

Title: WP6 (Hydrological Service)

Ben Gouweleeuw (GFZ)

**EGSIEM Project Meeting**

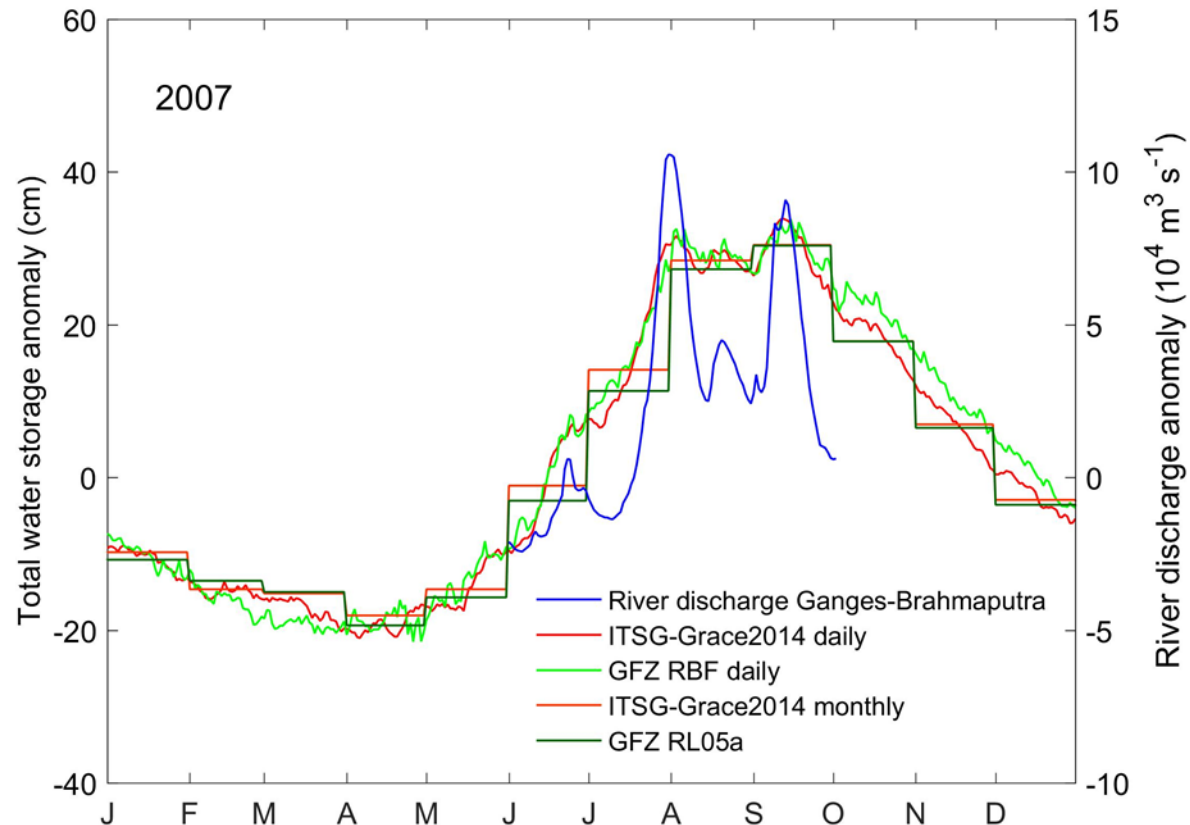
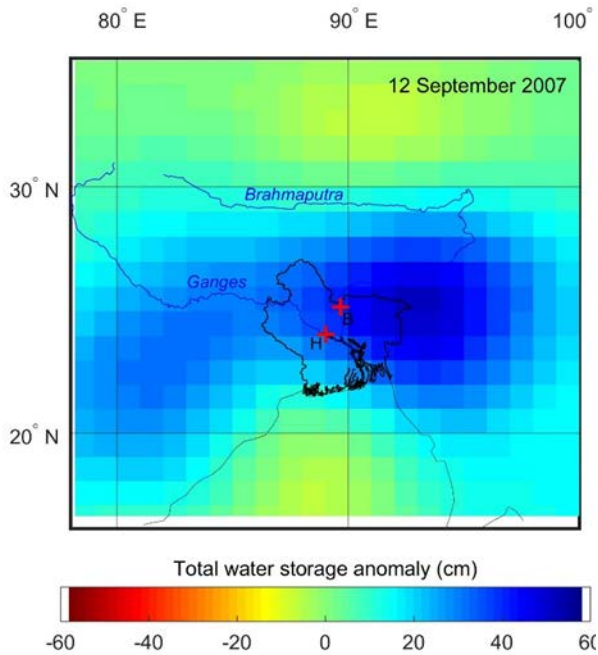
**GFZ potsdam**

**June 2-3.2016**

## Other activities & outlook

- Paper on evaluation of GRACE daily gravity solutions for hydrological extremes in selected river basins (Gouweleeuw et al., GRL, in prep.)

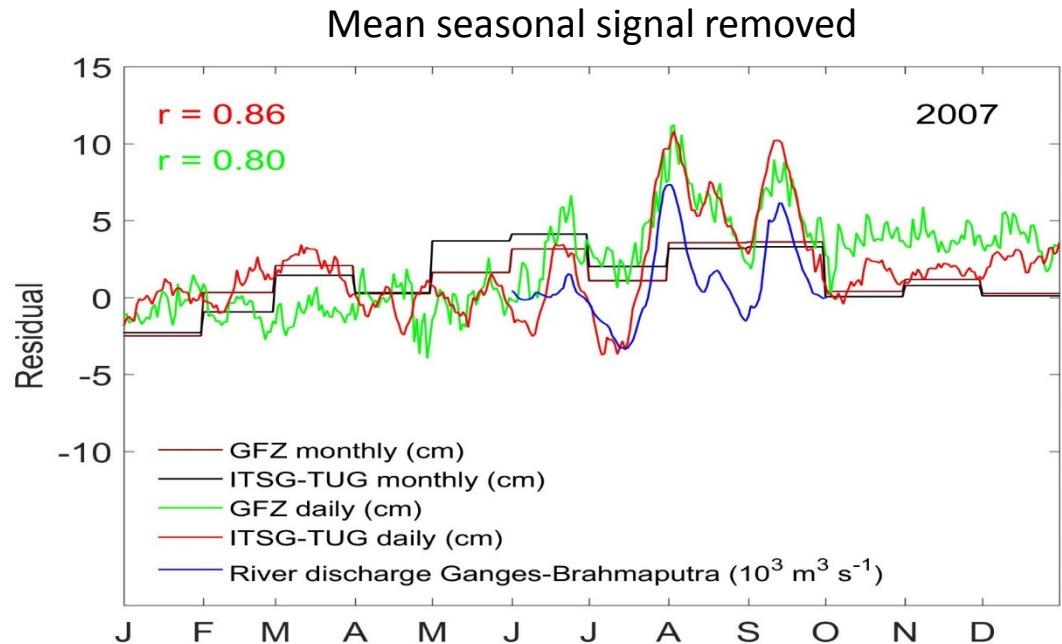
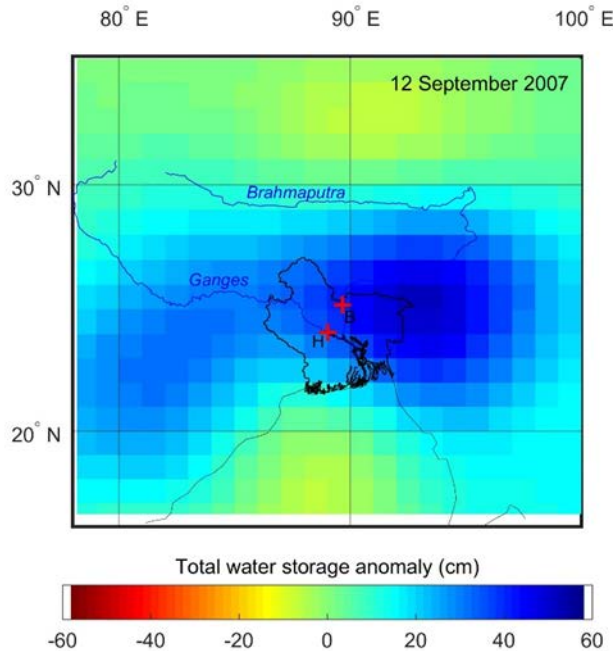
# WP6: Hydrological Service



## Key reviewers' comments

- Demonstrate (quantitatively) additional value of the daily solutions
- Information GRACE observations vs. hydrological model
- Noise level of the daily solutions
- Flood monitoring vs. flood forecasting

# WP6: Hydrological Service



WP6: Hydrological Service

## Other activities & outlook of last meeting

- Collection of complimentary hydrological data (groundwater level, surface water level, river discharge) for Ganges-Brahmaputra Delta.

WP6: Hydrological Service



## Other activities & outlook of last meeting

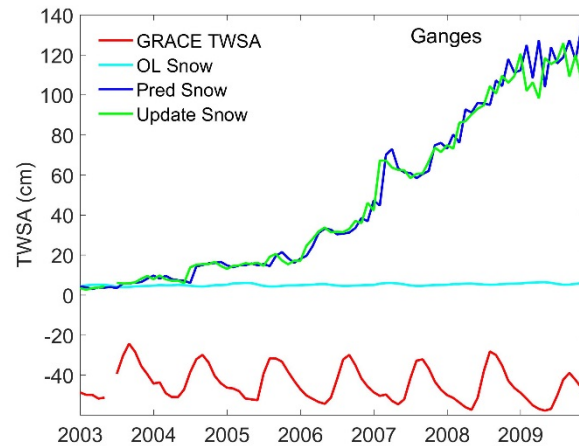
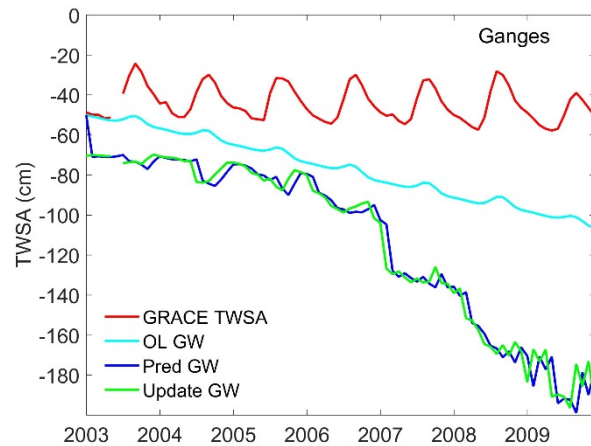
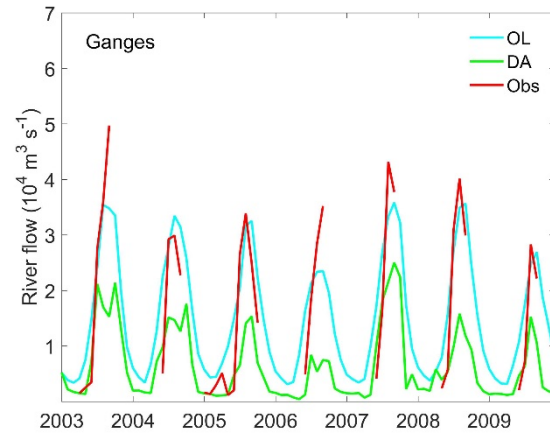
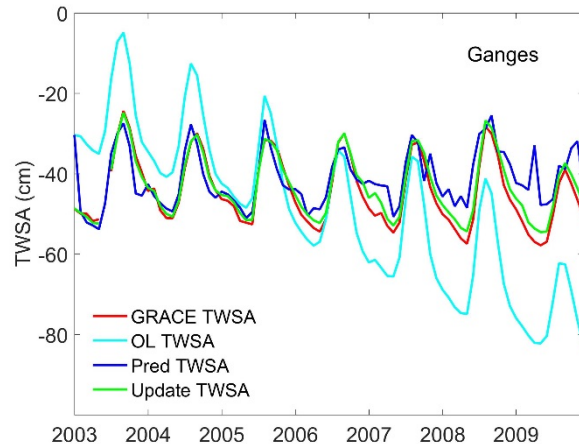
- Planned research stay at IGG, Bonn to set up DA framework for assimilation of EGSIEM data products into WGHM for Ganges-Brahmaputra Basin.

## WP6: Hydrological Service

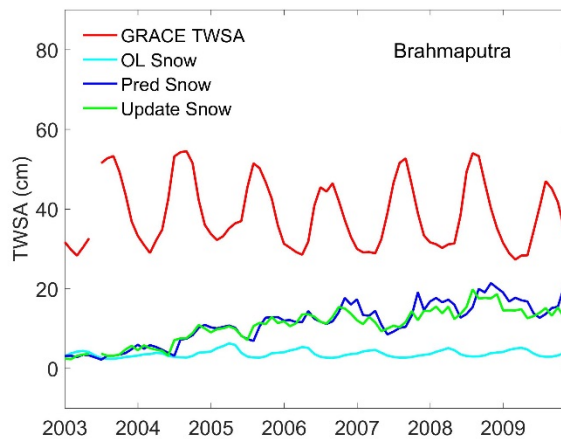
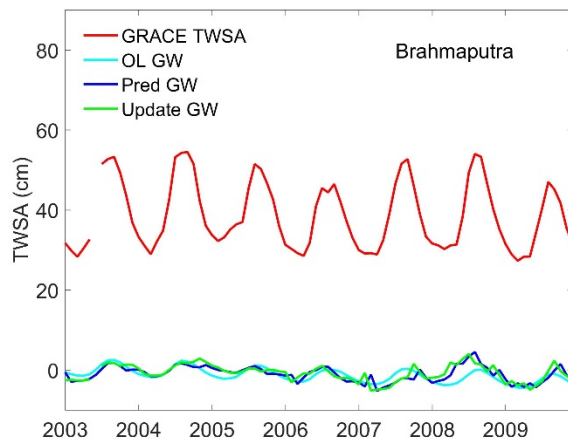
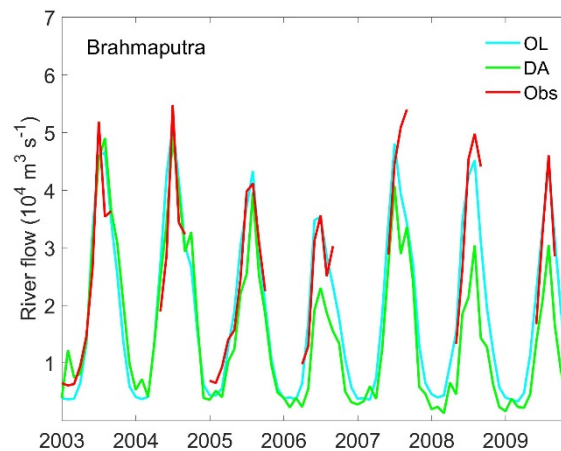
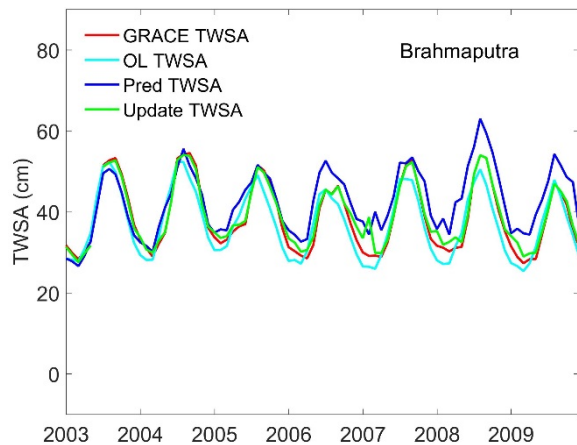




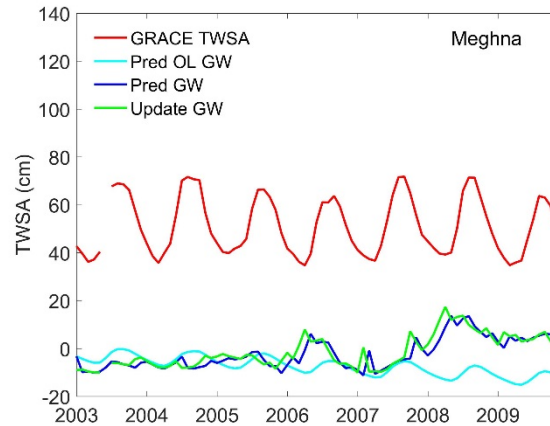
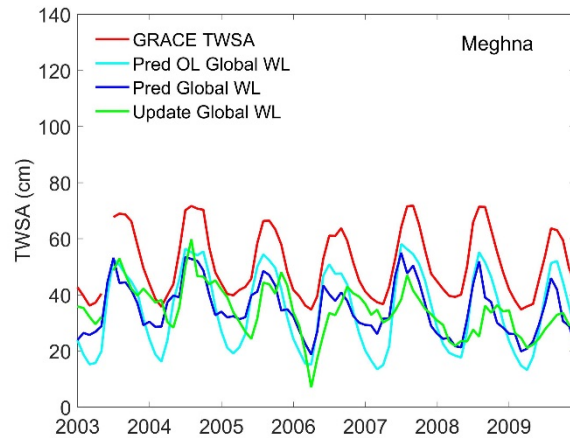
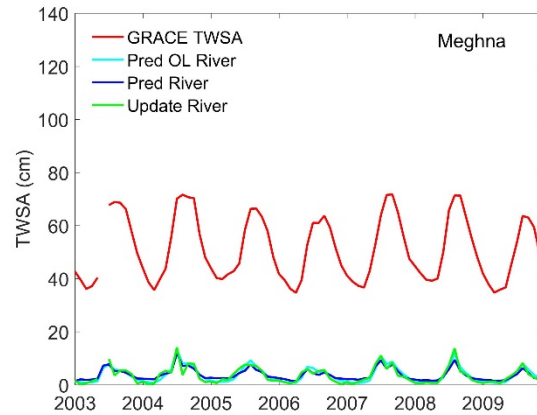
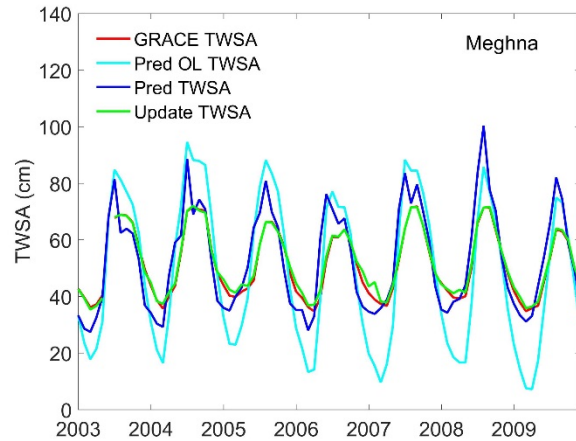
# Ganges



## Brahmaputra



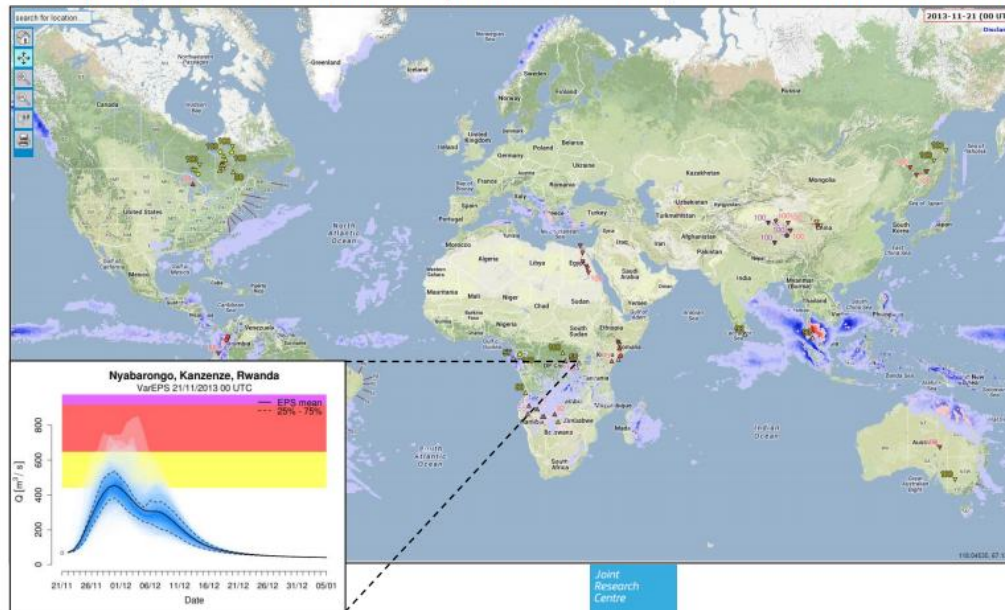
# Meghna





## Global Flood Awareness System (GloFAS) Flood early warnings for large river basins around the world

Developed by: Joint Research Center of the European Commission & European Center for Medium Range Weather Forecasting



Forecast lead time:  
Up to 20 days

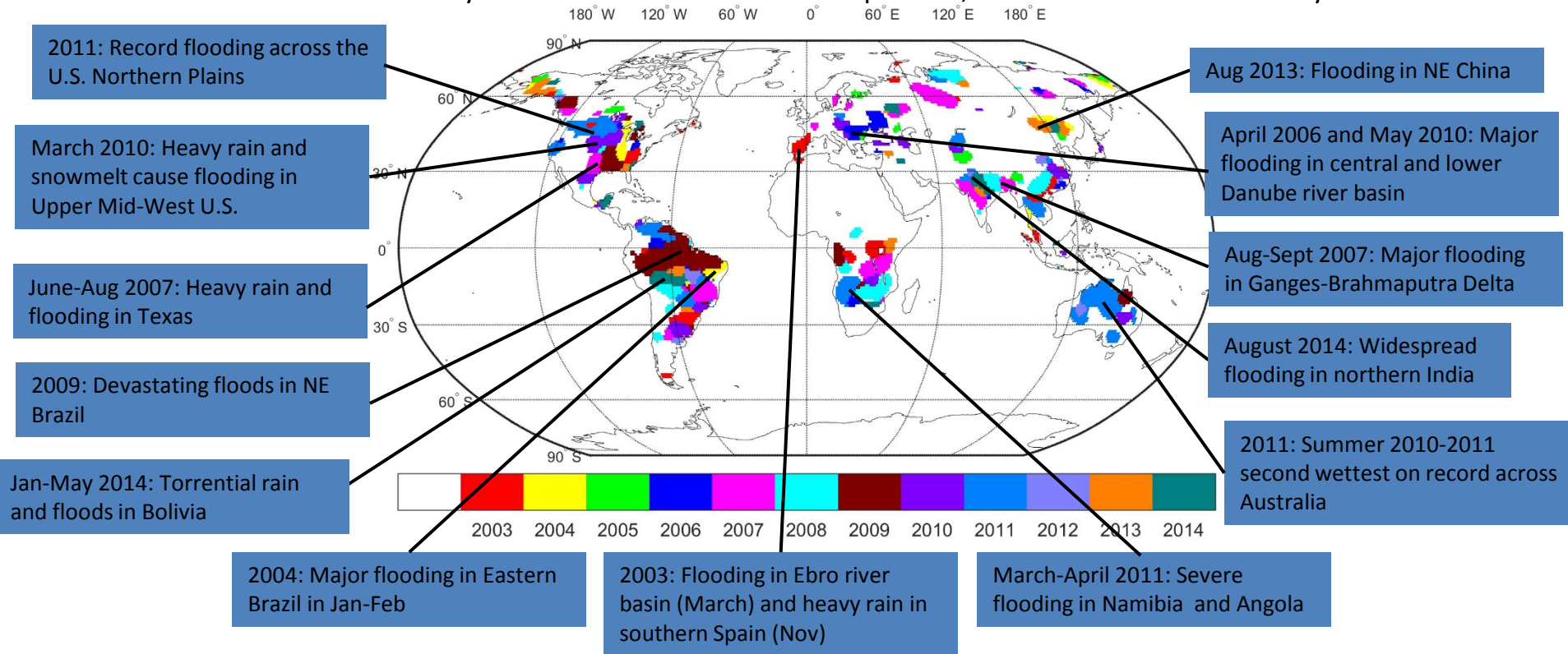
Minimum river  
basin size:  
10.000 km<sup>2</sup>

Forecast frequency:  
Daily

Forecast type:  
Probabilistic

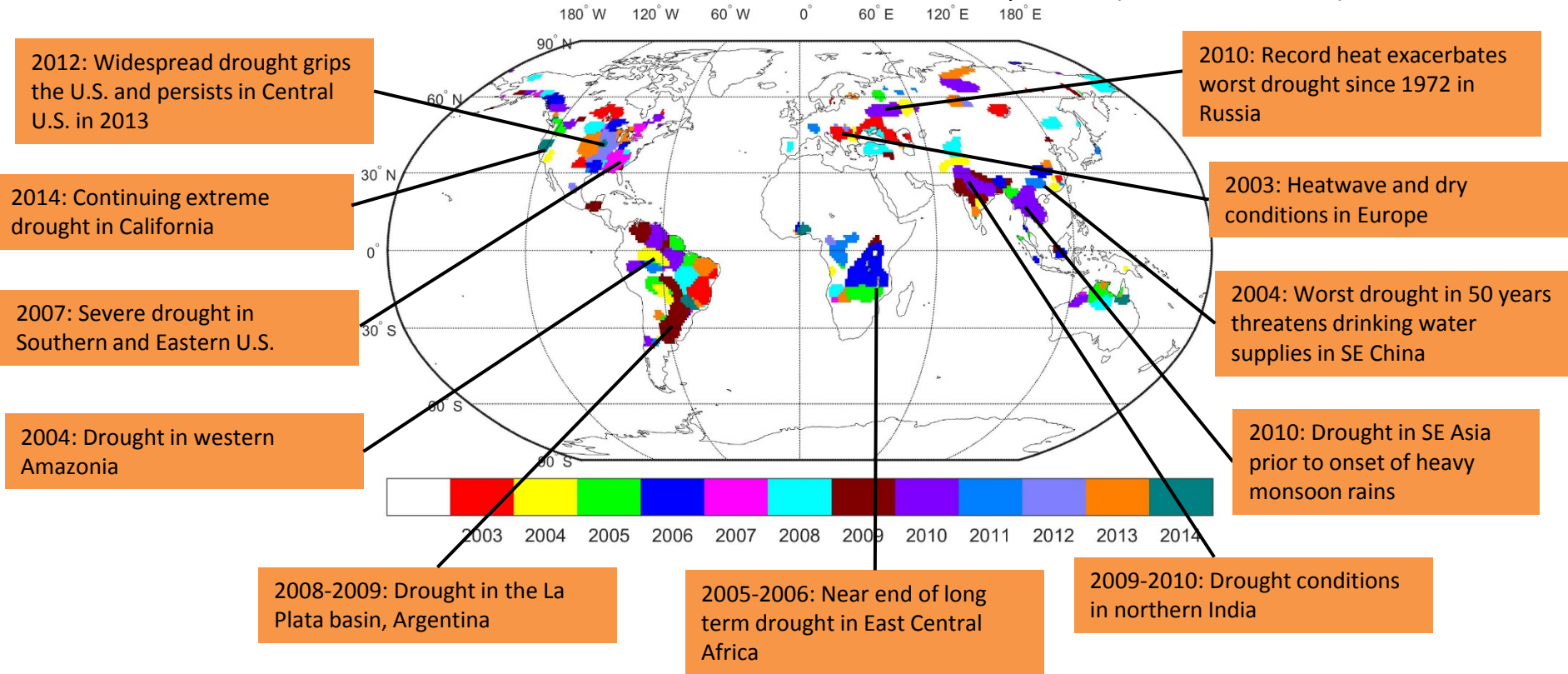
## Wettest Year on record, 2003-2014 (threshold > 10 cm)

Year of maximum monthly TWS of the EGSIEM combined product, linear trend and seasonal cycle removed



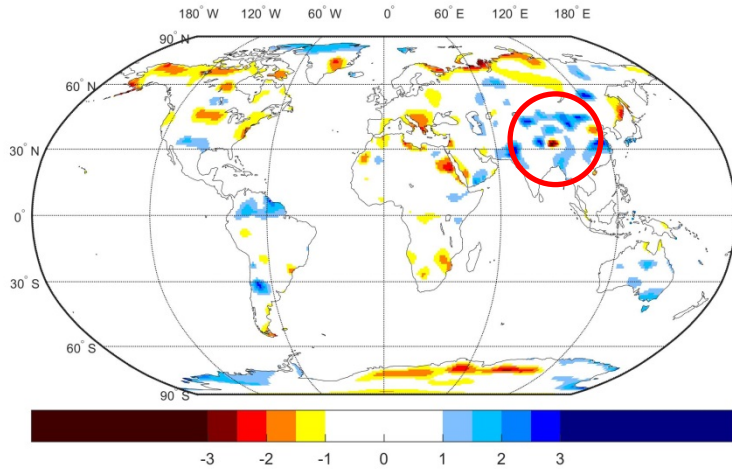
## Drought periods (3 months and longer), 2003-2014

Year of maximum TWS deficit of the EGSiEM combined product (threshold -10 cm)

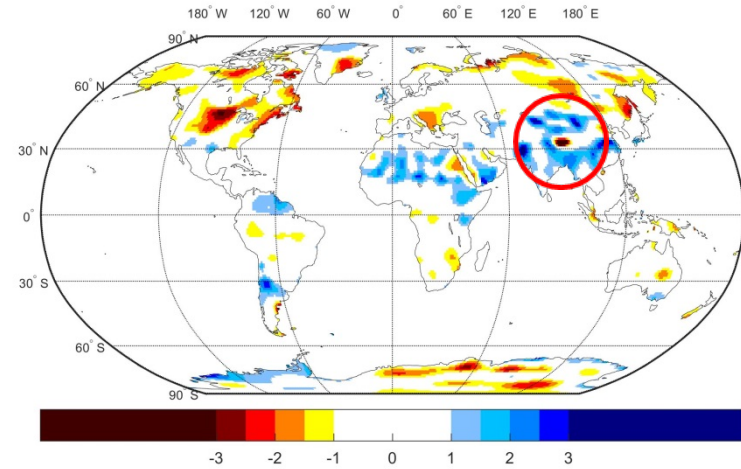


# Flood and drought indicator – normalized TWSA

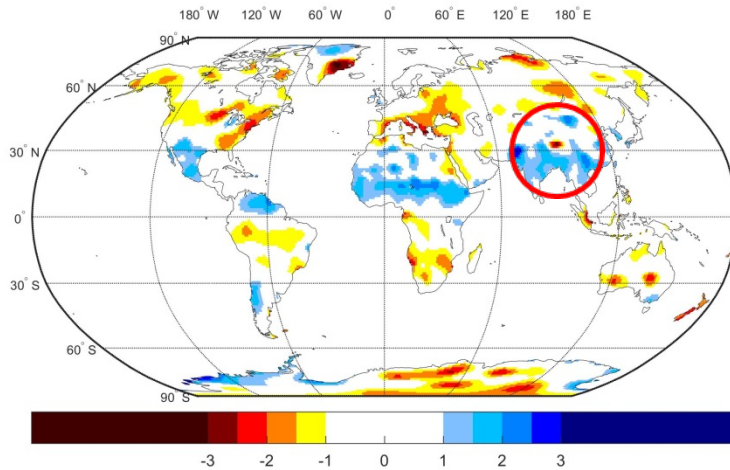
19 July 2007



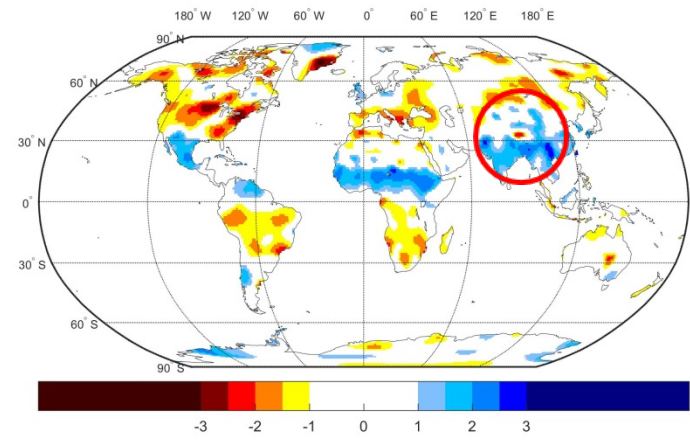
3 August 2007



28 August 2007

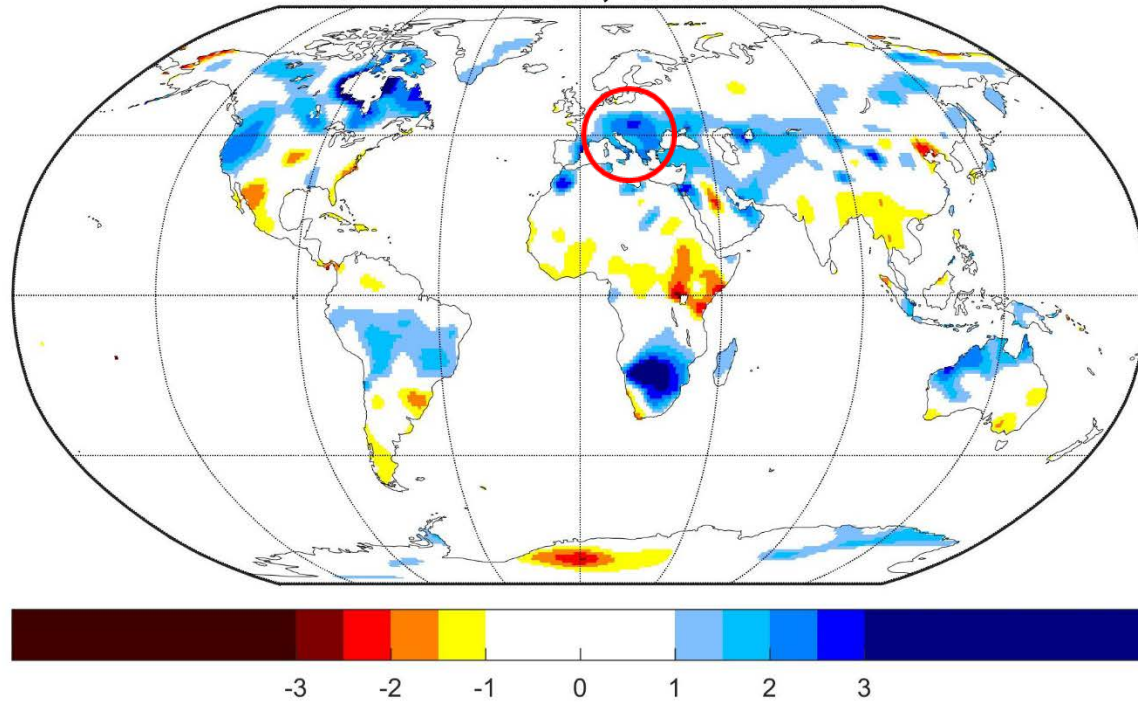


12 September 2007



# Danube basin

Normalized TWSA, 19 March 2006



Wetter than normal conditions (2.5-3 times the standard deviation) are indicated for the Danube basin in March 2006, just before the April 2006 flood.



## Other activities & outlook

- Revise and re-submit paper on evaluation of GRACE daily gravity solutions for hydrological extremes in selected river basins (Gouweleeuw et al., GRL, in review)
- Analyse and extend DA assimilation for Ganges-Brahmaputra-Meghna basin incl. analysis of complimentary hydrological data (groundwater level, surface water level, river discharge).
- Further development and refinement of global drought and flood indexing in preparation of real-time test.