

# JAXA's contribution to monitor the Water Cycle variables

Osamu Ochiai

Japan Aerospace Exploration Agency (JAXA)

3<sup>rd</sup> GEOSS African Water Cycle Coordination Workshop

El Jadida, Morocco

Feb. 4-5, 2013

# JAXA Satellite Programs

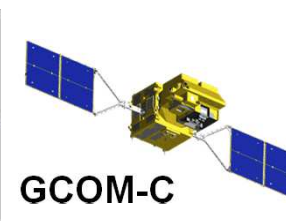
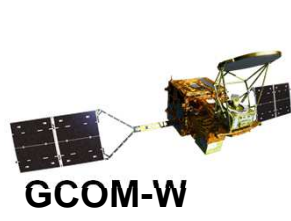


Late 1990s

2000s

2003 (JAXA established)

## Earth Observation



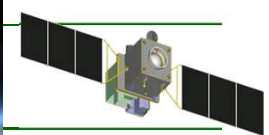
## Climate Change/Water

## Global Warming



## Land Use

## Disaster Monitoring



## Communications

COMETS

DRTS

WINDS

## Technology Development

## Positioning

QZSS

ETS-VI

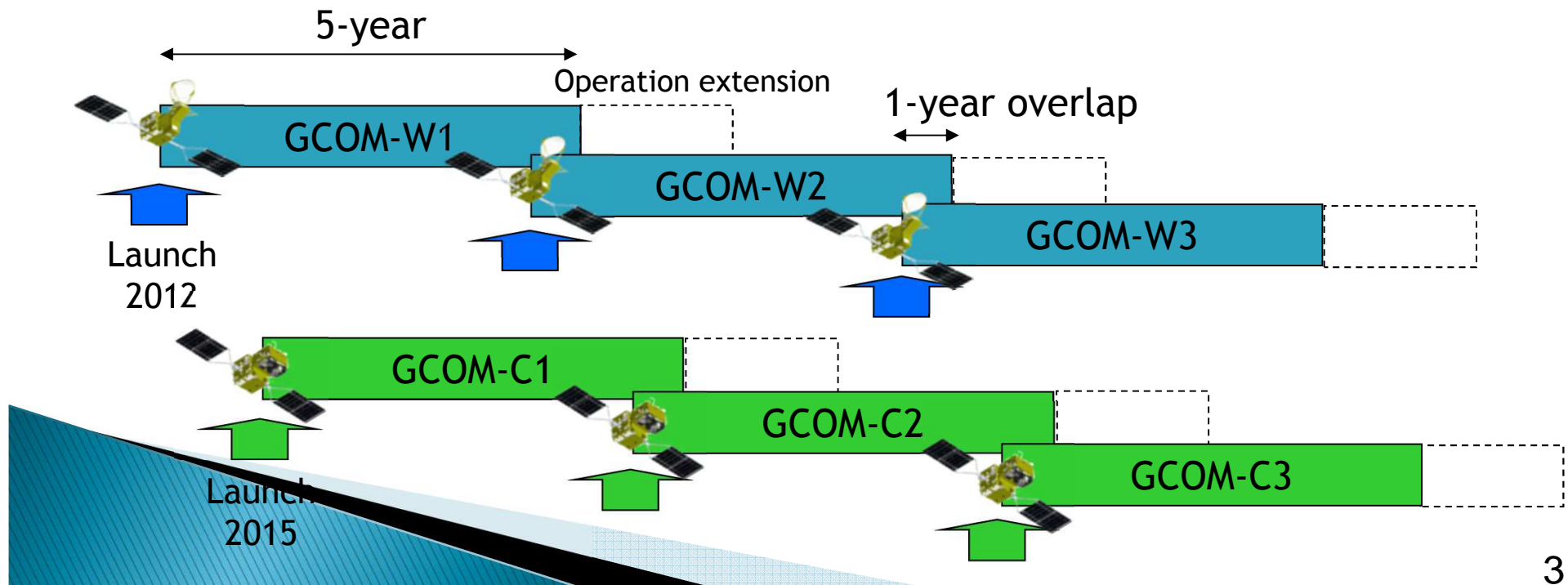
ETS-VII

OICETS

ETS-VIII

# Global Change Observation Mission - GCOM -

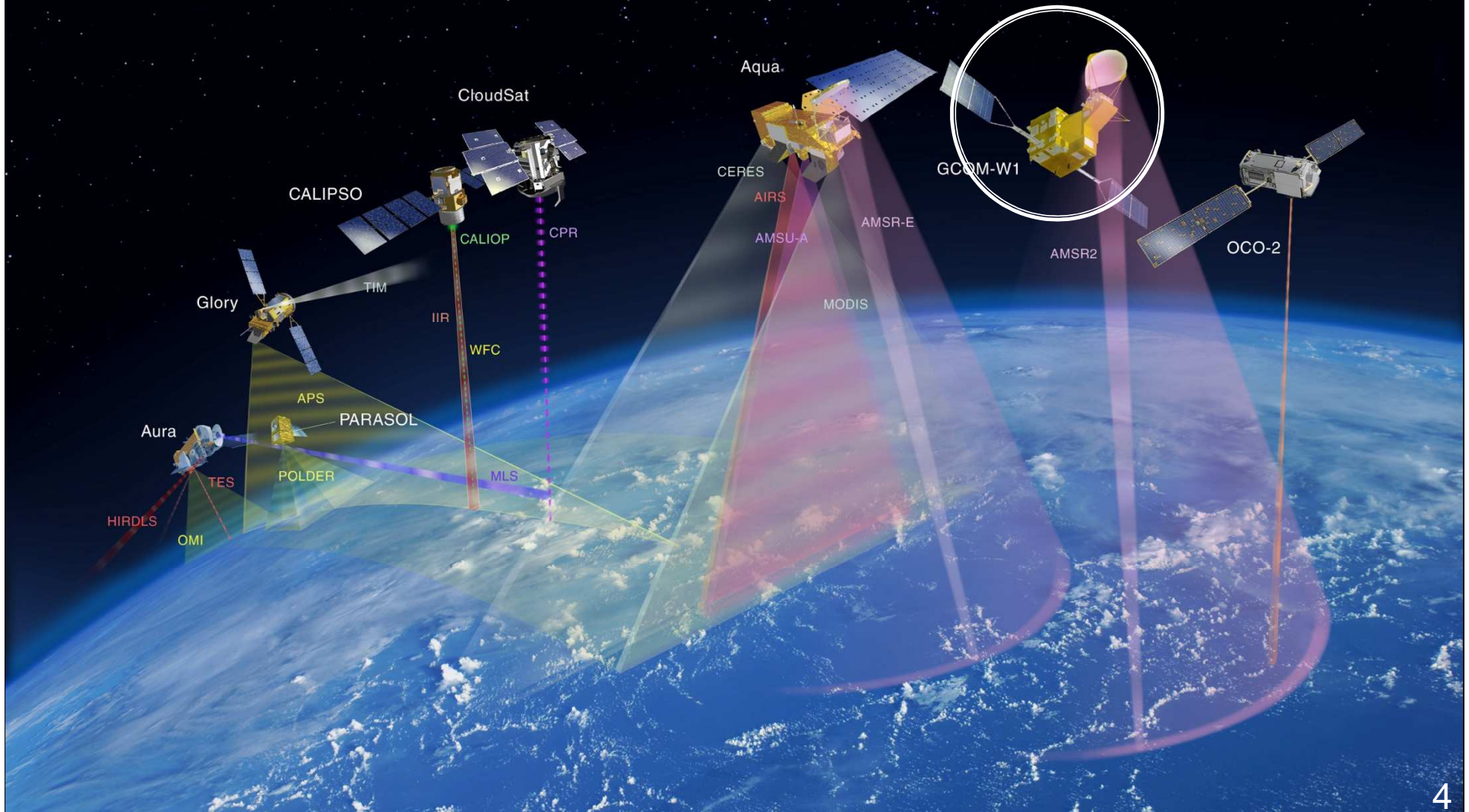
- ▶ Demonstrate long-term global observation of various geophysical parameters for understanding climate variability and water cycle.
- ▶ Two medium-sized satellites with three generations to ensure 10-15 years stable data records.





# A-Train

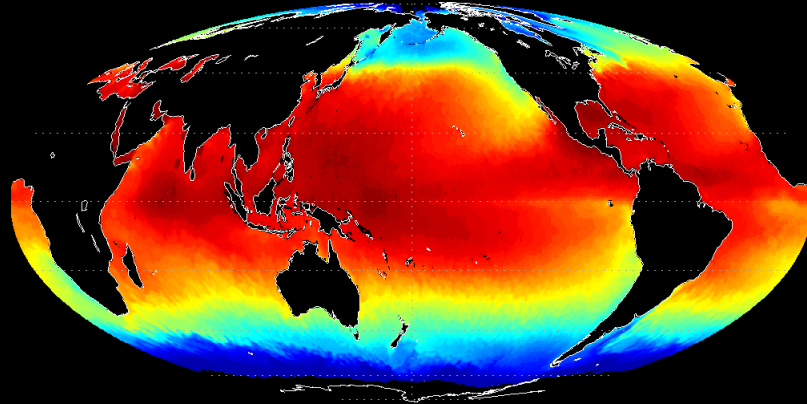
## GCOM-W1



# Monthly AMSR2 Images (unvalidated)

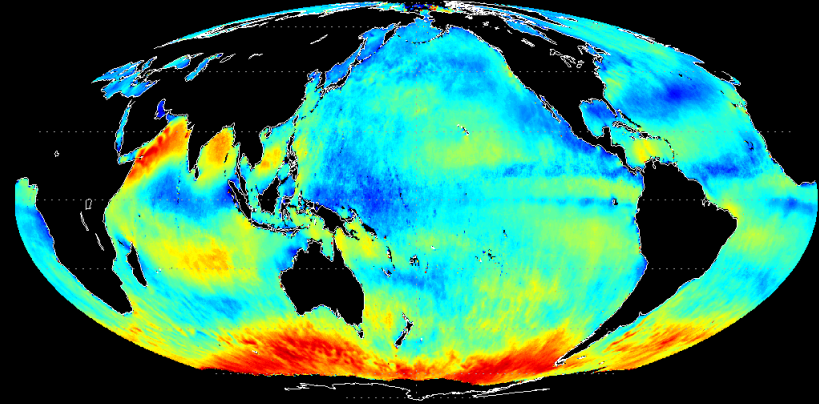
## Sea Surface Temperature

Sea Surface Temperature [deg.C] Jul.15–Aug.14, 2012



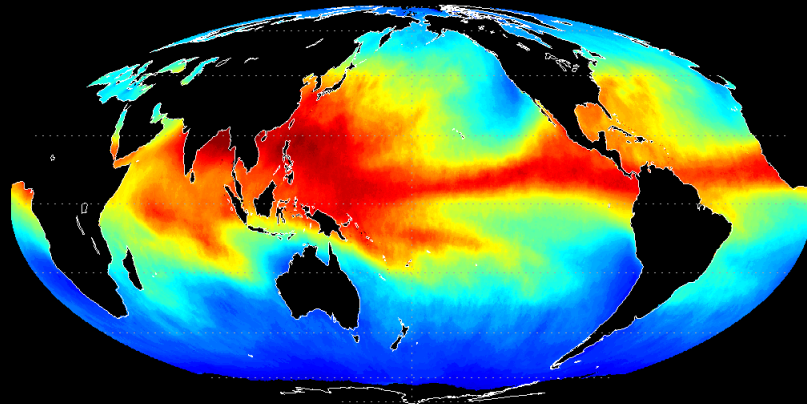
## Sea Surface Wind Speed

Sea Surface Wind Speed [m/s] Jul.15–Aug.14, 2012



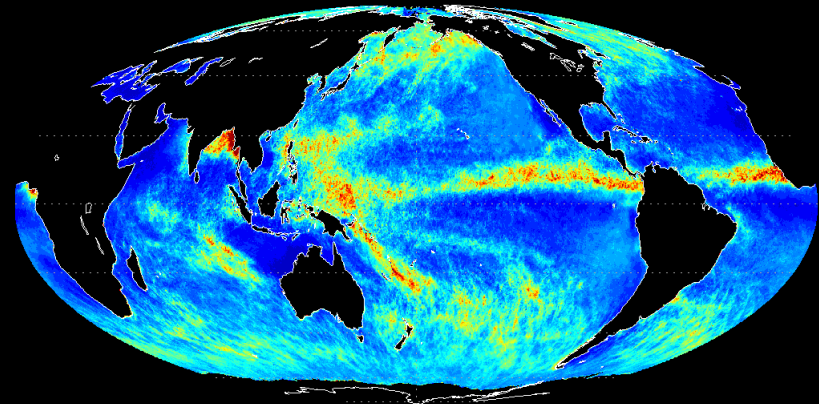
## Total Precipitable Water

Total Precipitable Water [mm] Jul.15–Aug.14, 2012



## Cloud Liquid Water

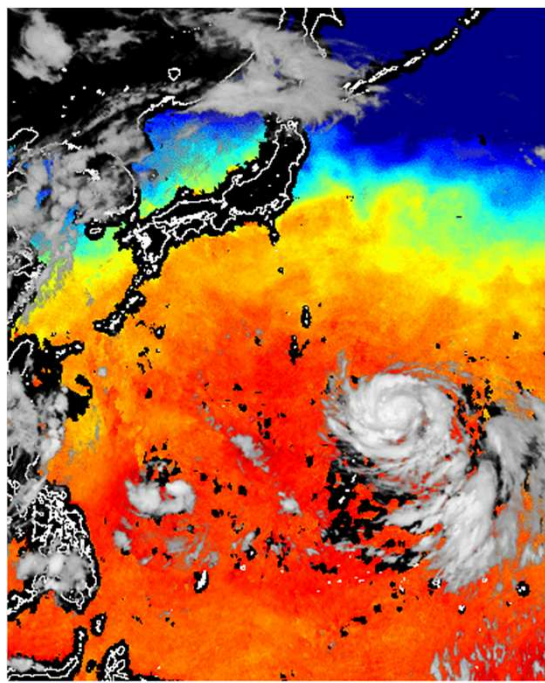
Cloud Liquid Water [mm] Jul.15–Aug.14, 2012



Monthly average (July 15 – August 14, 2012)

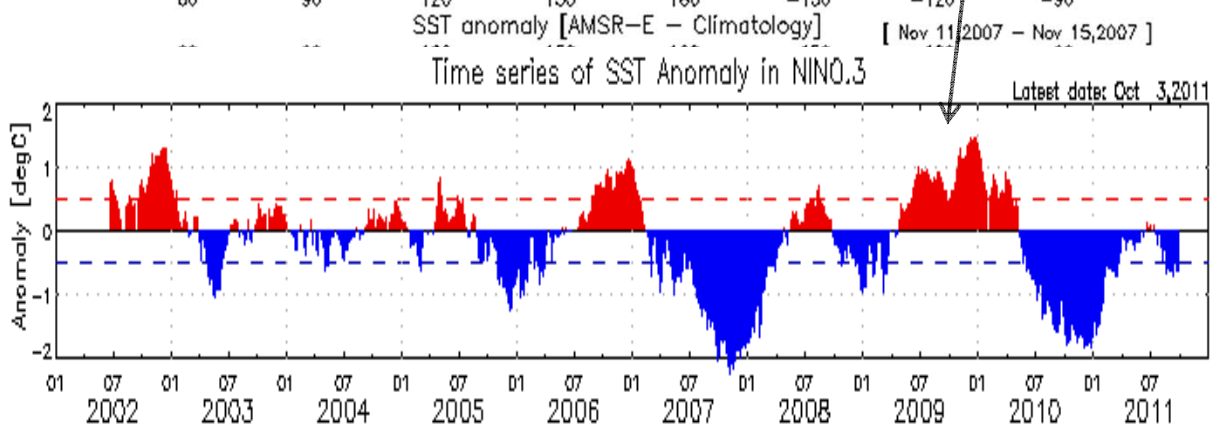
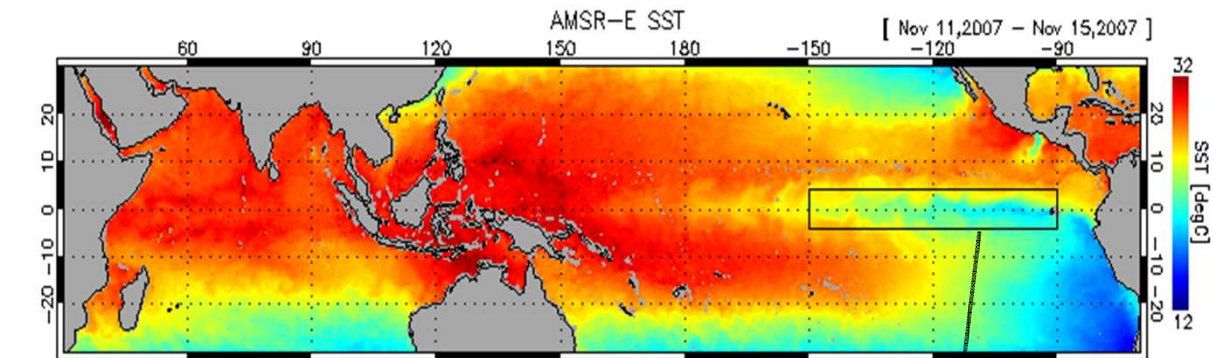


# Observations by AMSR-E

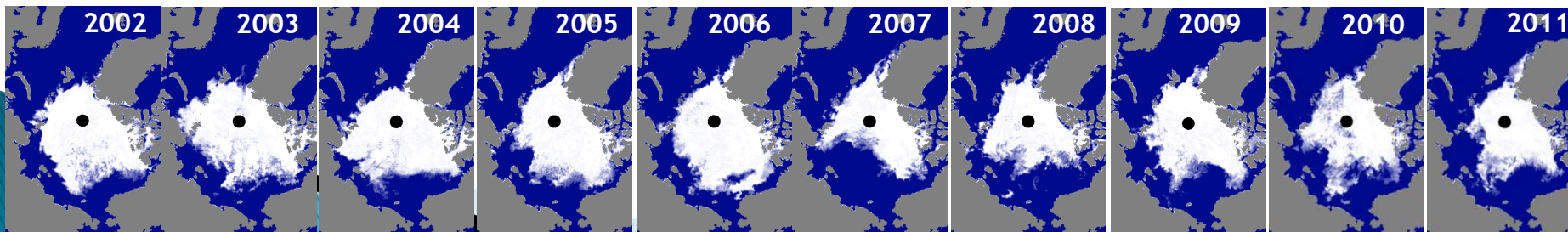


2011.7.13

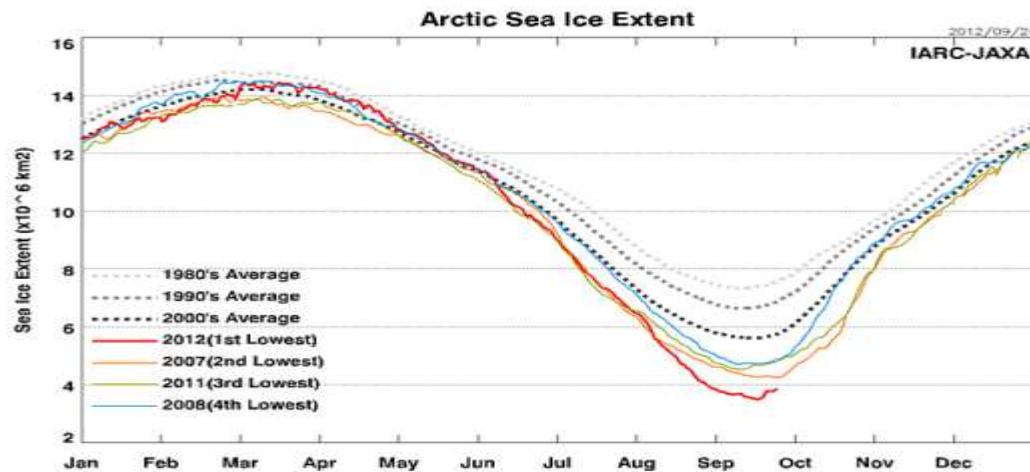
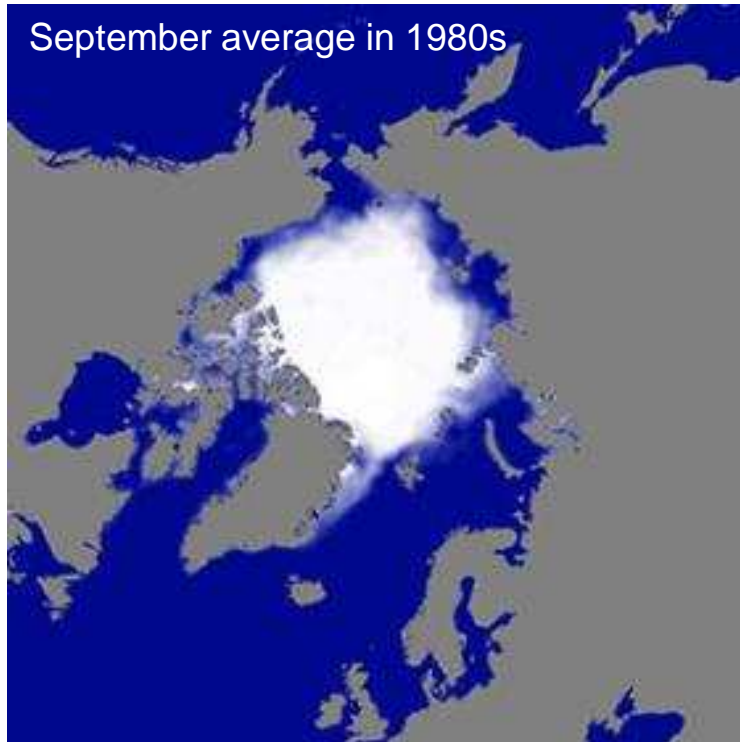
IR image © JMA/JWA



Previous  
lowest record



# Arctic Sea Ice by AMSR2

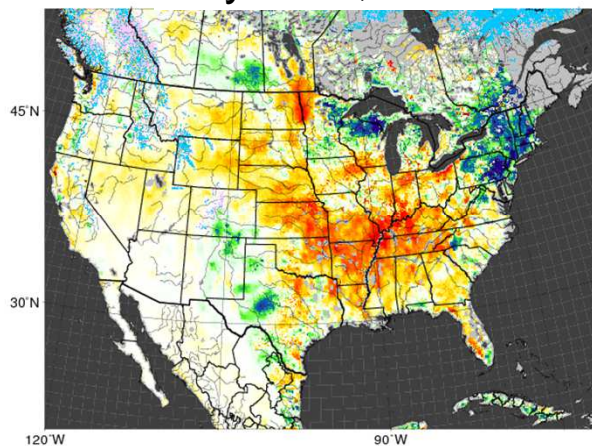


The smallest sea ice extent by satellite was recorded this year!

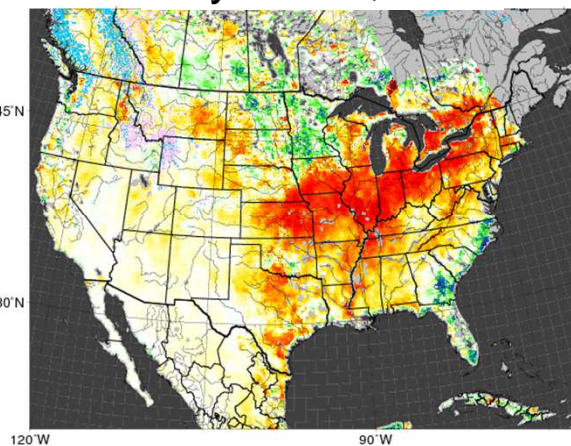


# Soil Moisture Anomaly over North America

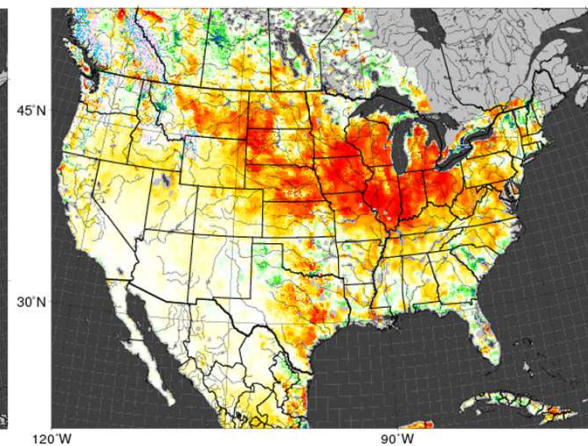
May 1-15, 2012



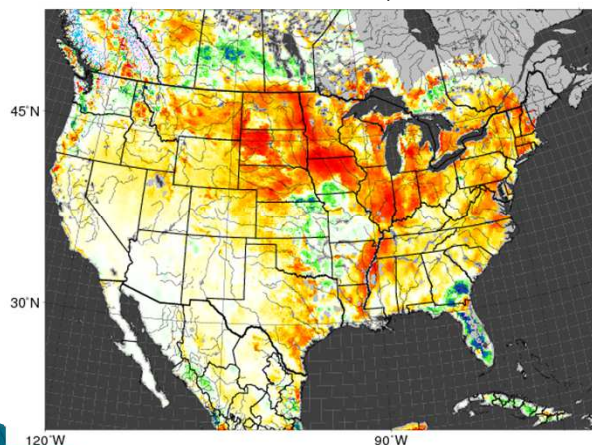
May 16-31, 2012



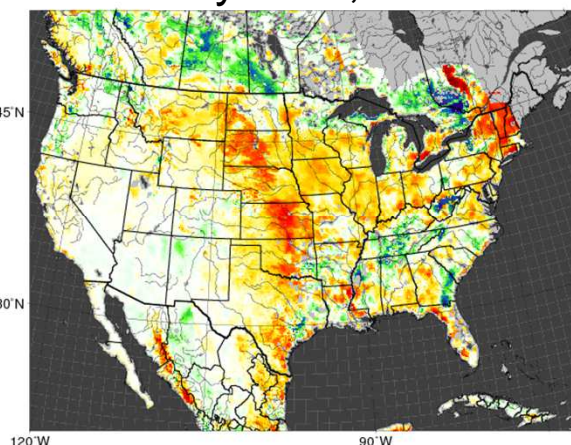
June 1-15, 2012



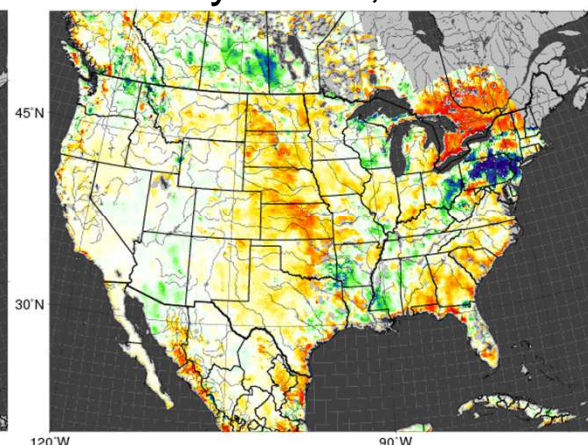
June 16-30, 2012



July 1-15, 2012



July 16-31, 2012

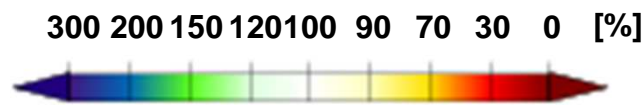


Snow Area  
by MODIS



Soil Moisture  
Anomaly Ratio  
by WindSat

Wet



Dry



JASMES Daily (for Microw) x JASMES Daily (for Microw) x JASMES Daily (for Microw) x

suzaku.eorc.jaxa.jp/GCOM\_W/JASMES\_daily/index.html

# JASMES JAXA Satellite Monitoring for Environmental Studies for water cycle

**Search Menu**

Show Images

**Date:**  
2012 Nov 11

**Projection:**  
Parallel Lat./Lon. (EQR)

**Sensor (Multiple selection):**

AMSR2 Asc/Des(Both)  
 AMSR-E Asc/Des(Both)  
 TMI Asc/Des(Both)  
 WindSat Asc/Des(Both)  
 SSM/I F13 Asc/Des(Both)  
 SSM/I F15 Asc/Des(Both)

**Product (Multiple selection):**

Sea Surface Temperature  
 Snow Depth  
 Soil Moisture Content  
 Total Precipitable Water  
 Cloud Liquid Water  
 Sea Surface Wind Speed  
 Precipitation  
 Sea Ice Concentration  
\*NPS/SPS projection only  
 Brightness Temperature

Show Images

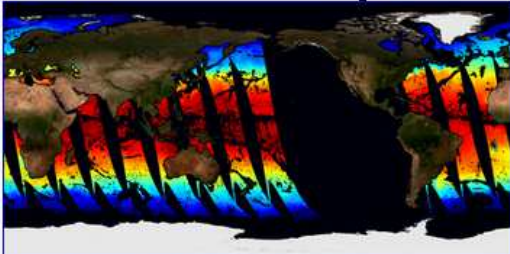
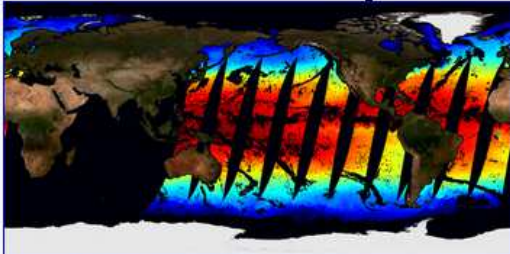
**Slide Show**

**Start:**  
2012 Nov 11

We are now validating the AMSR2 data, and will provide the following schedule.  
 - Level1 data: JAN, 2013  
 - Level2,3 data: MAY, 2013  
 AMSR2(GCOM-W1) Data Providing Service(<https://ecom-w1.jaxa.jp/auth.html>)

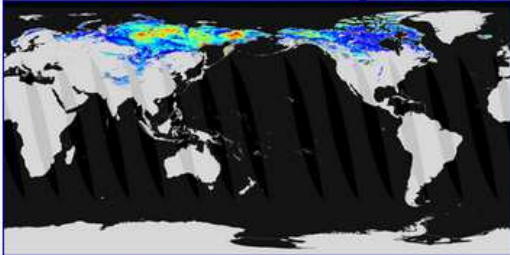
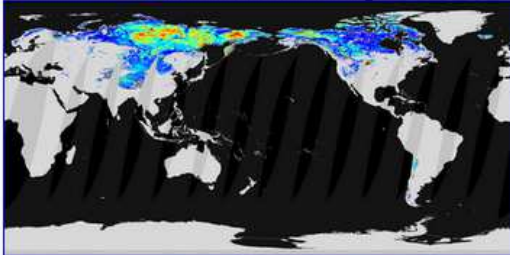
< prev. **2012-Nov-11** next >

AMSR2 SST(Ascending) AMSR2 SST(Descending)

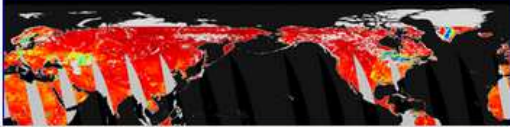
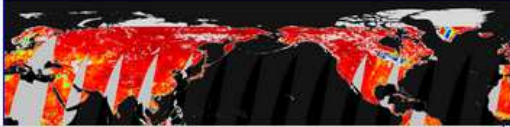
0 10 20 30 [deg C]

AMSR2 SND(Ascending) AMSR2 SND(Descending)

0 16.7 33.3 50 [cm]

AMSR2 SMC(Ascending) AMSR2 SMC(Descending)

- ▶ GCOM-W1 and AMSR2 are in good shape.
- ▶ GCOM-W1 “SHIZUKU”
  - Launched on May 18, 2012 (JST).
  - Joined A-Train constellation.
  - Completed the initial checkout phase on August 10, 2012.
- ▶ AMSR2
  - Started continuous observation from July 3, 2012 (JST).
  - Calibration and validation activities are ongoing.
  - Preliminary products were already made available to PIs and collaborating agencies.
  - Product release to public will be 8-months and 12-months after launch for brightness temperatures and geophysical parameters.
  - GCOM Data Providing Service at <http://gcom-w1.jaxa.jp>.
- ▶ Will participate in GPM constellation.



**Thank you for your attention.**