EGSIEM

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European Gravity Service for Improved Emergency Management

Objectives

The Grant Preparation with the European Commission in the frame of the Horizon 2020 program has been successfully completed last year and EGSIEM has officially started on January 1, 2015.

The three main objectives of EGSIEM are:
- delivering the **best gravity products** for applications in Earth and environmental science research,
- **reducing the latency and increasing the temporal resolution** of the gravity and therefore mass redistribution products,
- developing **gravity-based indicators for extreme hydrological events** and demonstrating their value for flood & drought forecasting and monitoring services.
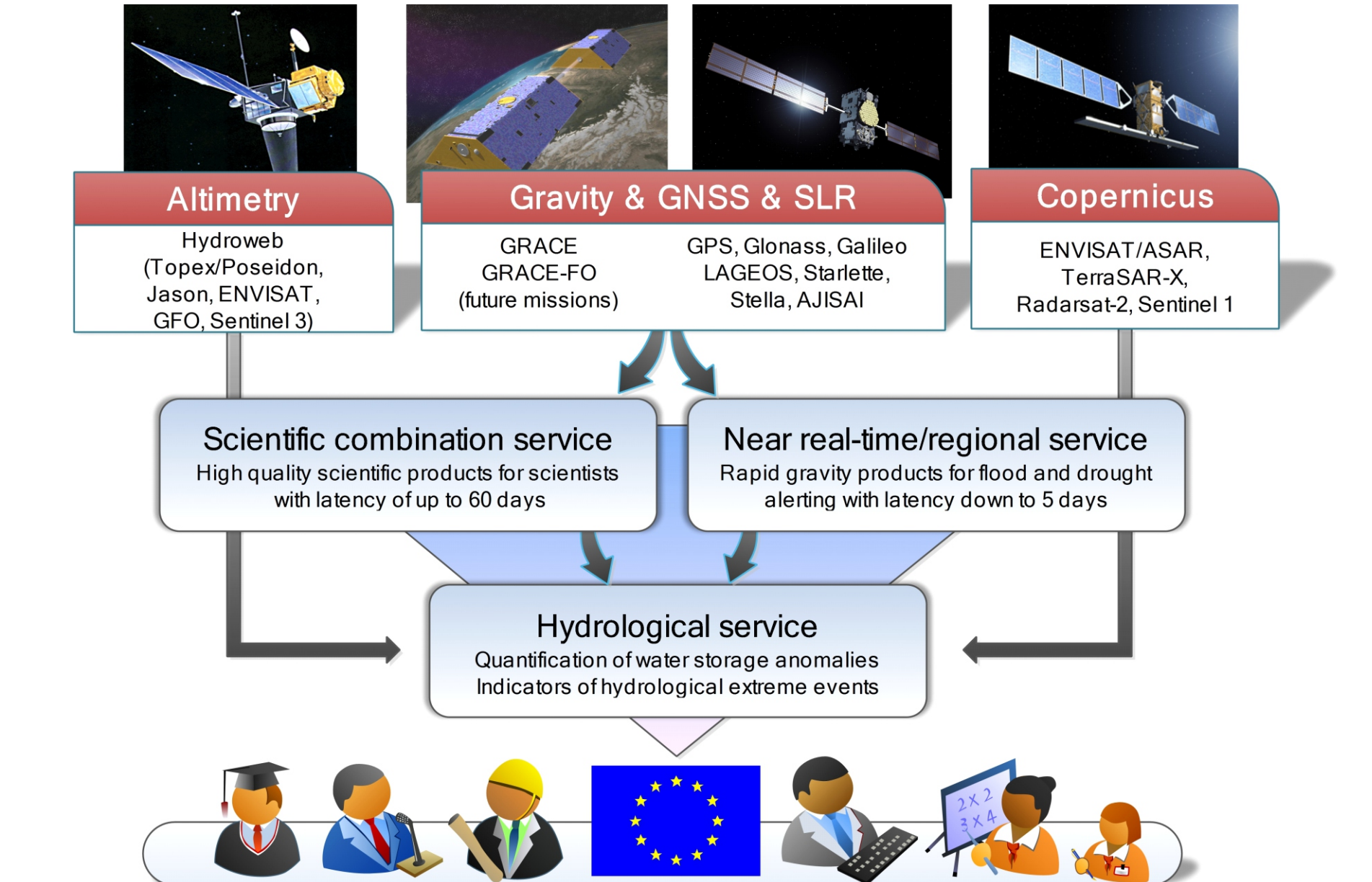
Project Partners

Project Structure
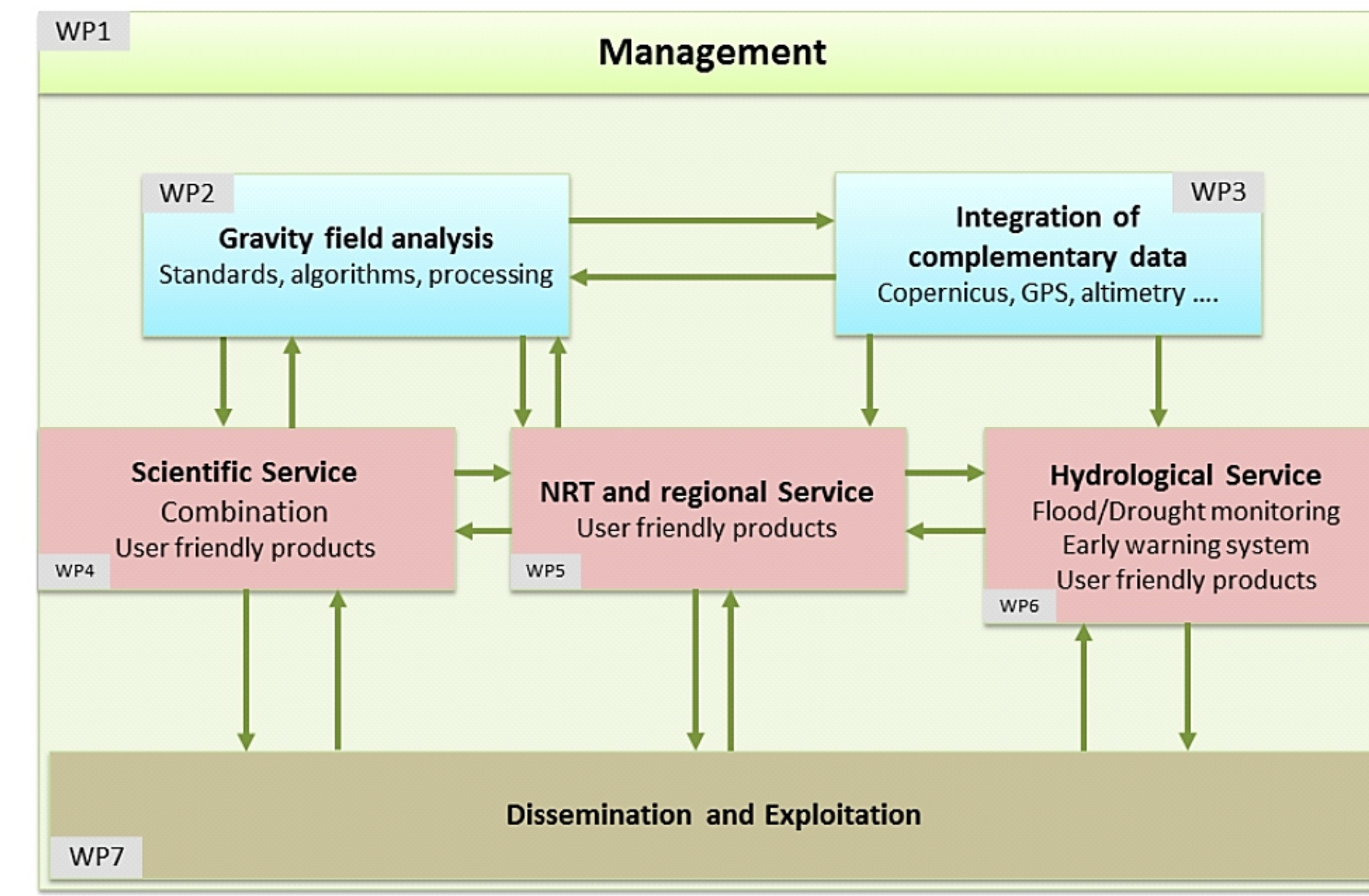
The used input data sources and the anticipated services that shall be established are reflected in the EGSIEM WP structure.

Upcoming Services

Services will be tailored to the needs of governments, scientists, decision makers, stakeholders and engineers. Special visualisation tools will be used to inform, update, and attract also the large public.

Scientific Service

In the frame of the project different groups will generate gravity field solutions based on independent processing strategies:
GFZ
    direct approach
CNES
    direct approach
AIUB
    celestial machanics approach
ITSG
    short-arc approach
University of Luxembourg
    acceleration approach
    (may be more in future)
    ...
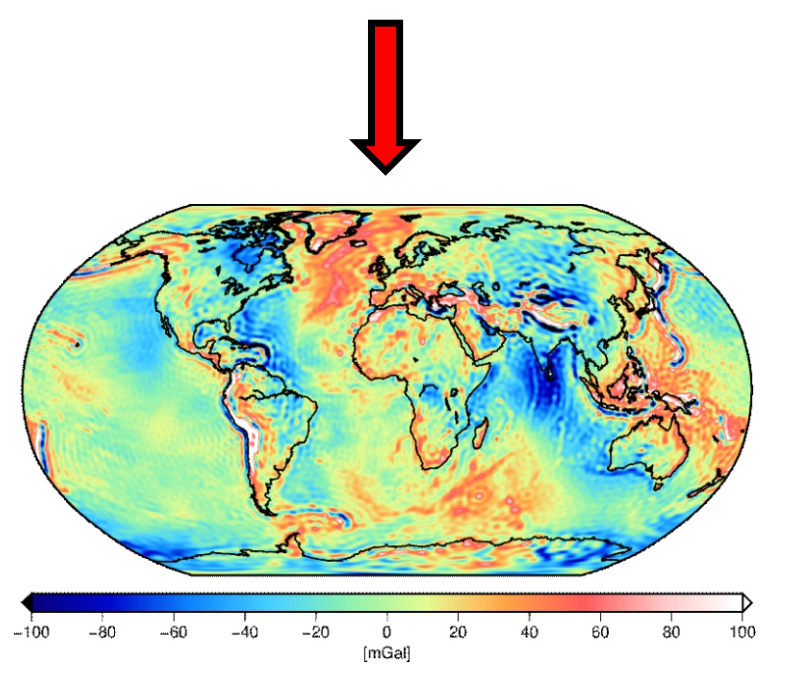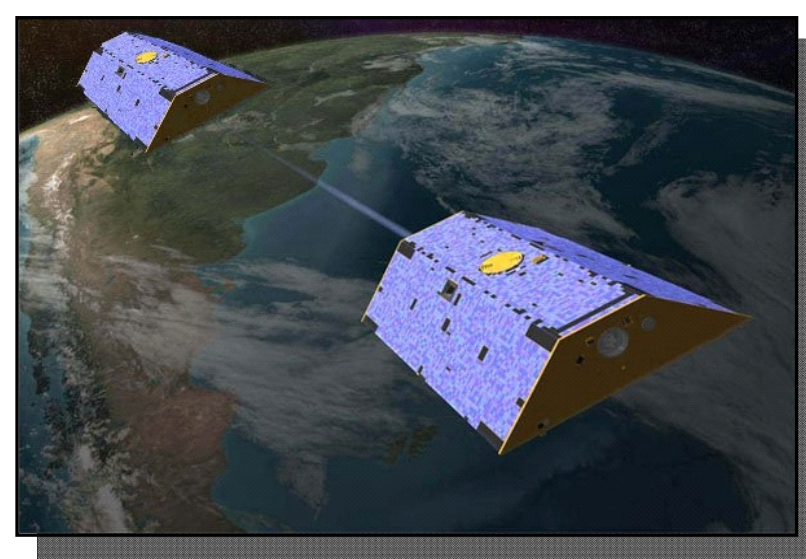
Adopting rigorous and independent processing approaches, each analysis center will deliver consistent gravity field solutions. For the first time, a meaningful combination of gravity field solutions will be possible.

This task will be coordinated by AIUB, it includes
- comparison of the analysis center solutions, identification of gross errors
- pair-wise comparison of gravity solutions to approximate empirical weights for the individual analysis centers
- combination of all analysis centers solutions to generate combined solutions using the following two schemes:
  - calculate weighted averages based on the empirical weights
  - determine the combined solution based on a combination of normal equations (NEQ) generated by the individual analysis centers
- provide suitable products for hydrological and geophysical applications from the combined and individual analyse center products

Near Real Time and Regional Service

Daily updated solution (Near real-time with max. 5 days delay)
ITSG:
    Kalman filtered solutions
GFZ:
    Alternative representations (e.g., radial basis functions)

Danube basin
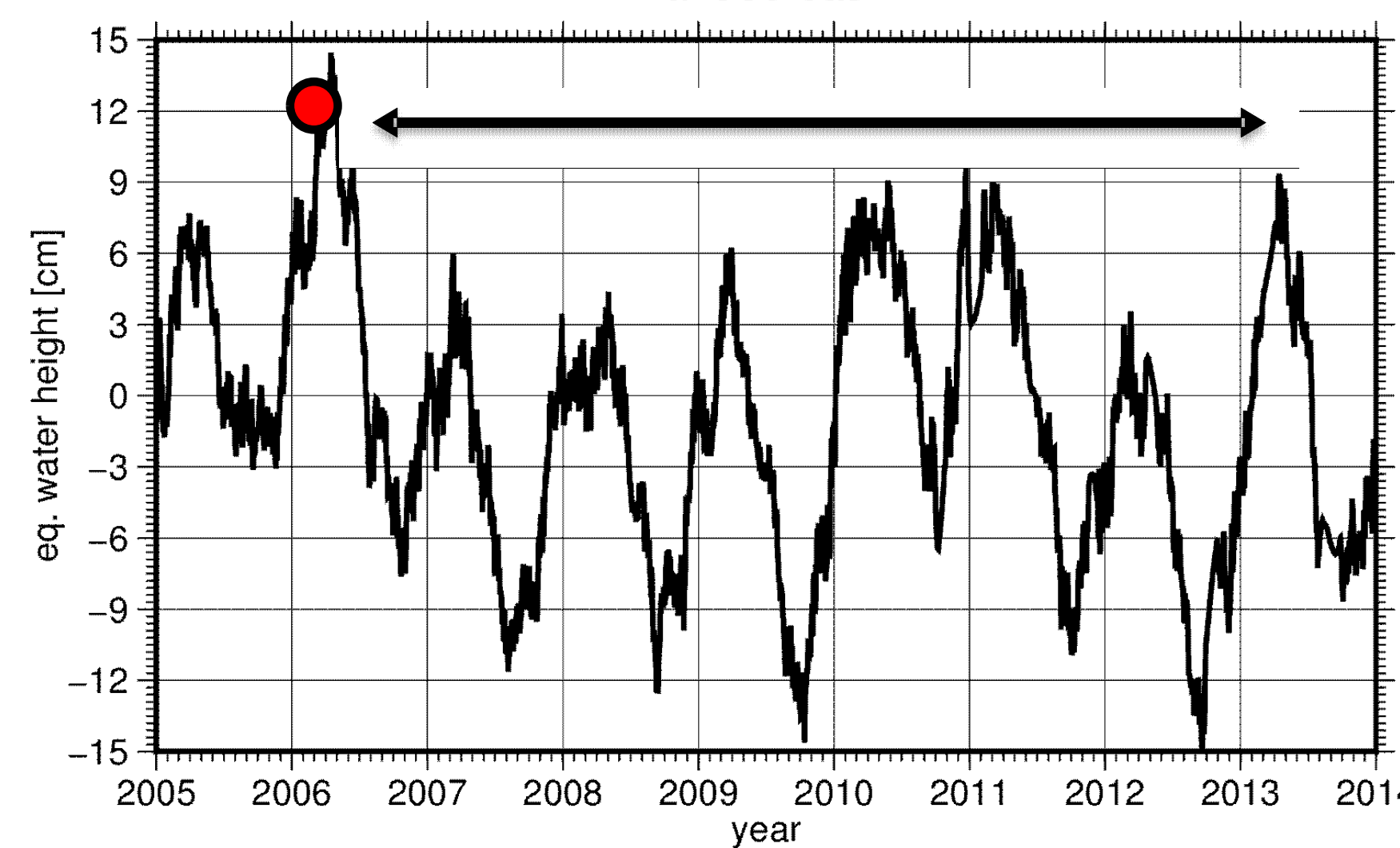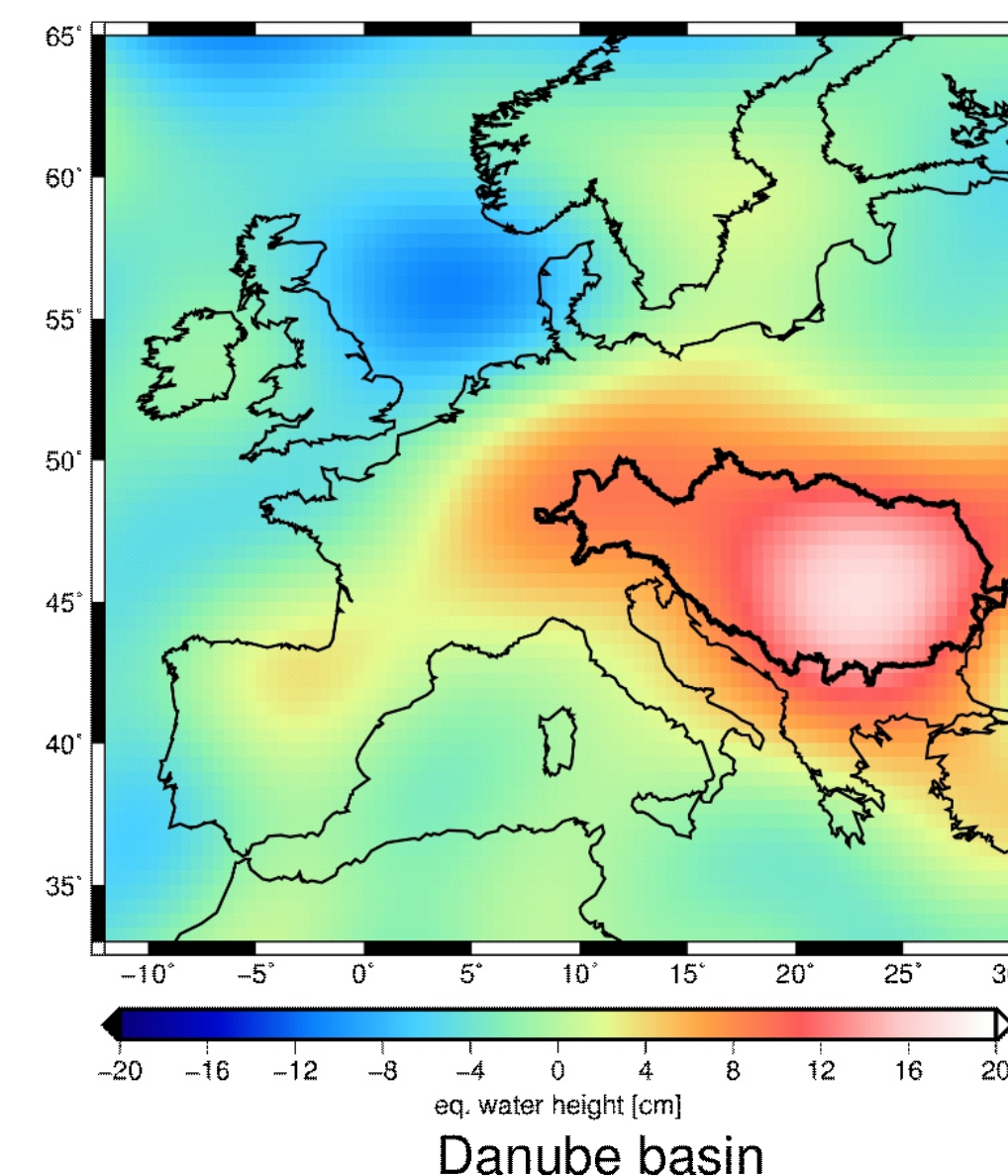
Hydrological Service

Gravity-based flood and drought indicators as descriptors of the integral wetness status of river basins → early warning for hydrological extreme events.
Integration into automatic flood emergency management services.
An operational test run of half a year is foreseen in the frame of DLR's Center for Satellite Based Crisis Information.
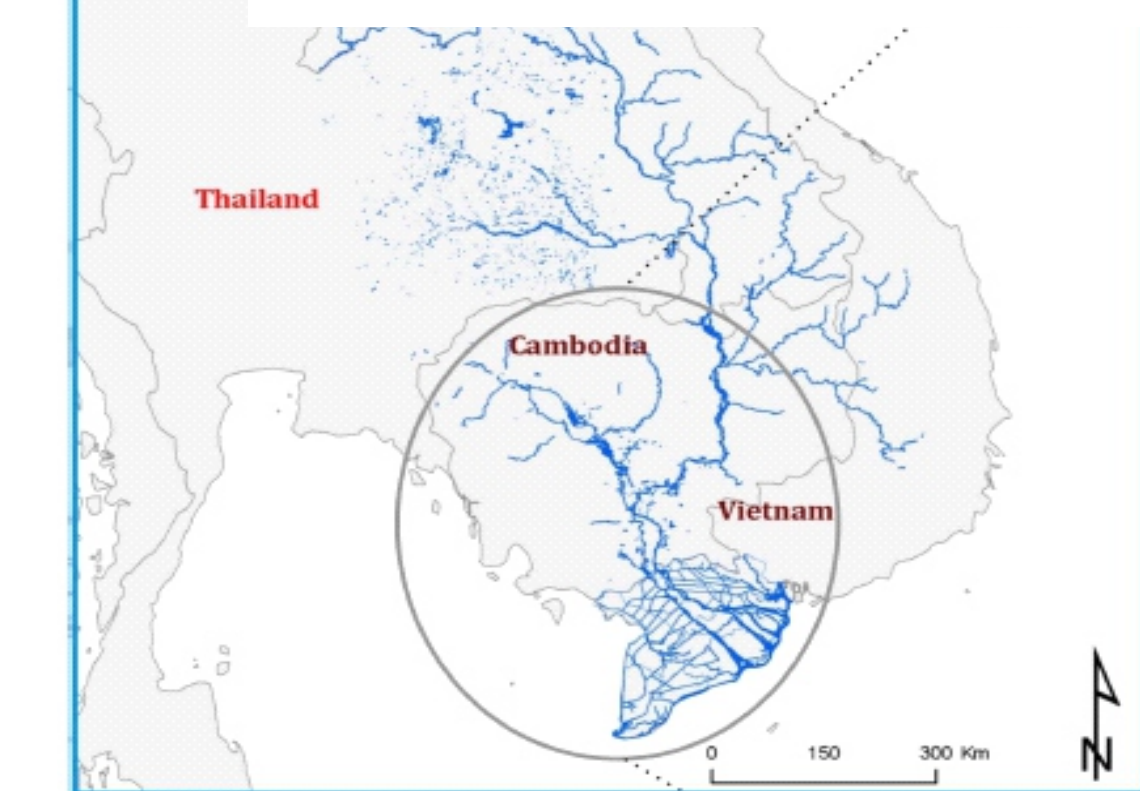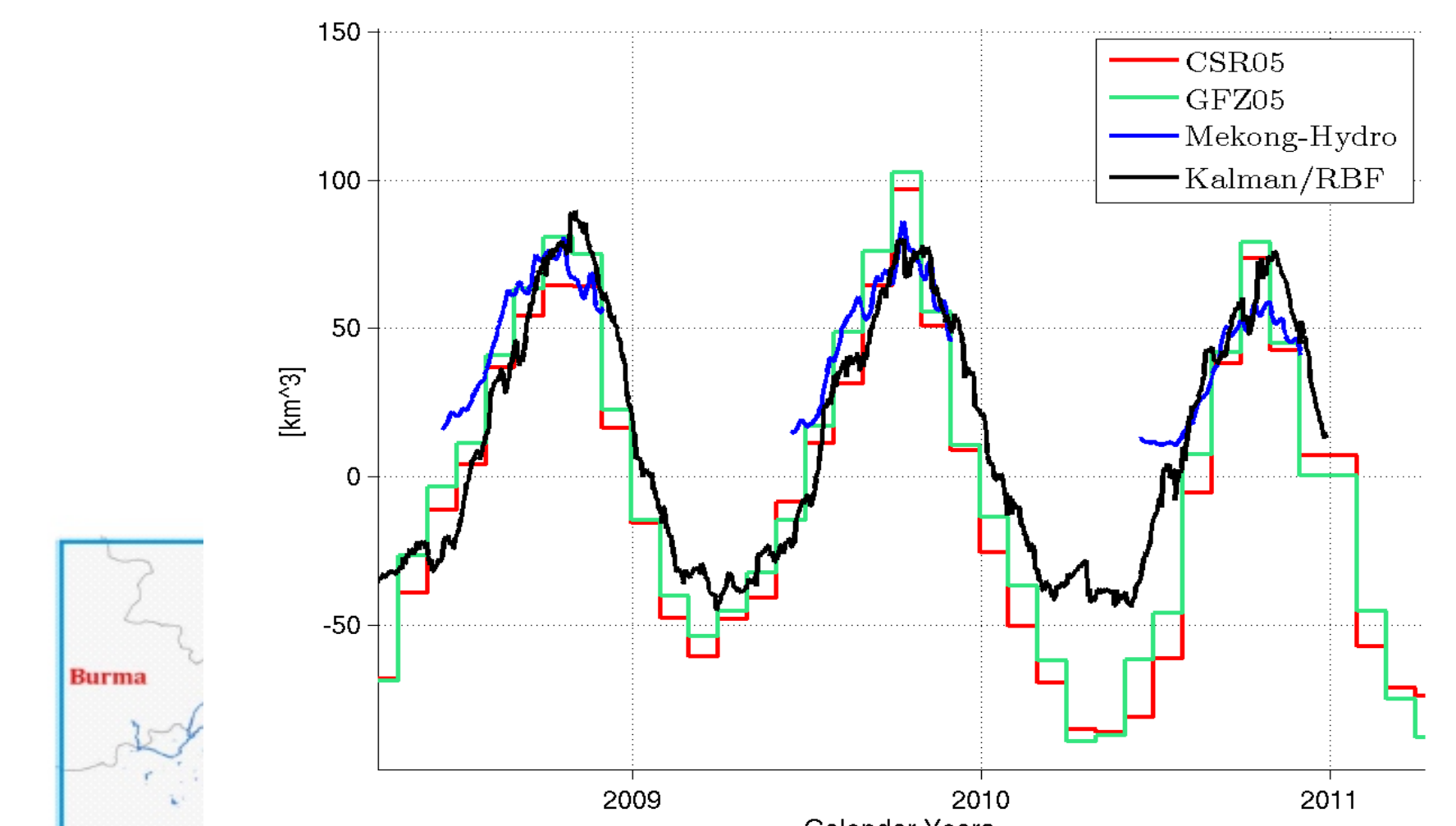
Testing the added value of gravity-based indicators at different lead times (several months to near real time)
- via assimilation into flood forecasting models
- in statistical forecasting approaches

Dissemination and Exploitation

A central component of the EGSIEM dissemination activities will be the EGSIEM plotter, which allows easy data access and visualization (examples on the right hand side).

EGSIEM will have an open data policy with respect to all data generated within the project. Accessibility to all levels will be guaranteed via the project website: **http://www.egsiem.eu**

You are kindly invited to subscribe to the quarterly EGSIEM Newsletter.

EGSIEM Visualization Tool: Extension of The GRACE Plotter, developped by Géode & Cie for CNES.

Data selection

center, type, version...

Multiple possibilities for extraction areas, custom or predefined

Interactive plots

Status of the Project

- The EGSIEM project started on January 1st, 2015.
- EGSIEM will run for three years (2015-2017).
- Future integration into the services of the International Association of Geodesy (IAG), e.g., under the umbrella of the International Gravity Field Service (IGFS), and into the Copernicus emergency service is envisaged.
- EGSIEM will have an open data policy and is open for collaborations with further partners.
- Collaborations/associating projects with other partners are very welcome. Service Level Agreements can be signed anytime during project duration.

In collaboration with and supported by
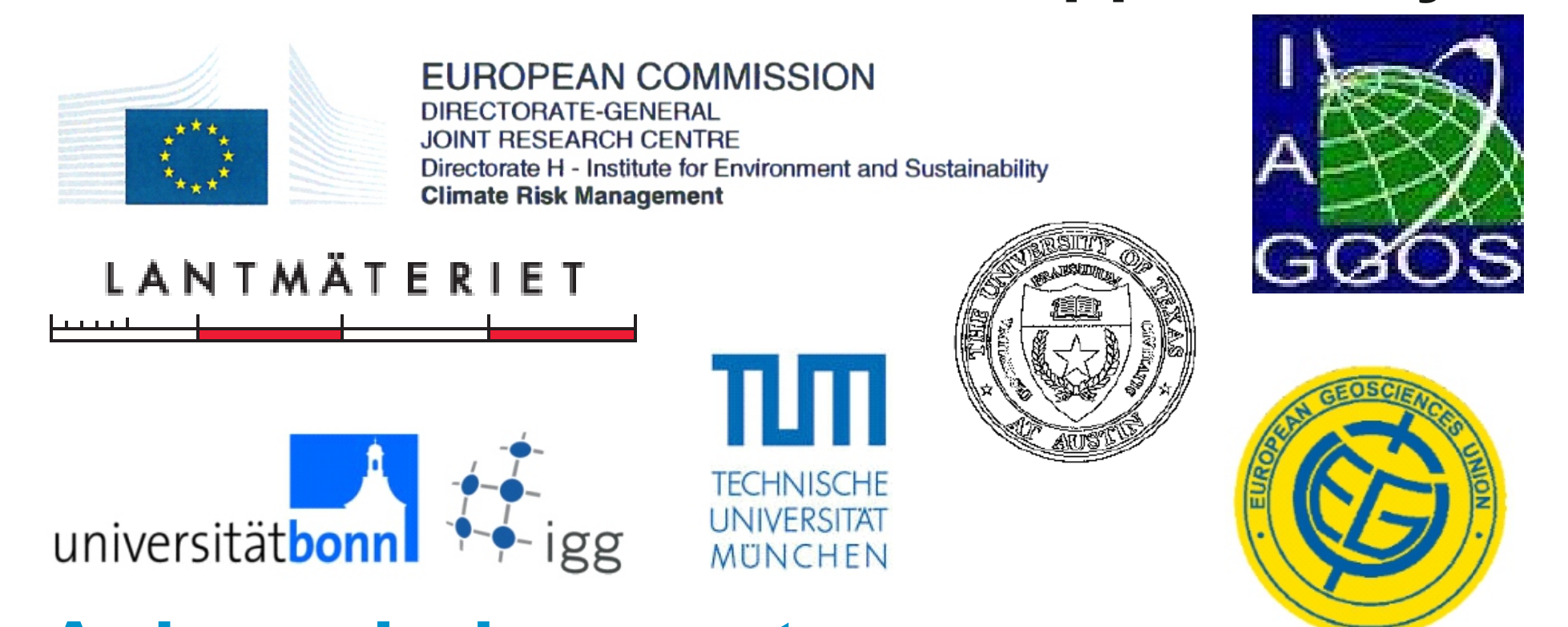
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