AMSR Series in A-Train
- JAXA Products and Services for AMSR-E -

Keiji Imaoka and Akira Shibata
Earth Observation Research Center
Japan Aerospace Exploration Agency

A-Train User Workshop
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New Orleans, USA

Advanced Microwave Scanning Radiometer for EOS (AMSR-E)

Mission status

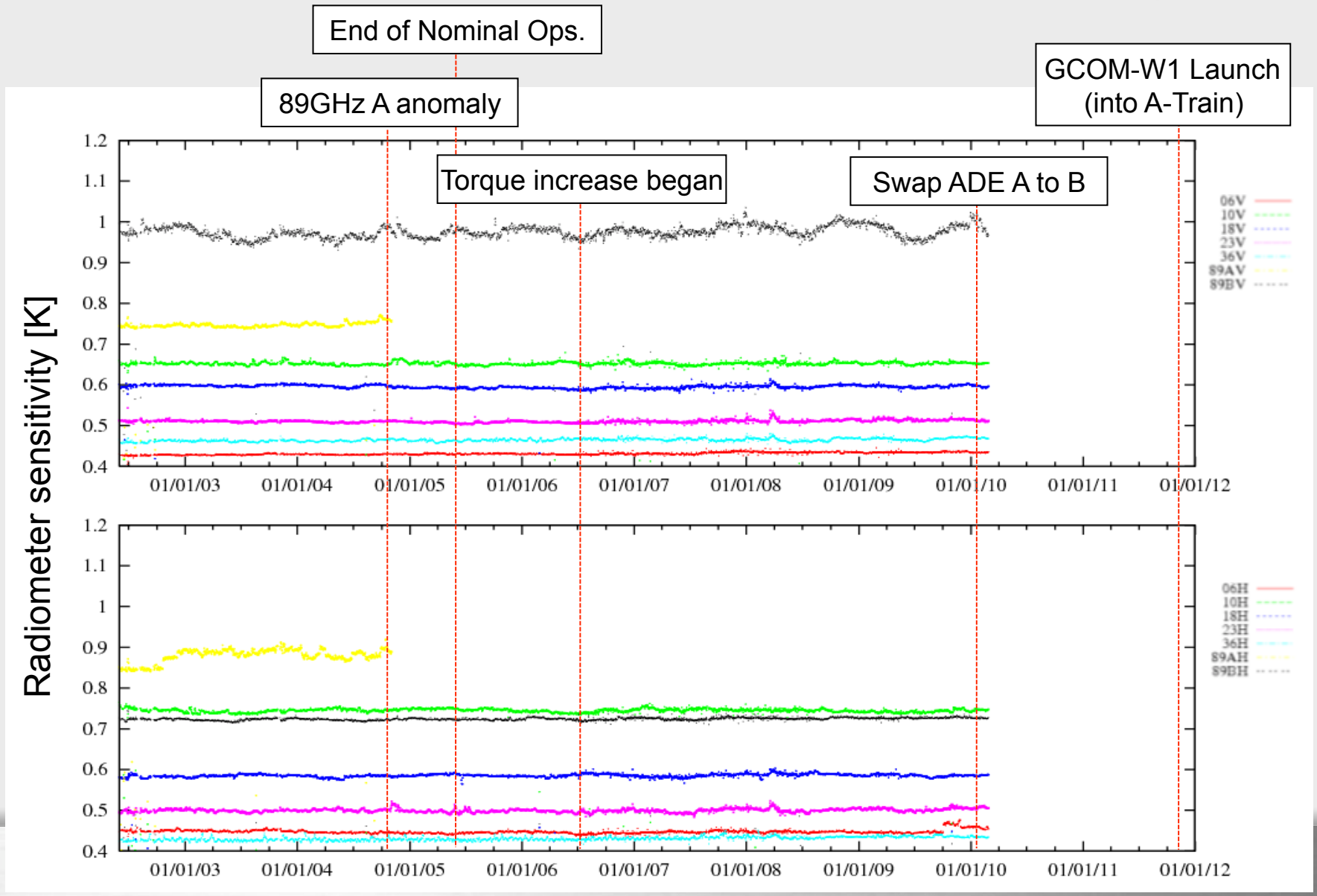
- Continuous observation over 8-years after the launch on May 4, 2002 onboard NASA's EOS Aqua satellite.
- Stable brightness temperature records, except the loss of 89GHz-A data from November 2004.

Instrument characteristics

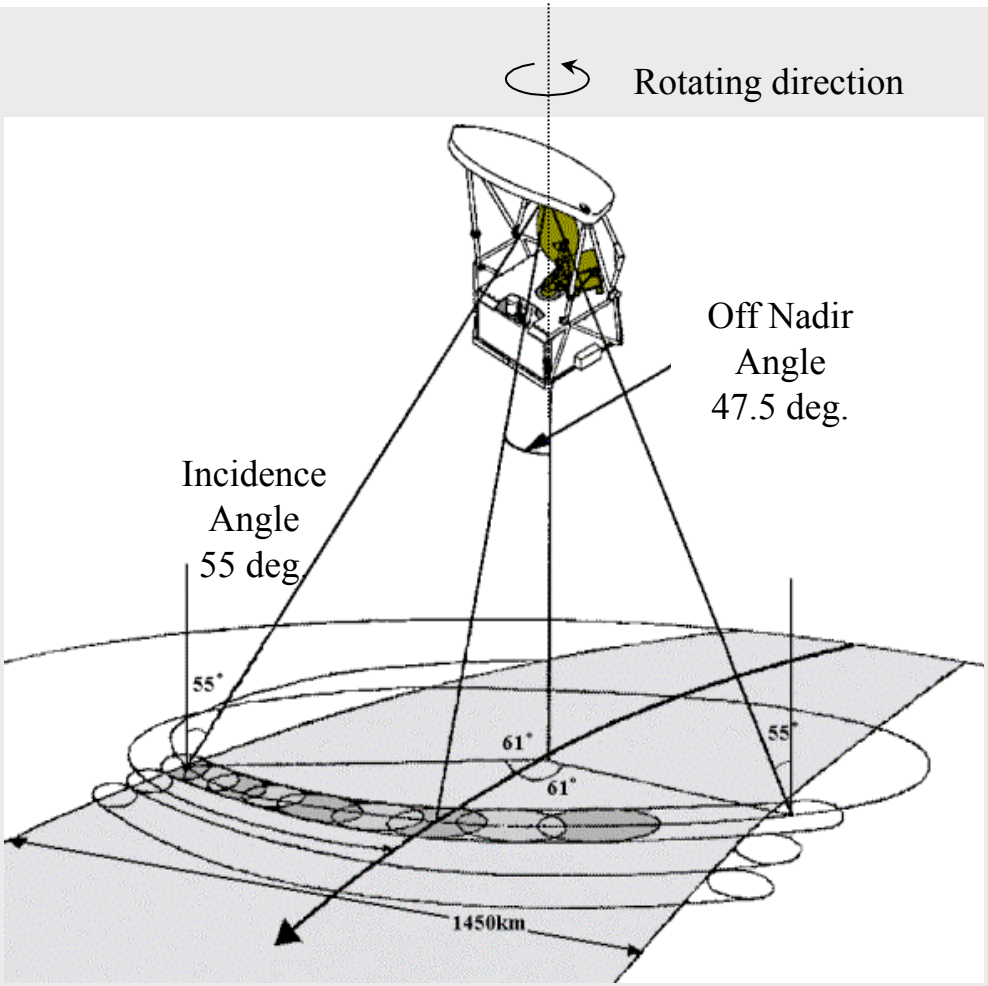
- Multi-frequency microwave radiometer, which is capable of observing various parameters related to water (developed by JAXA).
- High-spatial resolution compared to existing instruments by large size antenna.
- C-band (6.9GHz) channels for estimating SST and soil moisture.
- Afternoon (1:30 pm) equatorial crossing time that is currently unique for microwave radiometers.

Pre-launch AMSR-E in Tsukuba Space Center

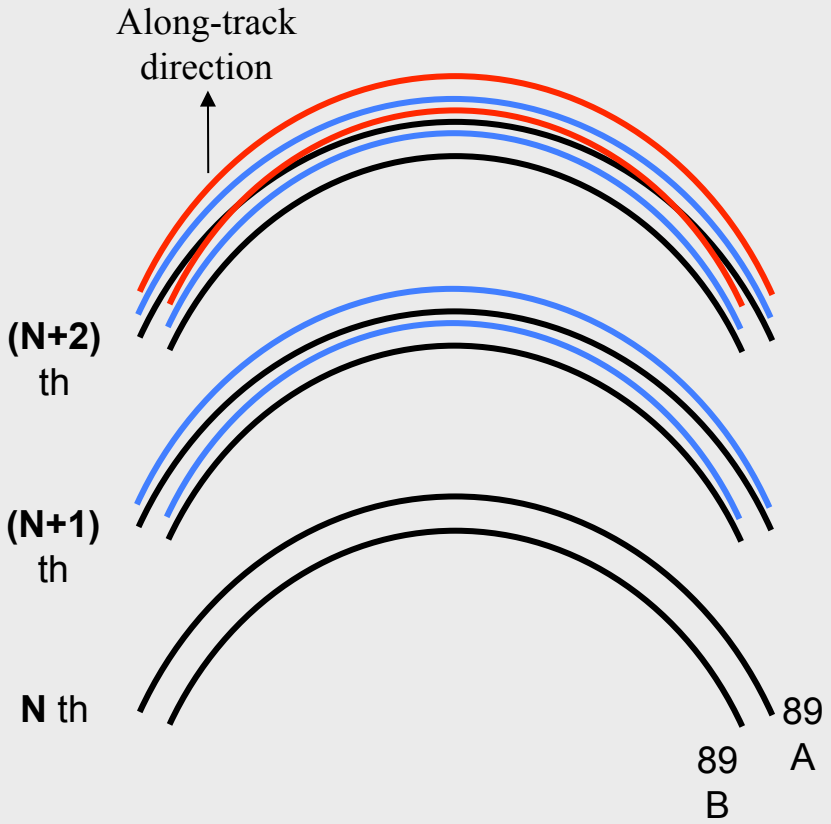
AMSR-E Operation Status



Scanning Geometry

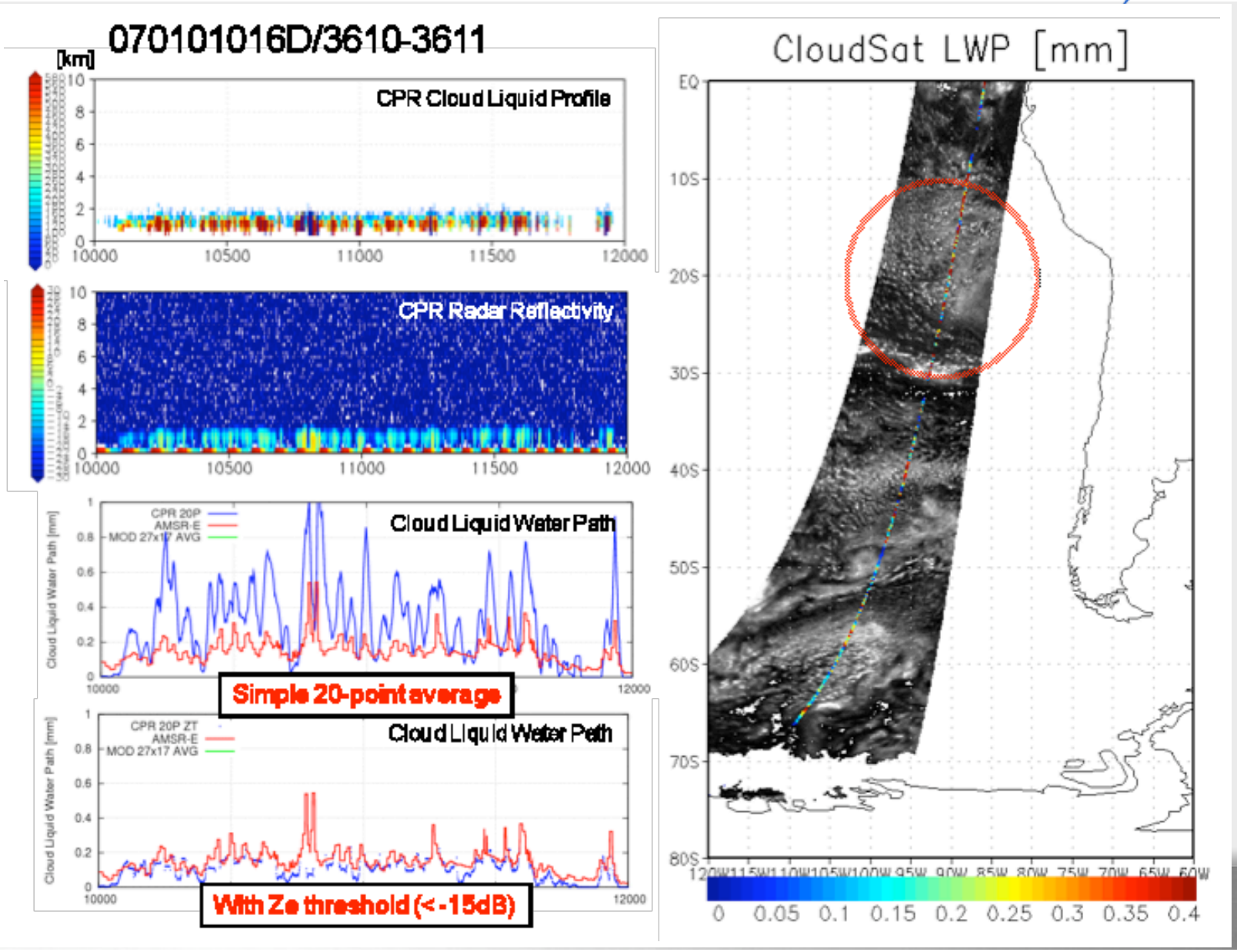


Scanning Geometry



89GHz Multi-horn Scan

Overlap with CloudSat



Processing Levels

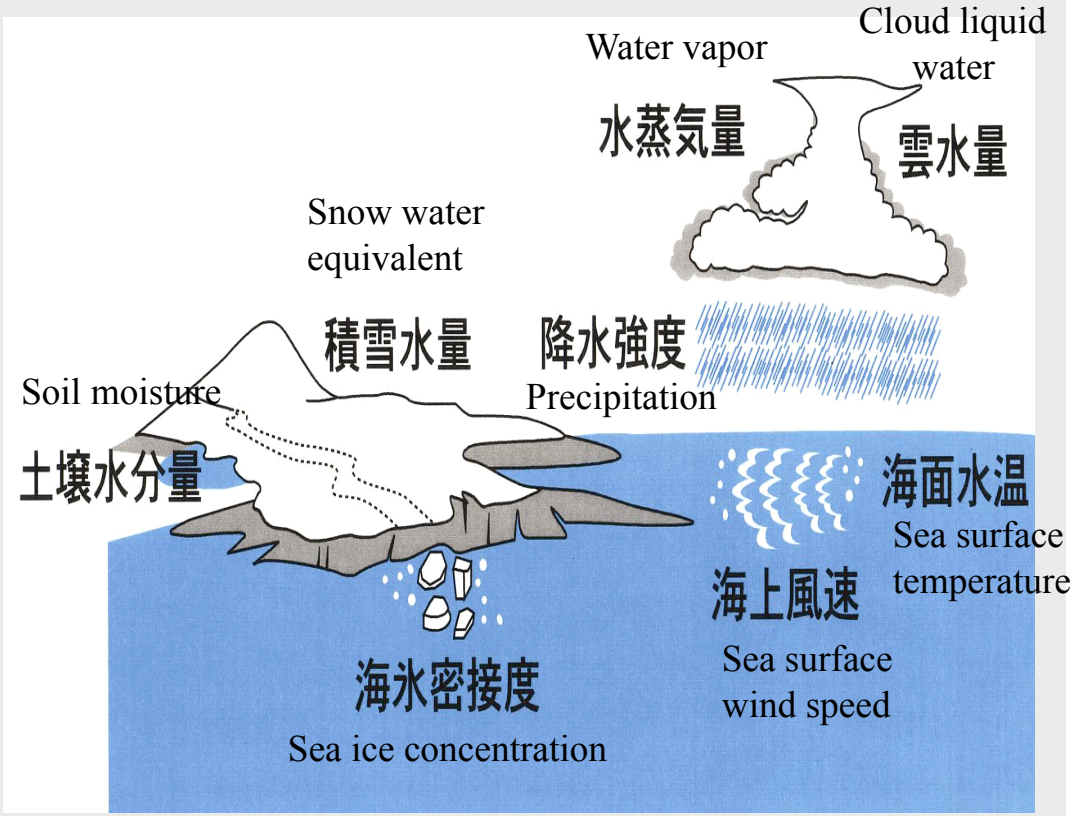
Level	Contents
Level-1A	•Swath data with geolocation information •Scene counts •½ orbit starting from northern/southern-most latitudes
Level-1B	•Swath data with geolocation information •Brightness temperatures •½ orbit starting from northern/southern-most latitudes
Level-2	•Swath data with geolocation information •Geophysical parameters (8 parameters) •½ orbit starting from northern/southern-most latitudes
Level-3	•Grid data with 0.25 degrees (or 25km) resolution •Brightness temperatures and geophysical parameters •Daily and monthly temporal average •Equidistant Cylindrical and Polar Stereo Projection

- All products are in HDF4 format, which can be accessed and read by using NCSA HDF Library. The “AMSR Data Input Toolkit (ADIT)” is also available.

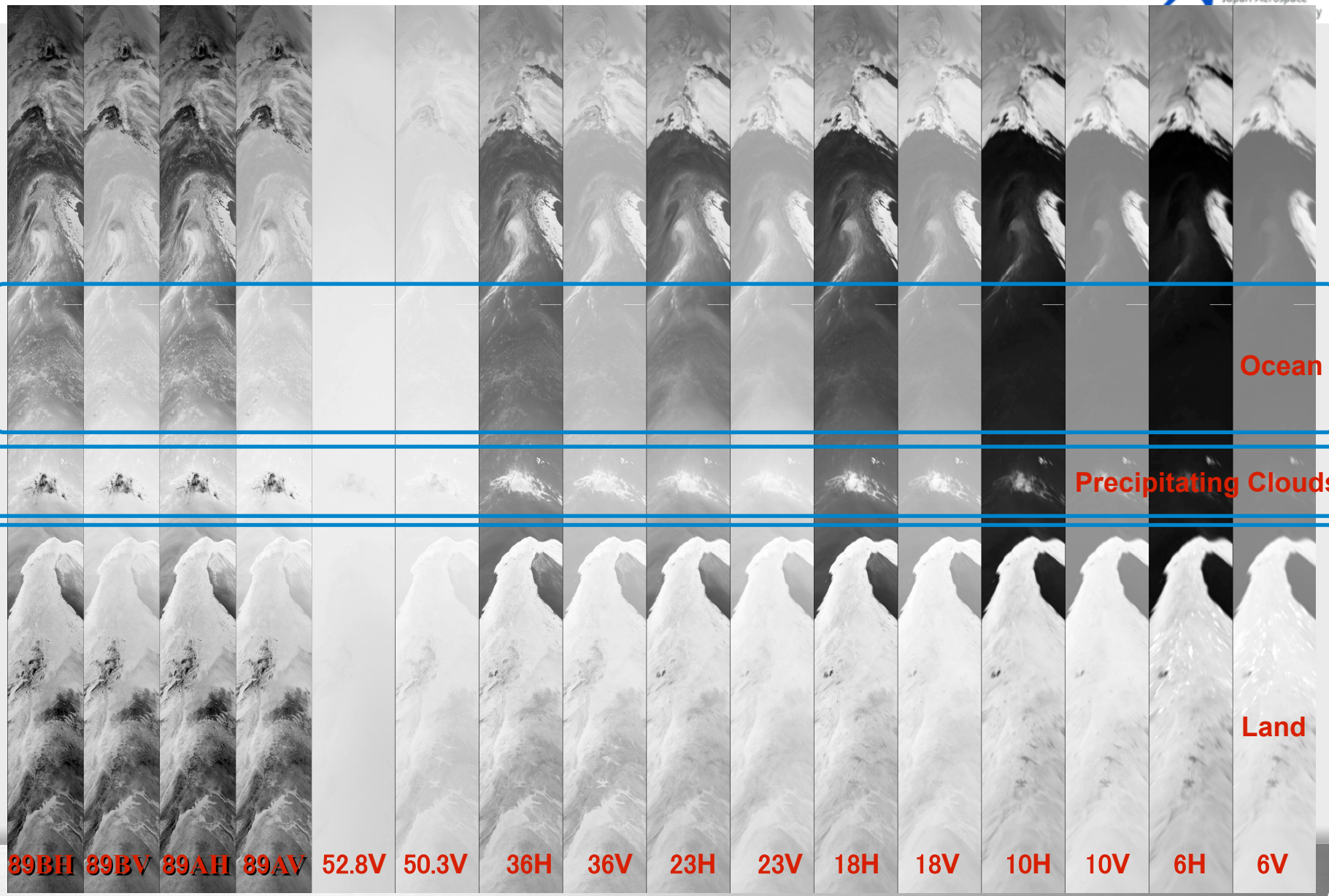
* Subset and mapped products are available for Level-1B and 2, with approximately 3000 by 3000km areas with designated center geolocation.

Standard Geophysical Products

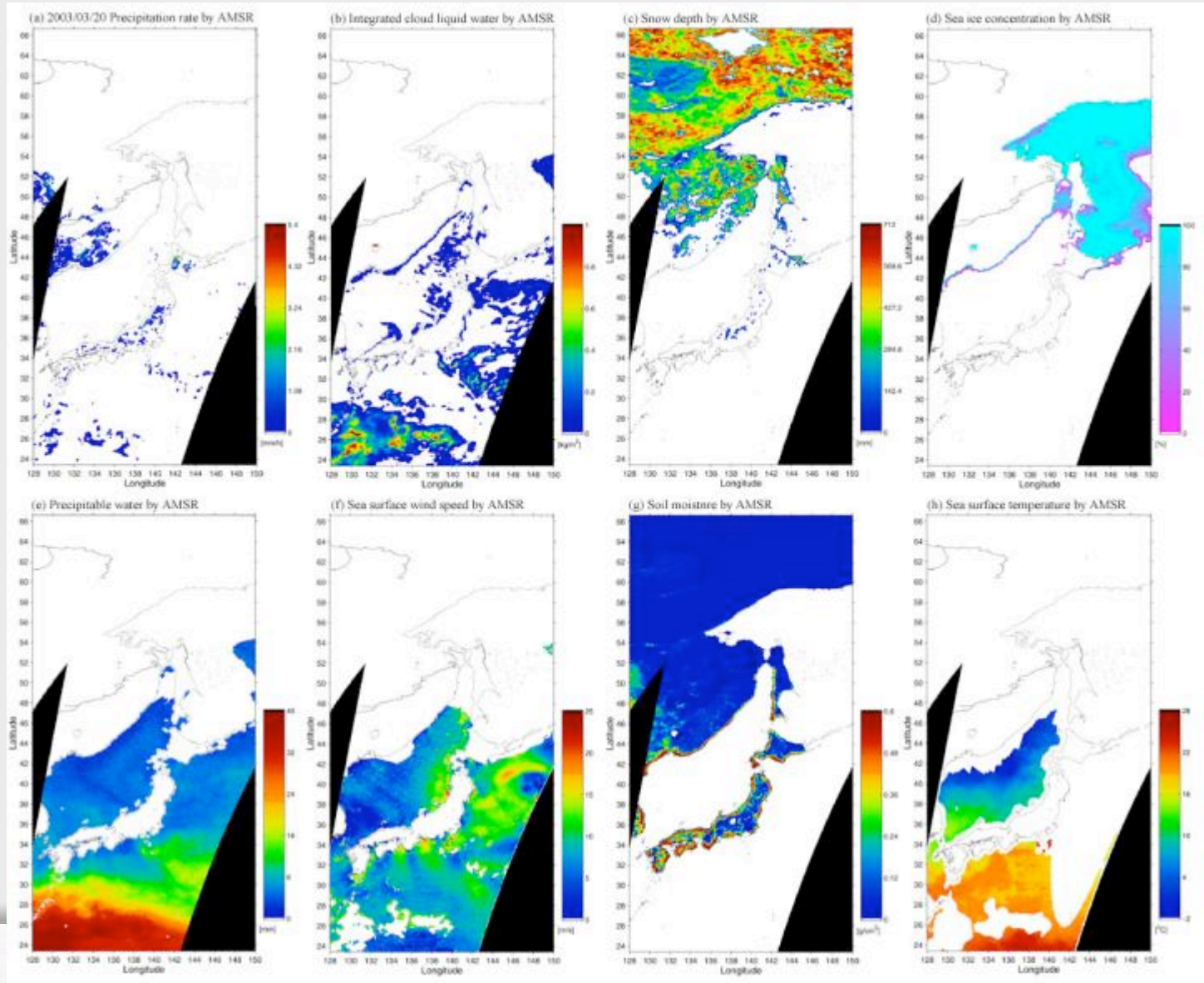
Products		Area	Spatial resolution
Brightness temperature		Global	5-50km
Geophysical parameter	Integrated water vapor	Over global ocean	15km
	Integrated cloud liquid water	Over global ocean	15km
	Precipitation	Tropical - extratropical	15km
	Sea surface temperature	Over global ocean	50km
	Sea surface wind speed	Over global ocean	15km
	Sea ice concentration	High latitude ocean	15km
	Snow depth	Land area	30km
	Soil moisture	Land area	50km



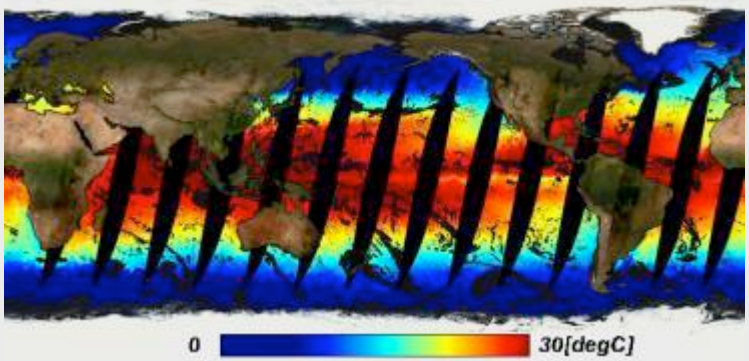
Level-1B Swath (AMSR)



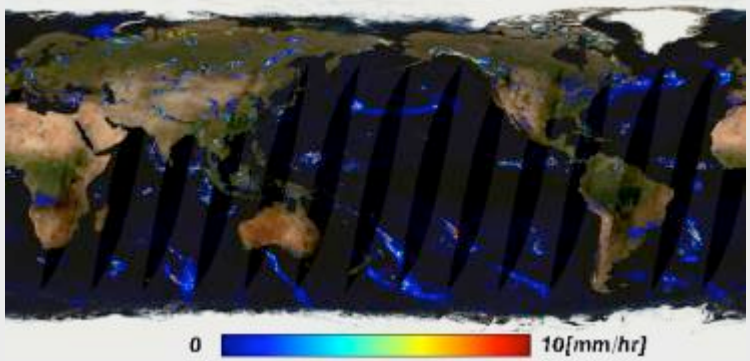
Level-2 Swath (AMSR)



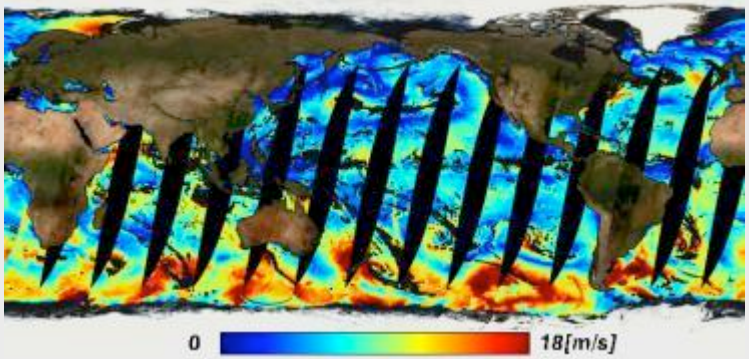
Level-3 Daily Grids



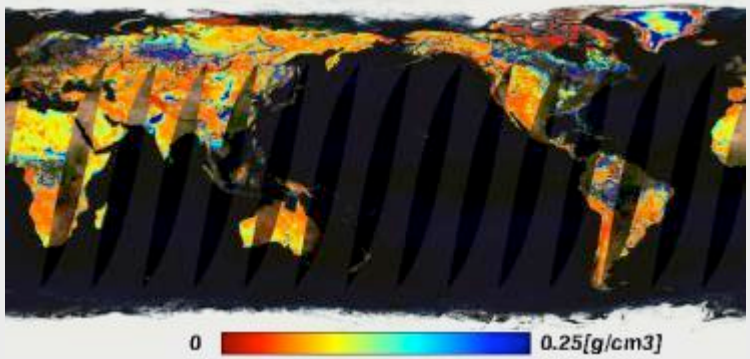
Sea Surface Temperature



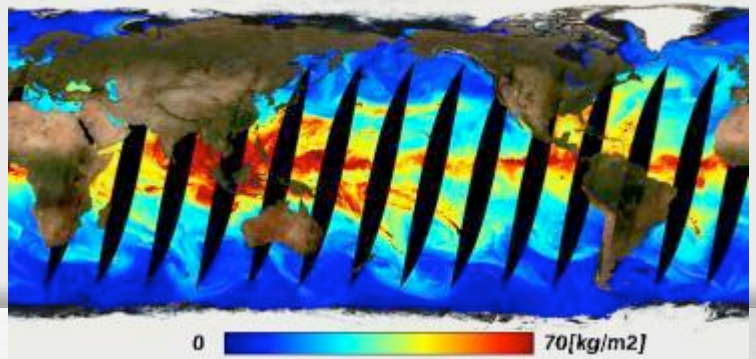
Precipitation



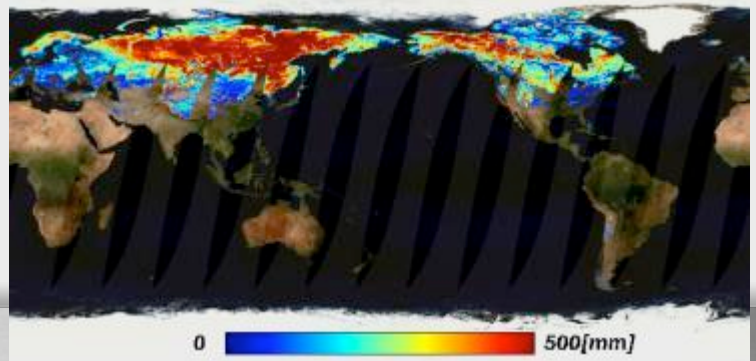
Sea Surface Wind Speed



Soil Moisture Content

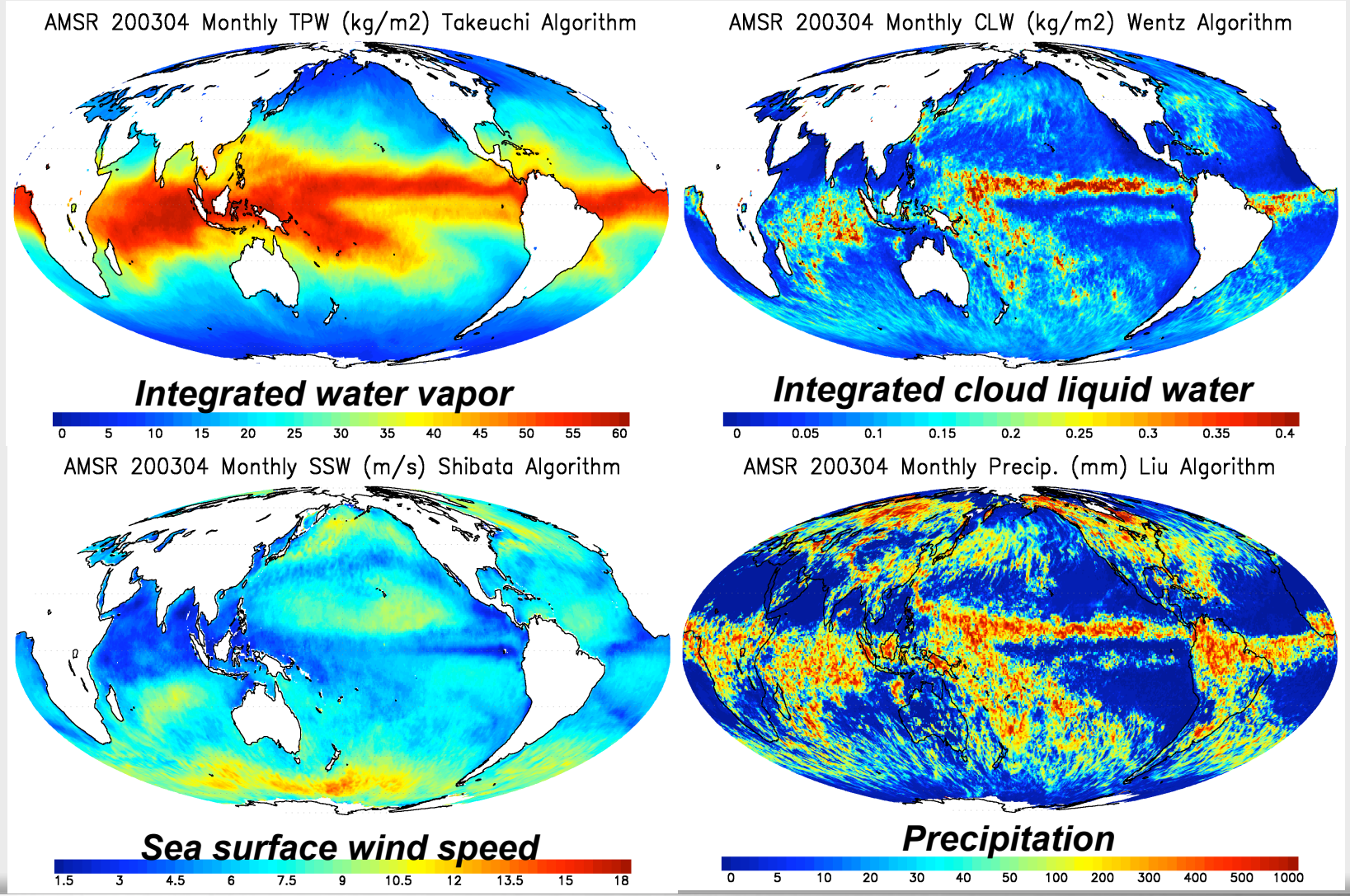


Total Precipitable Water



Snow Depth

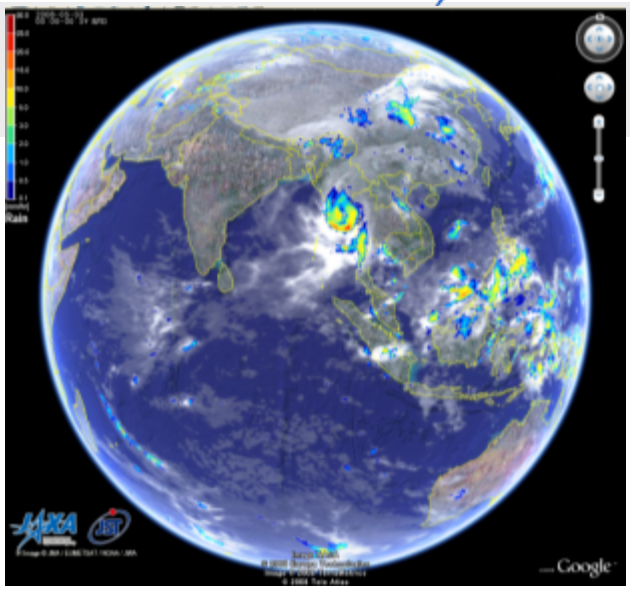
Level-3 Monthly Grids

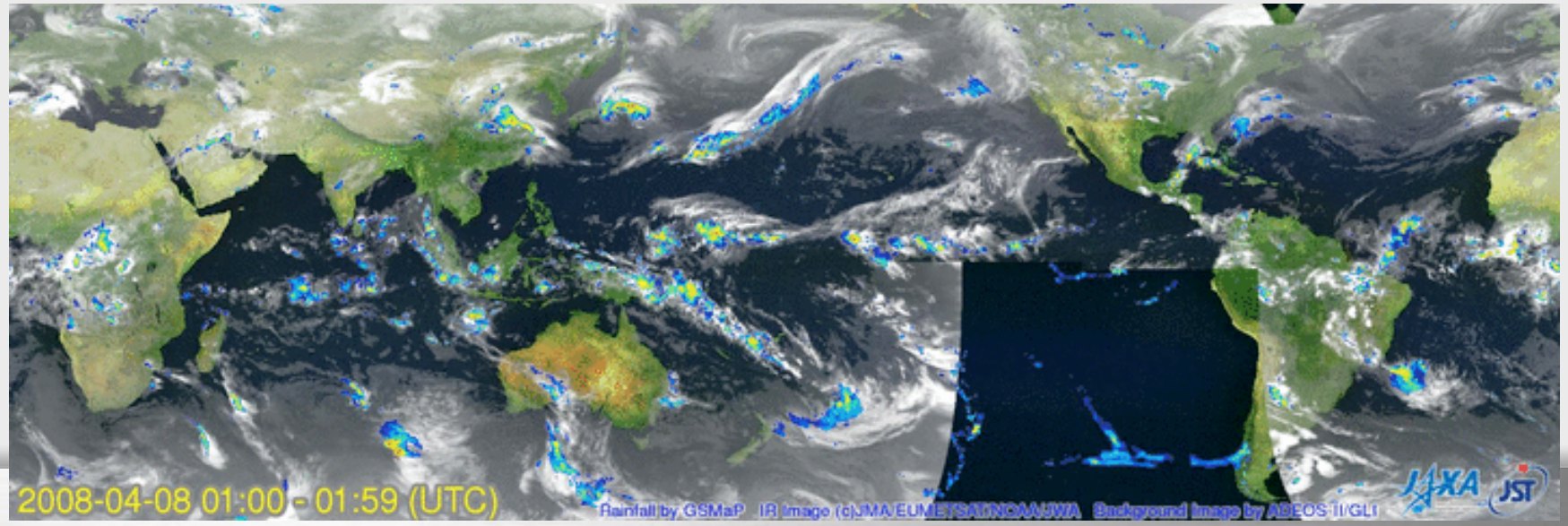


GSMaP

- Global rainfall map by merging TRMM, AMSR-E, and other satellite information.
- 0.1-degree lat/lon grid, hourly products.
- Available 4-hr after observation.
- Browse images, 24-hr animation, displaying by Google Earth.
- Binary data are also available via password protected ftp site.
- Based on JST/CREST GSMaP algorithm.

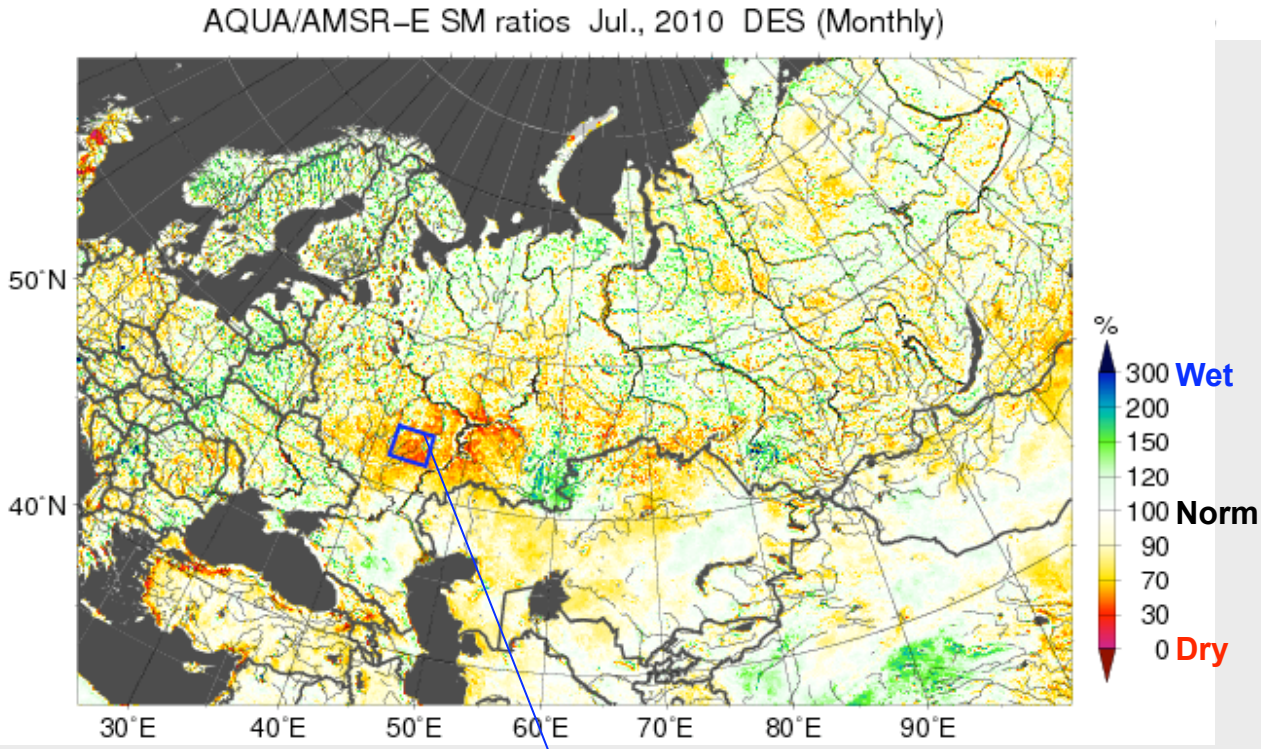
  http://sharaku.eorc.jaxa.jp/GSMaP/



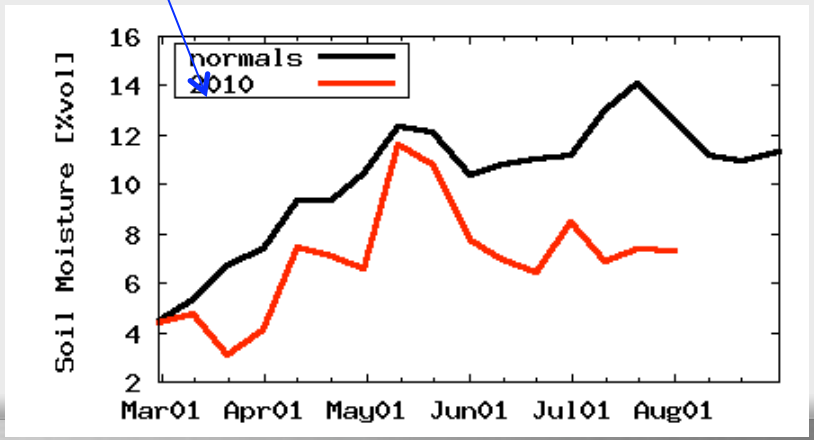


Monitoring Soil Moisture

AMSR-E is continuously observing the Earth after the launch on May 4, 2002 onboard EOS Aqua satellite.



- Serious crop damages have been reported due to catastrophic drought over western part of Russia in 2010.
- AMSR-E soil moisture is well capturing this phenomena and indicates that the drought already began from April-May period.

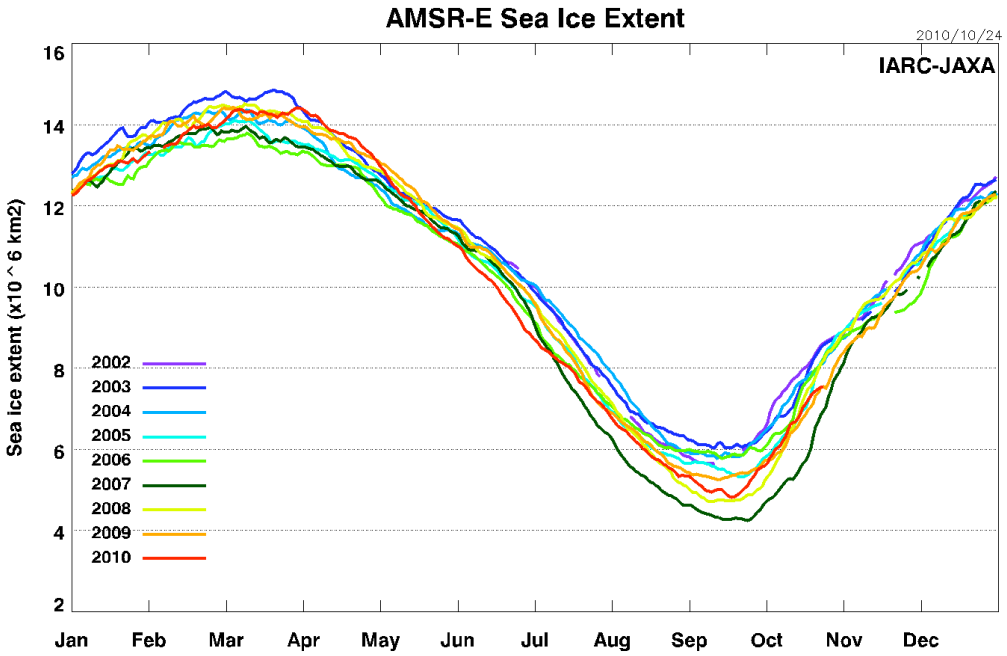


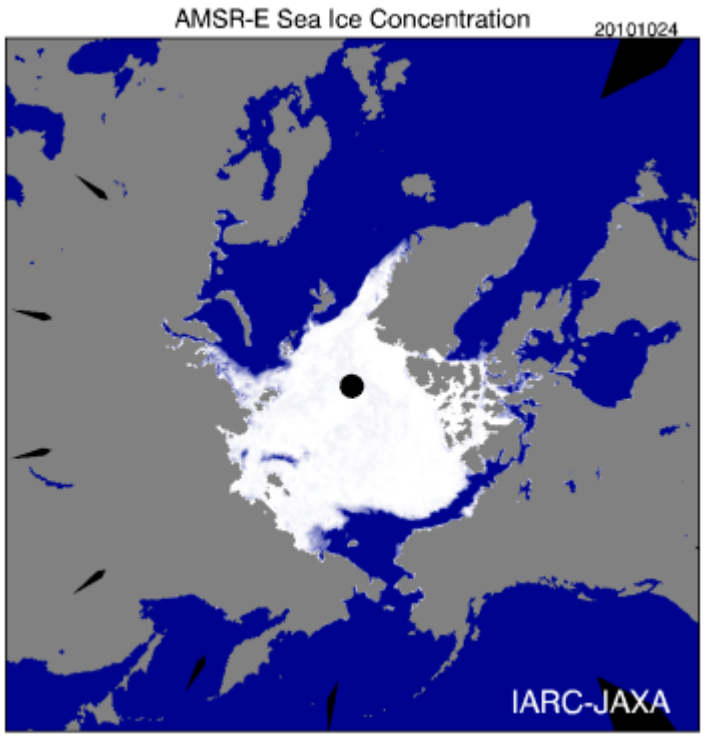
Black: Nominal trend (2002-2009 average)
Red : Trend in 2010

Images and data provided by H. Fujii of JAXA/EORC.

Monitoring Sea Ice Extent

Arctic Sea Ice Extent: 7,522,500 km2 (October 24, 2010)





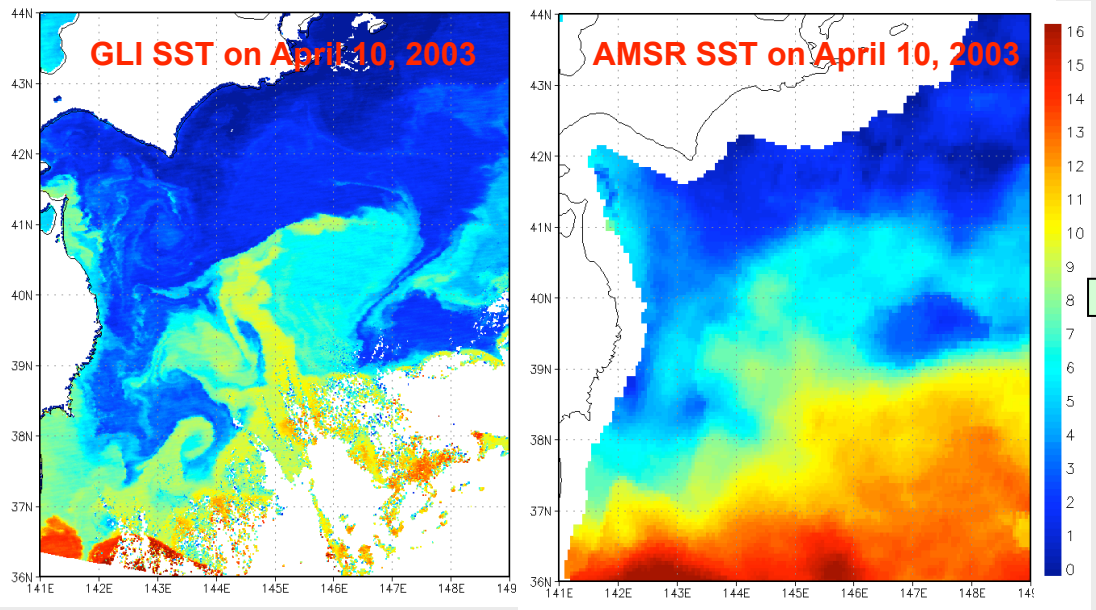
Arctic sea ice extent is monitored on a daily basis by AMSR-E

http://www.ijis.iarc.uaf.edu/en/index.htm

CSV data can be downloaded from the web site.

Microwave and IR SST Combination

- C-band (6.9GHz) is indispensable frequency for retrieving SST and soil moisture. Microwave measurement can provide cloud-through frequent SST mapping.
- Microwave and IR observations complement each other in terms of spatial resolution and error sources. Importance and needs of Merged SST from microwave and IR are increasing.



SST images around east coast of Japan on April 10, 2003, observed by GLI (left) and AMSR (right). Difference of spatial resolution and cloud effect are clearly seen in the figures.

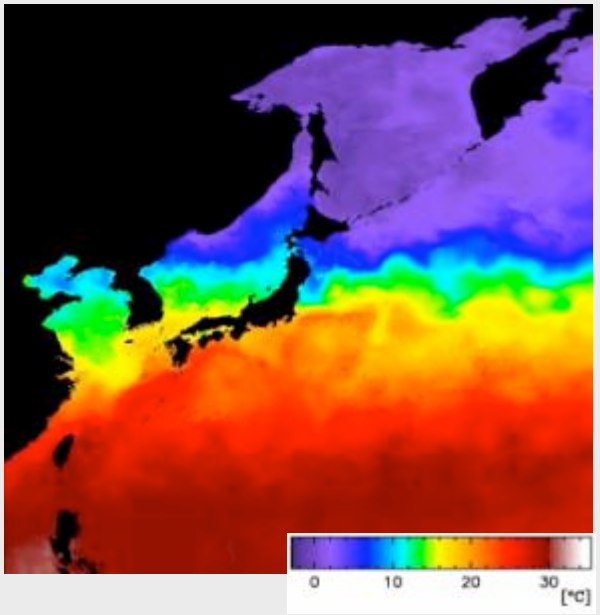
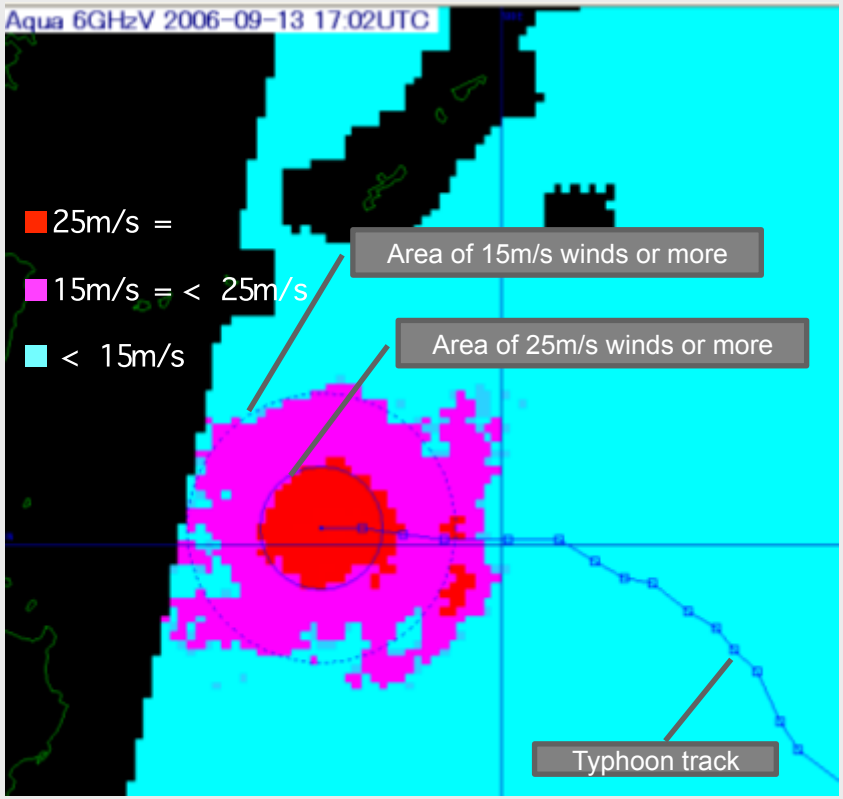


Image of the New Generation Sea Surface Temperature (NGSST) for Open Ocean on May 10, 2005. Provided by NGSST development group led by Professor Kawamura of Tohoku University.

Research Product: All-Weather SSW



AMSR-E all-weather ocean wind speed product (color shading) and the best-track data (circles, linear interpolation of the 12 and 18 UTC best-track data to 17 UTC) of Typhoon SHANSHAN at 17 UTC on 13 September 2006. The best-track data was determined without any AMSR-E data. (Courtesy of Shuji Nishimura.)

- AMSR-E 6.925 and 10.65 GHz data can be used to retrieve sea surface wind speed inside tropical cyclones.
- The all-weather sea surface wind speed product will find wide application to meteorological services.

Products and Services

- Standard Product
  - http://www.eorc.jaxa.jp/about/distribution/index.html
    All products, except ALOS and GOSAT, can be used by registration.
- Research Product (not limited to below), Browse Images
  - AMSR-E
    http://sharaku.eorc.jaxa.jp/AMSR/index.html
    http://sharaku.eorc.jaxa.jp/cgi-bin/amsr/pmips/quicklooks.cgi (testing)
  - GSMaP
    http://sharaku.eorc.jaxa.jp/GSMaP/index_j.htm
  - IARC-JAXA Information System
    http://www.ijis.iarc.uaf.edu/en/index.htm
- Tools
  - Earth Observation Data Viewer and ADIT
    http://sharaku.eorc.jaxa.jp/AMSR/tool/index.html

How to get JAXA's EO data

- EORC Homepage: **http://www.eorc.jaxa.jp/**

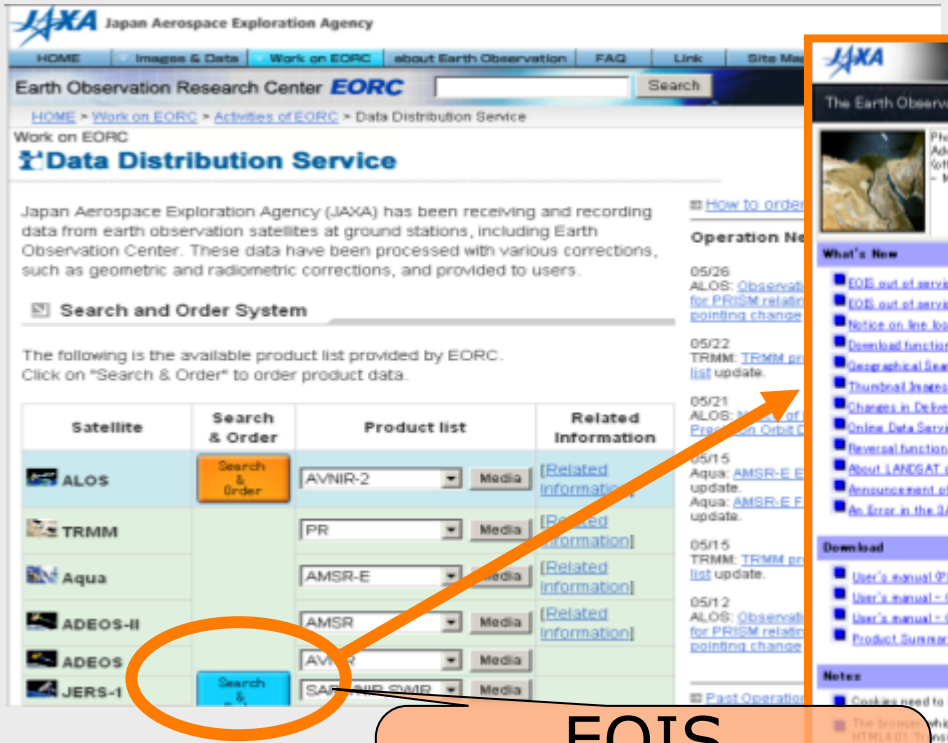
Data Distribution Service [Standard Product]

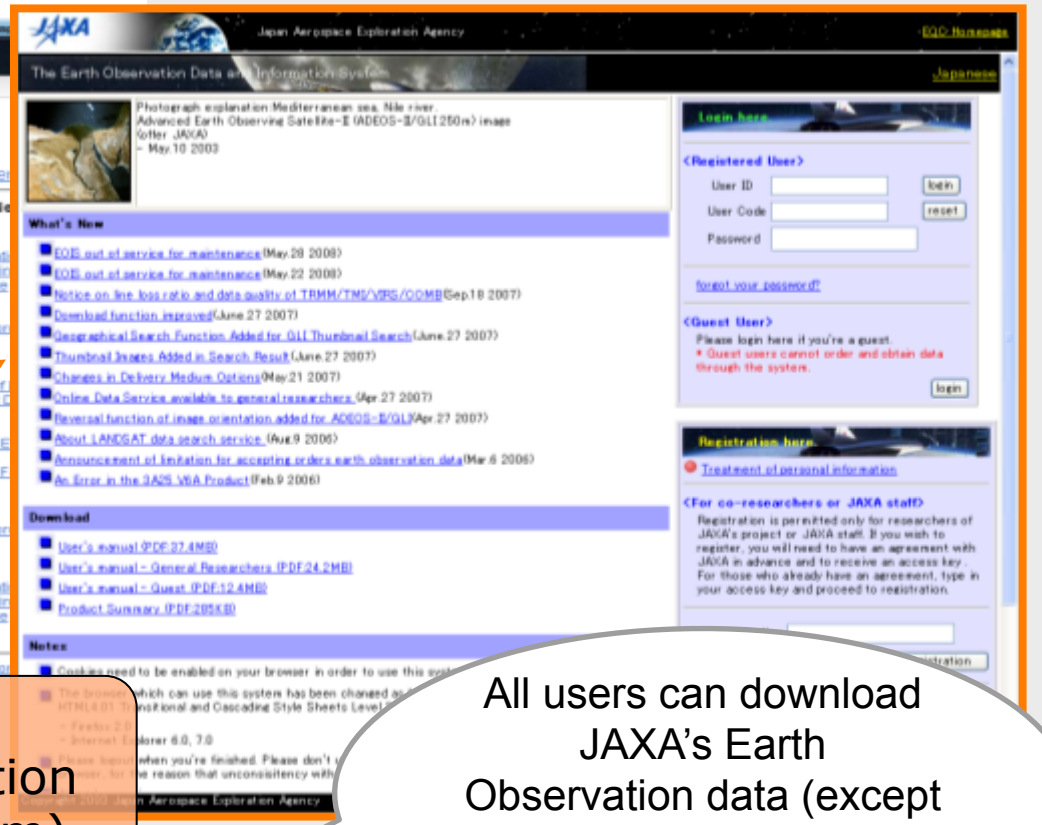
Research Project Sites [Research Product]

Top page of Data Distribution Service

- **EOC/EOIS:**

  Earth Observation Information System





EOIS
(Earth Observation Interface System)

All users can download JAXA's Earth Observation data (except for ALOS and GOSAT) after user resistration.

- **There is a category of users.**

Thank you for your attention.