



# Health Checkup of the Earth from Space

## ~"SHIZUKU" Application~

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**JAXA**  
**June 19<sup>th</sup>, 2013**



# 1. Overview of GCOM



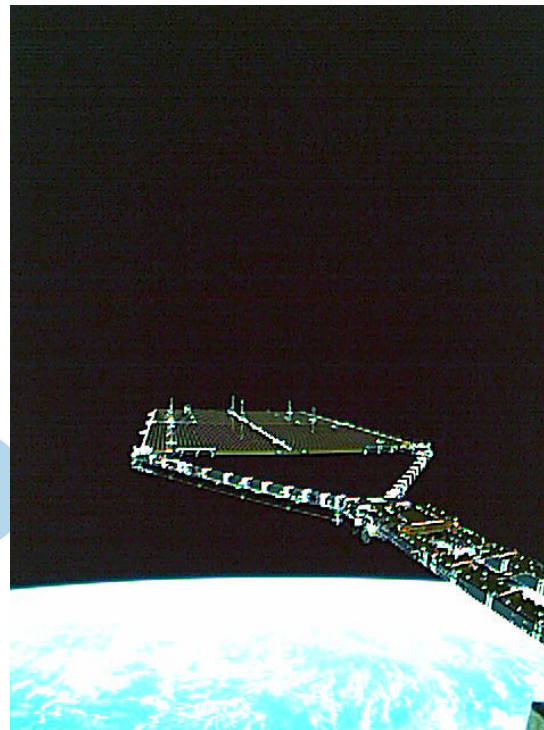


# JAXA's Newest Earth Observation Satellite "SHIZUKU"

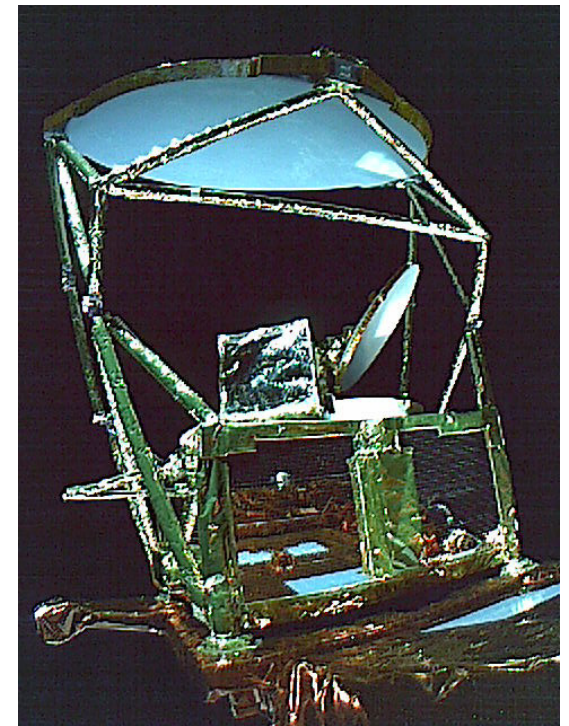
- May 17<sup>th</sup>, 2012, JAXA launched "SHIZUKU" by H-IIA launch vehicle
- Critical operational phase after the launch completed successfully
  - Solar array paddle deployment
  - Main refractor of mission sensor deployment



SHIZUKU launch



Solar paddles deployment



Main Refractor deployment



# Overview of GCOM Mission

## Objectives of GCOM

### ■ Climate change observation:

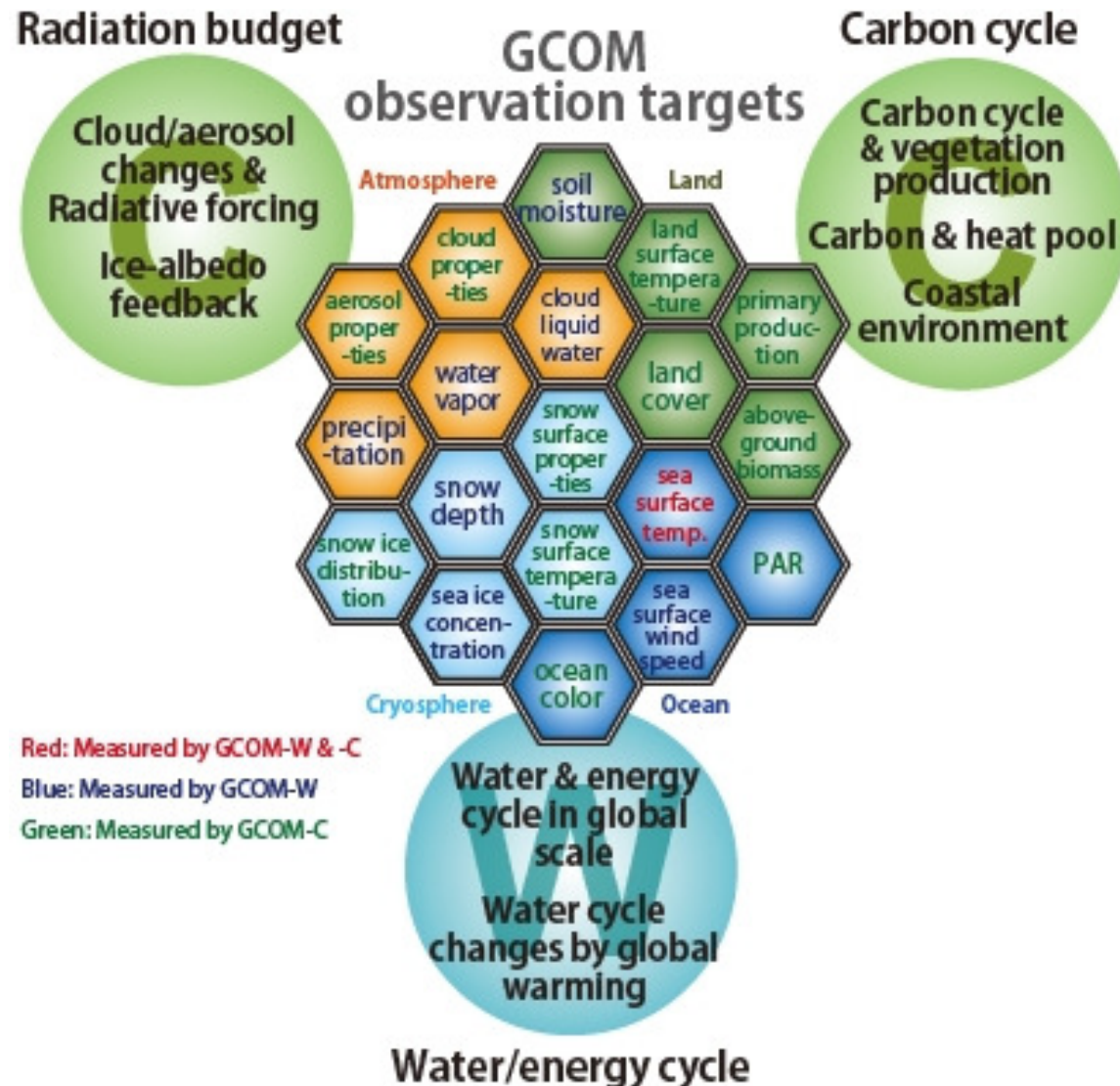
- Various targets: Atmosphere, land, Cryosphere, Ocean
- Understand: Radiation budget, Carbon cycle, Water and energy cycle

### GCOM-W (Water)

- ✓ Observe water cycle mechanism
  - ✓ Sea surface temperature
  - ✓ Sea-ice concentration, etc

### GCOM-C (Climate)

- ✗ Observe climate change factors
  - ✗ Cloud
  - ✗ Aerosol
  - ✗ Land cover, etc







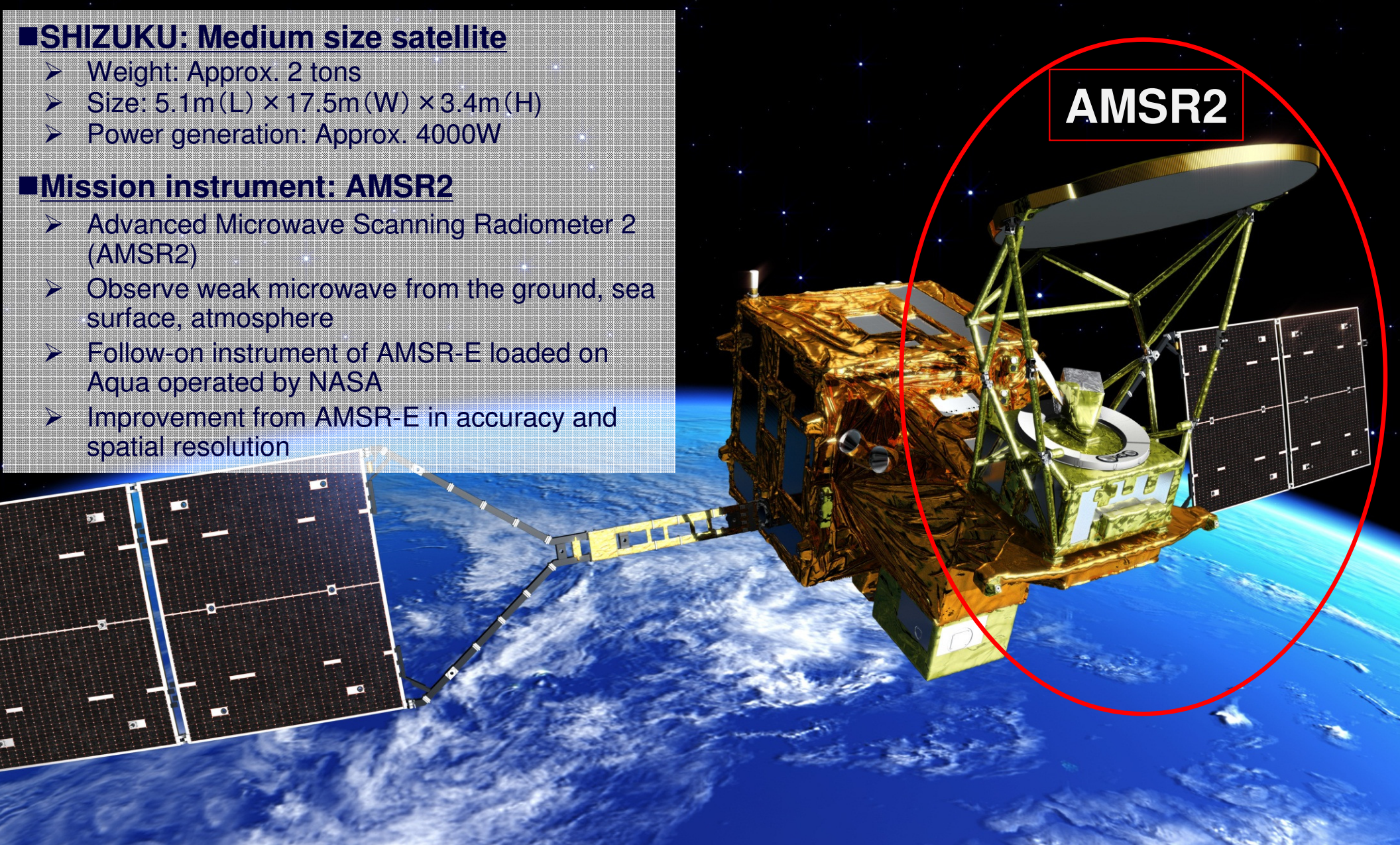
# Overview of “SHIZUKU”

## ■ SHIZUKU: Medium size satellite

- Weight: Approx. 2 tons
- Size: 5.1m (L) × 17.5m (W) × 3.4m (H)
- Power generation: Approx. 4000W

## ■ Mission instrument: AMSR2

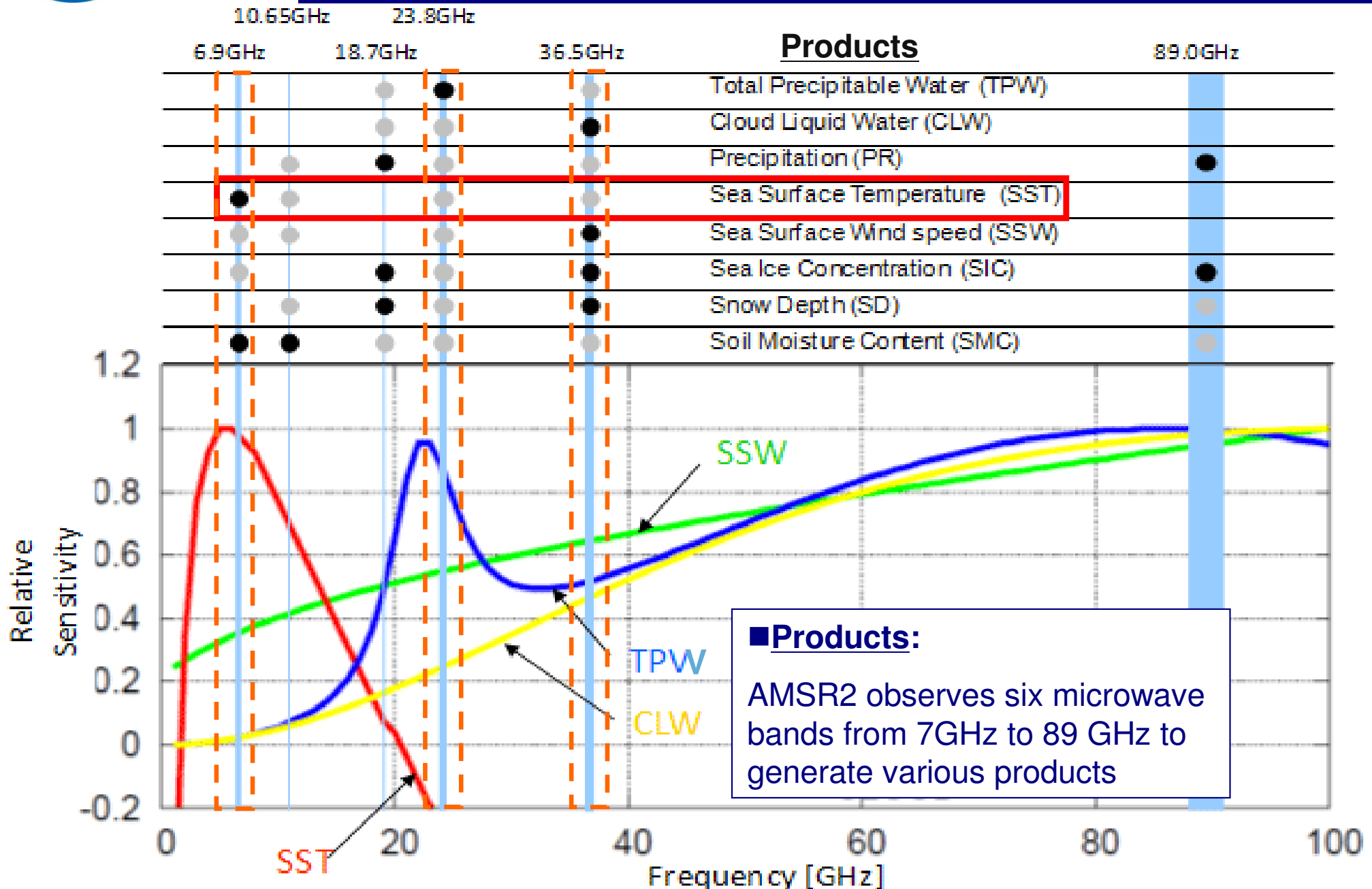
- Advanced Microwave Scanning Radiometer 2 (AMSR2)
- Observe weak microwave from the ground, sea surface, atmosphere
- Follow-on instrument of AMSR-E loaded on Aqua operated by NASA
- Improvement from AMSR-E in accuracy and spatial resolution



**AMSR2**



# Overview of "SHIZUKU"







# Overview of “SHIZUKU”



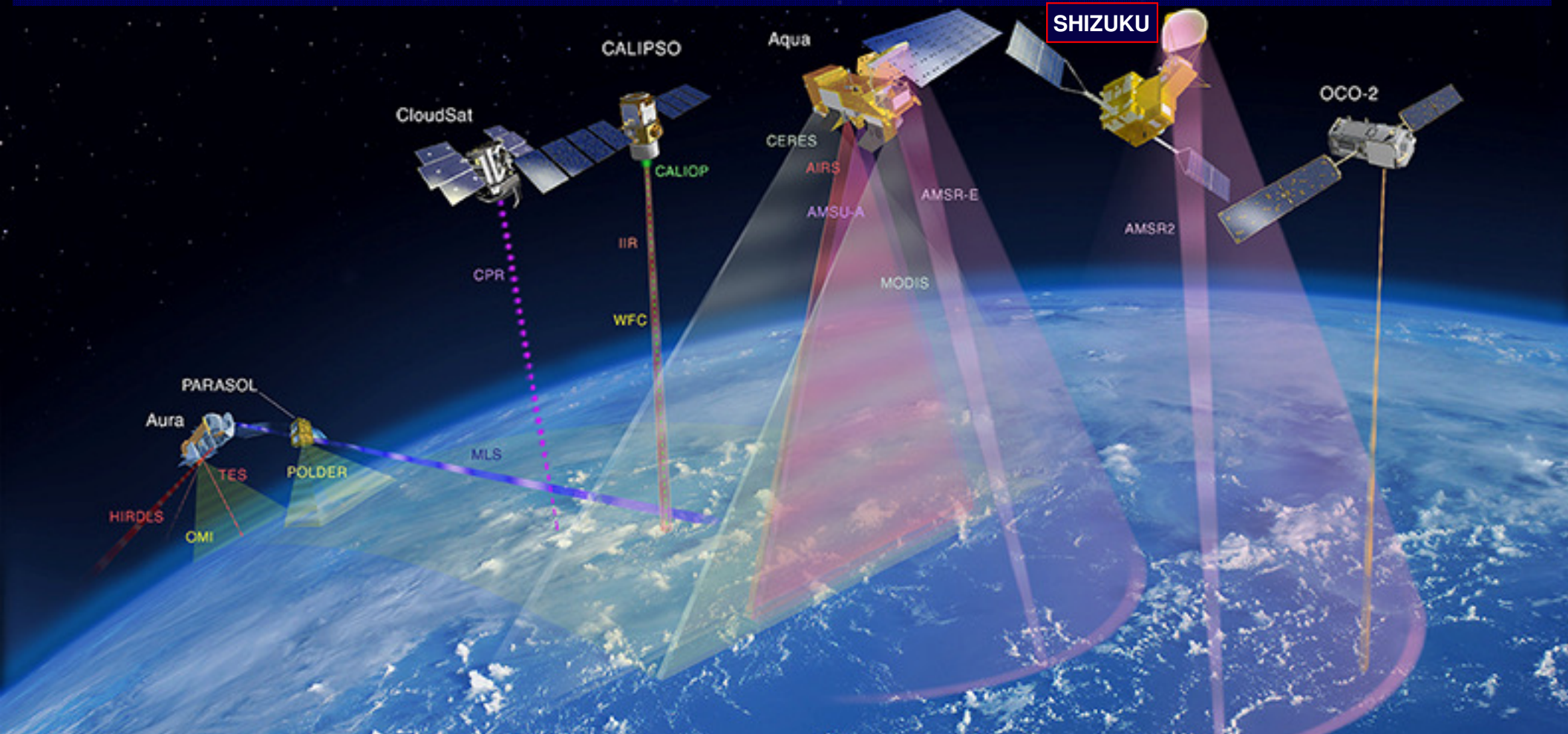




# Overview of “SHIZUKU”

## Special features of A-Train (The Afternoon Constellation):

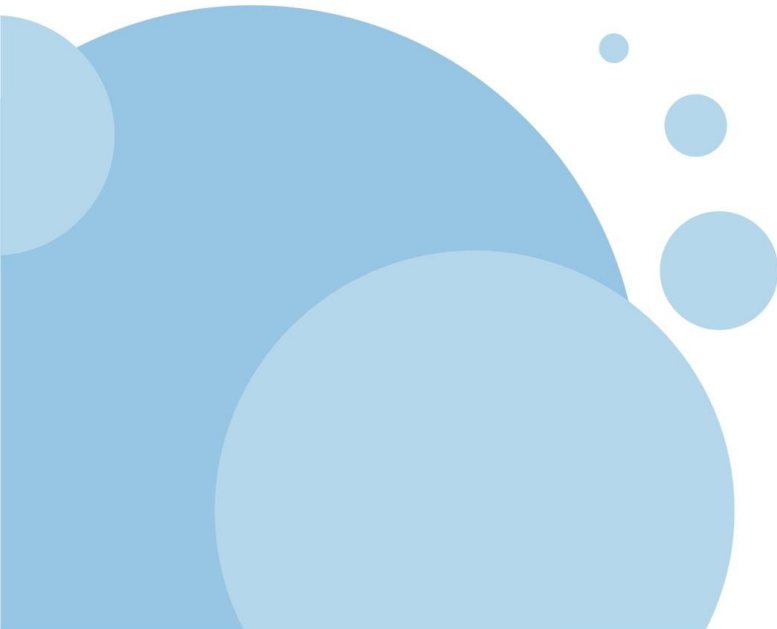
- Observe the same location on the Earth by multiple satellites around the same time approximately within 10 minutes
- Consist of multiple satellites orbiting the Earth in close proximity at an altitude of about 700km, crossing the equator at around 1:30 p.m. local mean solar time





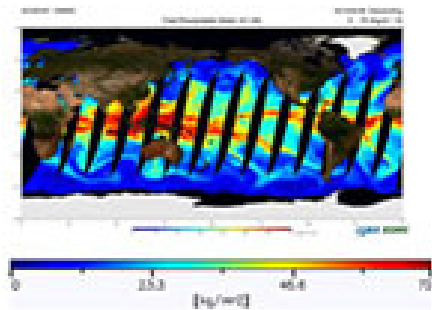


## **2. Current Activities**

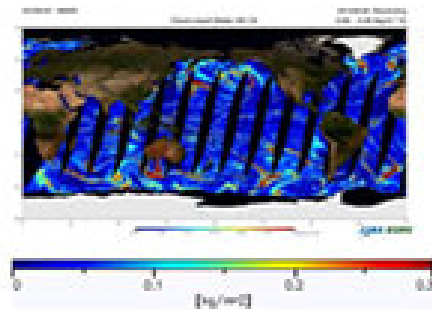




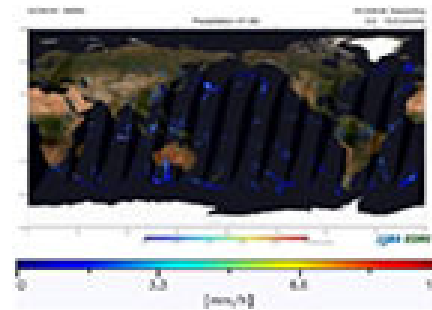
# Geophysical Quantity Products ~Just Started to Provide in May



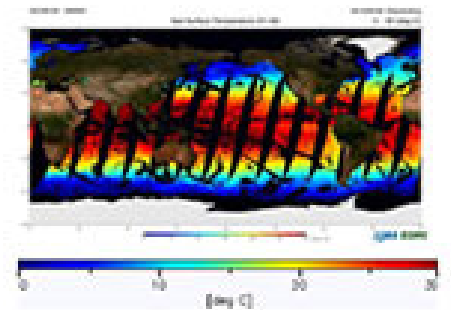
Total Precipitable Water



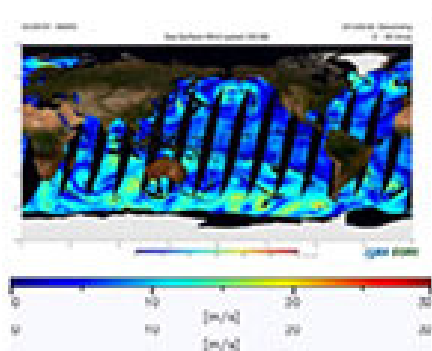
Cloud Liquid Water



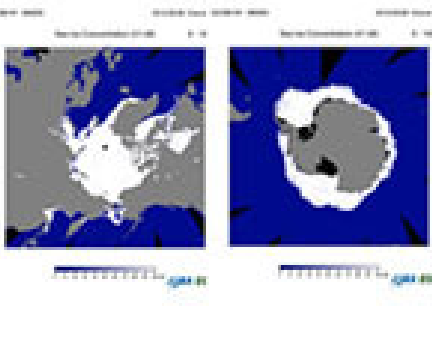
Precipitation



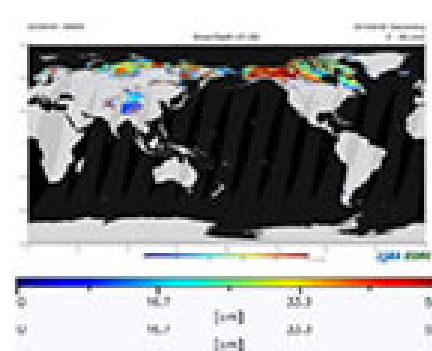
Sea Surface Temperature



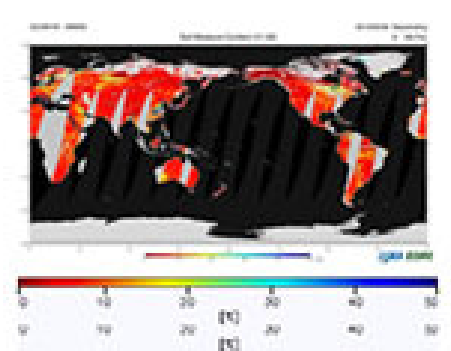
Sea Surface Wind speed



Sea Ice Concentration  
(Left: North Pole Right: South Pole)

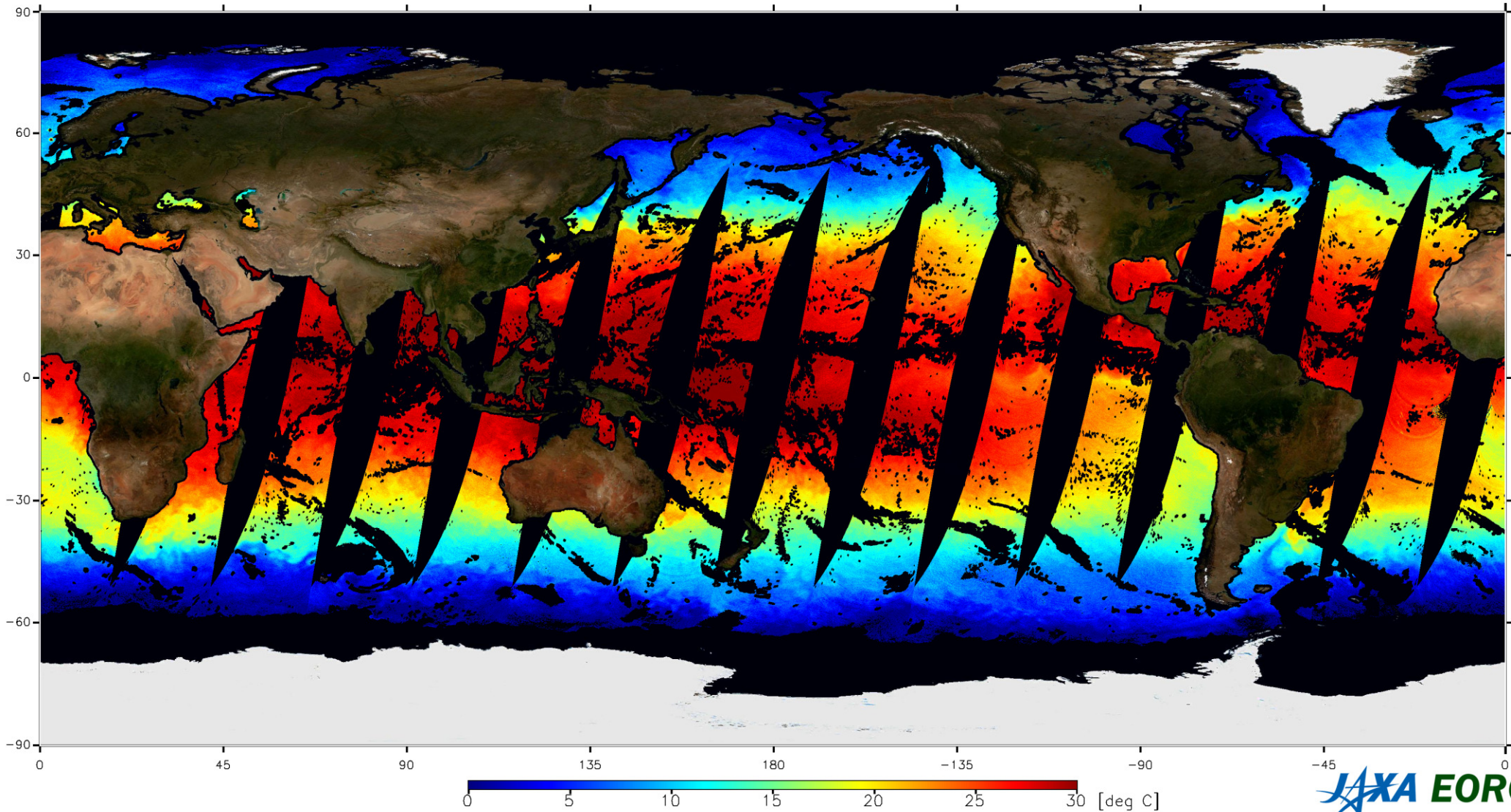


Snow Depth



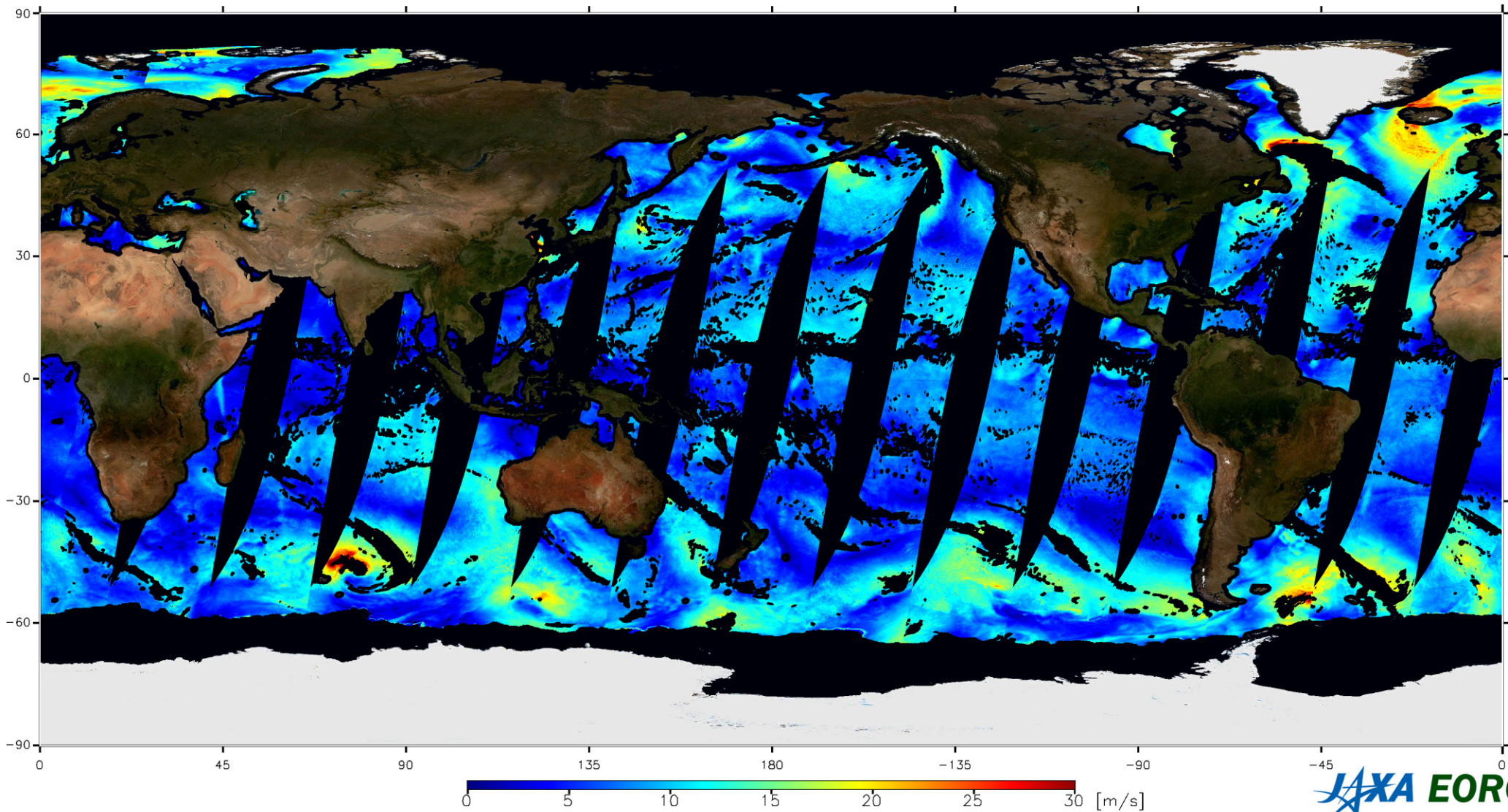
Soil Moisture Content

Sea Surface Temperature (V0.00)



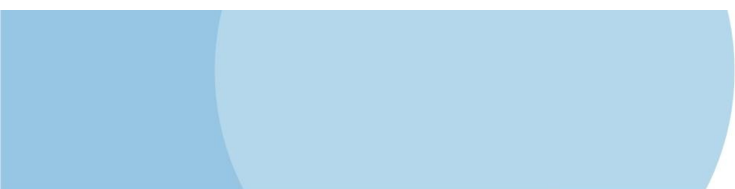
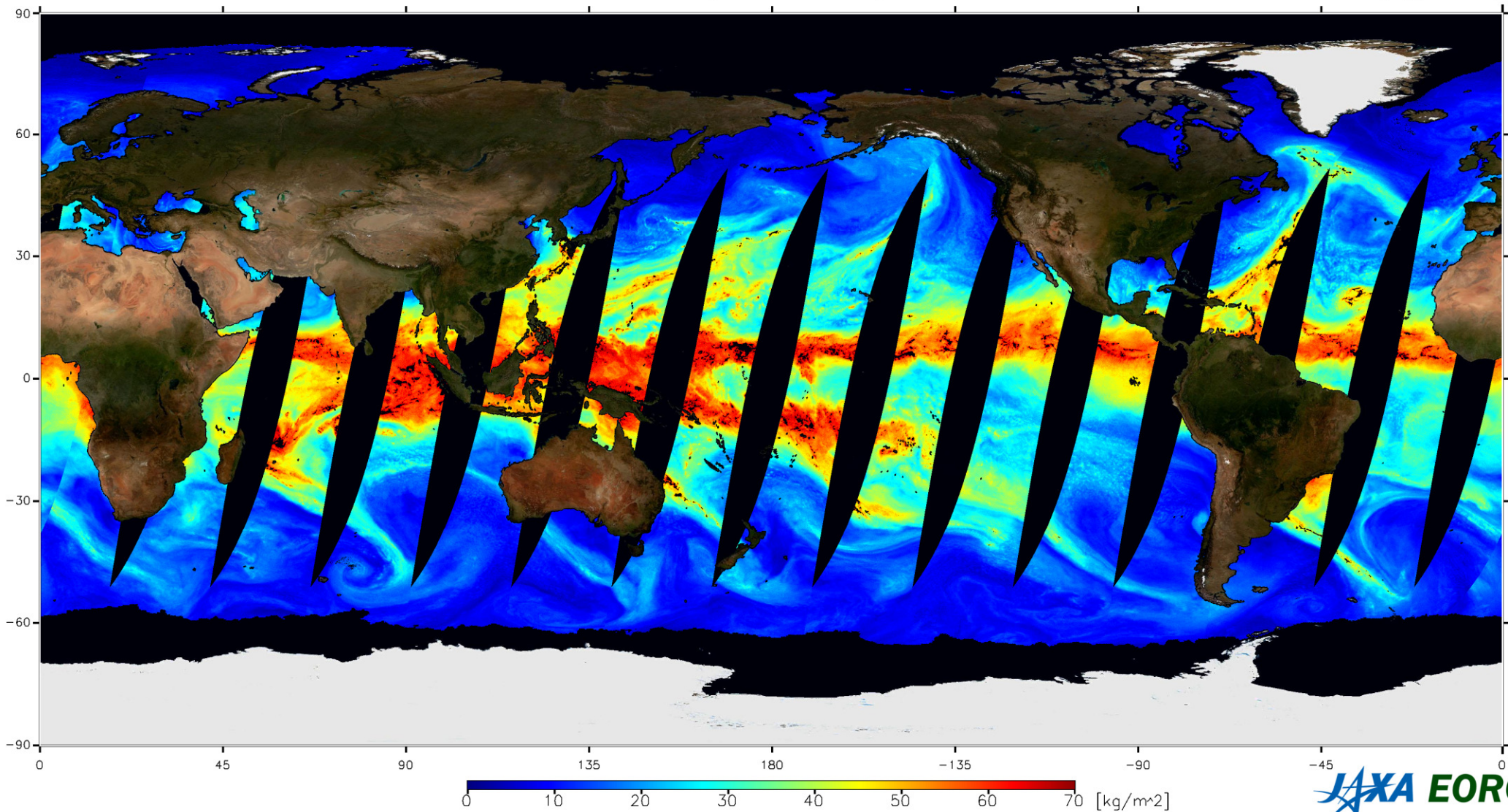


Sea Surface Wind speed (V0.00)



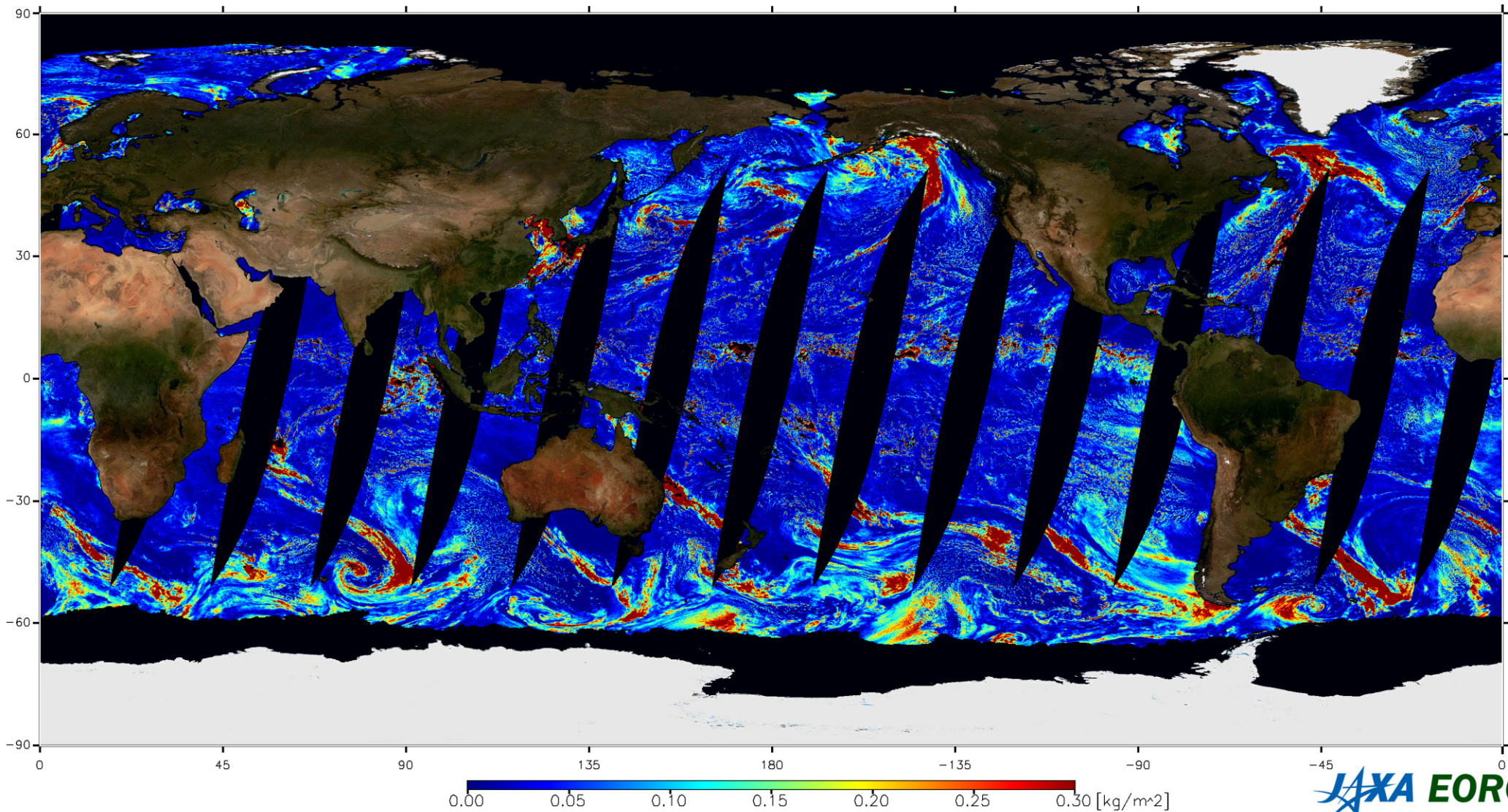


Total Precipitable Water (V0.00)

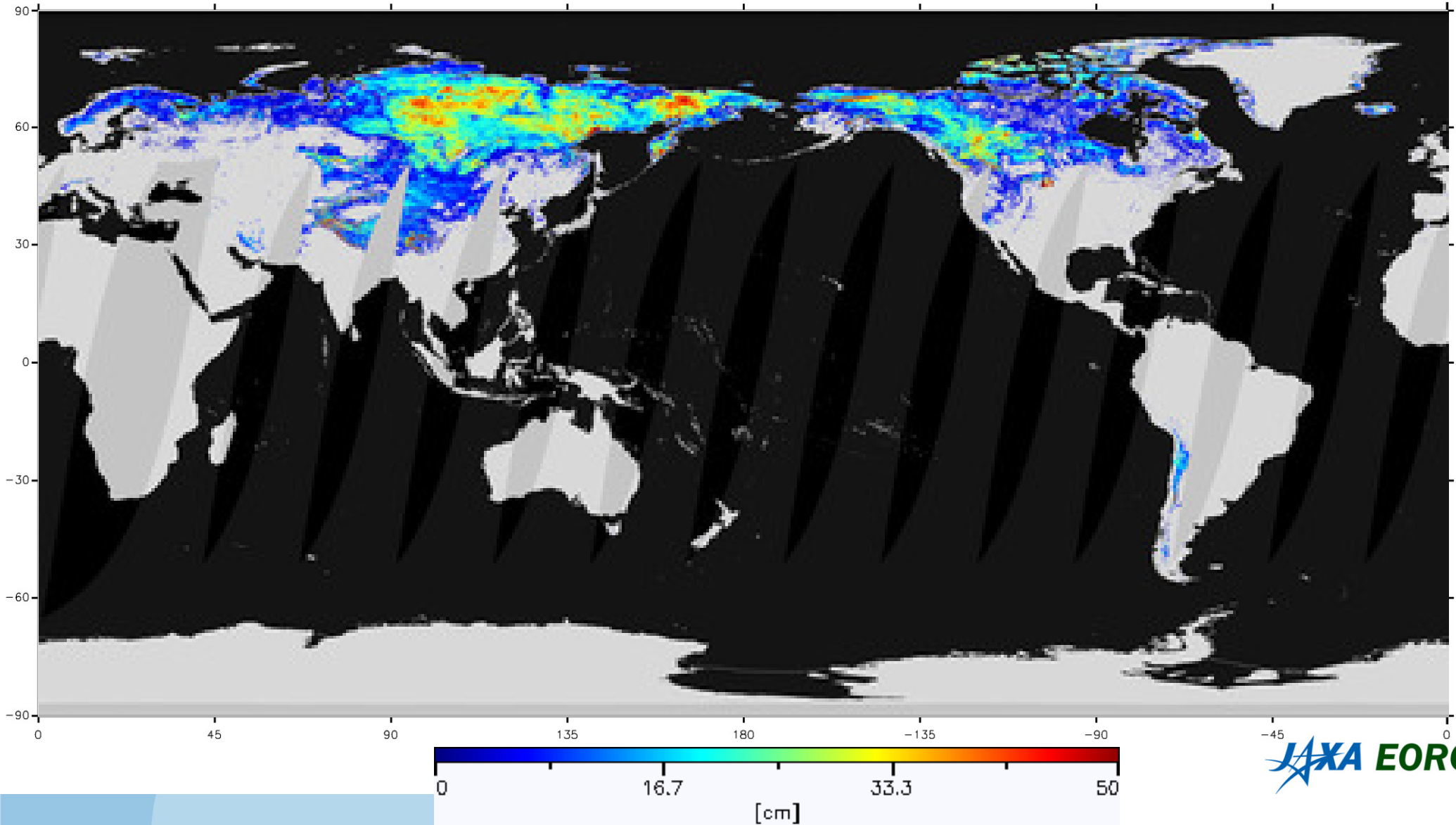




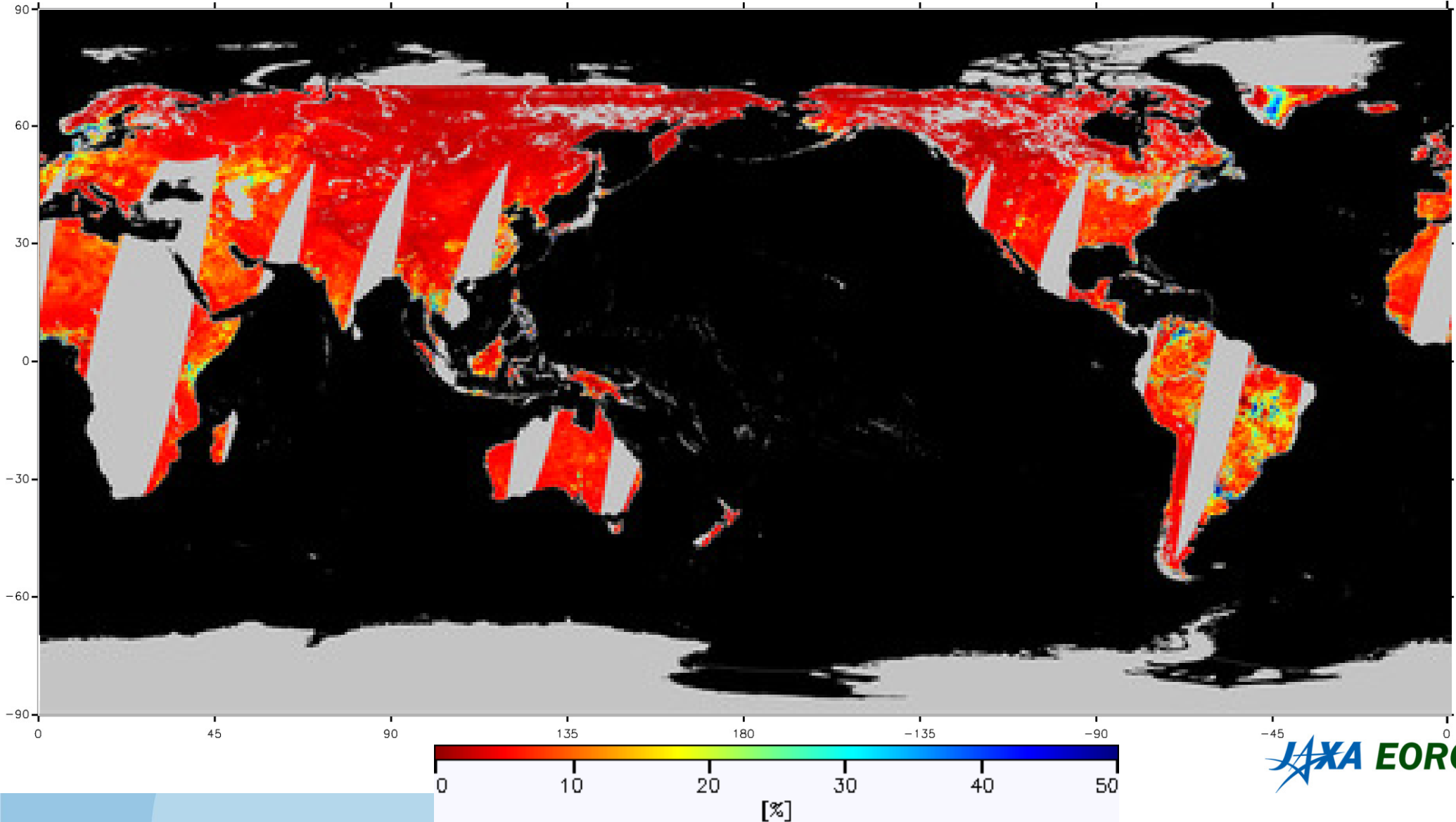
Cloud Liquid Water (V0.00)



Snow Depth (V0.00)

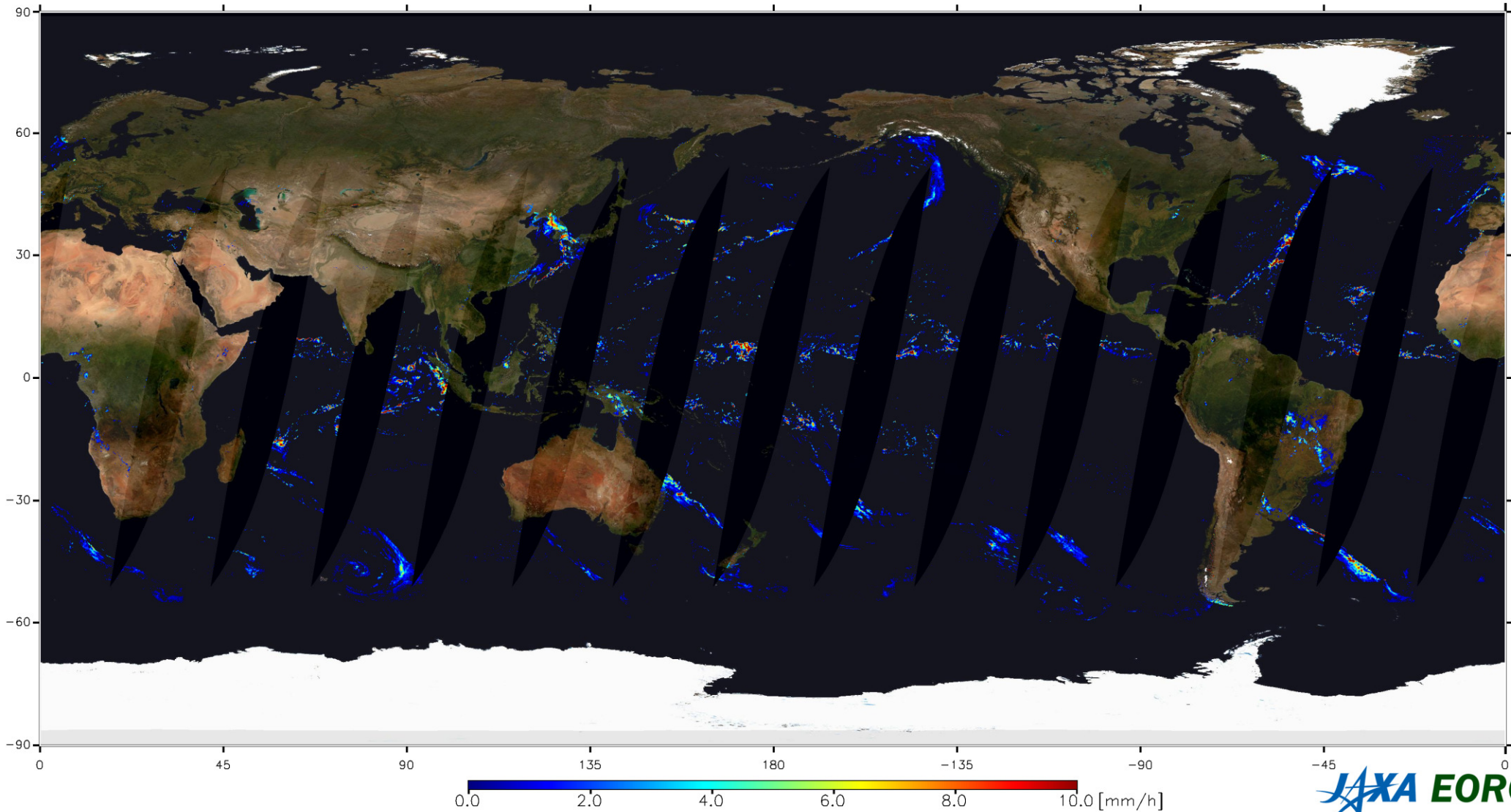


### Soil Moisture Content(V0.00)



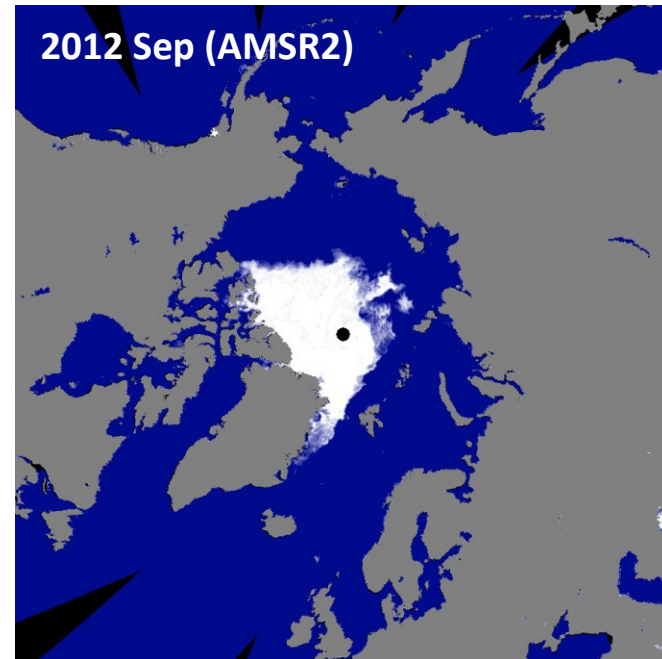
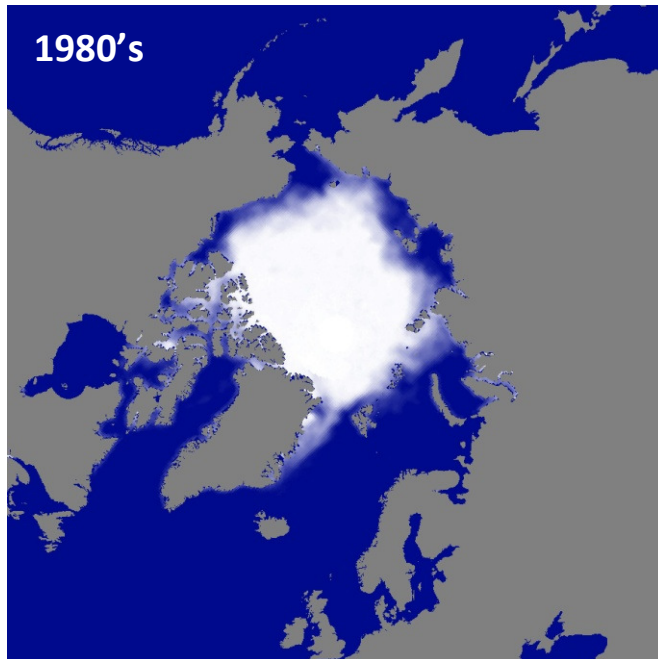


Precipitation (V0.00)

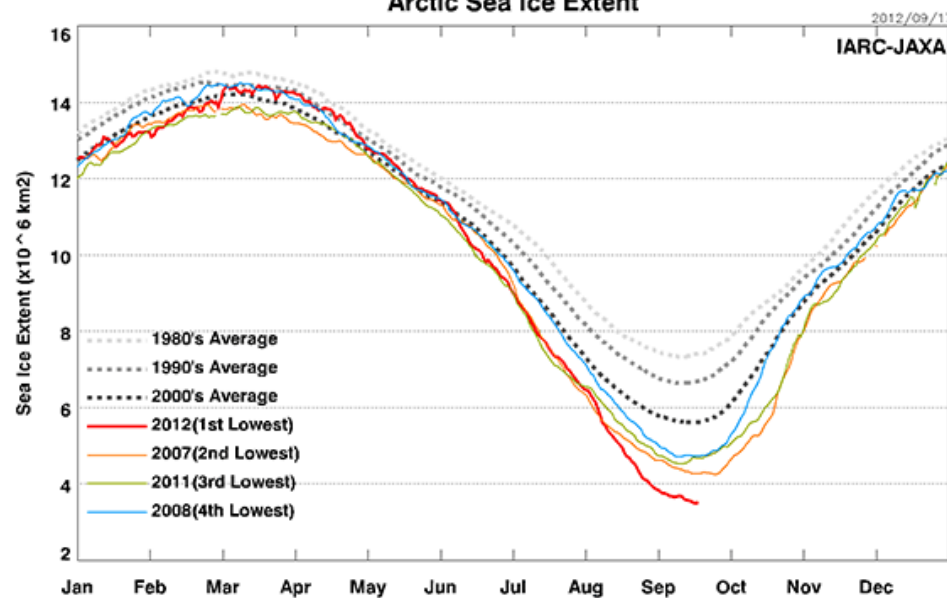




# Becoming Smaller and Smaller



Arctic Sea Ice Extent





# Health Checkup of the Earth

- The smallest sea ice extent shows the increase of global warming.
- Monitoring the current water cycle can make us obtain the knowledge of climate change and disease.
- As above, observation by “Shizuku” is a kind of “health checkup” of the Earth from space.
- JAXA hopes the expansion of the use of data to contribute to understanding the water cycle and to predicting its behavior in the short, medium, and long term.

# GCOM-W1 Data Providing Service



GCOM-W1 Data Providing Service



## Welcome,

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.

User registration is required to use the products. If you have not registered yet, register your e-mail address as your user account at "User Registration". If you try services at this site before user registration, login with a e-mail address "guest" (password is not required).

Input e-mail address and password.

E-mail address:  
(User Account)

Password:

日本語  English

Save Login Status

Login

[User Registration](#) | [If you forgot your password](#)

[For Beginners](#)

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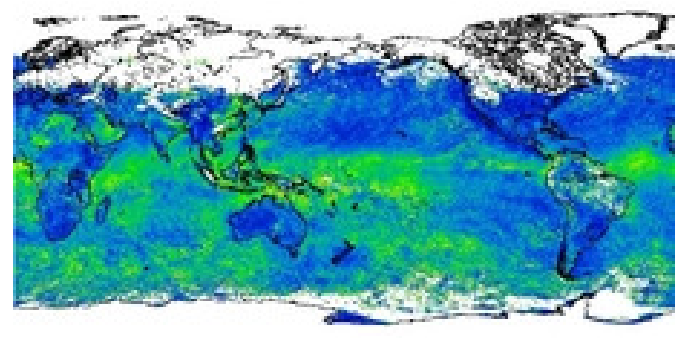
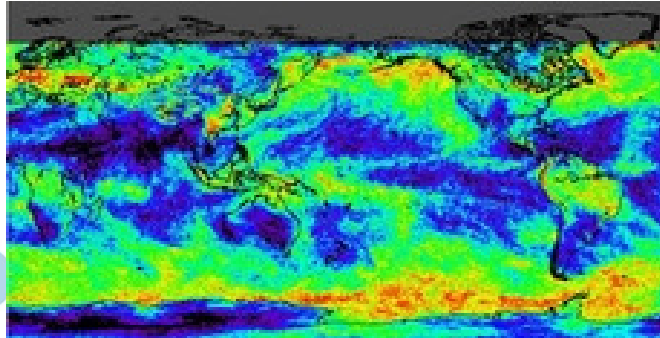
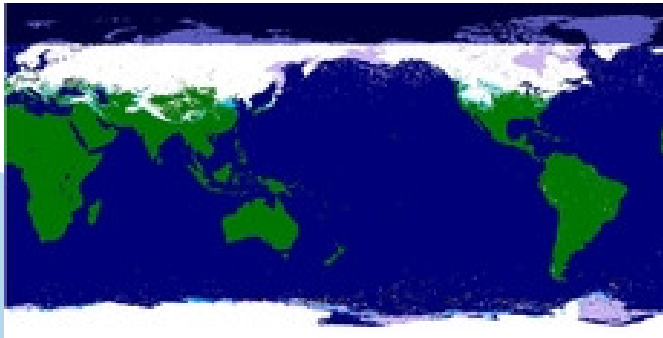
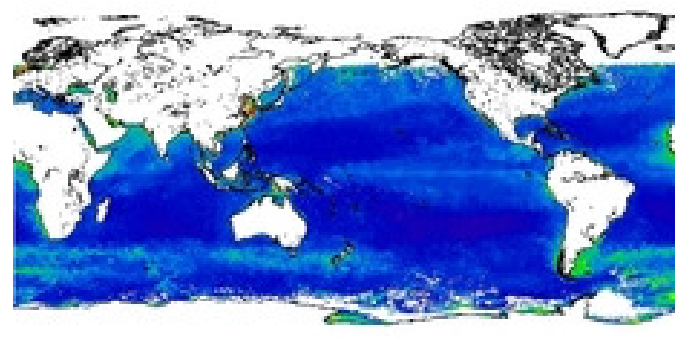
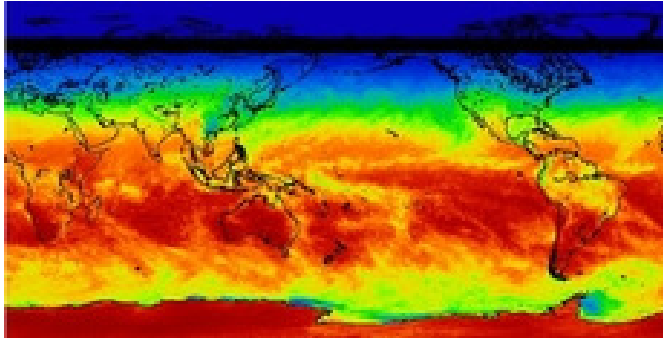
- <https://gcom-w1.jaxa.jp/>
- Standard products of AMSR2, AMSR-E, and AMSR
- AMSR2 brightness temperatures are already available to the public.
- AMSR2 geophysical parameters just have been released in May 2013.



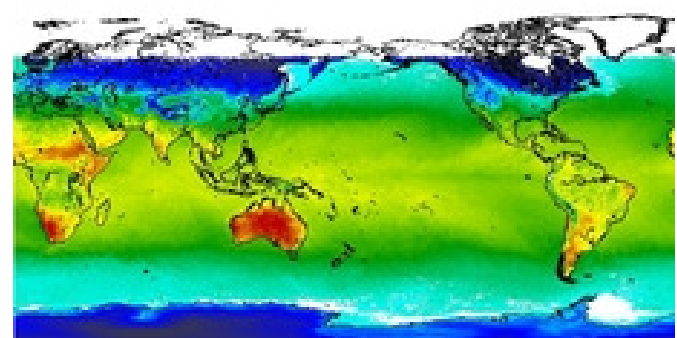
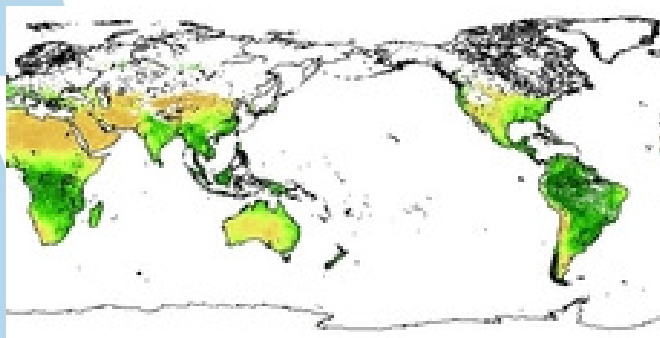
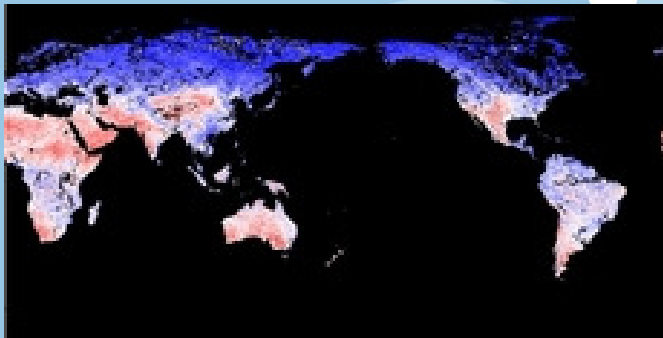
# JASMES

JAXA Satellite Monitoring for Environmental Study

<http://kuroshio.eorc.jaxa.jp/JASMES/index.html>



Plant Water Stress Trends





# Summary

- “Shizuku” has been successfully launched in May, 2012.
- After having completed its initial calibration operation, JAXA has started offering 8 kinds of products whose physical quantity concerning water on the Earth in this May.
- These products will contribute to capture environmental changes on a global scale.
- JAXA continues to make sincere effort to expand the data utilization.





**Thank you for your attention.**

