Flood monitoring using GSMaP-IF

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18 September 2023, Jakarta, Indonesia
Bias correction of Satellite precipitation (GSMaP)

Ground

Corrected GSMaP (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)

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

Sri Lanka Irrigation Department (2016)

“Developing and Implementing an Operational Prototype for Advanced Flood Forecasting, Early Warning, and Data Sharing System in the Kalu Ganga Basin, Sri Lanka”
Total catchment area of three basins: 1.72 million km²
Haor region at North Eastern Bangladesh

Only 1-4m above the mean sea level

Dry Season

Wet Season

Paddy field

MERIT Hydro by Tokyo Univ.
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)

- Haor Region
- Bhairabazar
- Catchment area of Bhairabazar (Meghna river)

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

Description
This map shows the detected flood water areas in Brahmanbaria, Hobigaj, Kushorganj, Moulivbazar, Narshingdi, Netrokona, Sun Angori, 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.

Disclaimer: The accuracy of this product is not validated.

Data provider: JAXA
Water Level at upstream of Haor region

Water Level at upstream of Haor region

Sunamganj
Islampur

Water Level (m)

Sunamganj
Islampur

5/18
5/9

Water Level at upstream of Haor region

Sunamganj
Islampur
Daily rainfall (12 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/.

Black: BWDB
White: SOHMON
Supported by Prof. Terao of Kagawa Univ. Japan

Corrected by ground rainfall in Bangladesh

"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/.

Black: BWDB
White: SOHMON
Supported by Prof. Terao of Kagawa Univ. Japan

Corrected by ground rainfall in Bangladesh

"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

Support 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