AMSR Series in A-Train
- Status/Products/Services for GCOM-W1-

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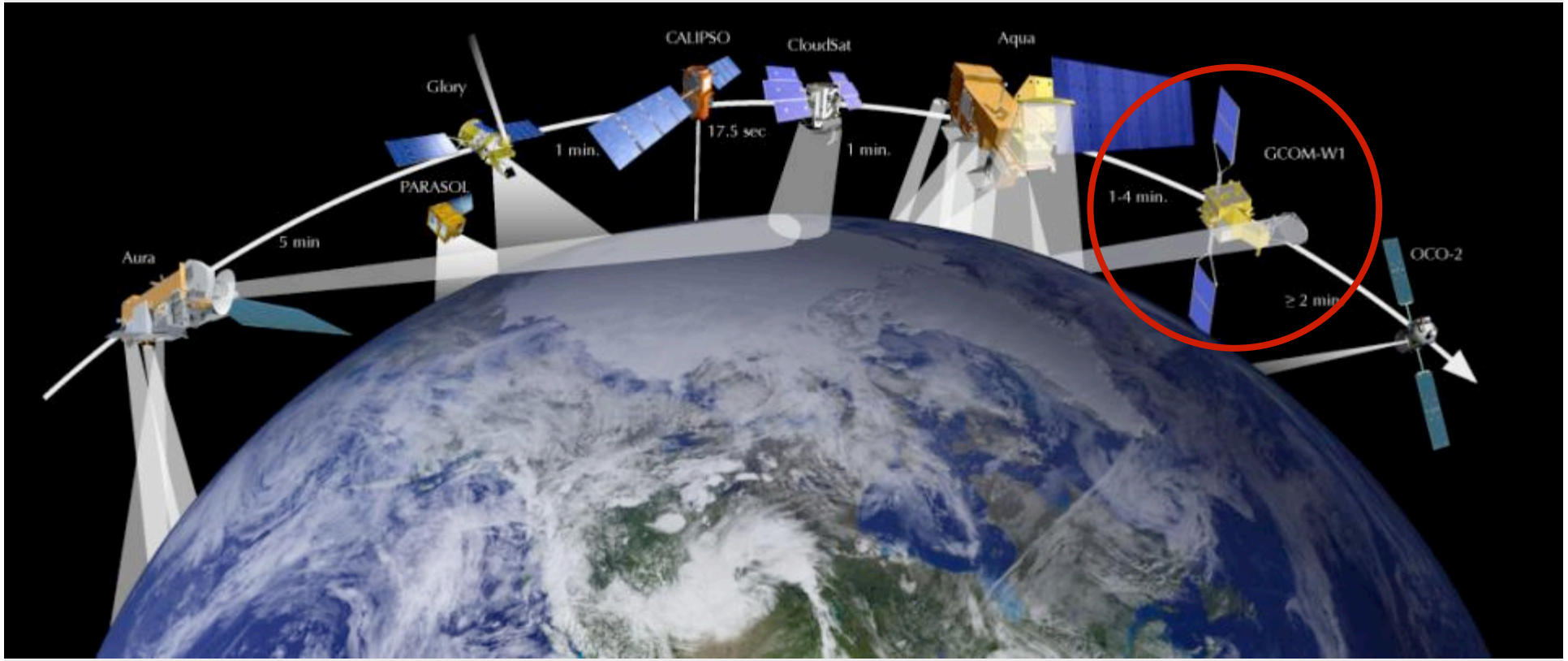
A-Train User Workshop
October 25, 2010
New Orleans, USA

GCOM-W1 will join in A-Train



AMSR2 Instrument


AMSR2

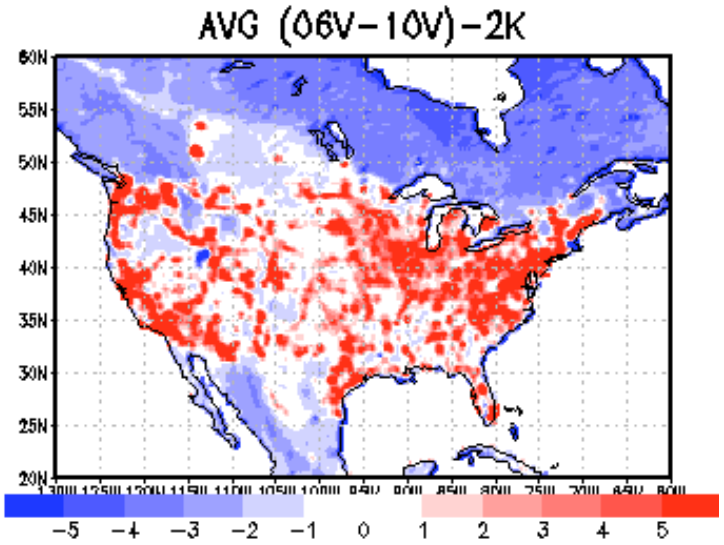

AMSR-E

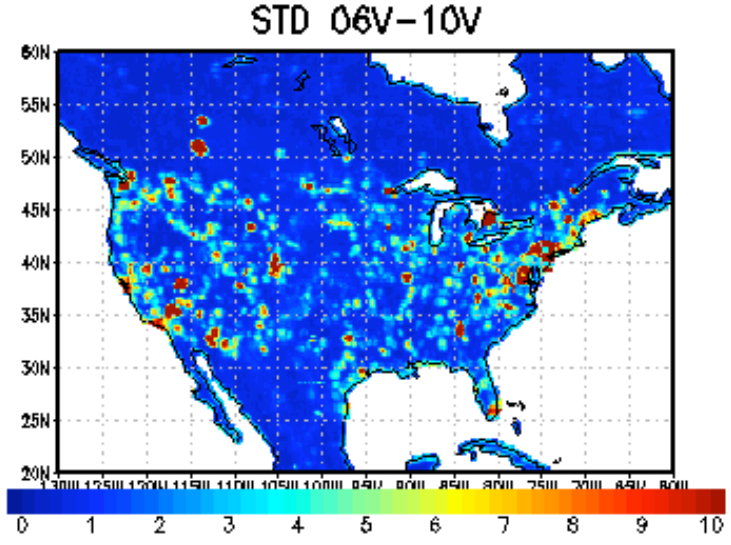
- Deployable main reflector system with 2.0m diameter (1.6m for AMSR-E).
- Frequency channel set is identical to that of AMSR-E except 7.3GHz channel for RFI mitigation.
- Two-point external calibration with improved HTS (hot-load).
- Deep space calibration maneuver to check consistency between main reflector and CSM.
- Add a redundant momentum wheel to increase reliability.

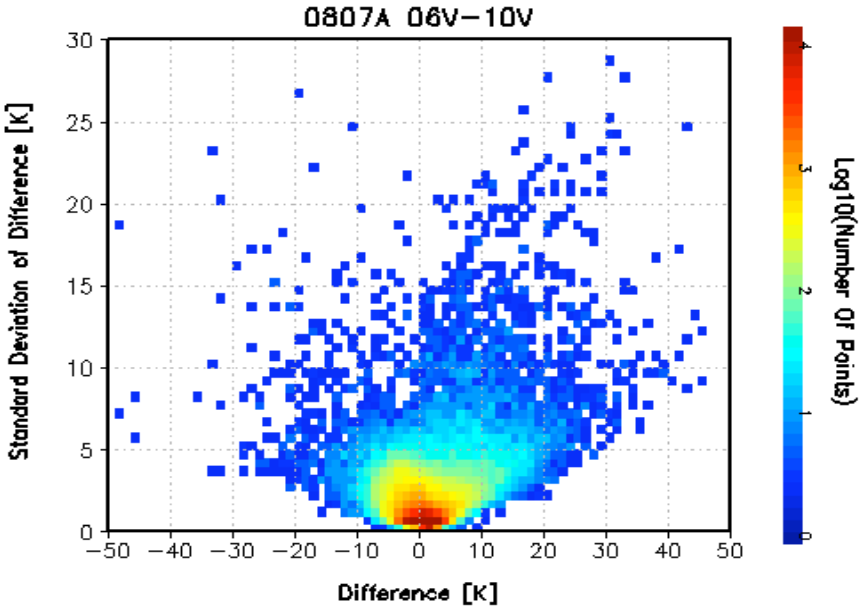
GCOM-W1/AMSR2 characteristics	
Scan and rate	Conical scan at 40 rpm
Antenna	Offset parabola with 2.0m dia.
Swath width	1450km
Incidence angle	Nominal 55 degrees
Digitization	12bits
Dynamic range	2.7-340K
Polarization	Vertical and horizontal

AMSR2 Channel Set				
Center Freq. [GHz]	Band width [MHz]	Pol.	Beam width [deg] (Ground res. [km])	Sampling interval [km]
6.925/ 7.3	350	V and H	1.8 (35 x 62)	10
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

RFI Signals in AMSR-E Data

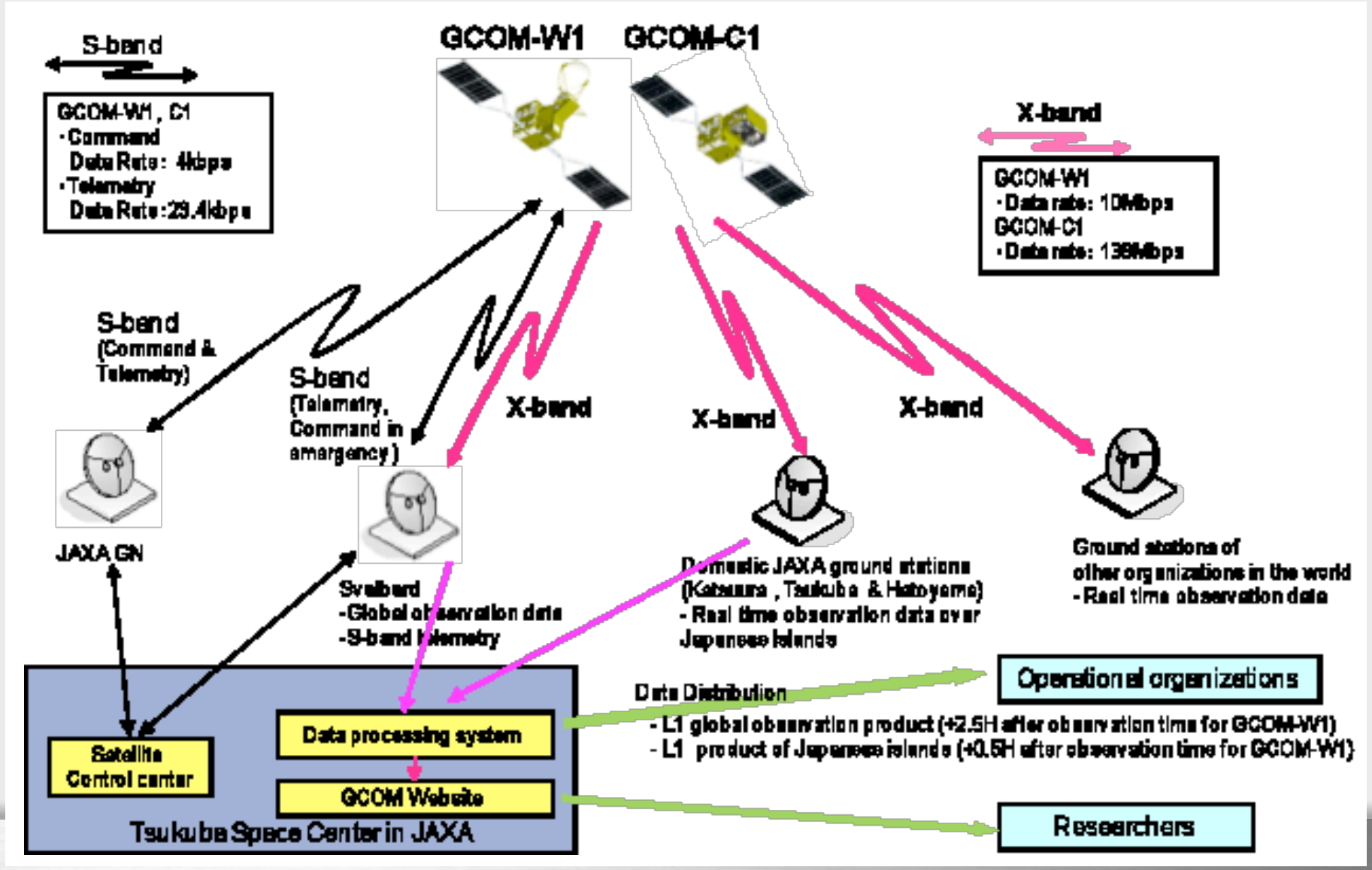






- Monthly Tb differences in July 2008 for average (top-left), standard deviation (top-right), and scatter plot between them (lower-left).
- Possible RFI signals are reported for 6.925 (most problematic), 10.65, and 18.7GHz channels of AMSR-E.
- Additional 7.3GHz channels are expected to increase RFI information.

GCOM Data Flow



Science Team and Products

- Science Team
  - Led by Professor Taikan Oki from the University of Tokyo.
  - Algorithm/Validation scientists were selected via international RA.
  - Selecting at-launch standard algorithms via algorithm comparison.
- Standard Product
  - Similar to AMSR-E, eight (8) geophysical parameters will be retrieved and distributed as standard products.
- Research Product
  - Potential candidates include all-weather sea surface wind speed, sea ice moving vector, sea ice thickness, land hydrological assimilated products, solid precipitation in high latitudes, and so forth.
- Near Realtime Product

Processing Levels

Level	Contents
Level-1A	•Swath data with geolocation information •Scene counts •½ orbit starting from northern/southern-most latitudes
Level-1B	•Swath data with geolocation information •Brightness temperatures •½ orbit starting from northern/southern-most latitudes
Level-1R	•Swath data with geolocation information •Spatial-resolution matched brightness temperatures •4 resolution sets (6,10,23,36GHz) and raw swath for 89GHz A/B
Level-2	•Swath data with geolocation information •Geophysical parameters (8 parameters) •½ orbit starting from northern/southern-most latitudes
Leve-3	•Grid data with 0.1/0.25 degrees (10/25km) resolution •Brightness temperatures and geophysical parameters •Daily and monthly temporal average •Equidistant Cylindrical and Polar Stereo Projection

- All products are in HDF5 format.

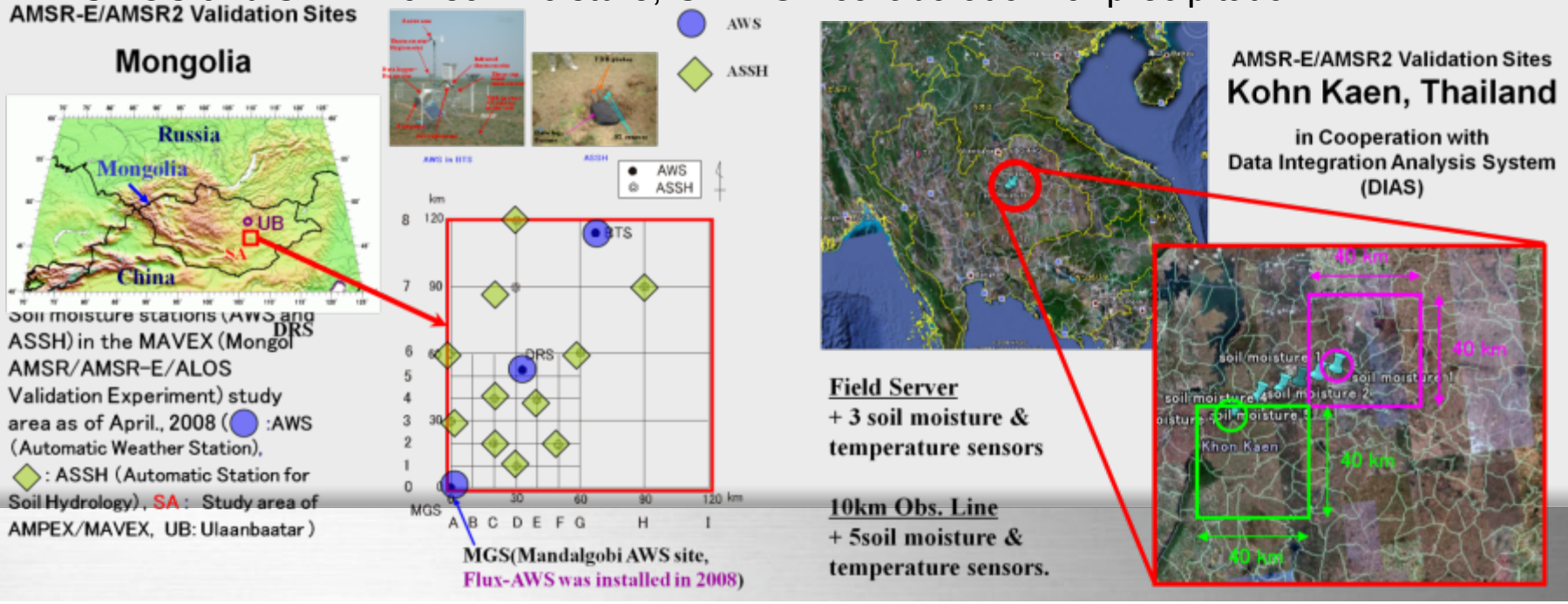
- Near Realtime products will be available for Level-1B/1R/2 with the granule of “received data length” at ground stations (not reshaped into half orbit) to minimize data latency.

GCOM-W1 Standard Products

Products		Areas	Res.	Accuracy			Range
				Release	Standard	Goal	
Brightness Temperature		Global	5–50km	±1.5K	±1.5K	±1.0K (systematic) ±0.3K (random)	2.7-340K
GEO	Integrated water vapor	Global, over ocean	15km	±3.5kg/m^2	±3.5kg/m^2	±2.0 kg/m^2	0-70kg/m^2
	Integrated cloud liquid water	Global, over ocean	15km	±0.10kg/ m^2	±0.05kg/ m^2	±0.02kg/ m^2	0-1.0kg/m^2
	Precipitation	Global, except cold latitude	15km	Ocean ±50% Land ±120%	Ocean ±50% Land ±120%	Ocean ±20% Land ±80%	0-20mm h^{-1}
	Sea surface temperature	Global, over ocean	50km	±0.5℃	±0.5℃	±0.2℃	-2-35℃
	Sea surface wind speed	Global, over ocean	15km	±1.5m s^{-1}	±1.0m s^{-1}	±1.0m s^{-1}	0-30m s^{-1}
	Sea ice concentration	Polar region, over ocean	15km	±10%	±10%	±5%	0-100%
	Snow depth	Land	30km	±20cm	±20cm	±10cm	0-100 cm
	Soil moisture	Land	50km	±10%	±10%	±5%	0-40%

Validation Activities

- Validation by utilizing the existing observation networks:
  - Radiosondes and GPS networks, SST and sea surface wind speed from various buoy system, Ground-based precipitation radar networks, Snow depth and other surface measurements by meteorological agencies, etc.
- Specific field campaigns/monitorings
  - Soil moisture test sites such as Mongolia, Thailand, and CEOP sites including Australia Murray-Darling Basin, and Snow depth test site in Yakutsuk.
- Potential interaction with other missions
  - SMOS and SMAP for soil moisture, GPM GV collaboration for precipitation.



Data Distribution Service

- New Data Distribution System for GCOM-W1
  - Search/Order/Distribution of all GCOM-W1 standard products, together with AMSR and AMSR-E standard products.
  - Direct download (i.e. data pool) of standard products via http and sftp.
  - Provision of satellite operation information and tools (e.g. I/O toolkit).
  - One-time registration for search/order/download of standard products.
  - Direct download of near realtime products for designated users.
- Research Product Distribution
  - Research products will be distributed from EORC ftp server.
  - Development of integrated browse website and calibration/validation monitoring pages are underway.
  - Multi-radiometer processing (e.g. including SSM/I and TMI) and data distribution via plain binary are under consideration.

Thank you for your attention.