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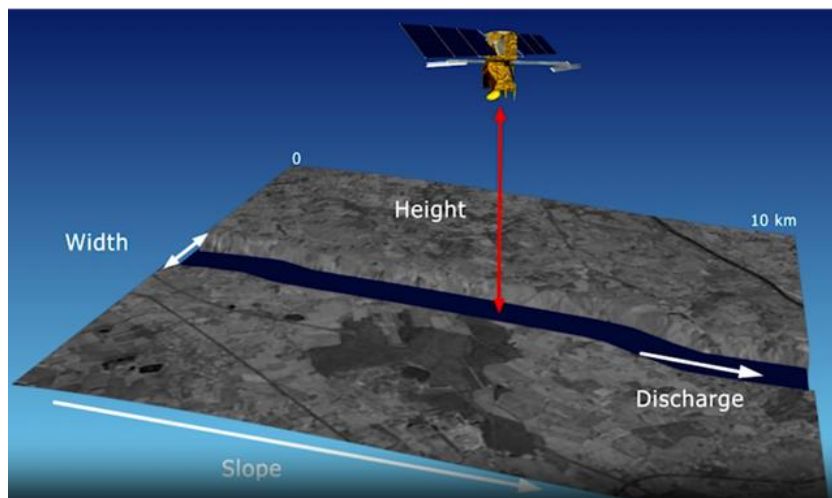
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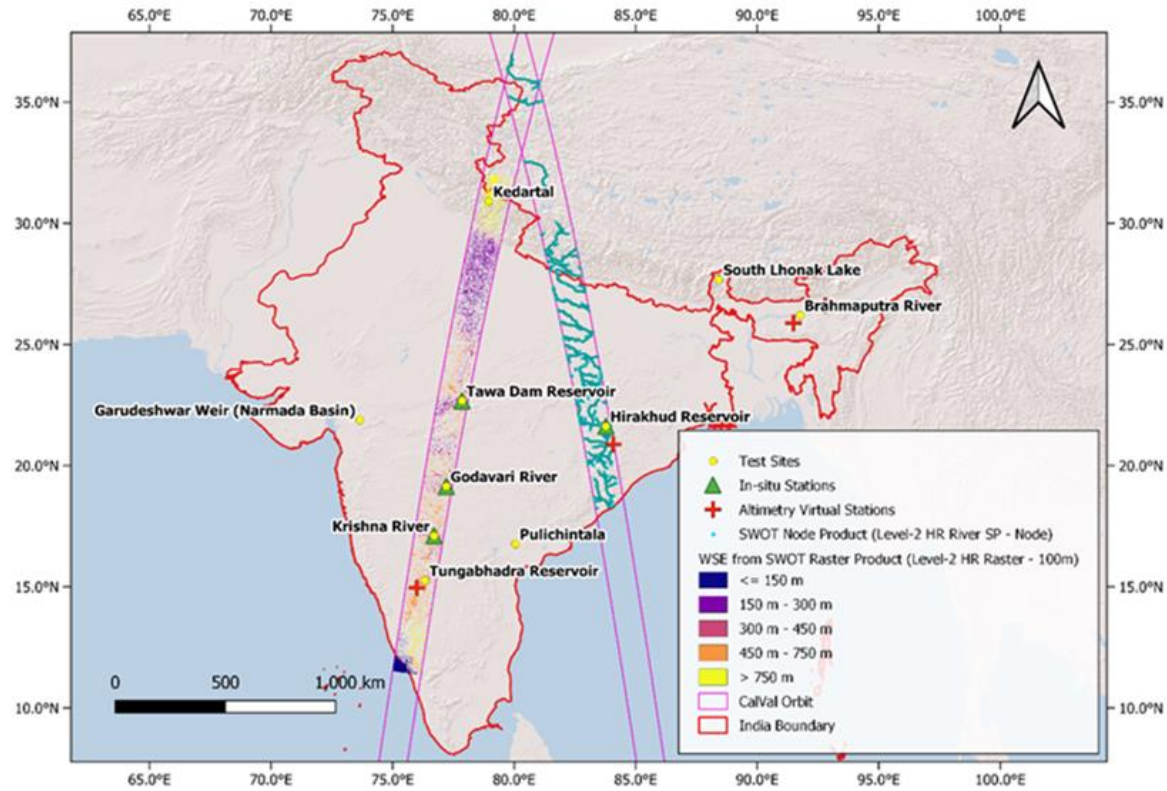
<sup>4</sup>Geological Survey of Brazil (SGB), Brazil

<sup>5</sup>Géosciences Environnement Toulouse (GET), Toulouse, France

<sup>5</sup>LEGOS, Université de Toulouse, CNRS-IRD-UPS-CNES, 31400, Toulouse, France



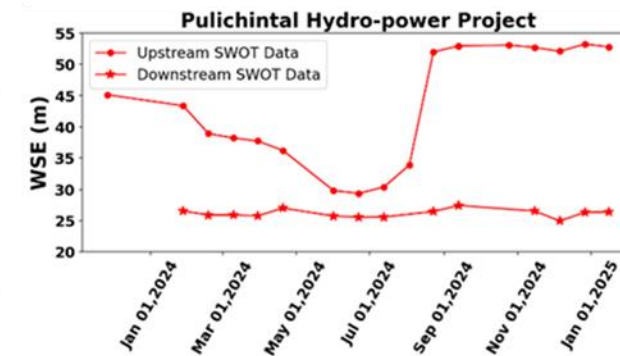
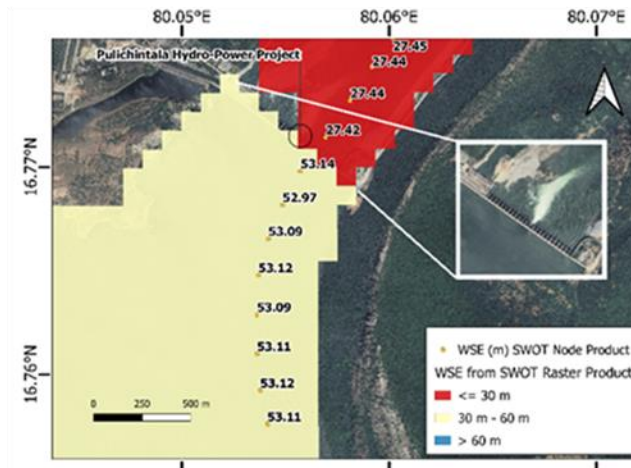
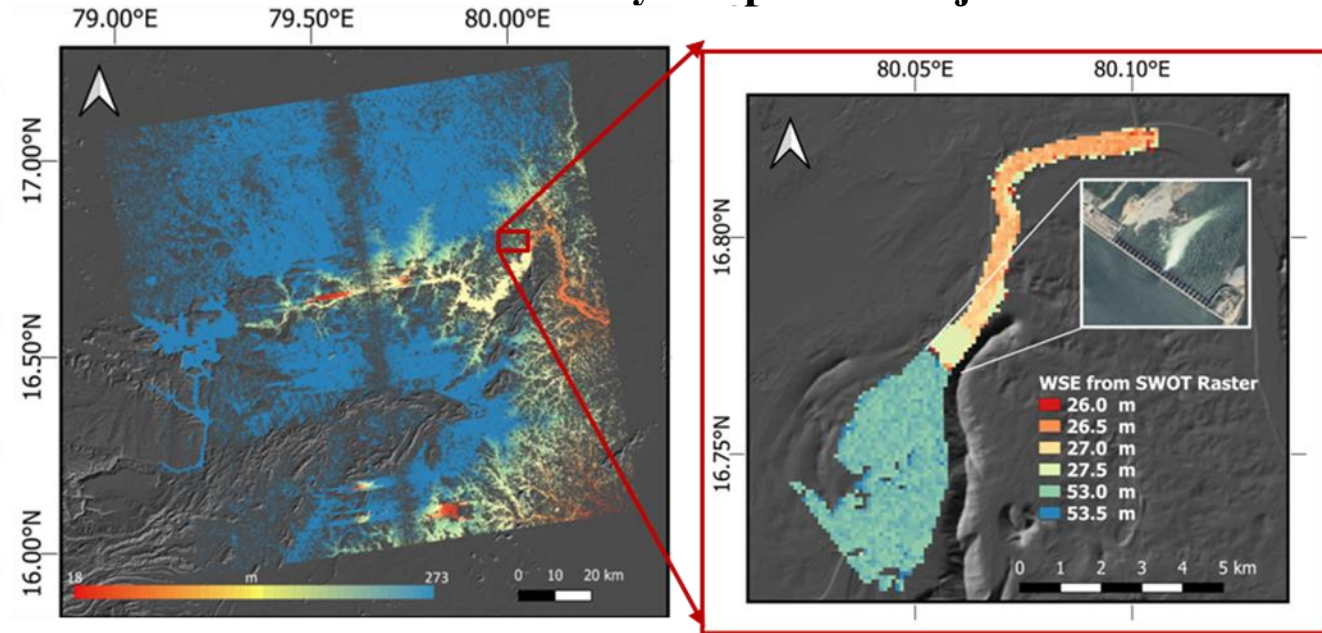
# Observations from SWOT over inland waterbodies



## Benefits:

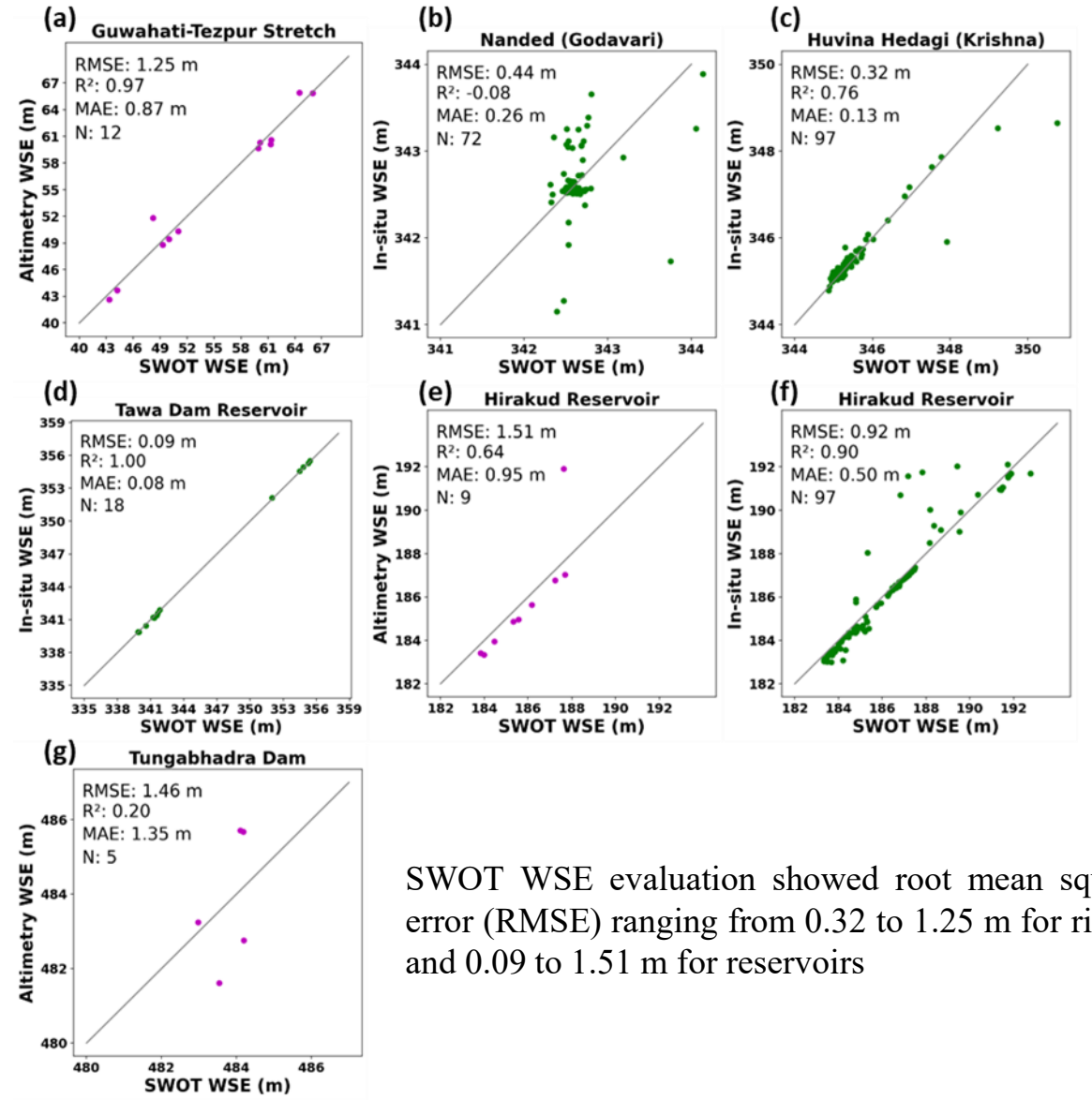
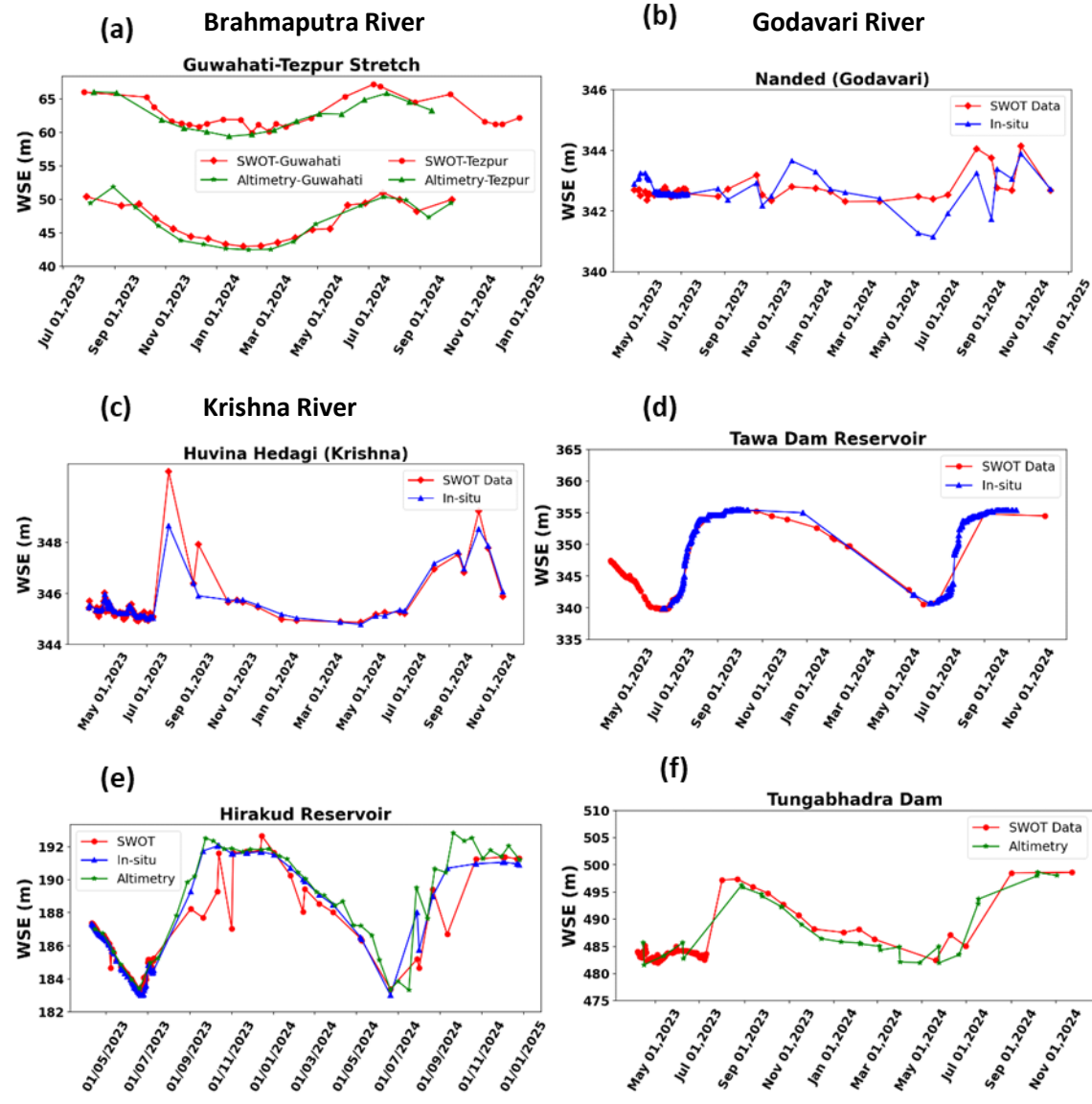
1. global spatial-temporal coverage of continental water surface
2. 2D WSE (DEM of water surface)
3. monitoring of water level over entire river reach
4. concurrent measurements of **water level, WSS and river width**

## Pulichintal Hydro-power Project



*Concurrent WSE measurements across hydraulic structures (u/s and d/s) are valuable for estimating discharge, analyzing hydraulic properties, assessments of hydraulic jumps and flow transitions.*

# Performance Evaluation of SWOT-based WSE at Reservoirs and Rivers



SWOT WSE evaluation showed root mean square error (RMSE) ranging from 0.32 to 1.25 m for rivers and 0.09 to 1.51 m for reservoirs

# SALIL Geo-Portal for Inland Waterbodies Monitoring of India



iirs

Indian Institute of Remote Sensing, Dehradun  
Indian Space Research Organisation, Department of Space  
भारत सरकार / Government of India



HOME

SURFACE WATER ANALYSIS

SNOW COVER ANALYSIS

GLACIER ANALYSIS

## Base Layers

India Boundary

CWC Stations

NADIR Altimetry Stations

Water Level Change Status

From October 2024 to October 2025  
(with  $\pm 0.5m$  tolerance level)

### Legend

Negative Change

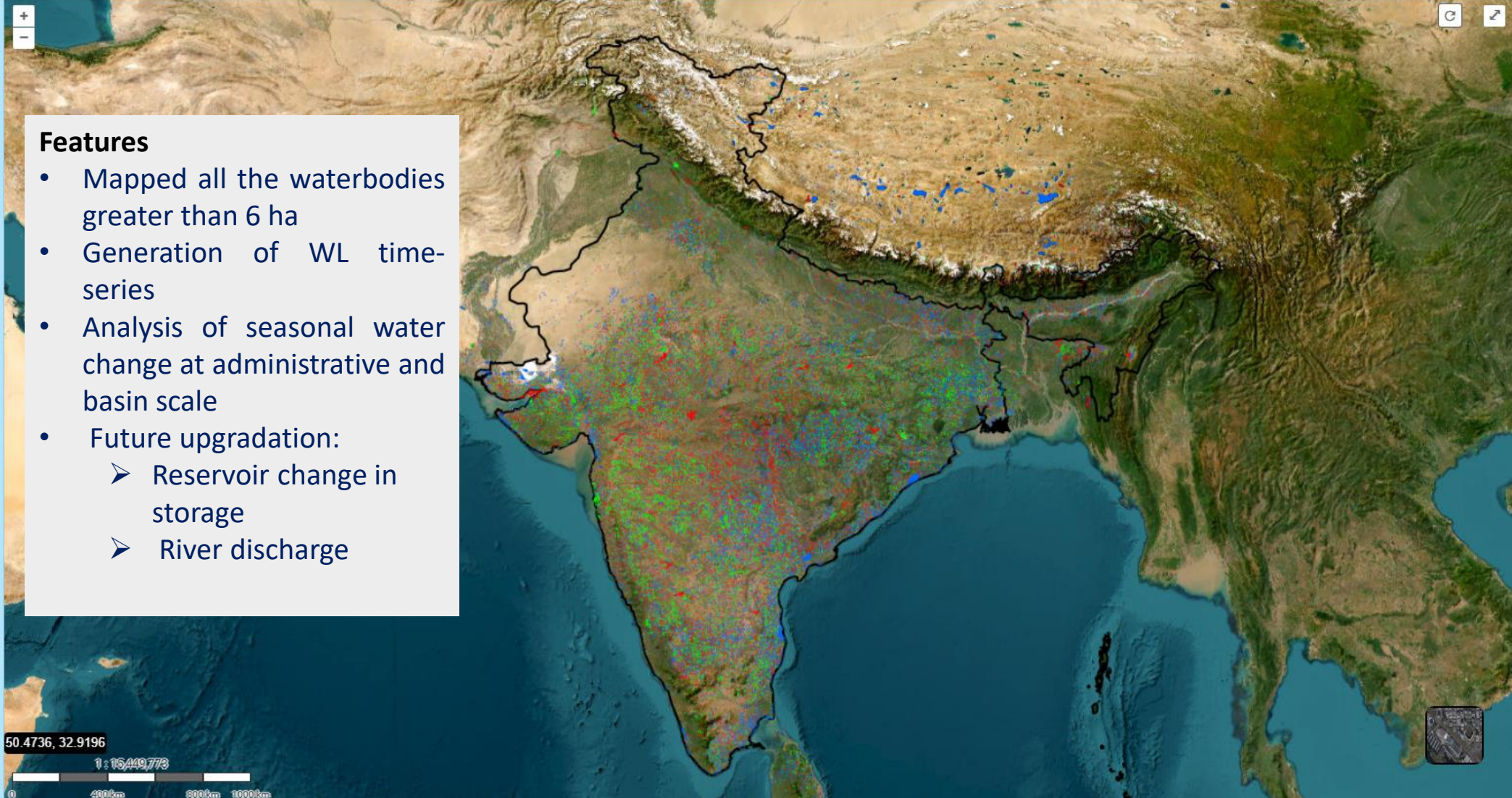
No Significant Change

Positive Change

RESET FILTER



Summarizing the data...



## Features

- Mapped all the waterbodies greater than 6 ha
- Generation of WL time-series
- Analysis of seasonal water change at administrative and basin scale
- Future upgradation:
  - Reservoir change in storage
  - River discharge

50.4736, 32.9196

1:16449773

0 400km 800km 1000km



← MAP VIEWER

Time Range

Start Date

10-12-2024

End Date

08-06-2025

Start Date : 10-Dec-2024

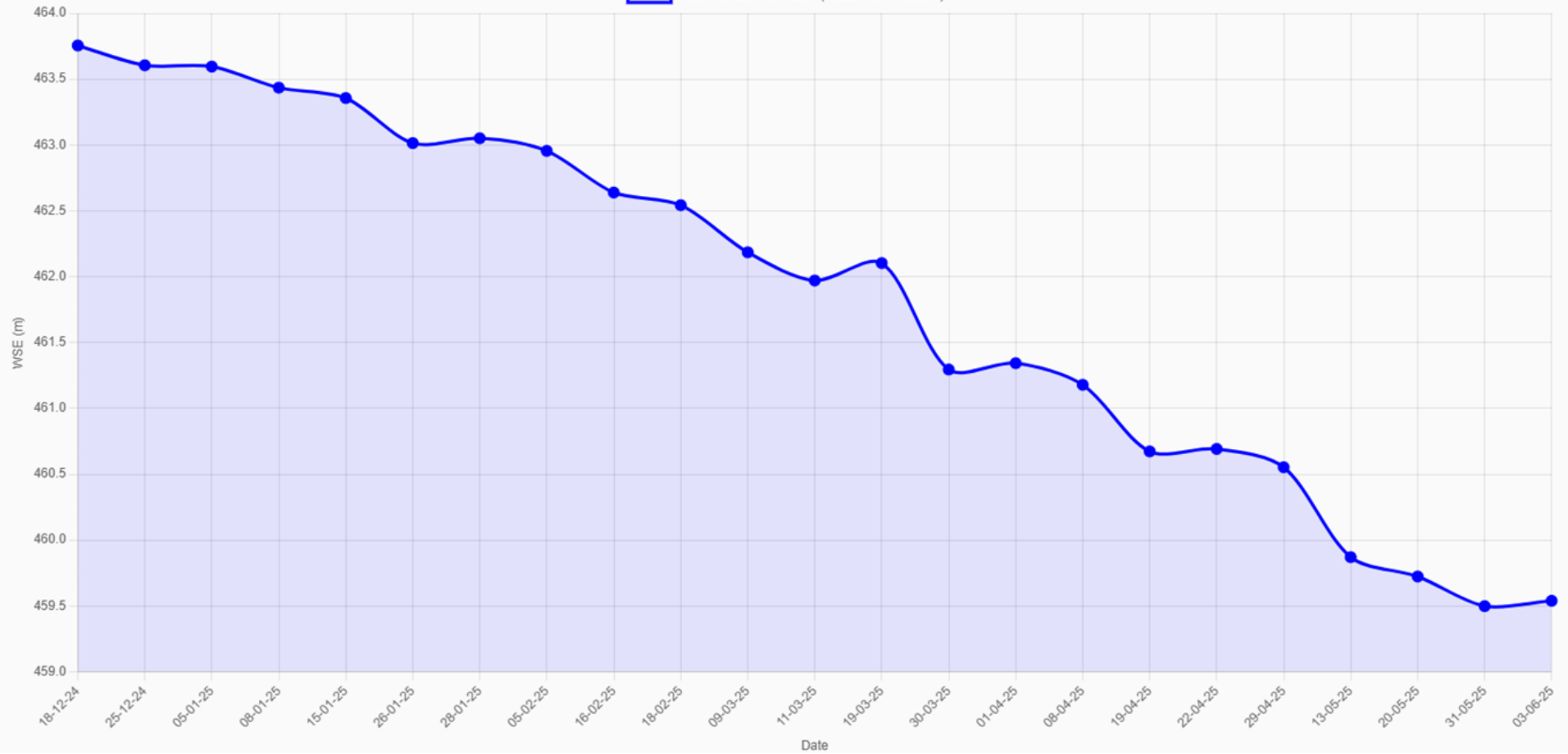
End Date : 08-Jun-2025

VIEW RESULTS

DOWNLOAD CSV

Unknown | 123925

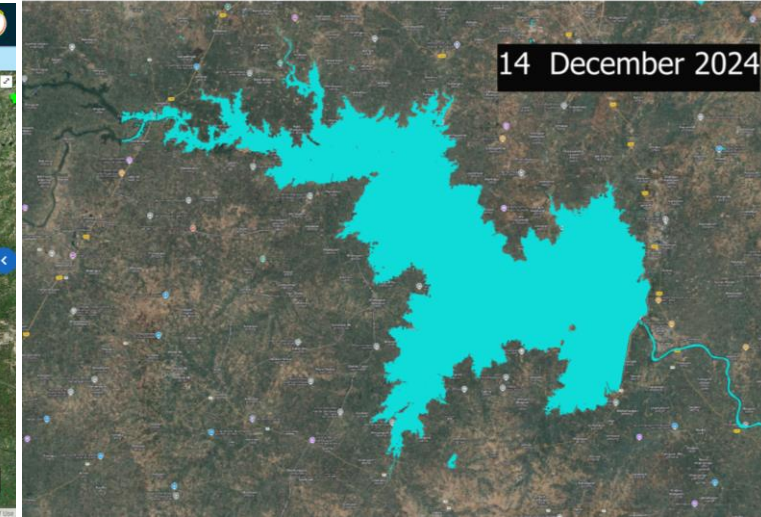
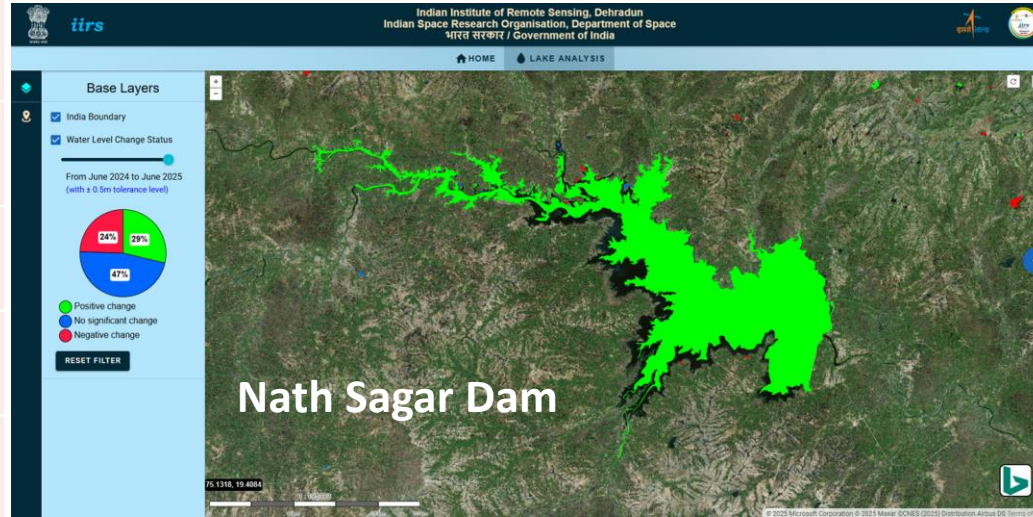
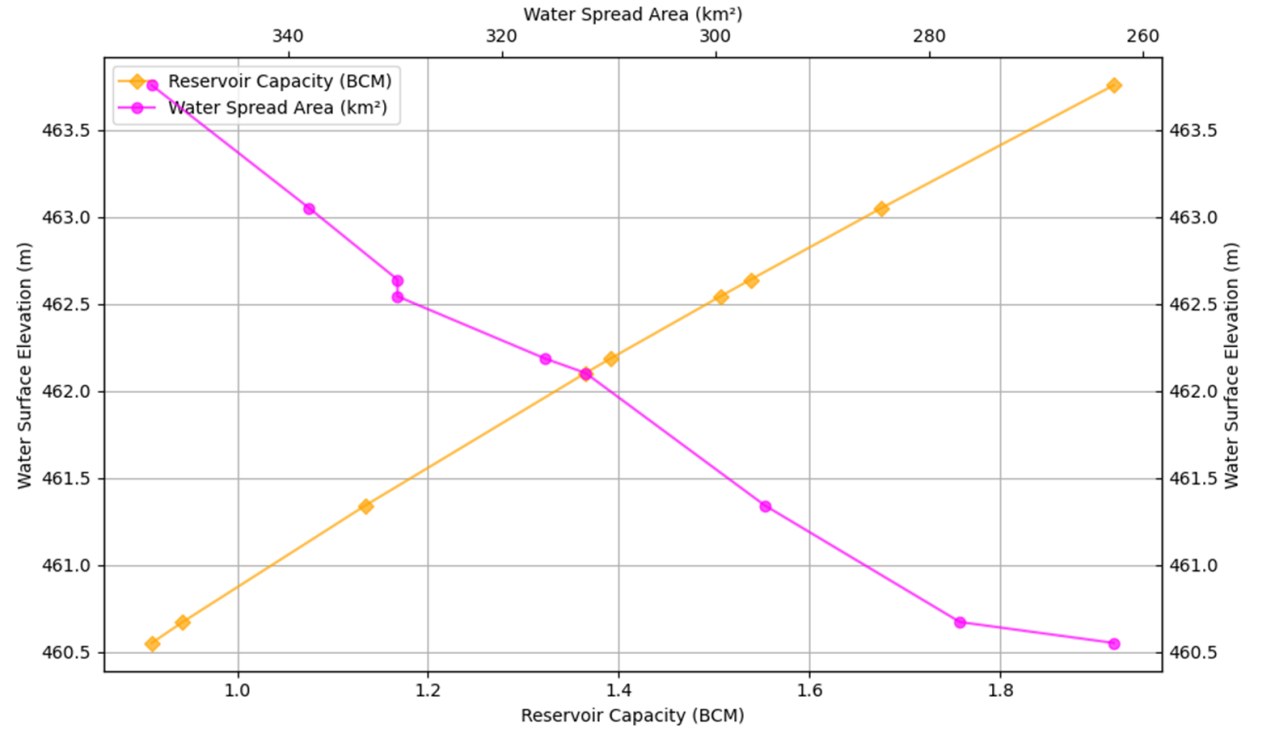
Water Surface Elevation (Actual Observations)



# Change in Reservoir Storage Monitoring using SWOT and Sentinel-2 data

Date	WSE (SWOT)	Area (S2) (Sq. Km.)	Cumulative Volume (BCM)
31-05-2025	459.50	13.04	-
03-06-2025	459.58	13.04	0.77
29-04-2025	460.55	262.71	0.91
19-04-2025	460.67	277.10	0.94
01-04-2025	461.34	295.38	1.13
19-03-2025	462.10	312.16	1.37
09-03-2025	462.19	315.91	1.39
18-02-2025	462.54	329.76	1.51
16-02-2025	462.64	329.76	1.54
28-01-2025	463.05	338.06	1.68
18-12-2024	463.76	352.77	1.92

**Potential for Live Storage Capacity Assessment**



# Characteristics of SWOT Data over Ganga River

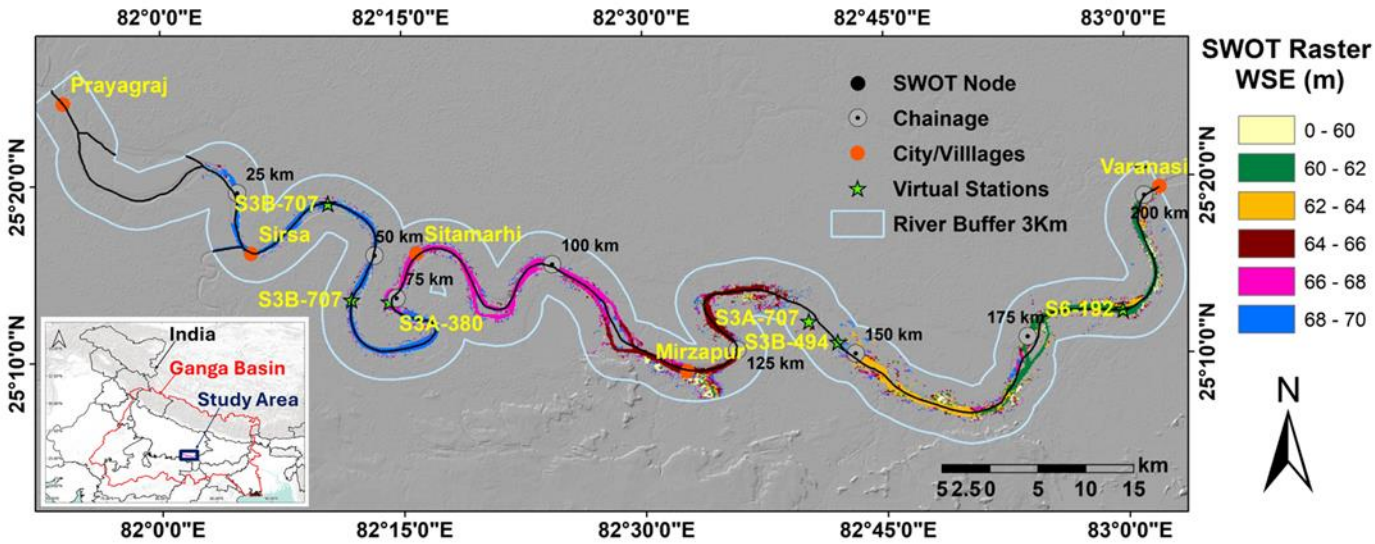


Fig. 2D WSE along the Ganga River reach derived from SWOT raster data (April 23, 2023)

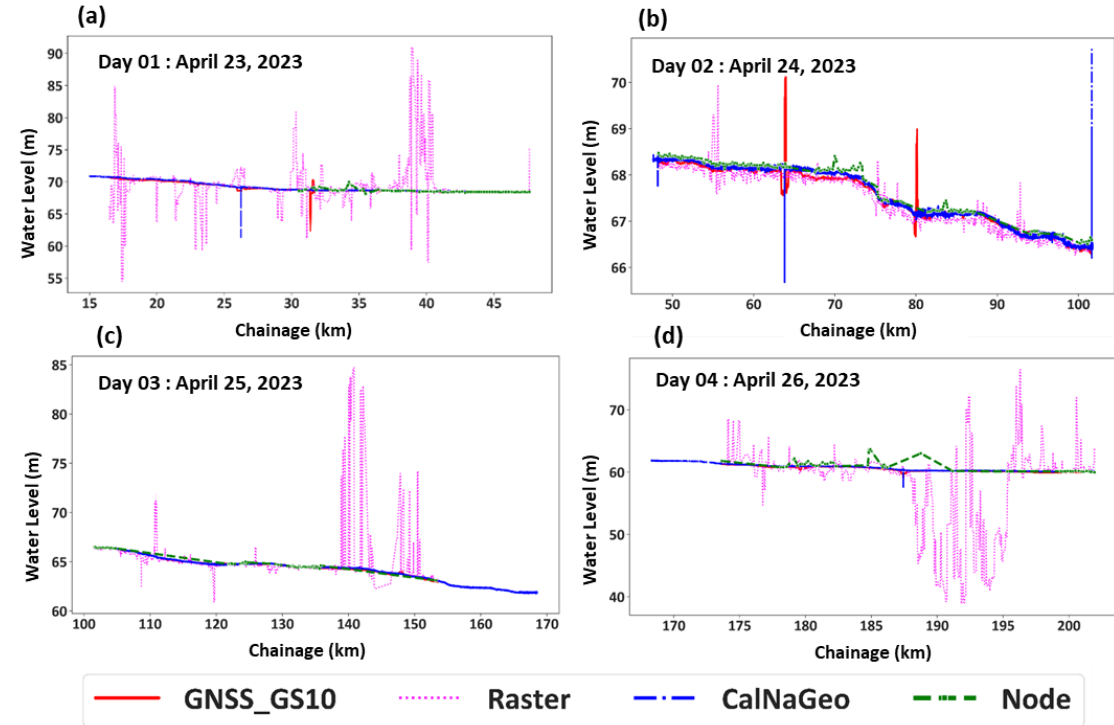


Fig. Longitudinal WSE profiles from SWOT raster and node products compared with two GNSS systems over 4 days of the field campaign.



Fig. Ganga River field campaign during April 23-26, 2025

- We show that the SWOT mission offers novel longitudinal WSE profiles and synoptic DEMs of water surfaces across river cross sections
- SWOT data capture WSE and WSS dynamics at ungauged sites with optimized selection of quality flags

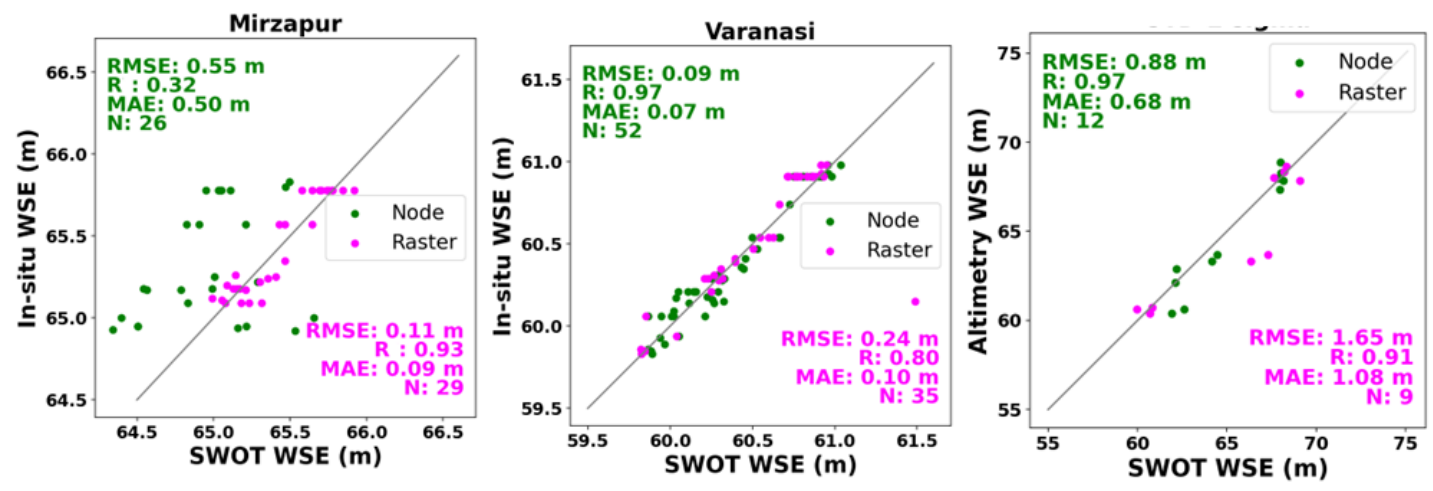


Fig. Comparison with in-situ gauge and satellite altimetry.

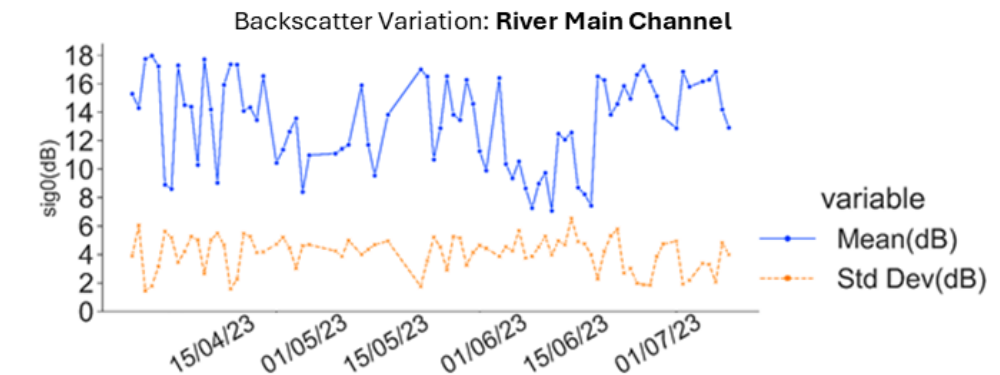


Fig. Temporal variation of backscatter along the river main channel.

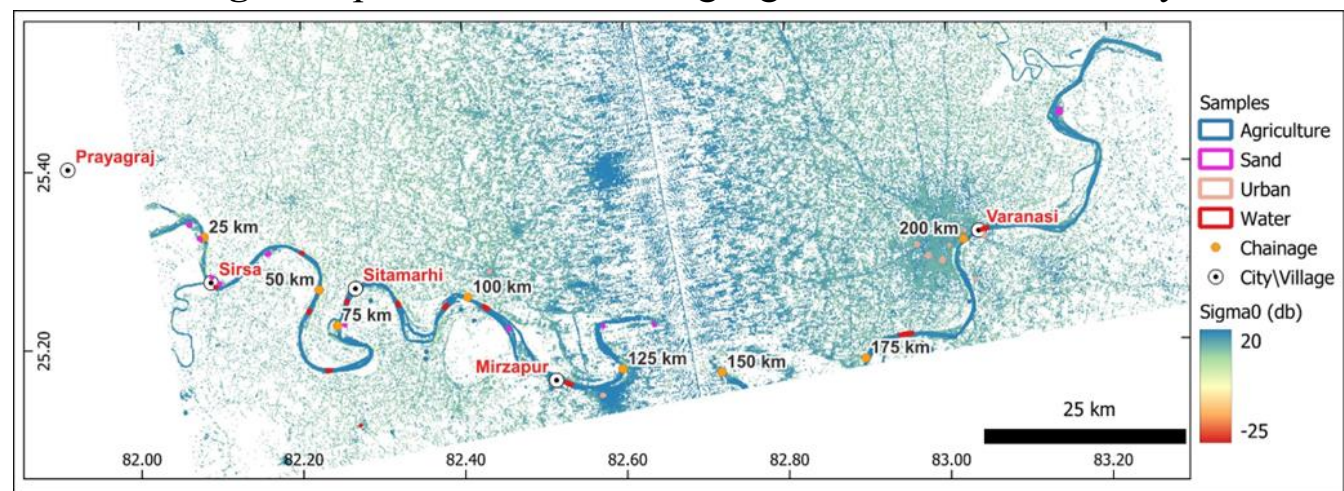


Fig. Backscatter analysis over semantic classes using SWOT (April 24, 2023).

- Node products show slightly better (WSE) accuracy than raster products, with RMSEs of 0.19 m (GNSS), 0.09 m (in-situ station, Varanasi), and 0.88 m (virtual stations),
- The quality filters reduce temporal resolution
- SWOT's near-nadir angles yield stronger backscatter from water surfaces compared to prior SAR systems enhancing river width detection

# Thank You

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