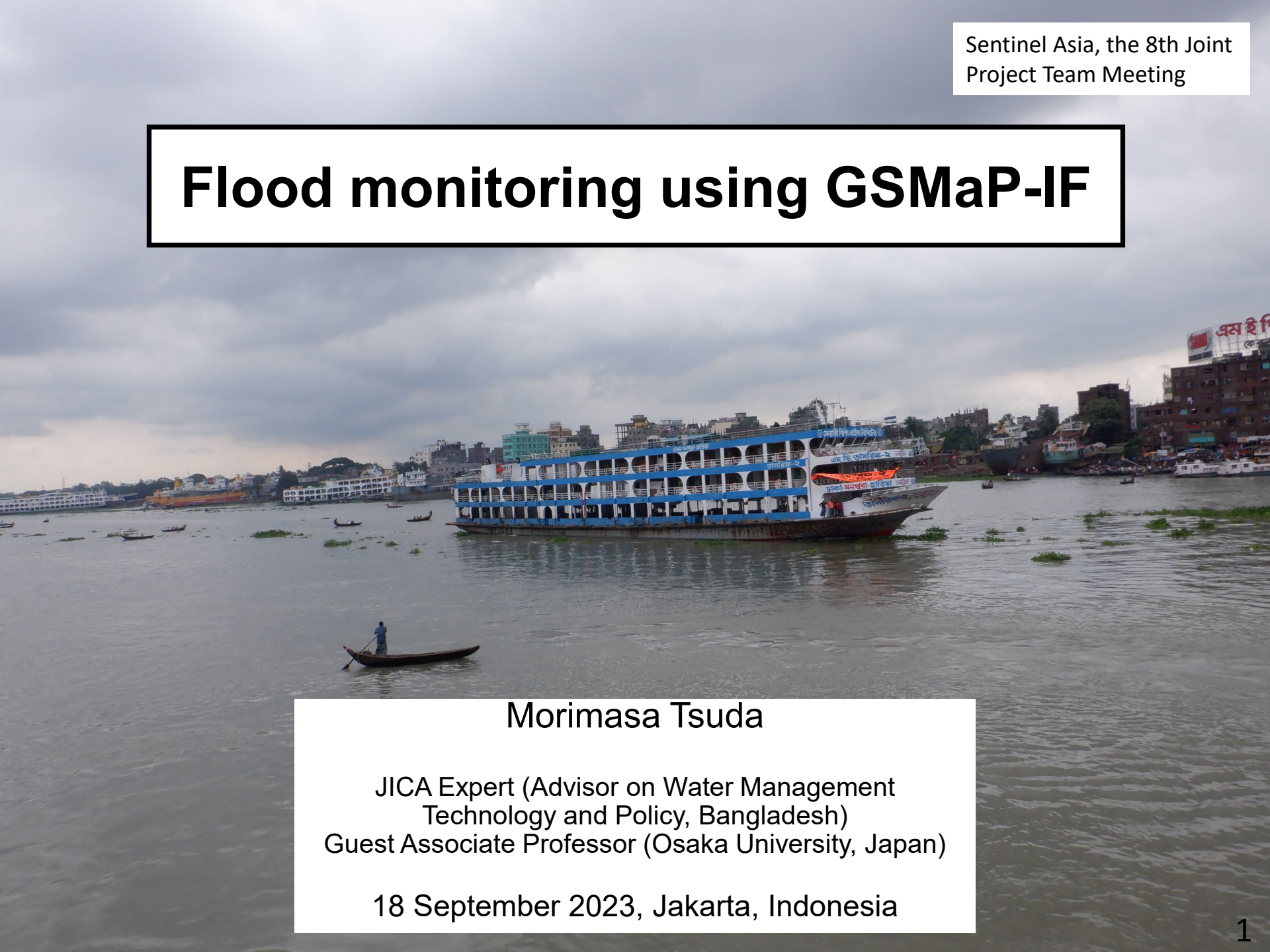


Flood monitoring using GSMaP-IF



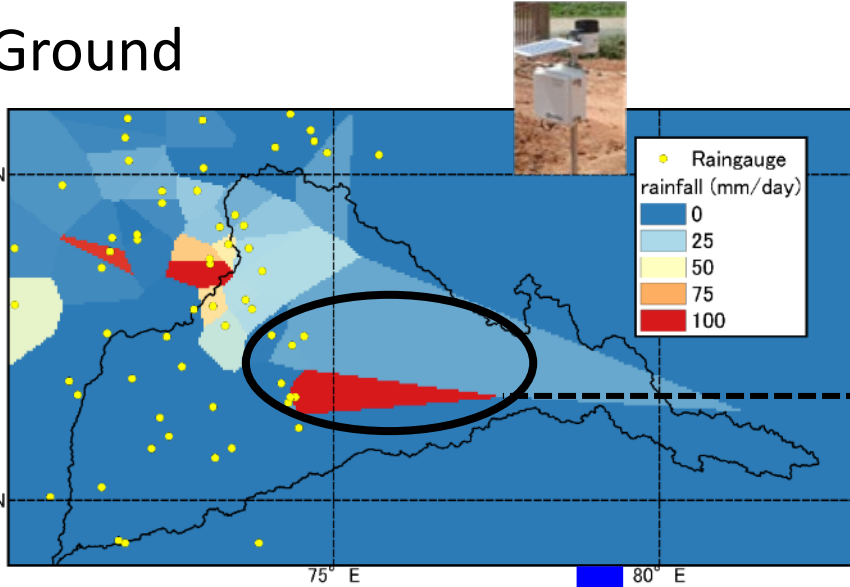
Morimasa Tsuda

JICA Expert (Advisor on Water Management
Technology and Policy, Bangladesh)
Guest Associate Professor (Osaka University, Japan)

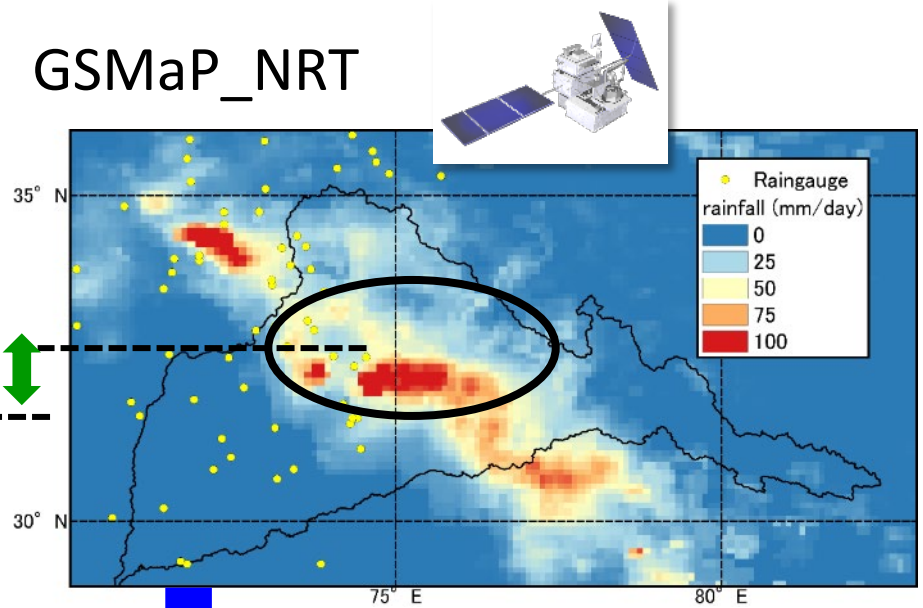
18 September 2023, Jakarta, Indonesia

Bias correction of Satellite precipitation(GSMaP)

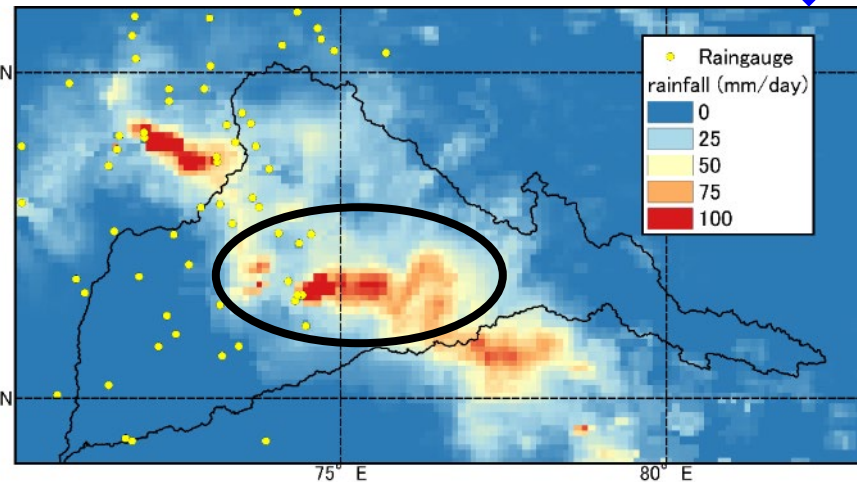
Ground



GSMaP_NRT



Corrected GSMaP
(GSMaP-IF)



Bias correction
(GSMaP-IF)

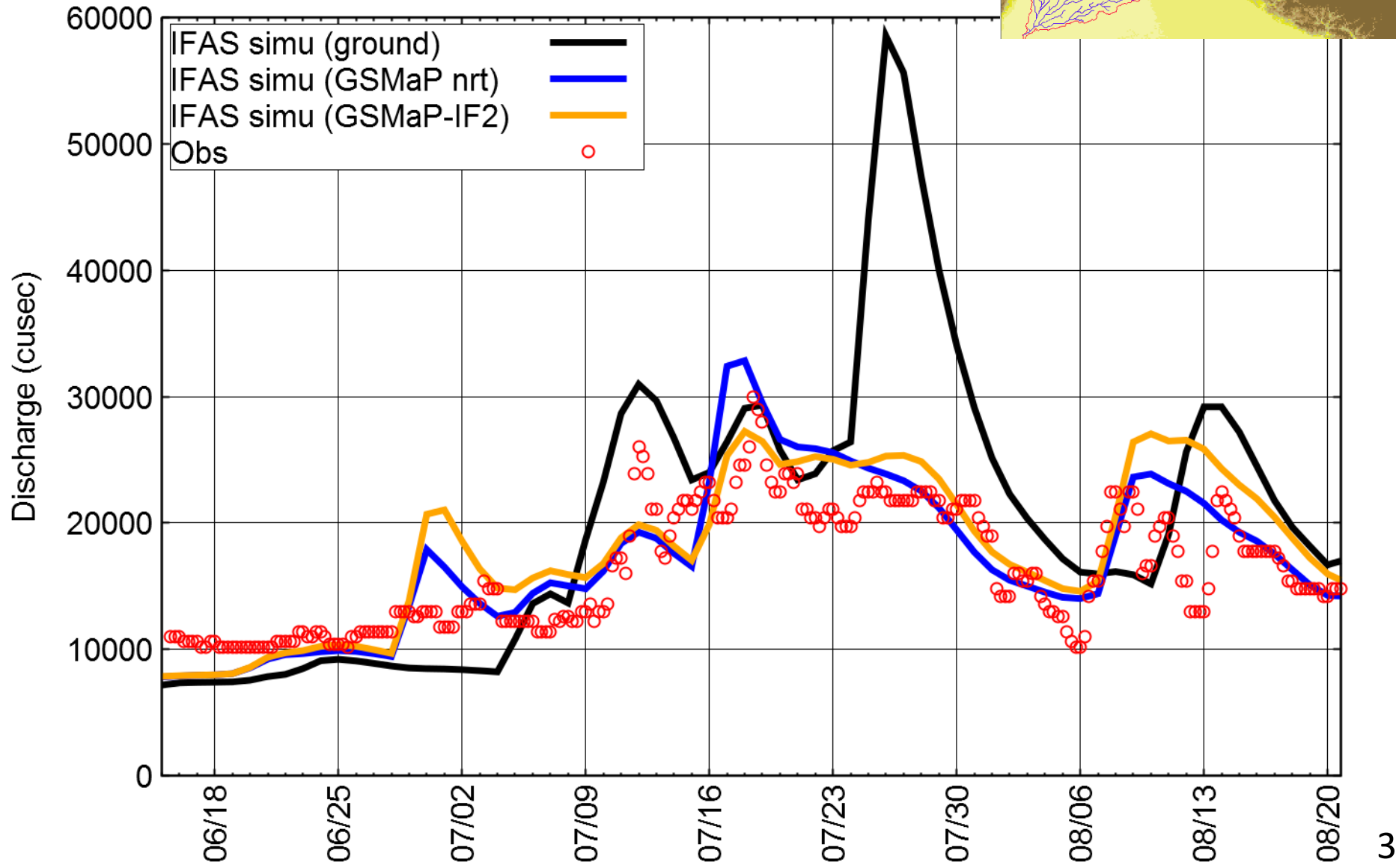
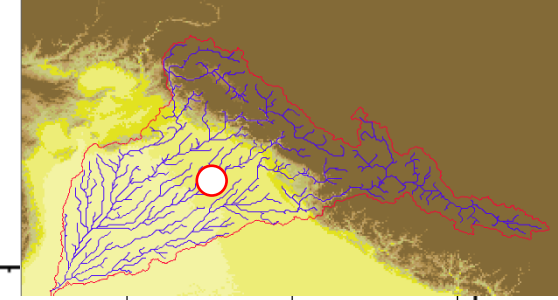


+



GSMaP: Global Satellite Mapping of
Precipitation by JAXA

Simulation of river discharge with GSMaP-IF



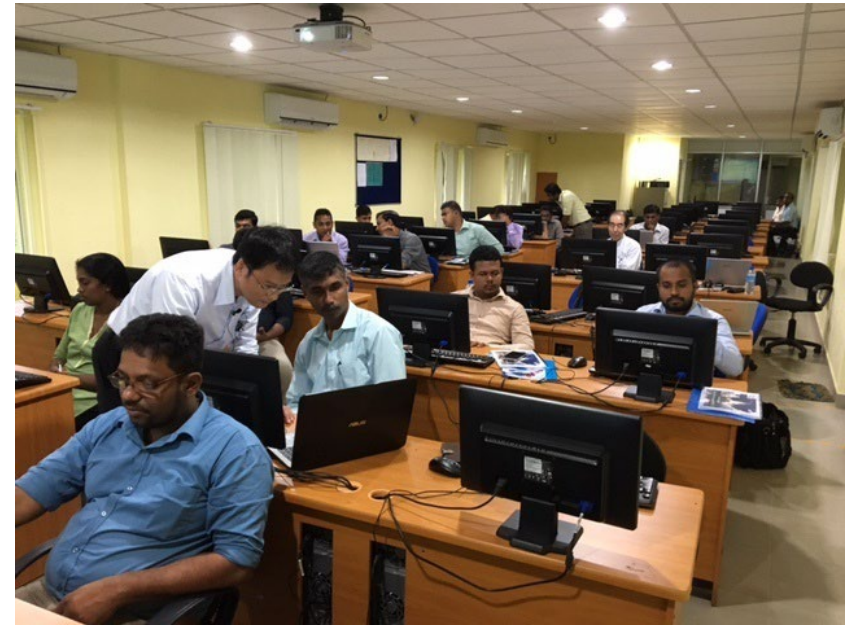
GSMaP Bias correction training by SAFE (Space Applications for Environment) prototyping projects

Mekong River
Commission (2016)

Sri Lanka Irrigation
Department (2016)



“Deploying GSMaP for Decision Support in Transboundary Catchments in the Lower Mekong Basin”



“Developing and Implementing an Operational Prototype for Advanced Flood Forecasting, Early Warning, and Data Sharing System in the Kalu Ganga Basin, Sri Lanka”

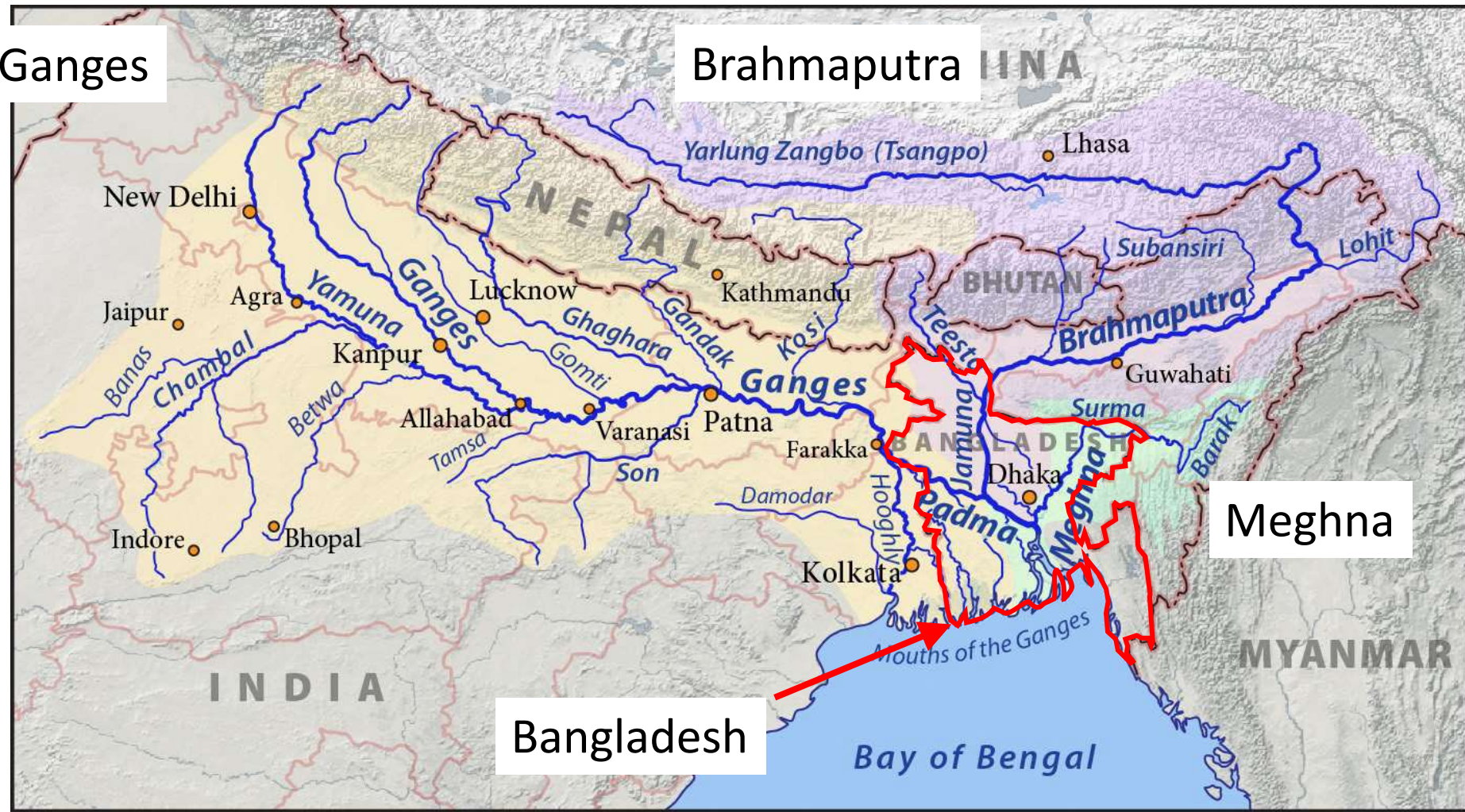
Ganges, Brahmaputra, Meghna river basins

Ganges

Brahmaputra

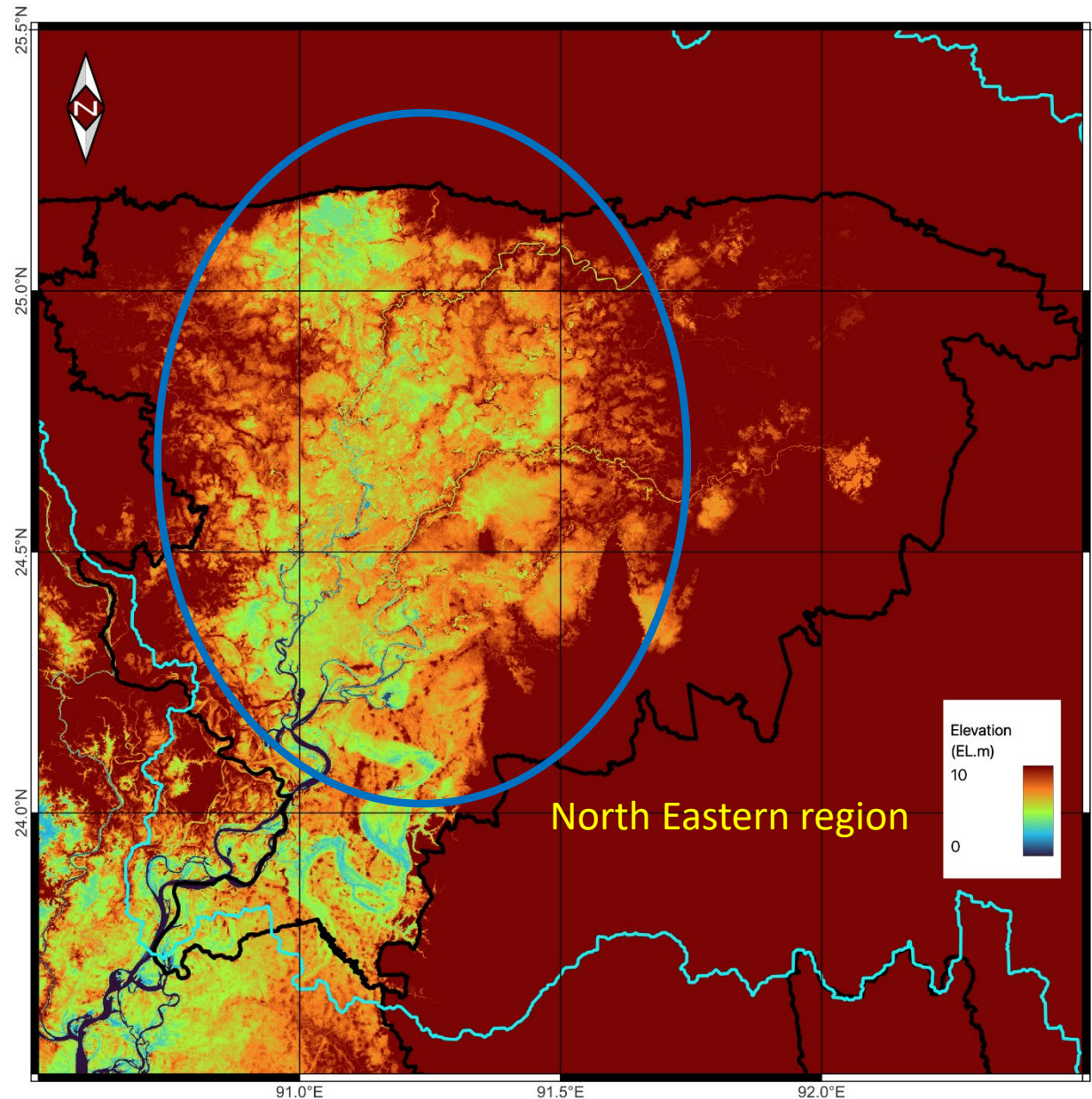
Meghna

Bangladesh



Total catchment area of three basins : 1.72 million km²

Haor region at North Eastern Bangladesh



Only 1-4m above the mean sea level

Wet Season



Dry Season

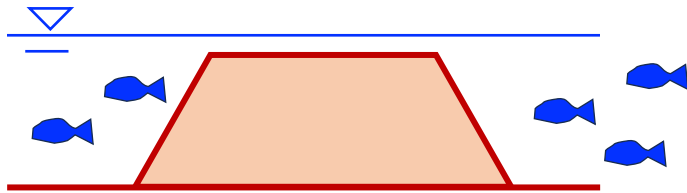


Paddy field

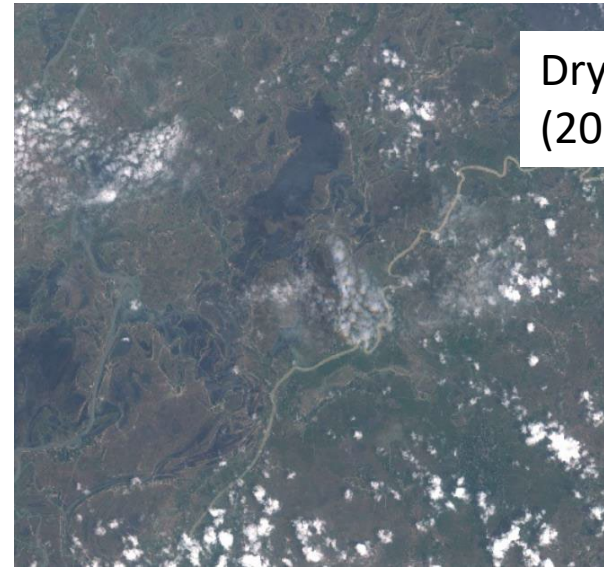
Flood control by submergible embankment



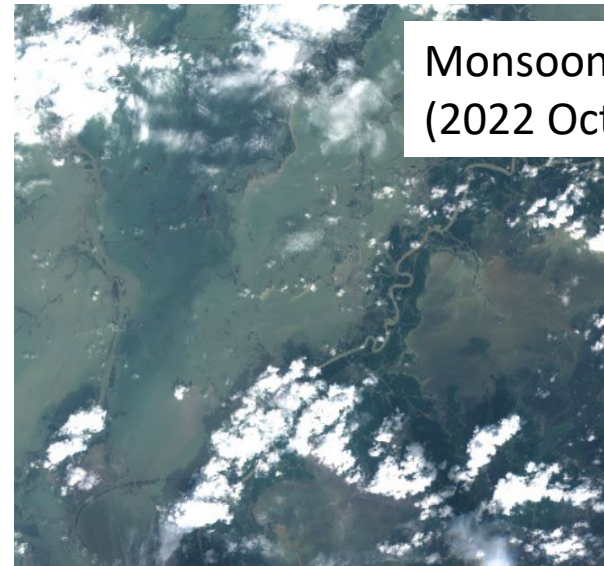
Before harvesting in May : Protection of cropland by embankment



After May : Fishery work



Dry season
(2022 May)



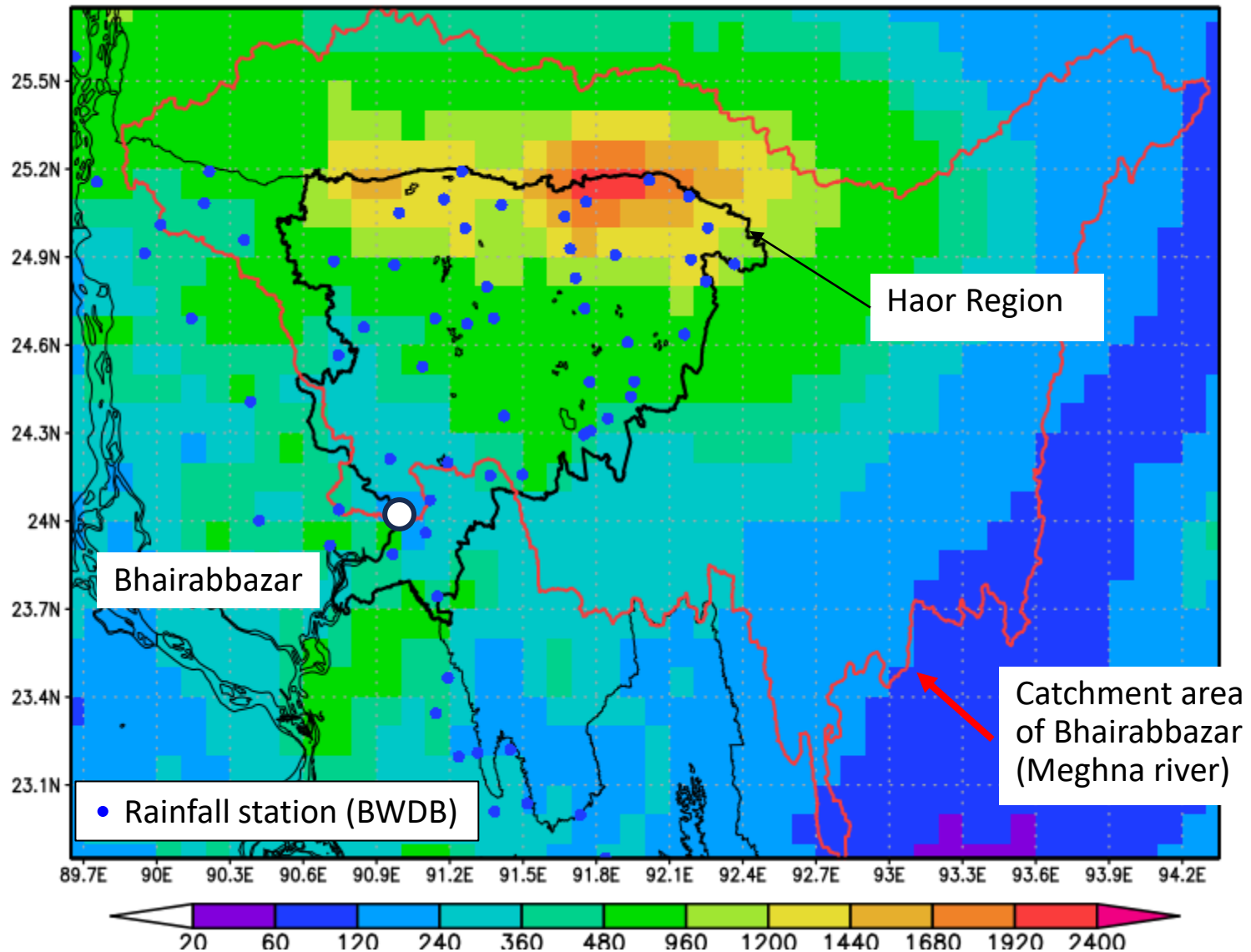
Monsoon season
(2022 October)



Rui Beel Haor (2023 January)

Heavy rainfall outside observation network

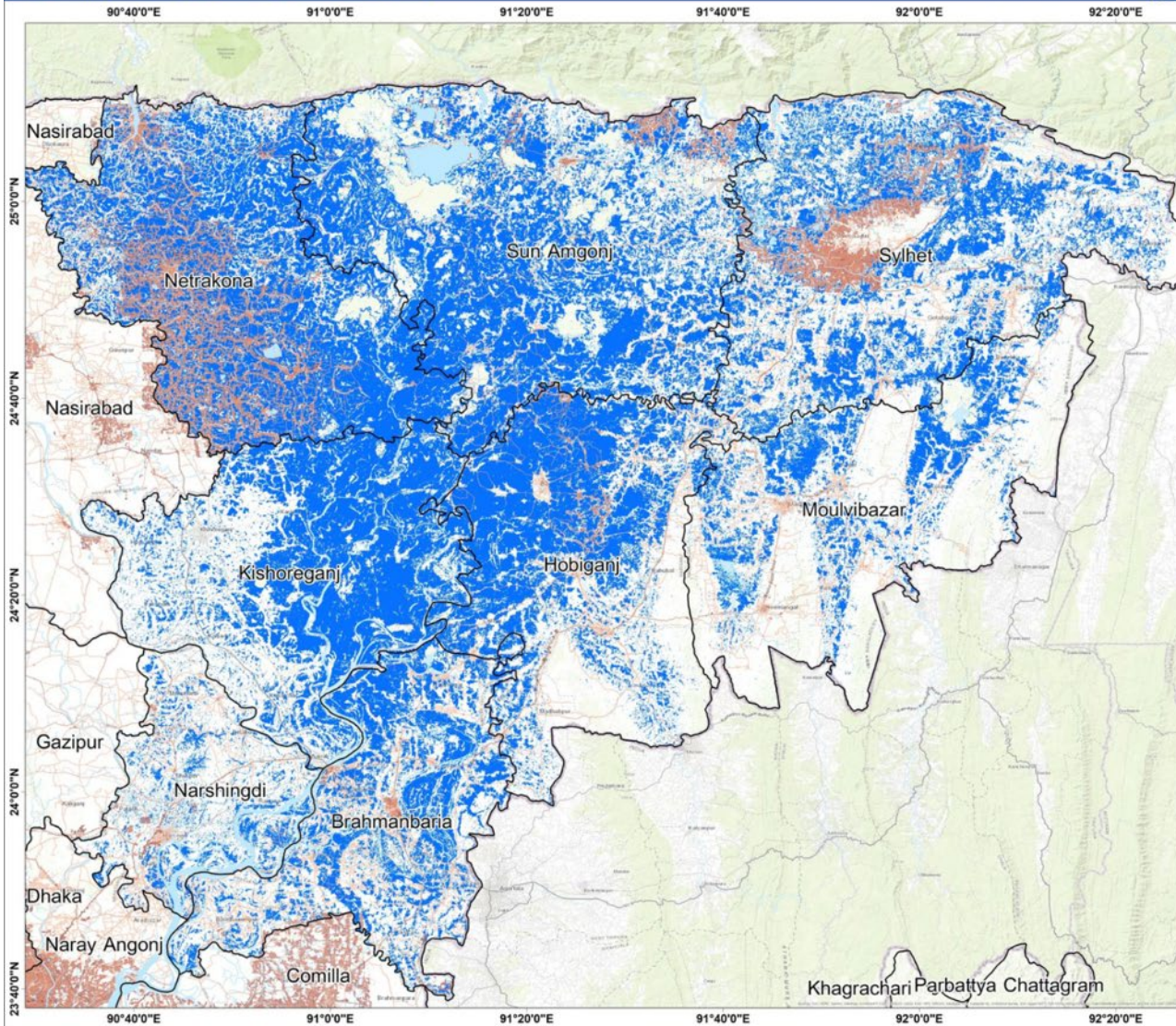
GSMaP NRT 2022 June01–June30 (mm)



2022 Monsoon flood in Haor area

DETECTED FLOOD WATER IN SYLHET REGION, BANGLADESH

As observed by ALOS-2 image on 18 June 2022



Map Information



0 4 0 8
Kilometers

Map Scale 1:350,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

- Detected Flood Water
- Waterbody
- Building
- Waterway
- Road
- District Boundary

Data Sources

Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 7 May 2022
Post-disaster : ALOS-2 PALSAR-2, 18 June 2022
Copyright: © JAXA (2022) - All rights reserved.

GIS Data:
Waterway, Waterbody, Building, Road © OSM (2022)
Administrative Boundary © GADM (2022)

Description

This map shows the detected flood water areas in Brahmanbaria, Hobiganj, Kishoreganj, Moulvibazar, Narshingdi, Netrakona, Sun Amgonj and Sylhet Districts in Bangladesh on 18 June 2022 due to heavy monsoon rains and water from upstream in India's northeast.

Note that the detected flood water may also include water in cultivated areas.

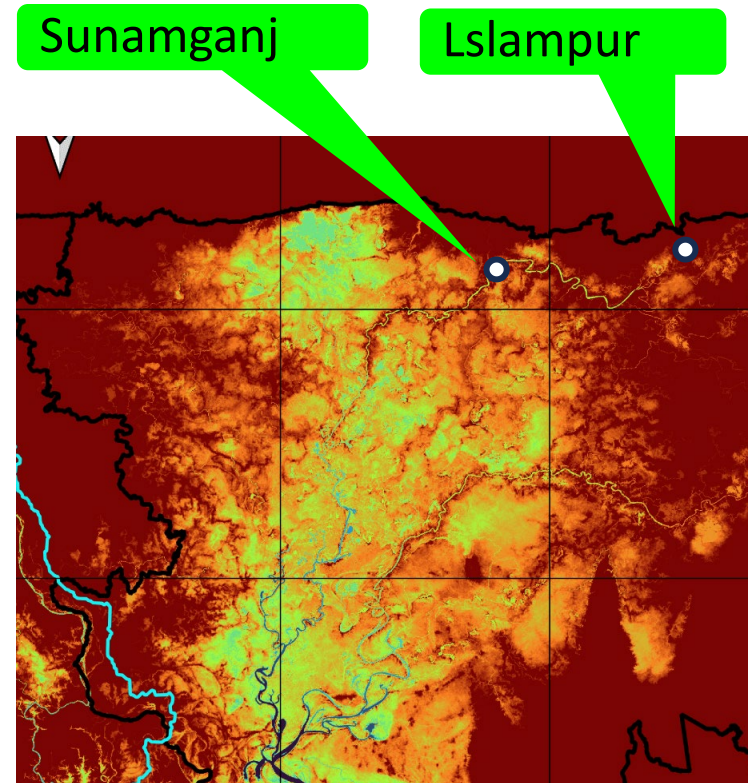
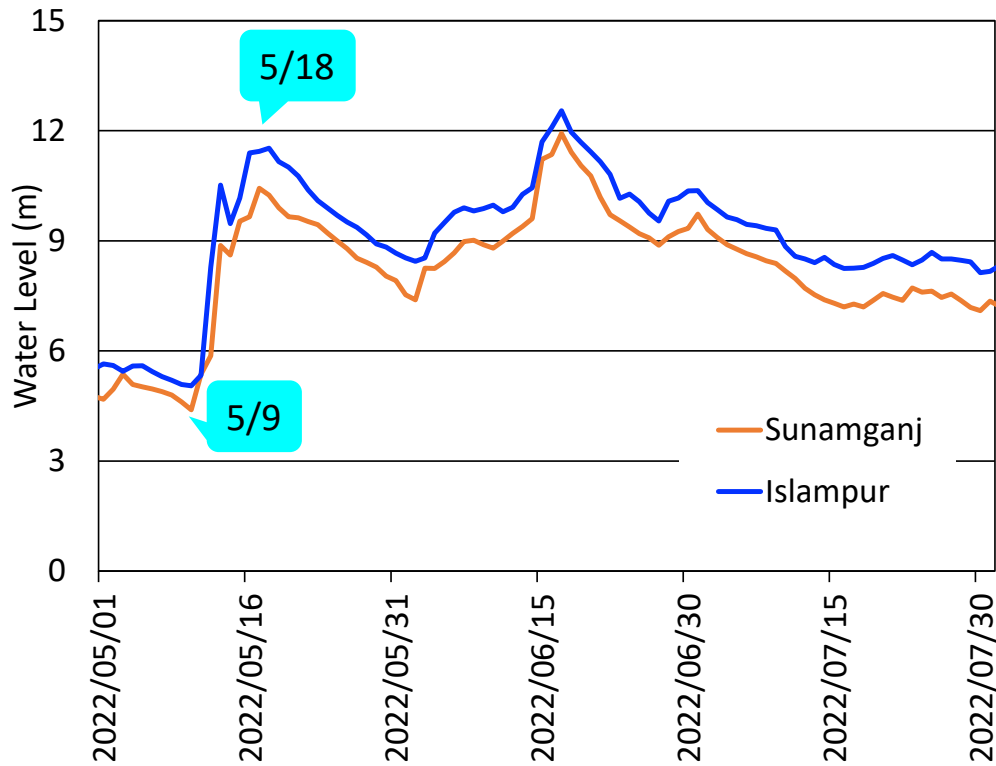
Map product made by GIC-AIT (v1.0).

Disclaimer: The accuracy of this product is not validated.

Data provider:

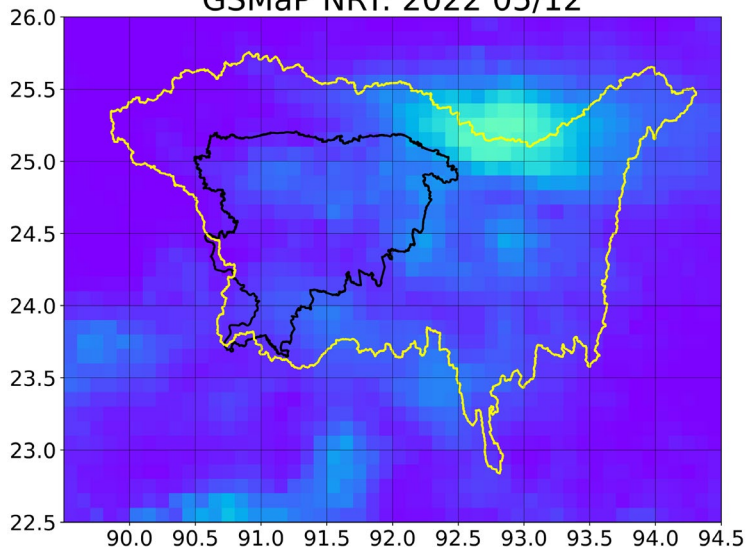


Water Level at upstream of Haor region

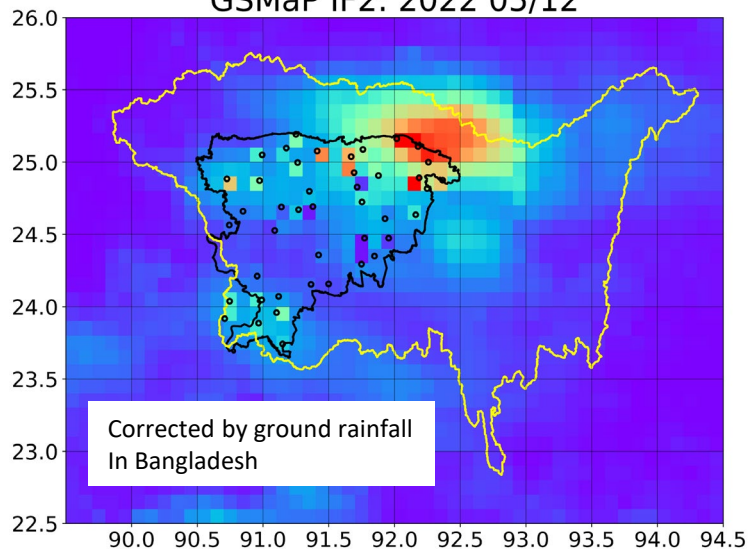


Daily rainfall (12 May 2022)

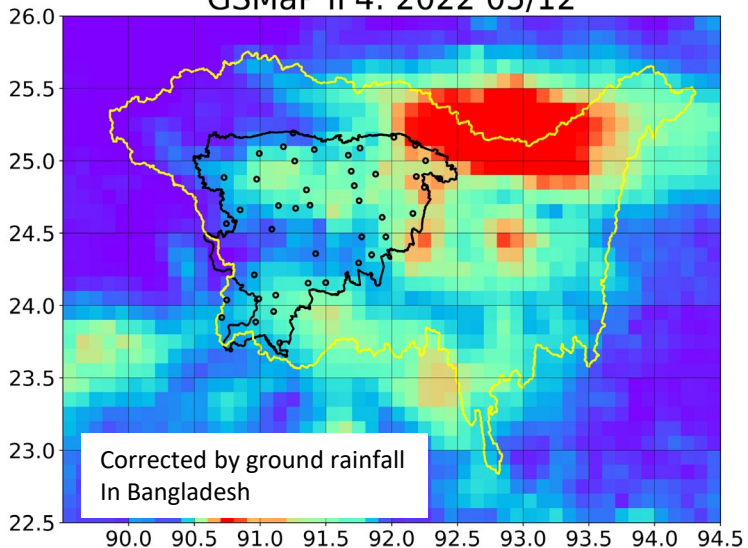
GSMaP NRT: 2022 05/12



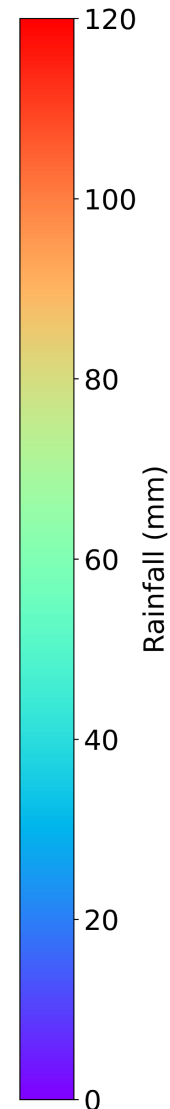
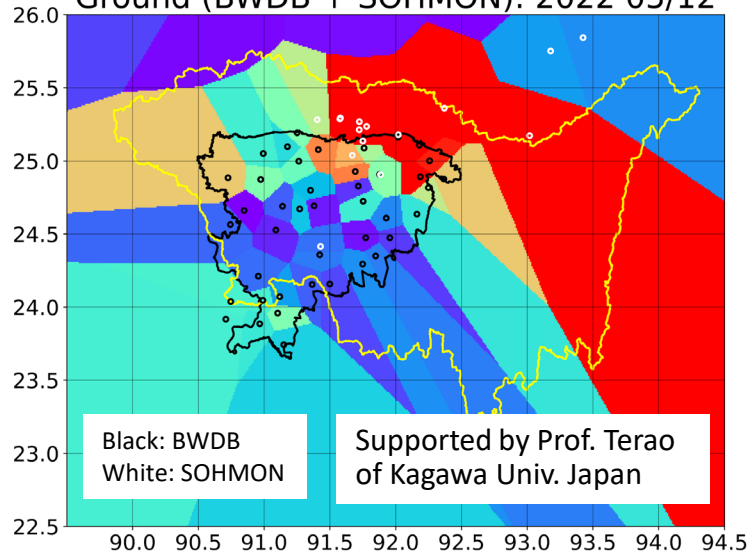
GSMaP IF2: 2022 05/12



GSMaP IF4: 2022 05/12

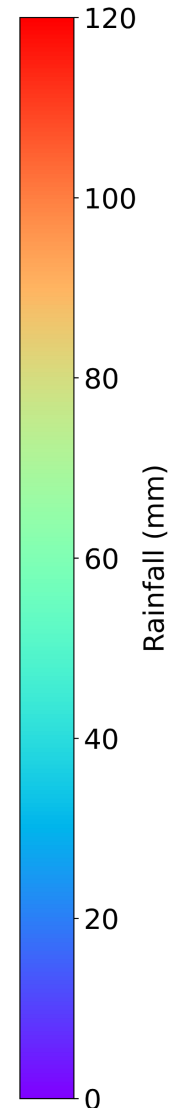
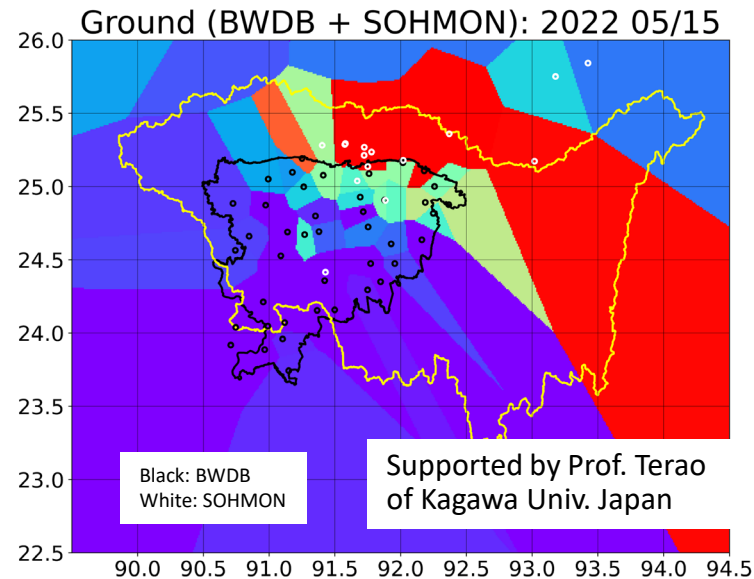
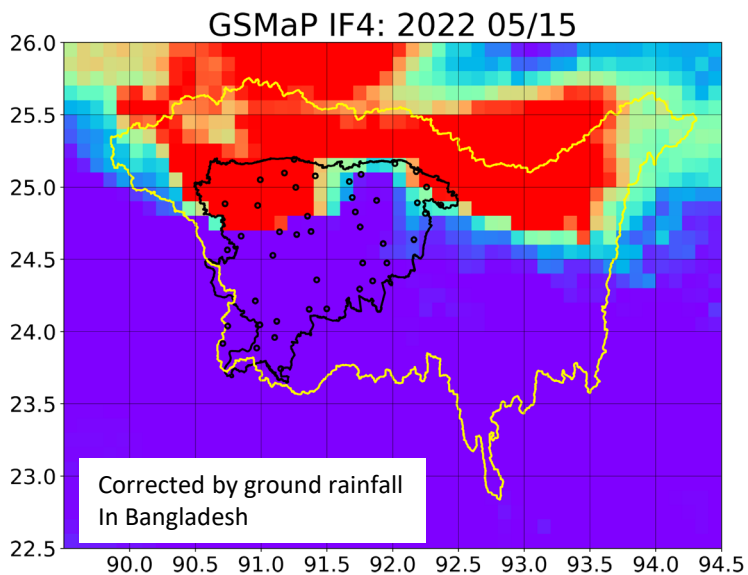
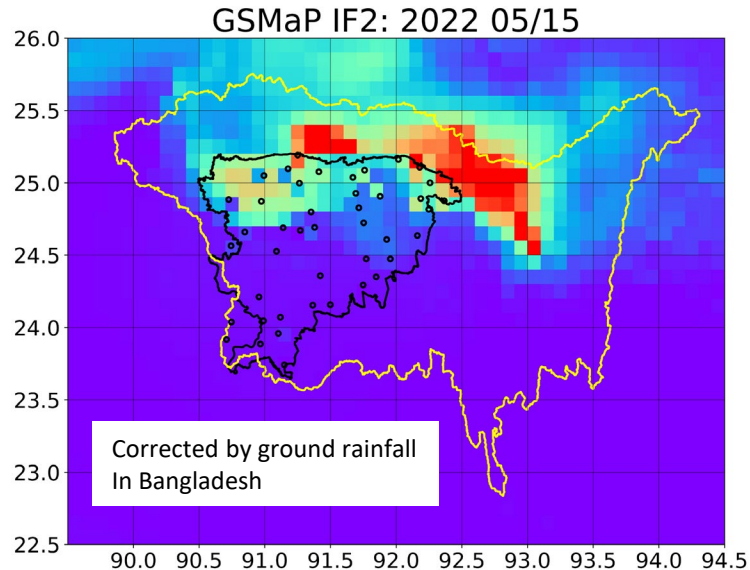
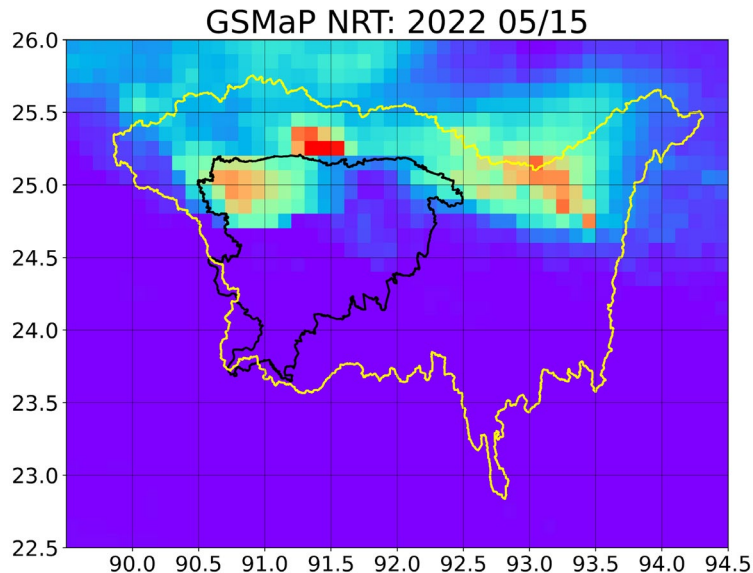


Ground (BWDB + SOHMON): 2022 05/12



"Data was provided by the Bangladesh /
Northeastern India Meteorological Data Archive from the web site at
http://rfweb.ed.kagawa-u.ac.jp/dav/gbm_jp/data/DATABASE/."

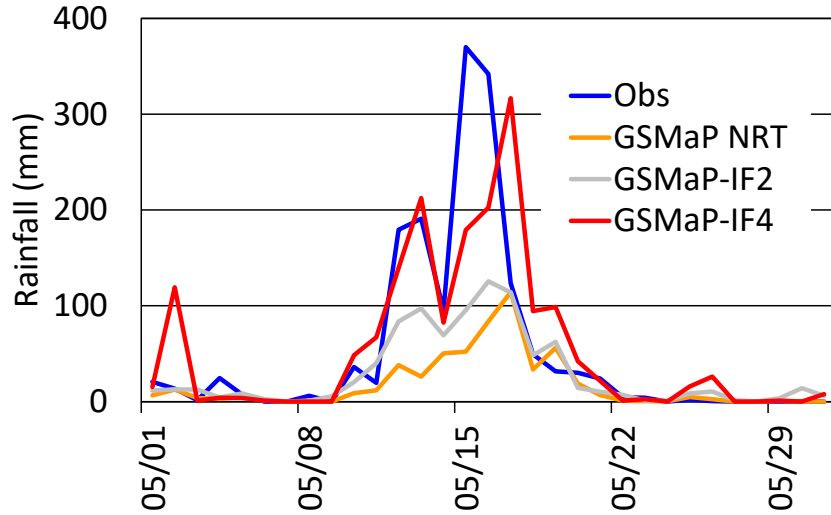
Daily rainfall (15 May 2022)



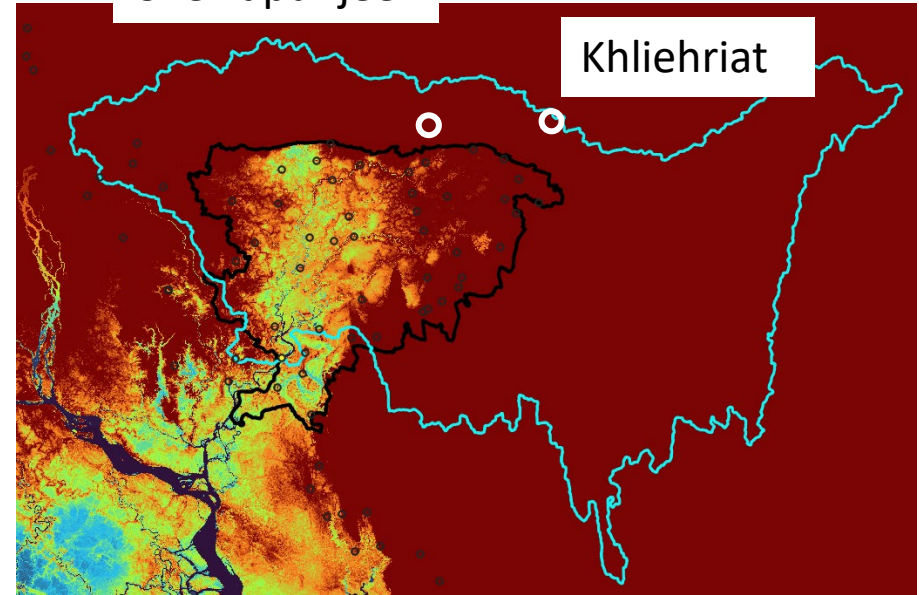
"Data was provided by the Bangladesh /
Northeastern India Meteorological Data Archive from the web site at
http://rfweb.ed.kagawa-u.ac.jp/dav/gbm_jp/data/DATABASE/."

Comparison to observed rainfall outside observation network

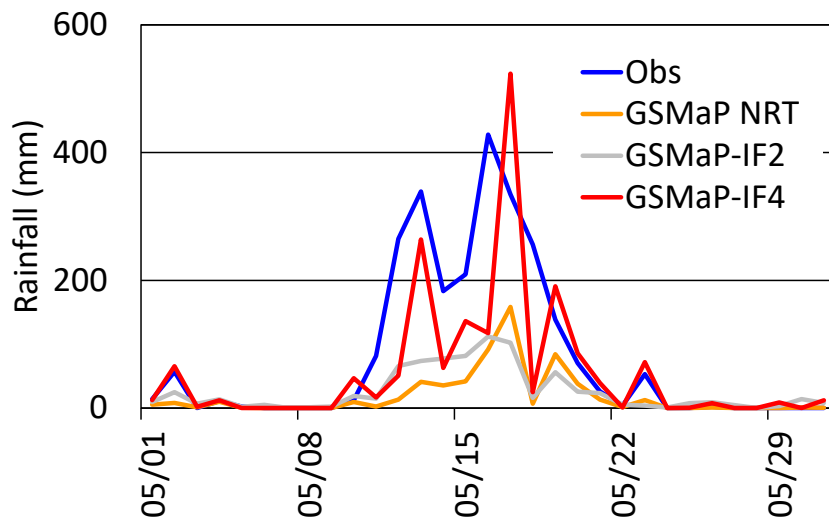
Khliehriat



Cherrapunjee



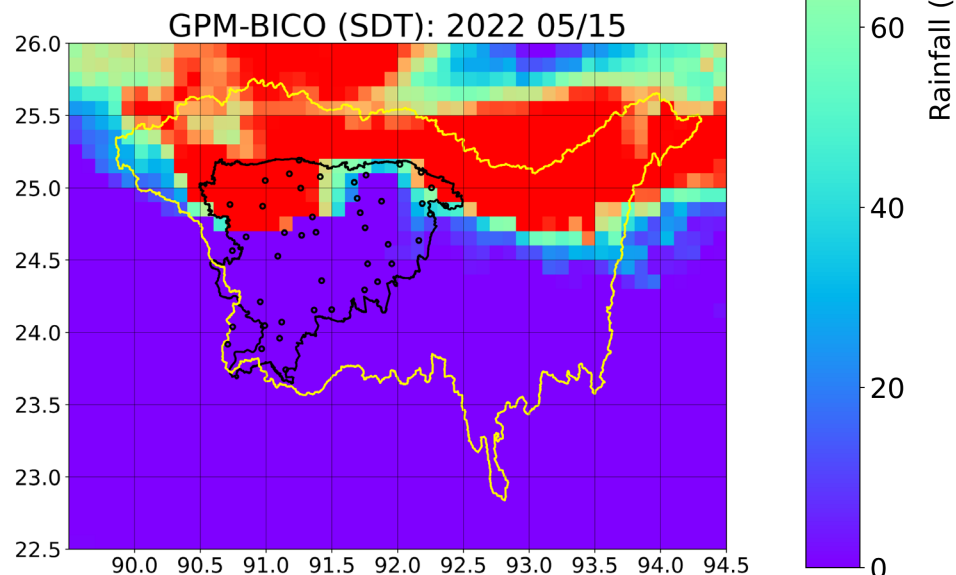
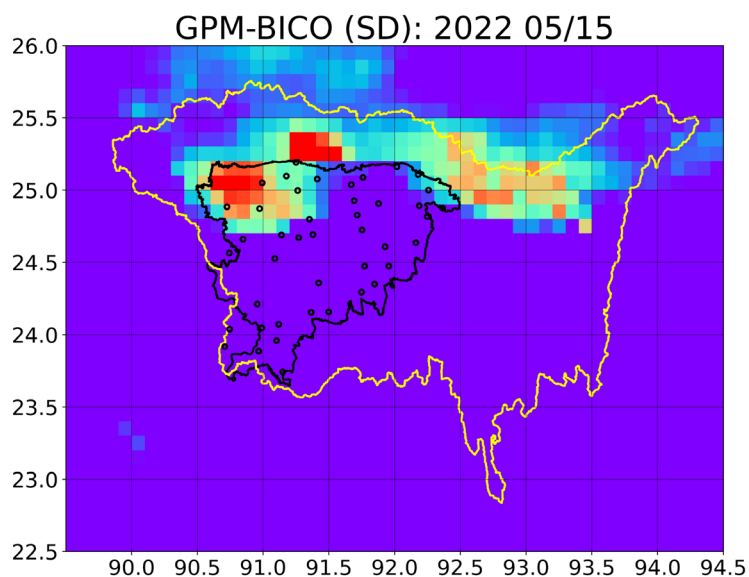
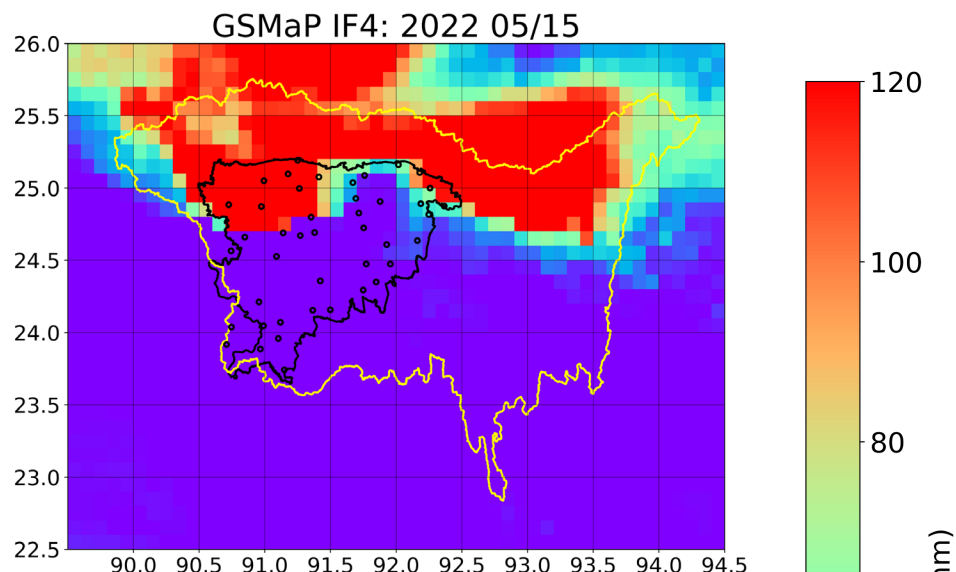
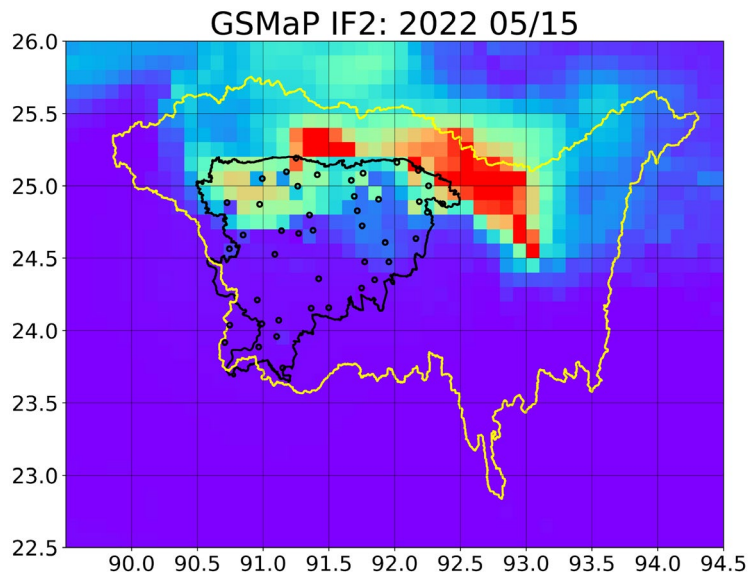
Cherrapunjee



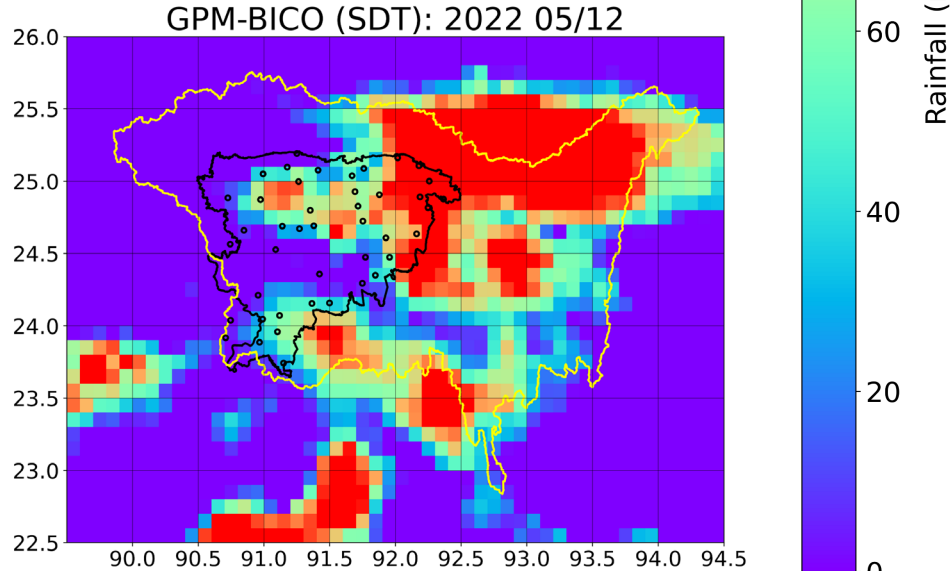
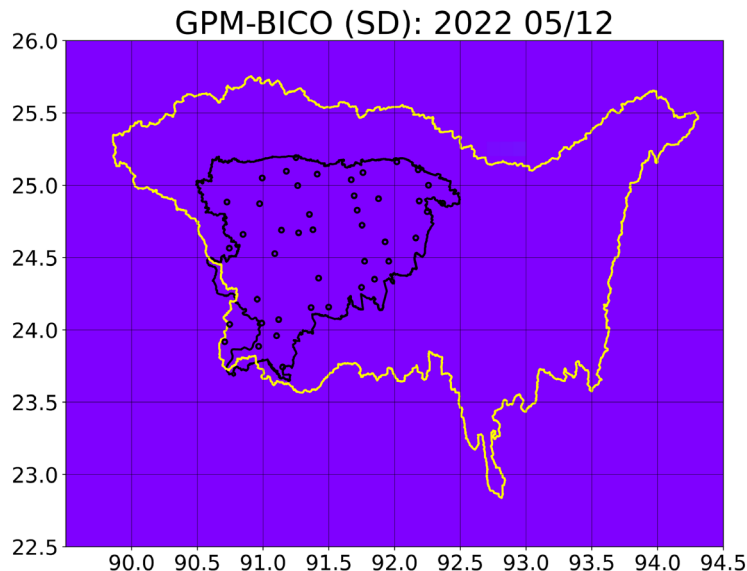
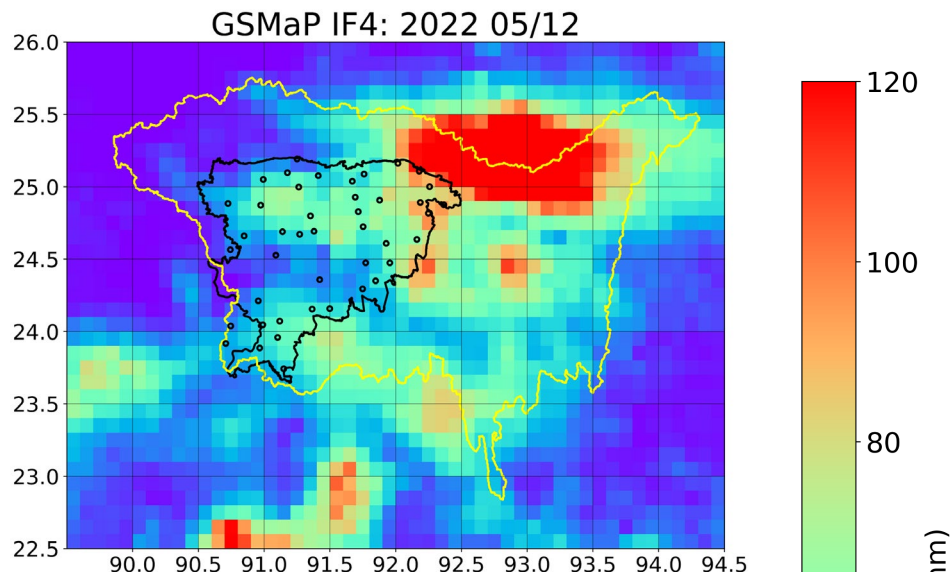
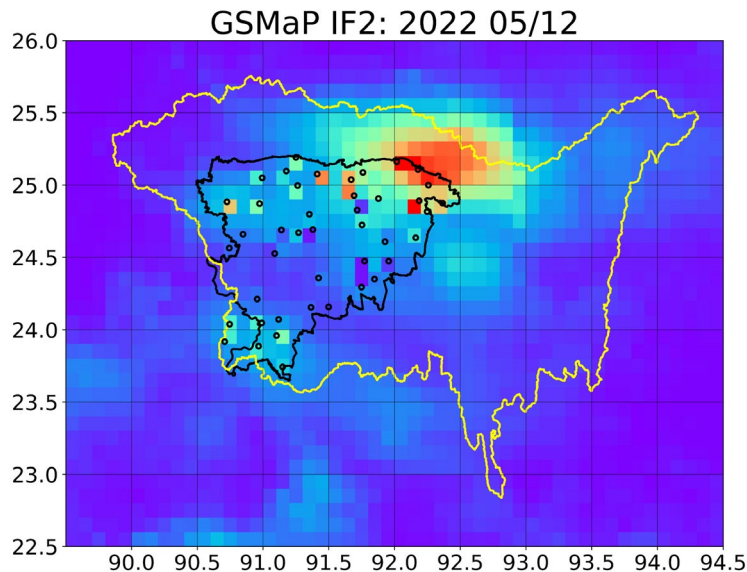
Supported by Prof. Terao of Kagawa Univ. Japan

"Data was provided by the Bangladesh / Northeastern India Meteorological Data Archive from the web site at http://rfweb.ed.kagawa-u.ac.jp/dav/gbm_jp/data/DATABASE/".

Comparison with GPM-BICO tool (15 May 2022)



Comparison with GPM-BICO tool (12 May 2022)



Summary

- Rainfall information outside of observation network is important for flood management at transboundary basin
- GSMap-IF was developed by UNESCO Pakistan project funded by Jica's ODA. Copyright of the GSMap-IF model program is jointly owned by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Japan Aerospace Exploration Agency (JAXA)
- GSMap-IF provides several correction methods. Users need to consider which method is suitable for their target basin