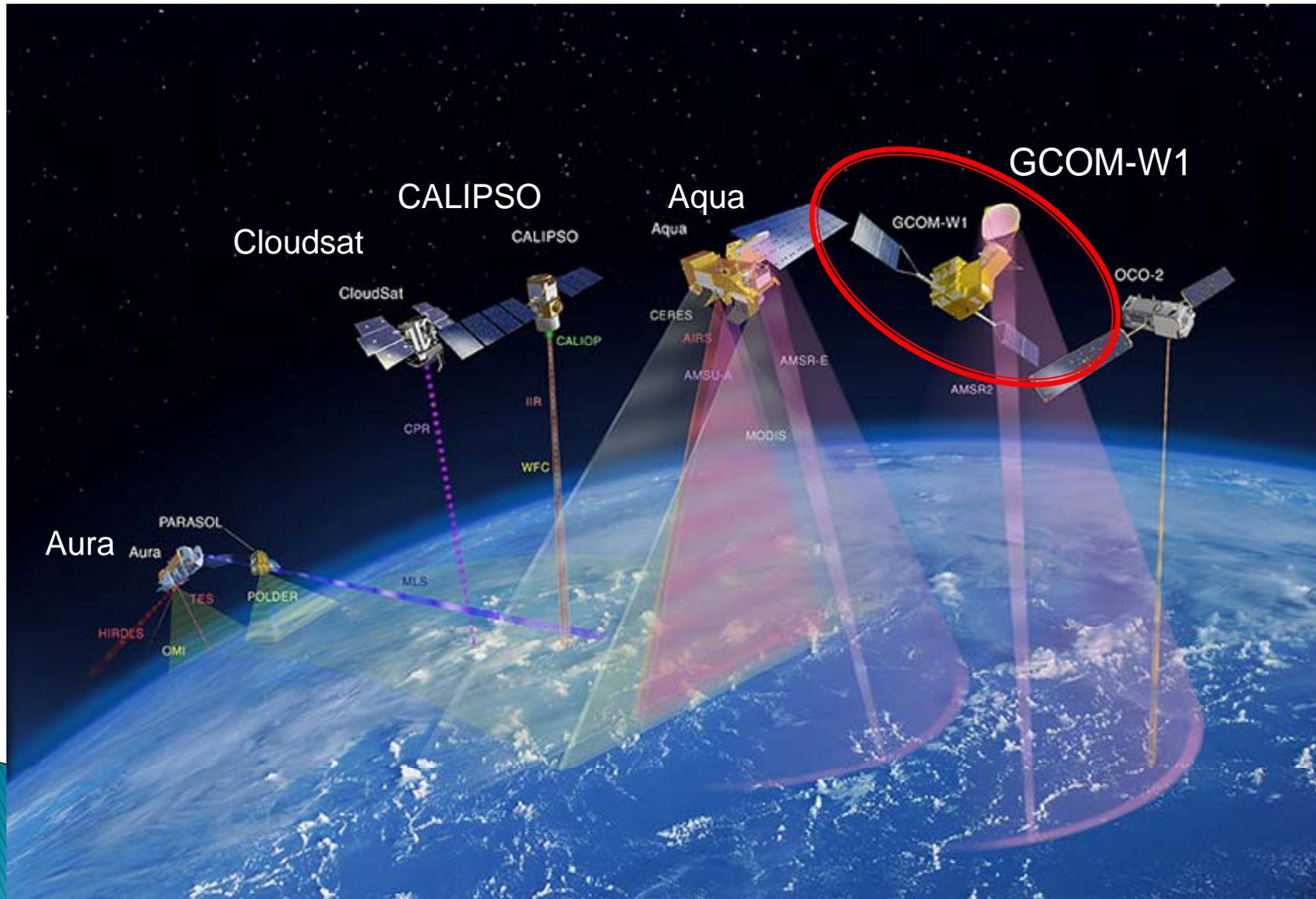
GCOM-W1 initial operation

- (4) 3:43, May 18th (UT), 2012: The antenna of AMSR2 was deployed.
- (5) 13:34 (UT): AMSR2 started rotation in 4 rpm.
- (6) 17:00 (UT): The Critical Operational Phase was finished.



(4) AMSR2 antenna deployment

Participation in A-Train



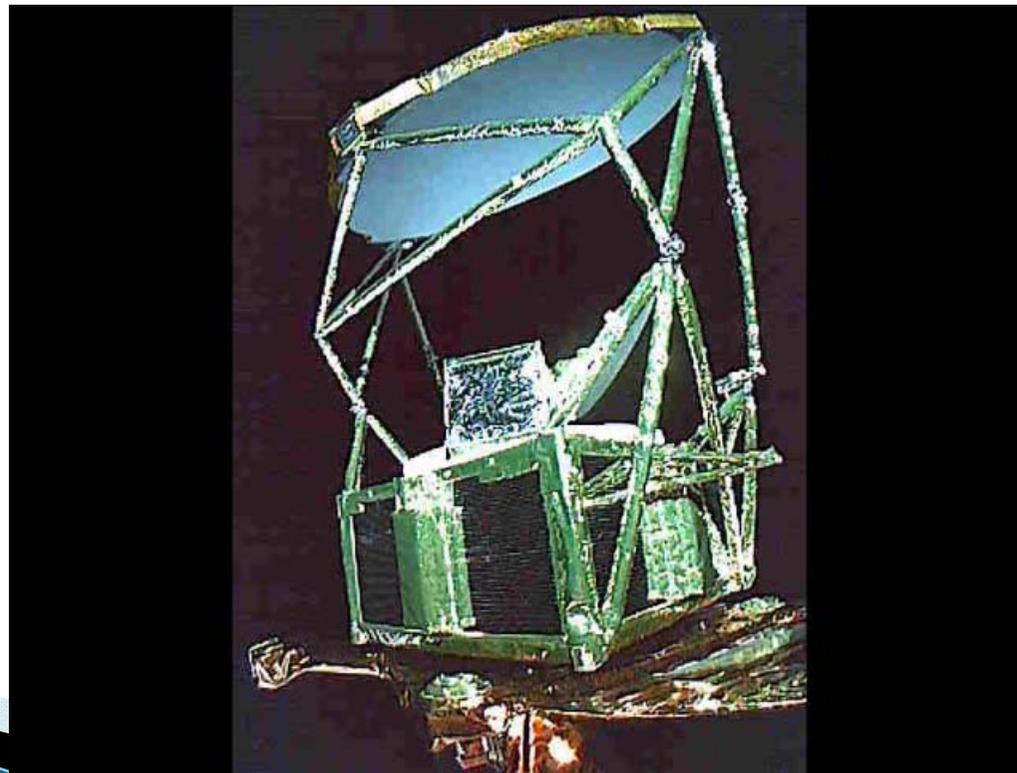
GCOM-W1 initial operation

(7) June 29th (UT): Entered to the specified position of A-Train.

(8) July 2nd (UT): AMSR2 antenna was spun up to 40 rpm.

(9) July 3rd (UT): AMSR2 began the observation.

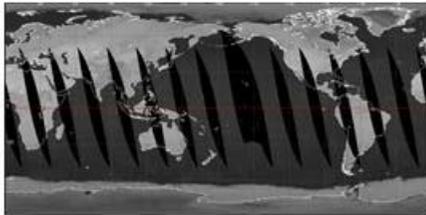
(8) AMSR2 40 rpm
rotation



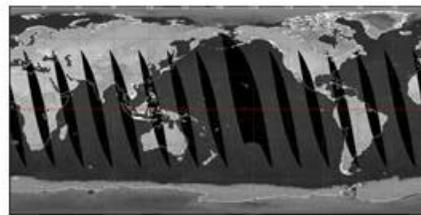
Products of AMSR2 (Level 1)



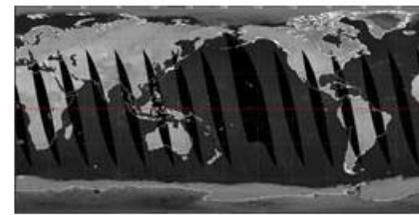
Brightness Temperature (Ascending Orbits) (Not Calibrated)



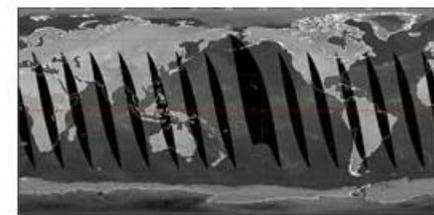
6.9V



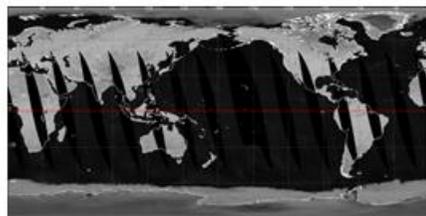
7.3V



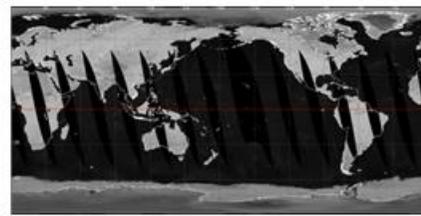
10V



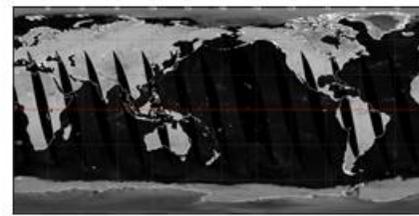
18V



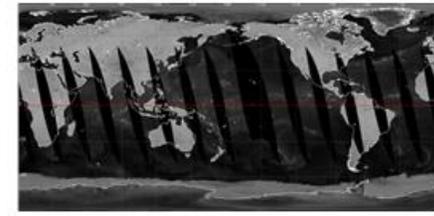
6.9H



7.3H



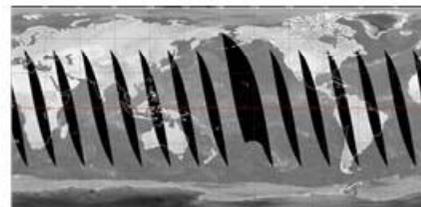
10H



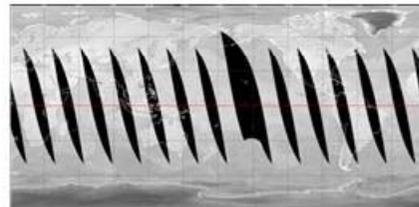
18H



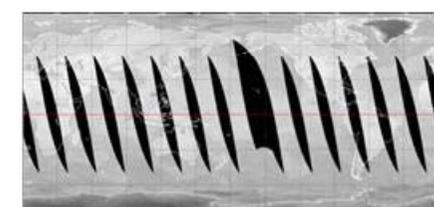
23V



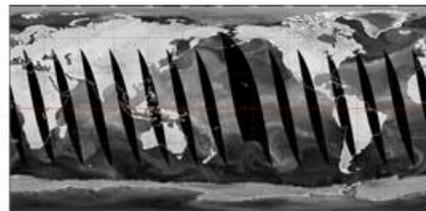
36V



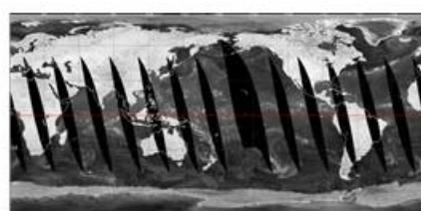
89AV



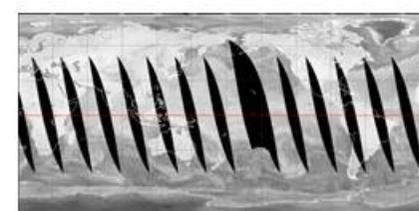
89BV



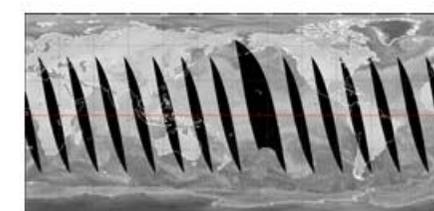
23H



36H



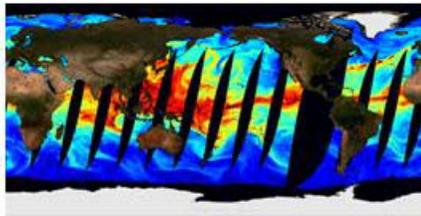
89AH



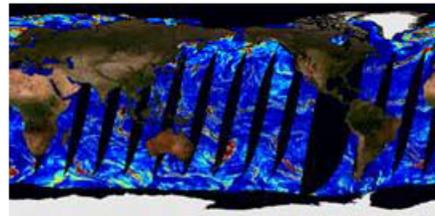
89BH

Products of AMSR2 (Level 2)

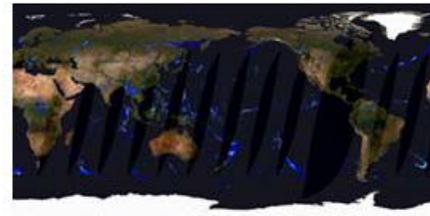
Geophysical parameter products
(Descending Orbits) (Not Validated)



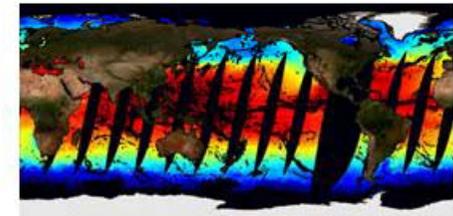
Integrated water vapor



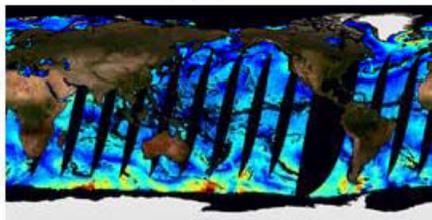
Integrated cloud liquid water



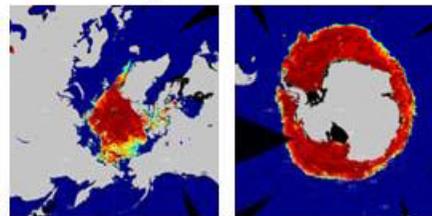
Precipitation



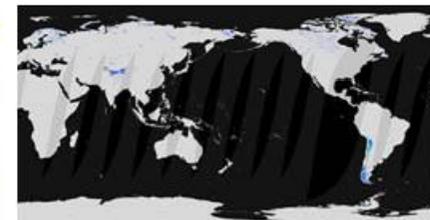
Sea surface temperature



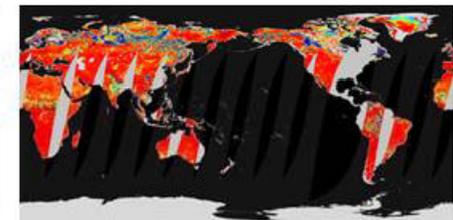
Sea surface wind speed



North Pole South Pole
Sea ice concentration



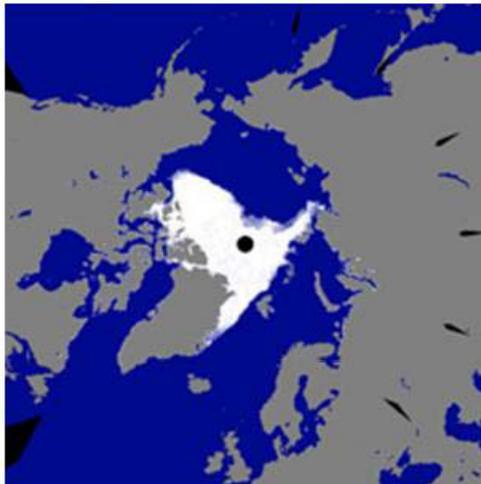
Snow depth



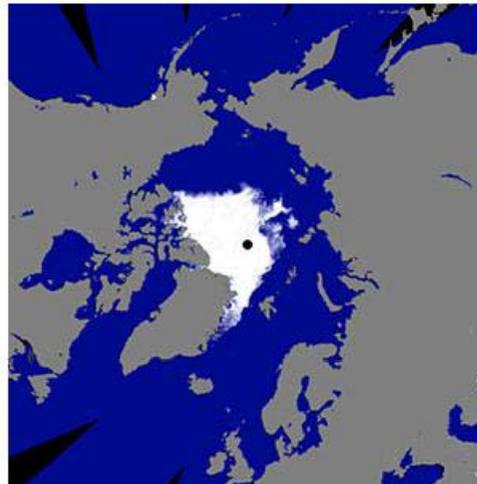
Soil moisture content

Topics: Arctic Sea Ice Extent

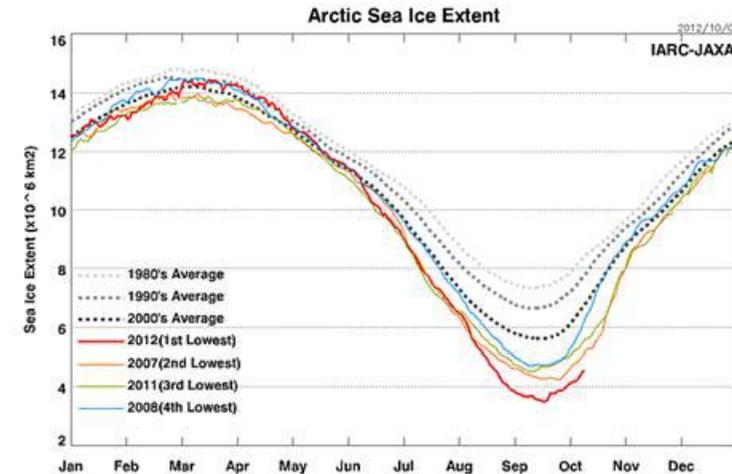
AMSR2 observed the minimum record of Arctic sea ice extent on September 16th, 2012. Before then the minimum record was observed by AMSR-E on September 24th, 2007.



Sep. 24, 2007 by AMSR-E



Sep. 16 2012 by AMSR2
(new minimum record)



Seasonal variation
of the Arctic sea ice extent

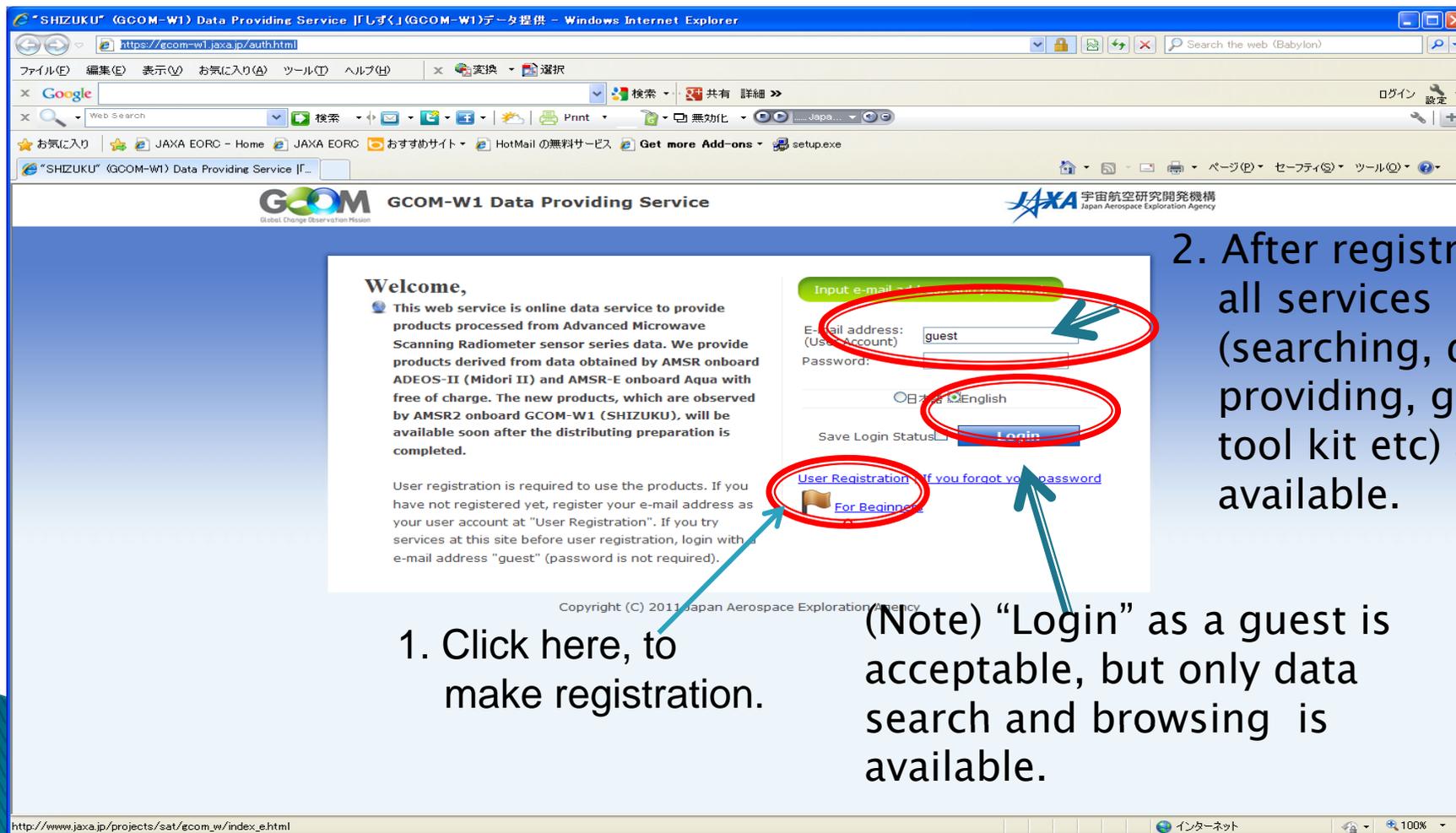
Future planning

- ▶ L1 products (brightness temperatures) are planned to be released in late January, 2013 at the GCOM-W1 Data Providing Service:
<https://gcom-w1.jaxa.jp>
- ▶ L2 products (geophysical parameter products) are planning to be open at the same web site in May, 2013, after the CAL/VAL activity.

How to get AMSR2 Data

Visit this URL : <https://gcom-w1.jaxa.jp>

Top menu of GCOM-W1 Data Providing Service



1. Click here, to make registration.

2. After registration, all services (searching, data providing, getting tool kit etc) are available.

(Note) "Login" as a guest is acceptable, but only data search and browsing is available.

Data Providing Service 1st menu

Navigation Home

This web service is online data service to provide products processed from Advanced Microwave Scanning Radiometer sensor series data. We provide products derived from data obtained by AMSR onboard ADEOS-II (Midori II) and AMSR-E onboard Aqua with free of charge. The new products, which are observed by AMSR2 onboard GCOM-W1 (SHIZUKU), will be available soon after the distributing preparation is completed.

 [Feedback!! Tell us what you think.](#)

Search Product (Search Function)

If you search and order products, please select one of the following three ways:

- Categories or Physical Parameters**
- Explanations**
- Satellites or Sensors**  [For Beginners](#)

The following products are provided.

Category	Physical Parameters
Atmosphere	Total Precipitable Water, Cloud Liquid Water, Precipitation
Ocean	Sea Surface Temperature, Sea Surface Wind speed
Cryosphere	Sea Ice Concentration
Land	Snow Depth, Soil Moisture Content
Brightness temperature	Brightness Temperature

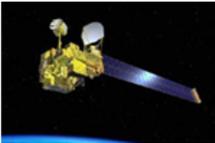
Satellites and Sensors which acquire data offered on this site are as follows:



GCOM-W1/AMSR2



Aqua(US)/AMSR-E



ADEOS-II/AMSR

Information

New Information

stop immediate download on the website. There is no effect on the other downloads.

«Aug 28, 2012»
This web service was restarted.

«Aug 23, 2012»
This web service will be down for scheduled maintenance during the following period.
Aug. 28, 2012 0:30-7:00(UT).

«Jul 24, 2012»
Available for higher level products of AMSR-E processed by version 7. For more information, please refer to [this page](#).

«Jul 04, 2012»
GCOM-W1 "SHIZUKU" onboard sensor (AMSR2) acquired observation data. For more information, please refer to [this page](#).

Satellite and Sensor related

AMSR-E sensor operational information are distributed [here](#).

Document and Tool

User's manual and format descriptions are available [here](#).
Tools for data viewer are distributed [here](#).

Related Site Information

GCOM-W1/AMSR2
Japan Aerospace Exploration Agency (JAXA)
-- About GCOM-W project
-- Research (FORC)

If you click here, the explanation of search function will appear.

- Format**
- HDF (original)
 - NetCDF
 - GeoTIFF

Three AMSRs will be available at this service.

How to get the near-real time data

Top menu of GCOM-W1 Data Providing Service



Various tools for analyzing data are distributed free of charge.

[Download Toolkits](#)

Document and Guide

User's Manual and Format Conversion Descriptions are available here.

[Download Documents](#)

About Algorithm theoretical basis document (ATBD), refer to [EORC Bulletin/Technical Report](#).

Attention

Please see the following notes:

- [Recommended Environment](#)
- [Terms of use](#)
- [Implementation Guideline for GCOM-W1 Data Provision \(including the application form for becoming "Special-User"\)](#)

[Mission Directorate\)](#)
-- [AMSR/AMSR-E Home Page](#)

National Aeronautics and Space Administration (NAS)
-- [Aqua Project Science](#)
-- [AMSR-E](#)

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Click "Implementation Guideline for GCOM-W1 Data Provision" and download the application form for becoming "Special-User". Special Users can download the near-real time data.

Application of special user

SGC-120034



Implementation Guideline for GCOM-W1 Data Provision

SGC-120034

Appendix 1

Application Form for becoming a GCOM-W1 Data Providing service “Special User”

Document Number

MMMM DD XXXX

1. GCOM-W1 Data Utilization

(1) Purpose

JAXA aims to see GCOM-W1 water circulation change mechanism so that the data will take root in science.

(2) Policy

In order to achieve the above-mentioned purpose, the data is constructed so that the GCOM data can be used for various purposes.

Moreover, through proactive collaboration, the data use can be enlarged, and new products and services can be provided through wide provision.

1) Collaboration with research

Observation data (including the observation sensor data) and validation of GCOM-W1 data using other satellite data to conduct research on the accuracy for long-term data.

2) Collaboration with other organizations

Processed data is provided to other organizations carrying out demonstration of weather forecasting or oceanographic condition management. Moreover, through these organizations,

To
Mr. Keizo Nakagawa, GCOM Project Manager,
Space Applications Mission Directorate,
Japan Aerospace Exploration Agency

I hereby apply for “Special User” services through the GCOM-W1 Data Providing service as follows. I have already agreed with the on-line data utilization policies of the GCOM-W1 Data Providing service and have registered for the Service using the following identification information. In addition, I agree to submit the results of my research or utilization results using the GCOM-W1 data to JAXA every fiscal year.

Registered user ID	
Data required	
Period of utilization of data	

Status of GCOM-C1

GCOM-C1 status

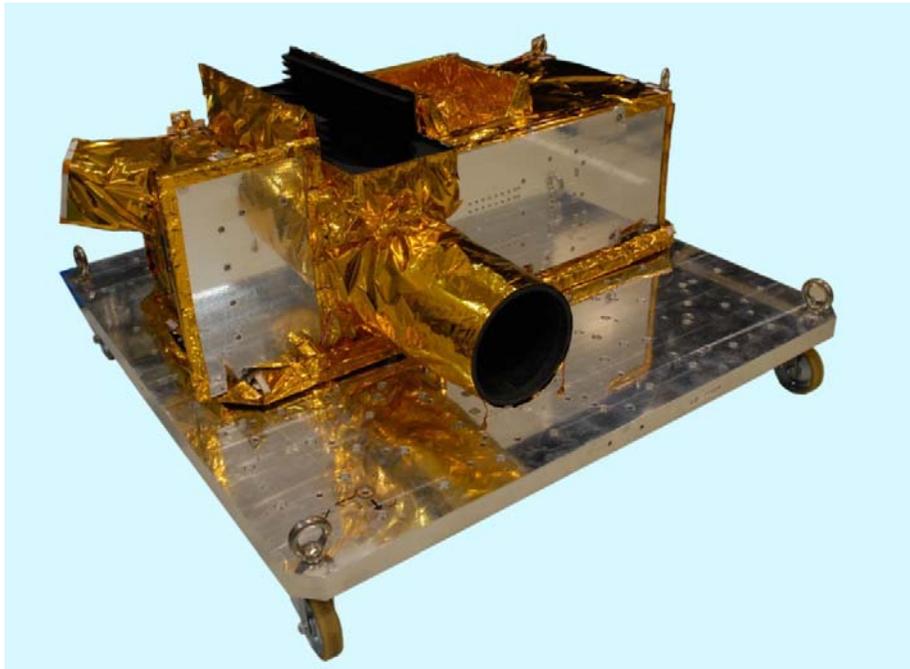
- ▶ The engineering model (EM) tests have been performed.
 - System structure model test was finished.
 - System thermal balance test was finished.
 - SGLI EM tests are being performed in a sensor level.
- ▶ The subsystem CDR's are on-going.
- ▶ The system CDR will be planned to be held in February 2013.

Structure model tests



Micro-vibration Test

SGLI Engineering Model



**SGLI Infrared Scanning Radiometer
(SGLI-IRS)**



**SGLI Visible and Near infrared radiometer
(SGLI-VNR)**

Conclusion

- ▶ GCOM-W1 was launched successfully and is operated in a good condition. The observation data will be released soon.
- ▶ GCOM-C1 is in the critical design phase and the system CDR will be held soon.