

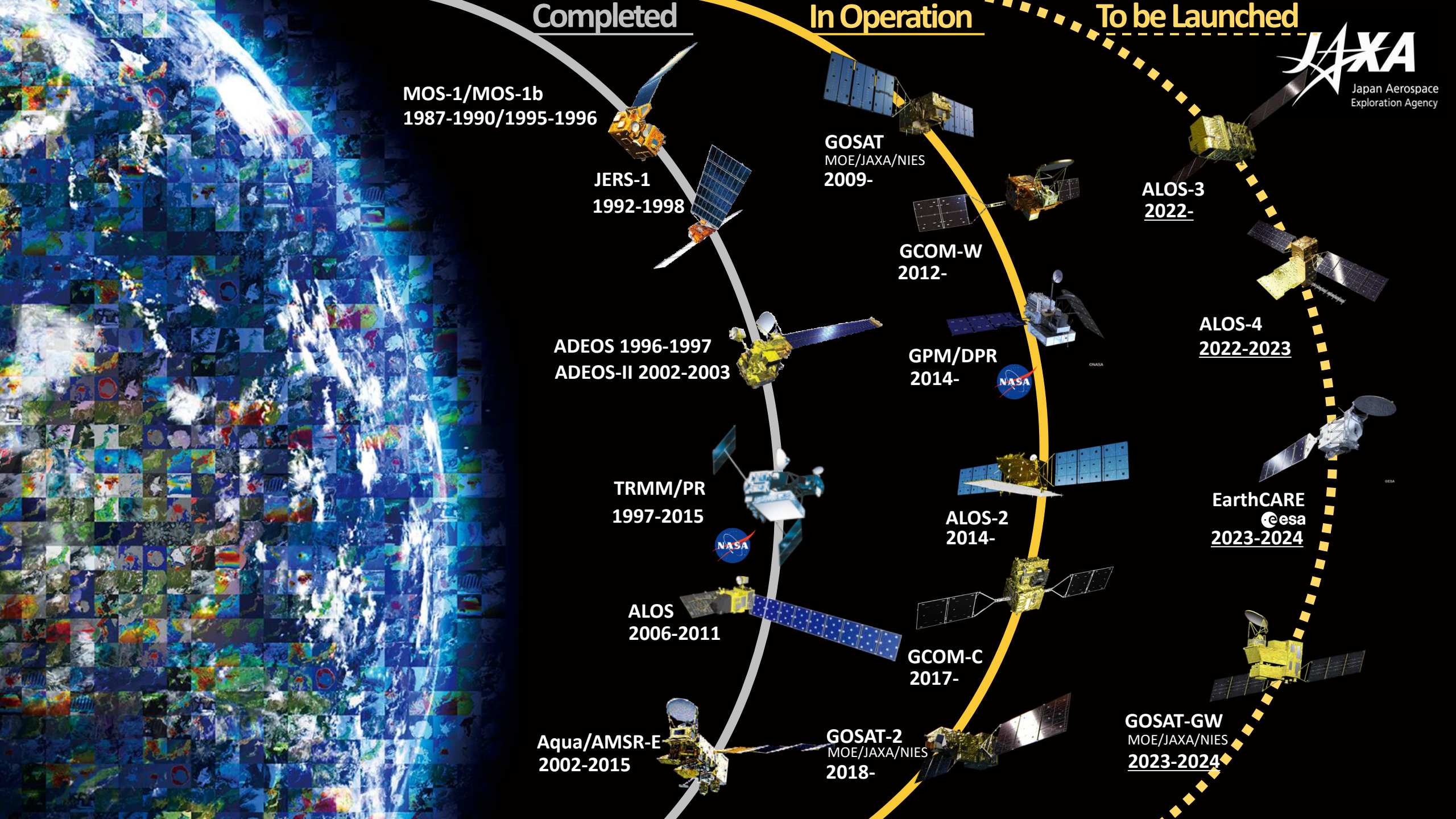


# JAXA Satellite Missions Addressing Water Issues

April 23, 2022

**YAMAKAWA Hiroshi**  
**President**

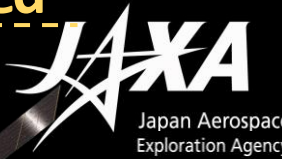
Japan Aerospace Exploration Agency



**Completed**

**In Operation**

**To be Launched**



**MOS-1/MOS-1b**  
1987-1990/1995-1996

**JERS-1**  
1992-1998

**ADEOS 1996-1997**  
**ADEOS-II 2002-2003**

**TRMM/PR**  
1997-2015

**ALOS**  
2006-2011

**Aqua/AMSR-E**  
2002-2015

**GOSAT**  
MOE/JAXA/NIES  
2009-

**GCOM-W**  
2012-

**GPM/DPR**  
2014-

**ALOS-2**  
2014-

**GCOM-C**  
2017-

**GOSAT-2**  
MOE/JAXA/NIES  
2018-

**ALOS-3**  
2022-

**ALOS-4**  
2022-2023

**EarthCARE**  
esa  
2023-2024

**GOSAT-GW**  
MOE/JAXA/NIES  
2023-2024



# U.S – Japan Collaboration: Global Water Cycle Observation by TRMM, GPM and Beyond.



*Tropical Rainfall Measuring Mission*

## TRMM

1997 - 2015

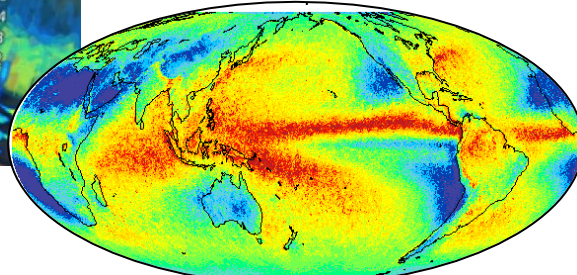
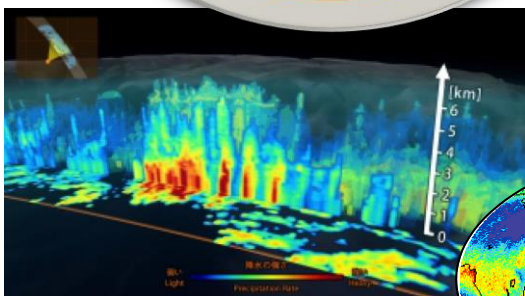
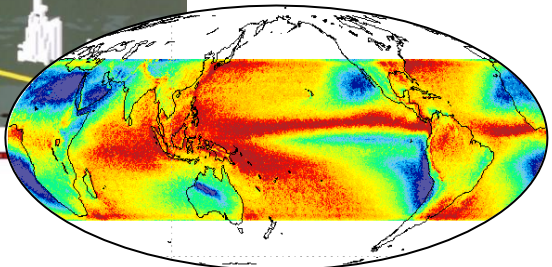
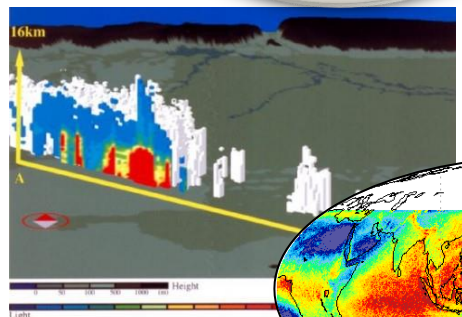
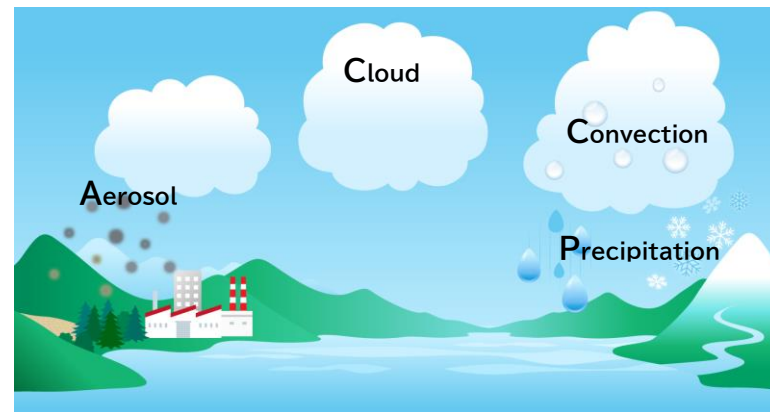
*Global Precipitation Measurement Mission*

## GPM

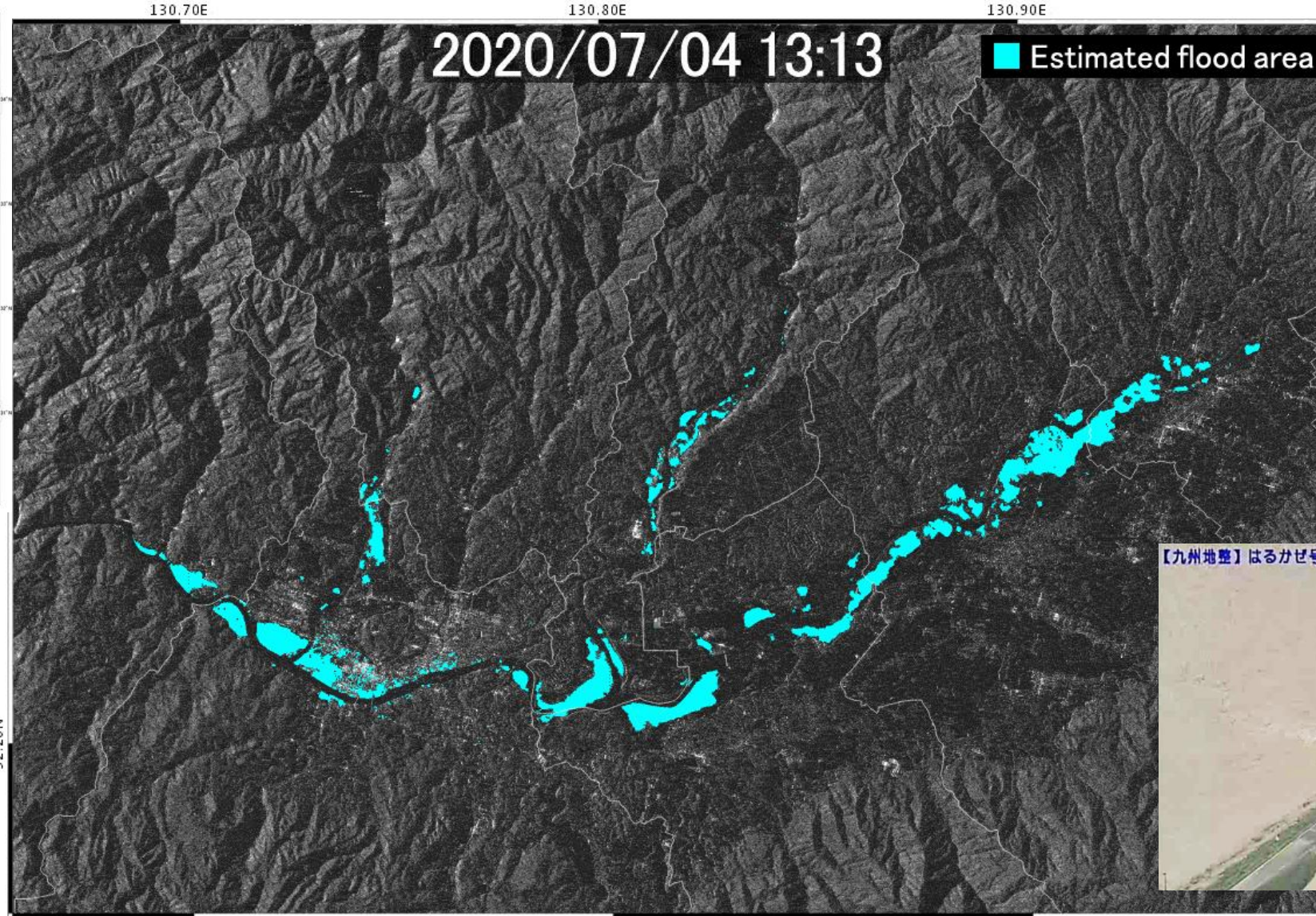
2014 - Present

Future

*Aerosol, Cloud, Convection  
and Precipitation (ACCP)*



# Contribution to Disaster Management: “DAICHI-2” (ALOS-2) observation



Inundated area around the Kuma river (July 2020)

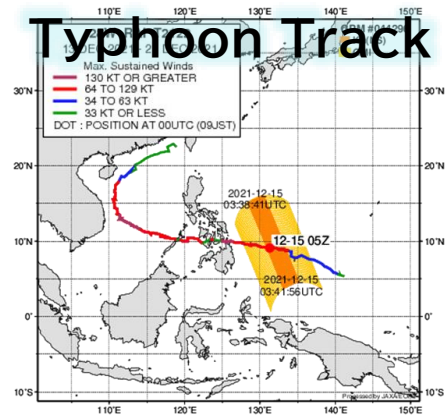
Photo by Ministry of Land, Infrastructure, Transport and Tourism, Kyusyu Regional Development Bureau

# Contribution to Disaster Risk Reduction & Water Resource Management:

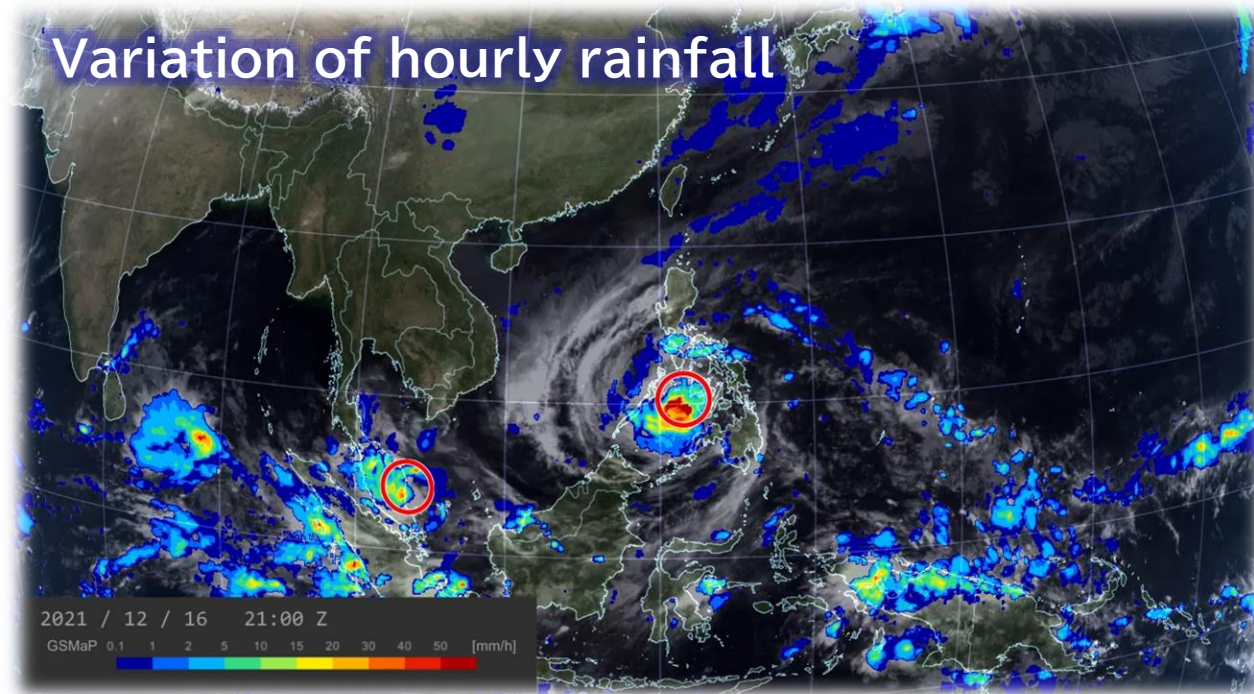
## Global Satellite Mapping of Precipitation (GSMaP)



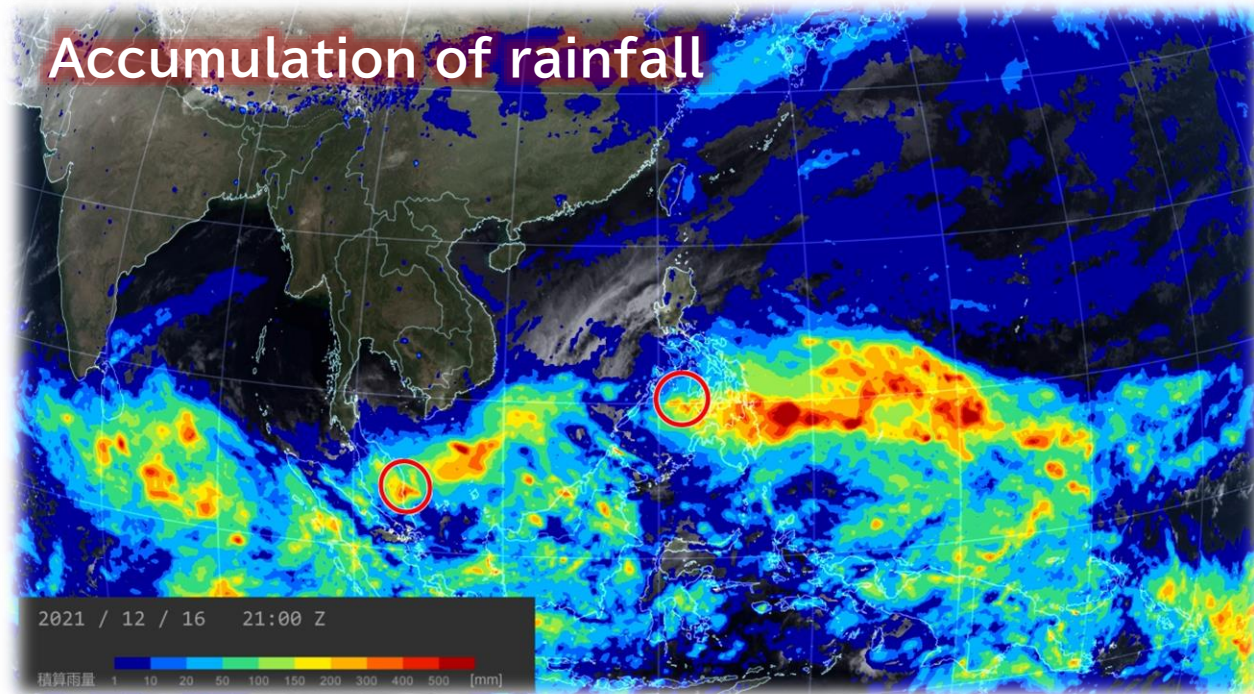
GSMaP captures the Typhoon Rai passage from the east of the Philippine Sea to the westward.



Variation of hourly rainfall



Accumulation of rainfall

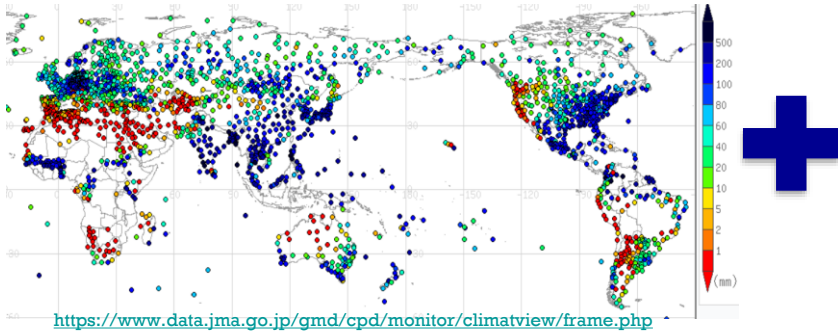


Precipitation from December 13 to 20, 2021 based on GSMaP

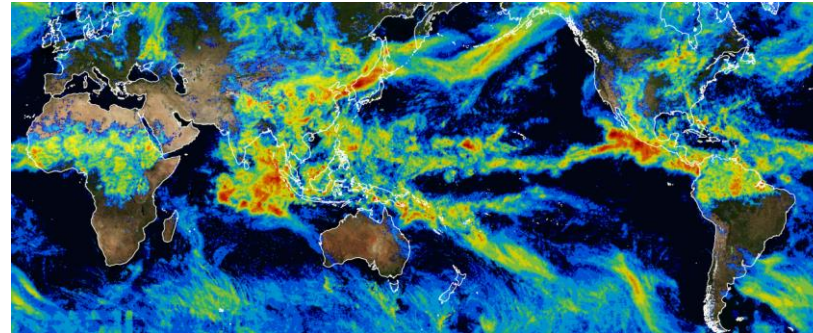
# Flood Prediction Realized by Integration of GSMaP and Ground Observations



### Ground observations



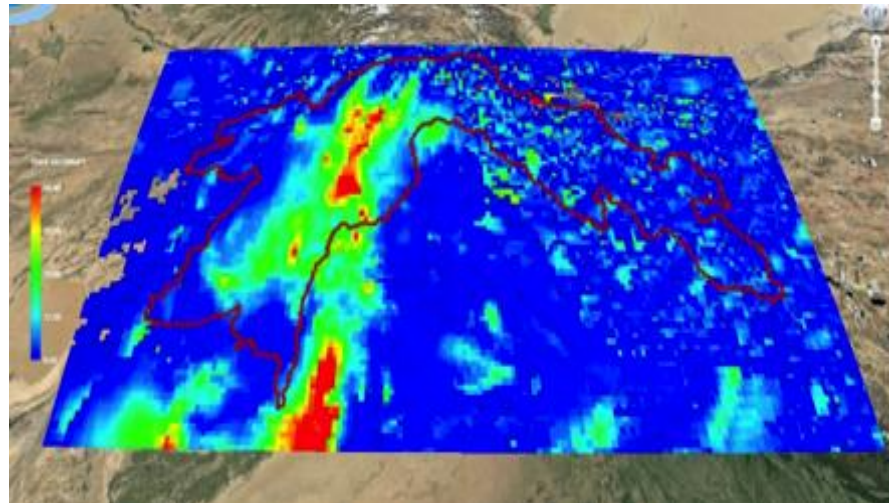
### Satellite precipitation (GSMaP)



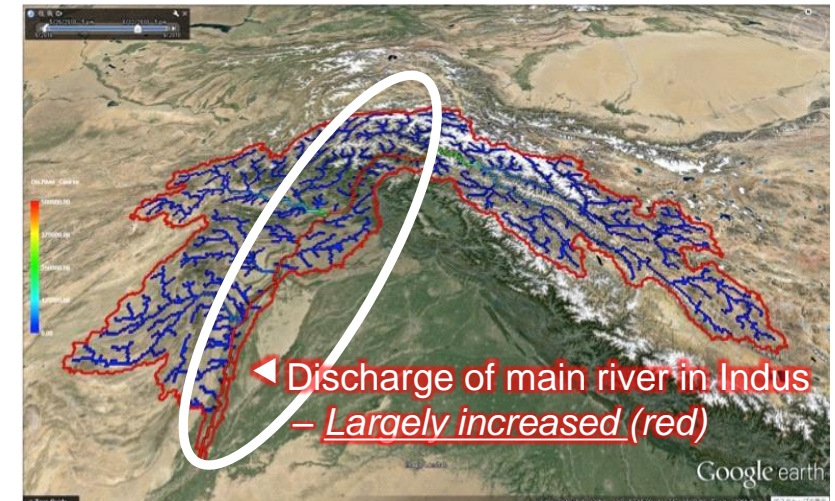
Partners



### Rainfall over the river basin during flood in Pakistan

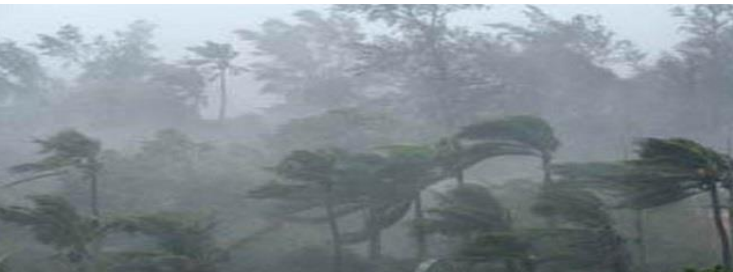


### River discharge using GSMaP by Integrated Flood Analysis System (IFAS)



(Images provided by ICHARM)

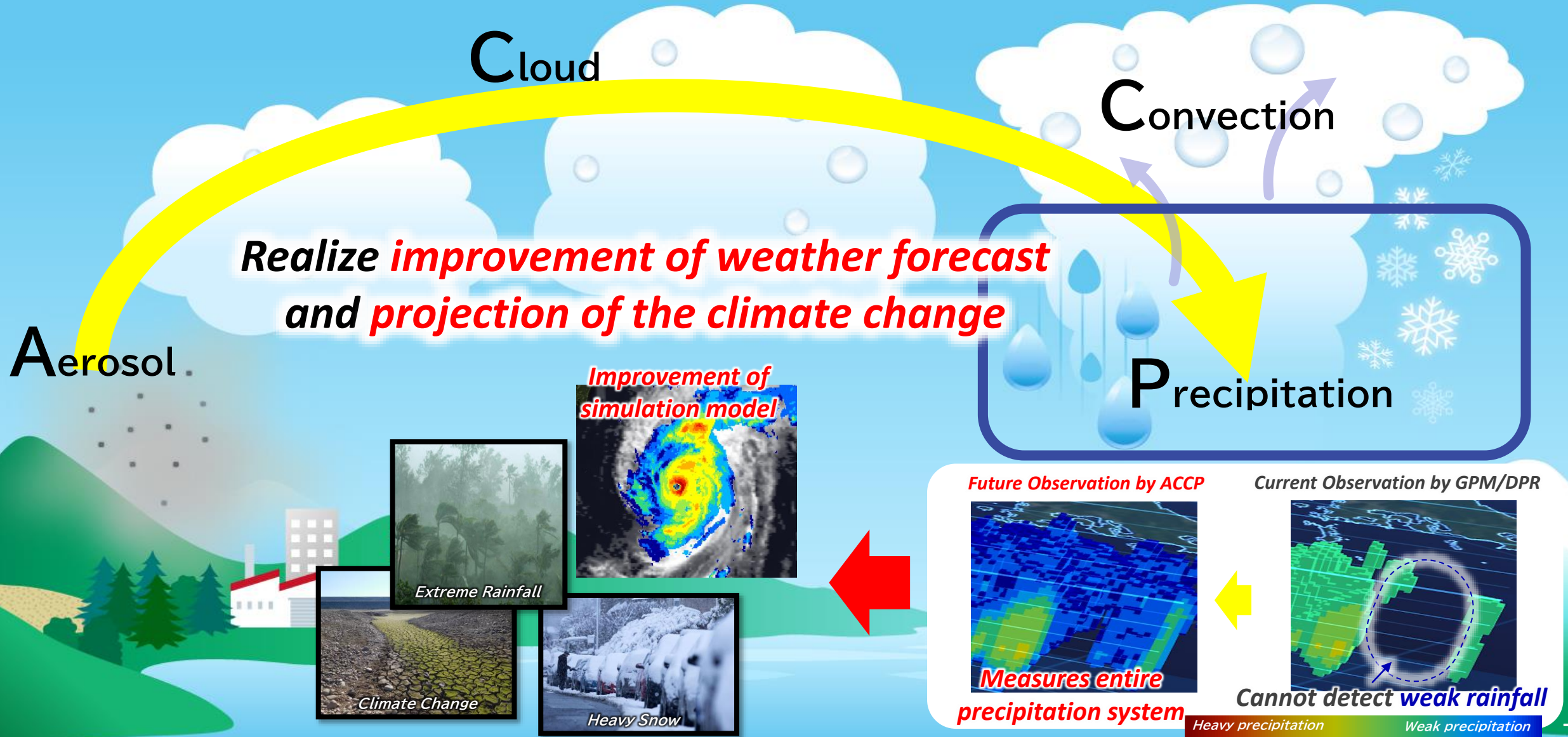
# Water related disasters cause human suffering in Asia Pacific Region



Average annual deaths per 100,000 population

Country or Region	Number of annual deaths per 100,000 population		Rank
			World
Philippines	1.217		10
Thailand	0.180		44
India	0.133		58
Japan	0.090		70
U.S.A.	0.080		76
Indonesia	0.059		85
Korea	0.057		86
China	0.047		92
Taiwan	0.025		117
Italia	0.020		123
France	0.019		124
Germany	0.005		152
U.K.	0.005		154
Canada	0.004		156
Netherlands	0.003		160

# Toward Realization of Further Improvement of Weather Forecast & Projection of the Climate Change







***Space Technologies  
for our Prosperous and Sustainable Future***