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EGSIEM

European Gravity Service for Improved Emergency Management

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Objectives

EGSIEM is a project of the Earth Observation Space Calls of the Horizon 2020 Framework Programme for Research and Innovation of the European Commission.

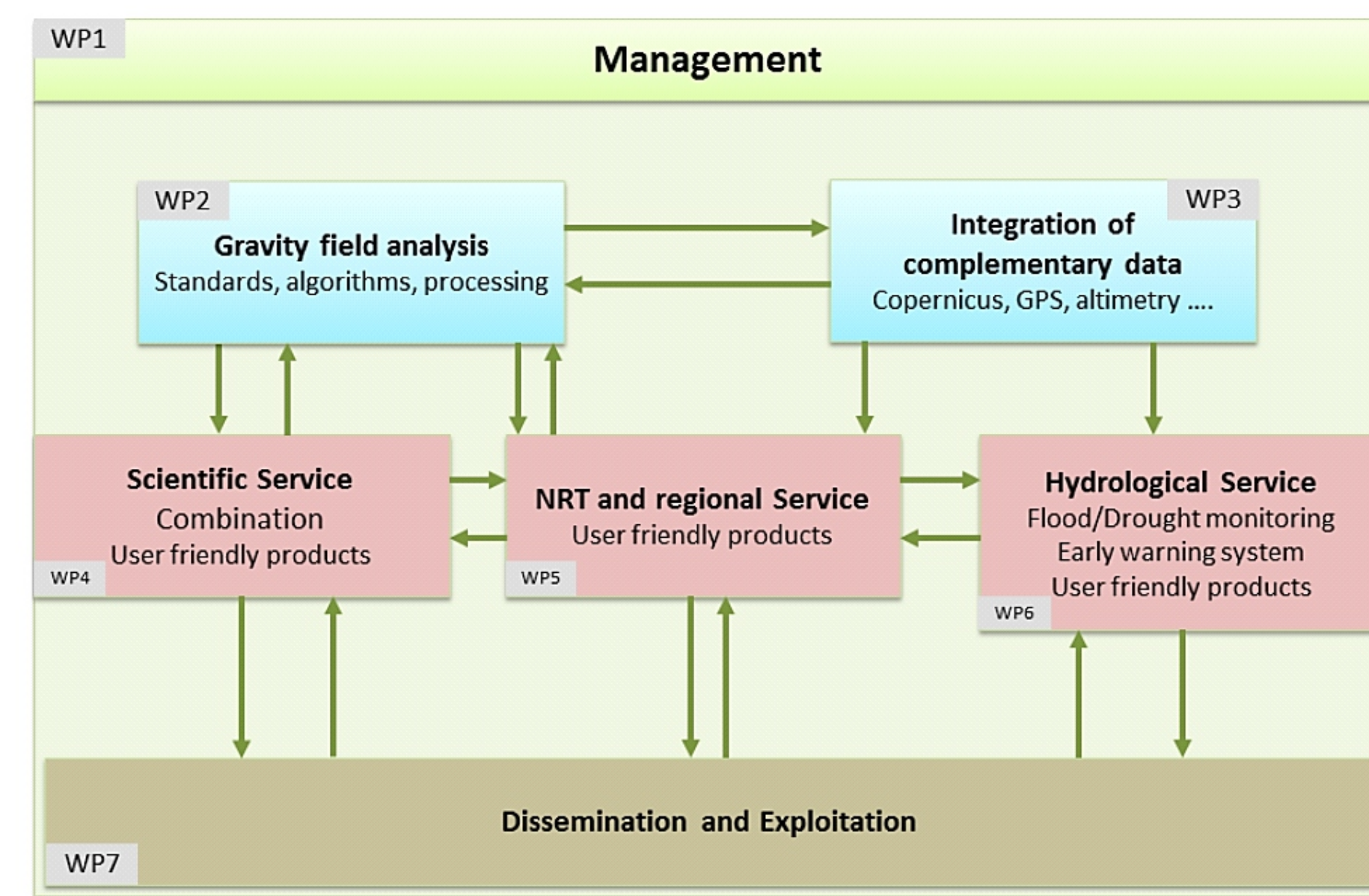
The three main objectives of EGSIEM are:

- 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 thereof derived mass redistribution products,
- developing **gravity-based indicators for extreme hydrological events** and demonstrating their value for flood and drought forecasting and monitoring services.

Project Partners

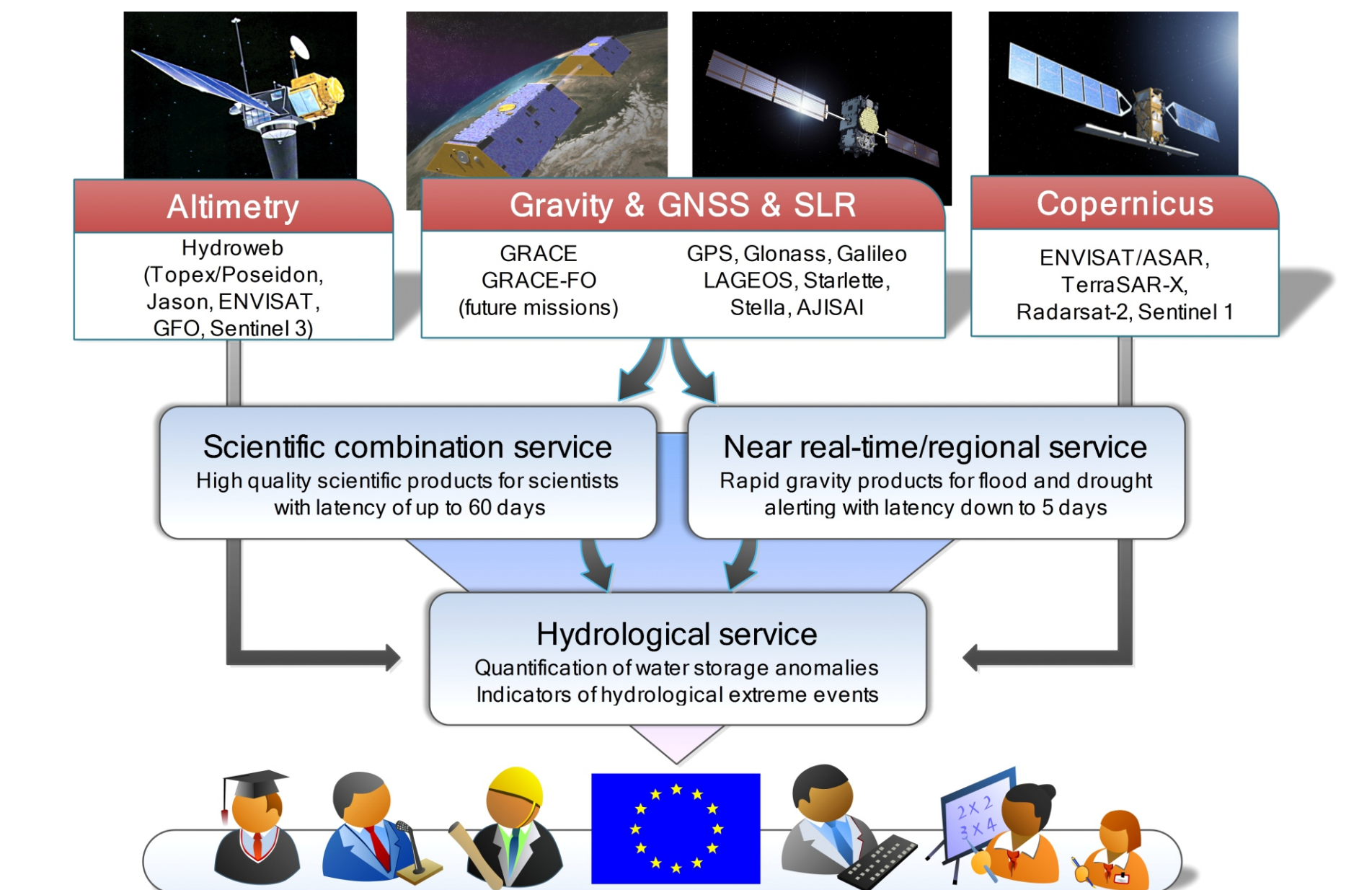


Project Structure



The used input data sources and the anticipated services that are currently being established (see right hand side) are reflected in the EGSIEM work package (WP) structure.

Upcoming Services

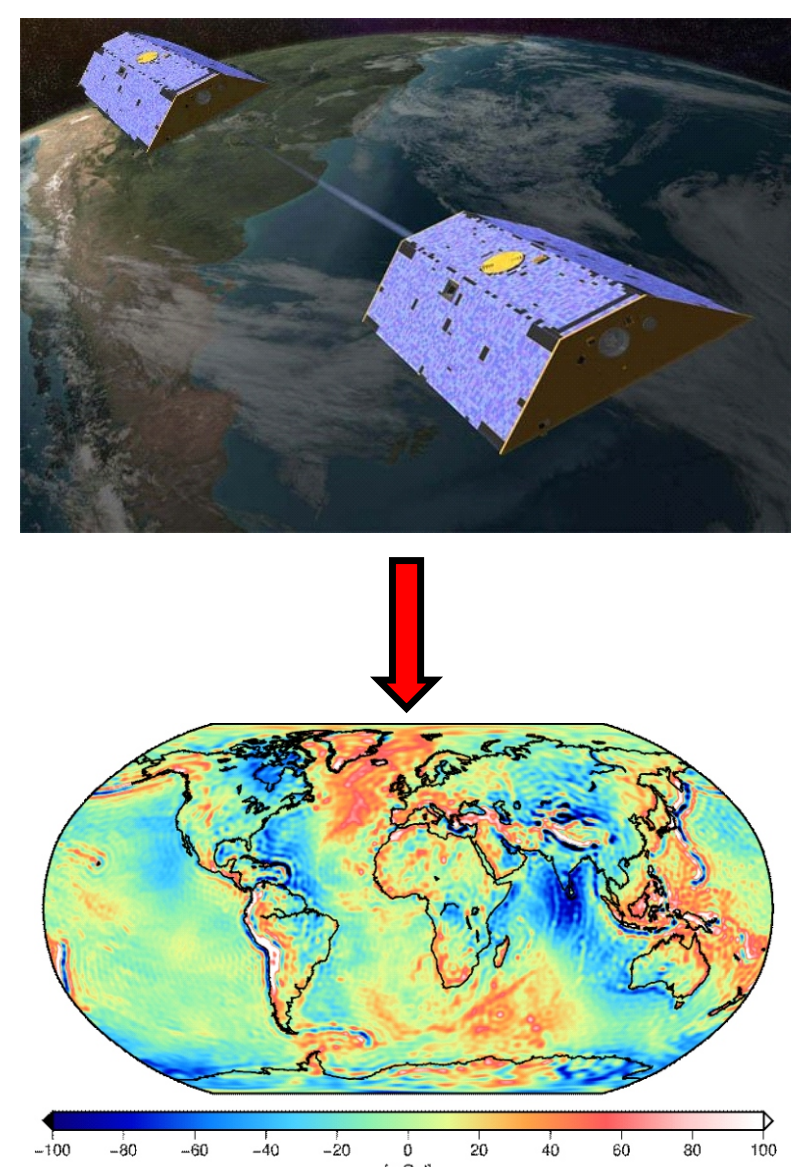


Services are tailored to the needs of governments, scientists, decision makers, stakeholders and engineers. Special visualisation tools are used to inform, update, and attract also the large public.

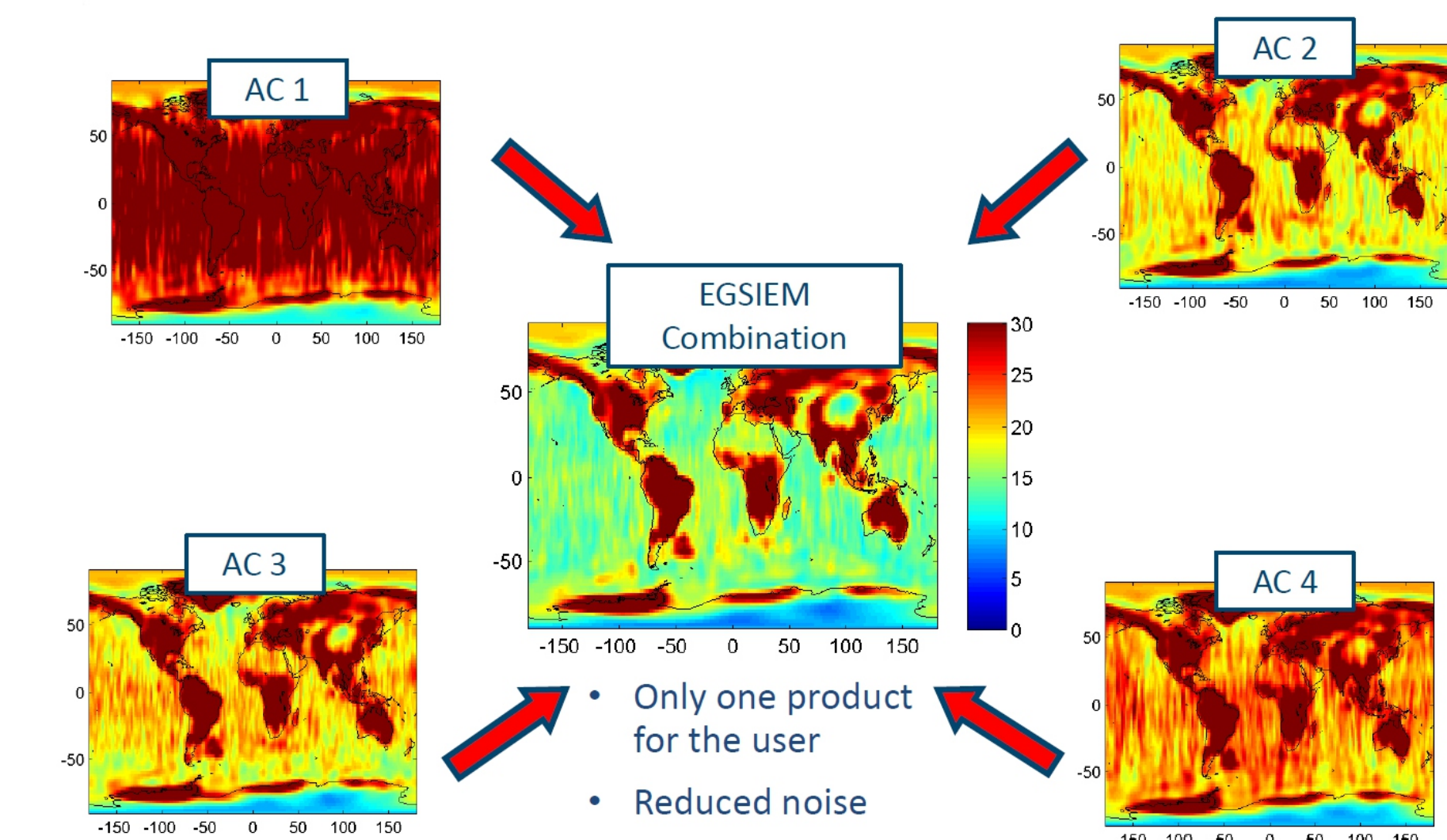
Scientific Combination Service

In the frame of EGSIEM different groups generate gravity field solutions based on independent processing strategies:

- GFZ** direct approach
- CNES** direct approach
- AIUB** celestial mechanics approach
- ITSG** short-arc approach
- University of Luxembourg** acceleration approach (may be more in future)
- ...



Adopting rigorous and independent processing approaches, each analysis center (AC) delivers consistent gravity field solutions. For the first time, a meaningful combination of gravity field solutions is possible.

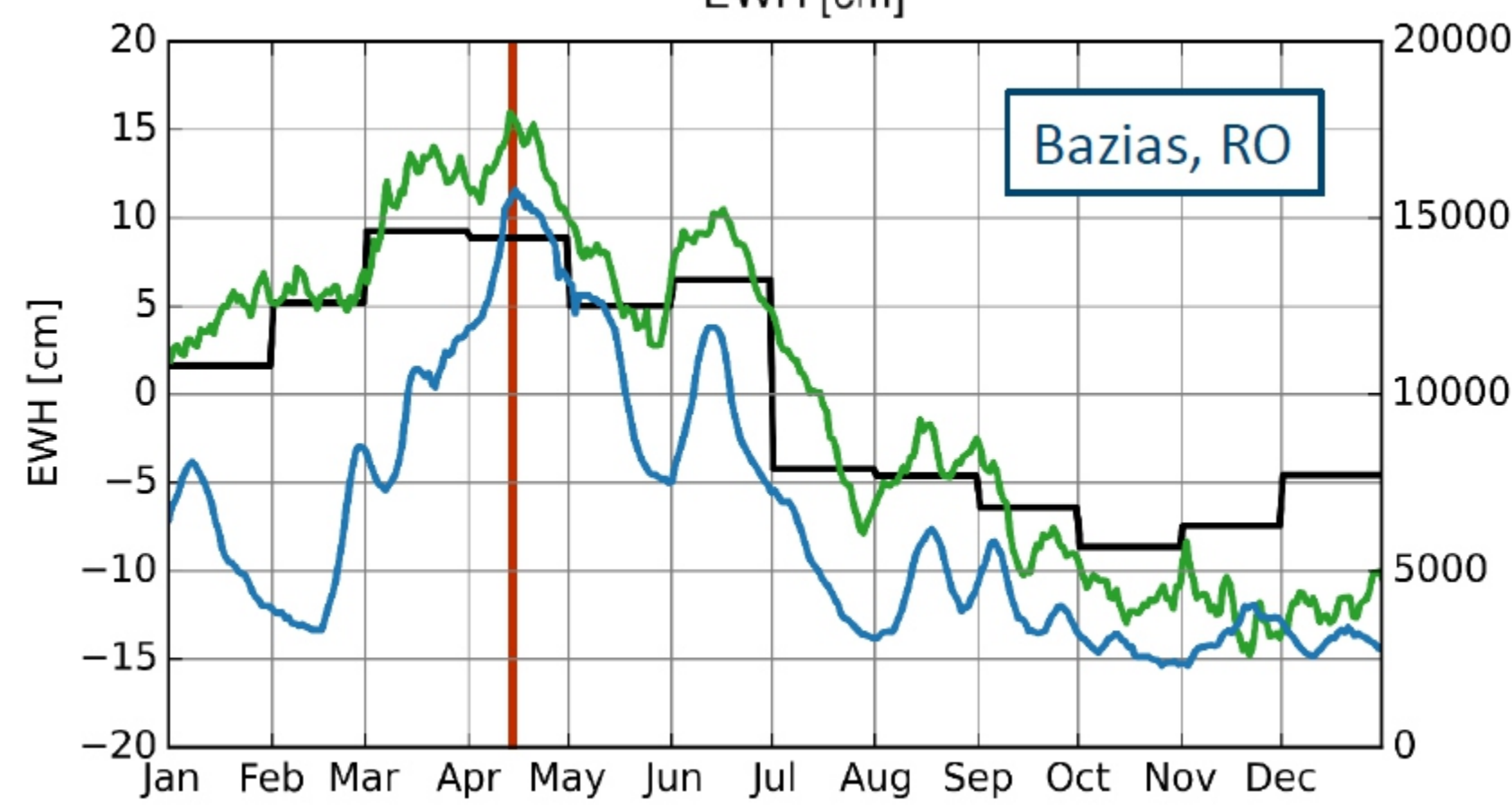
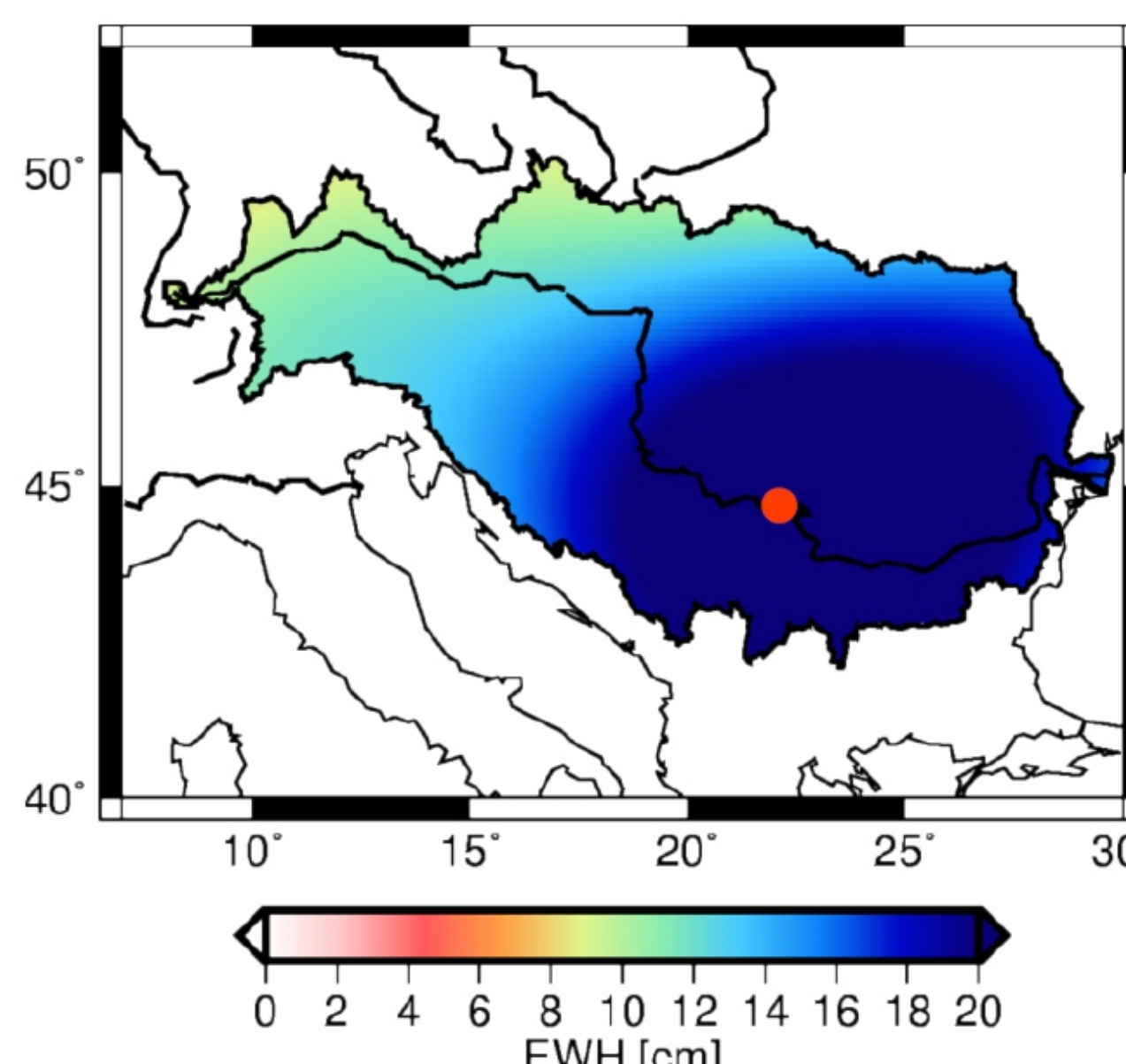


Near Real-Time / Regional Service

Daily updated solutions (near real-time with max. 5 days delay)

ITSG: Kalman filtered solutions

GFZ: Alternative representations (e.g., radial basis functions)

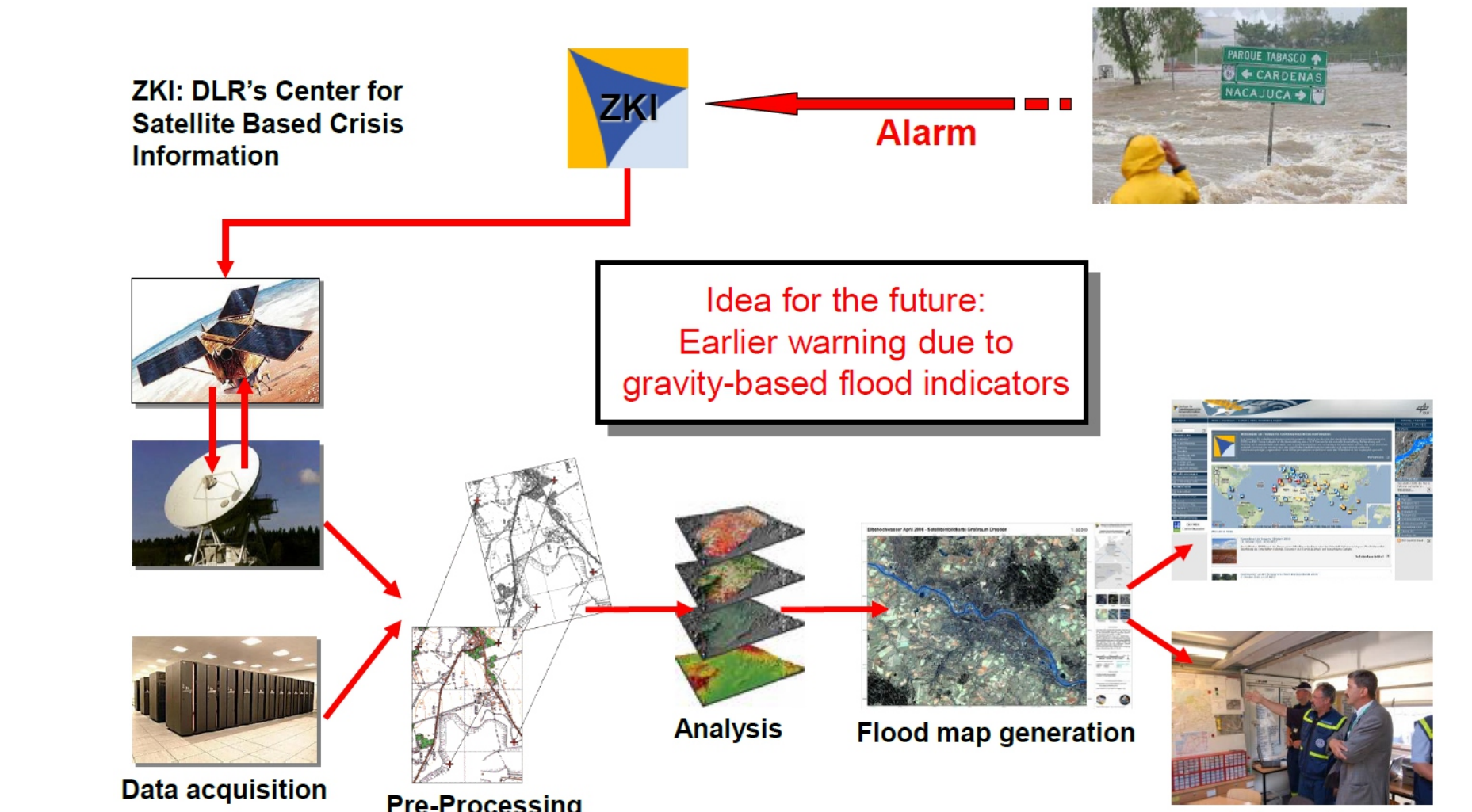


Daily Kalman filtered solutions (green) agree well with river discharge data (blue) provided by the Global Runoff Data Center (example for Bazias, Danube basin).

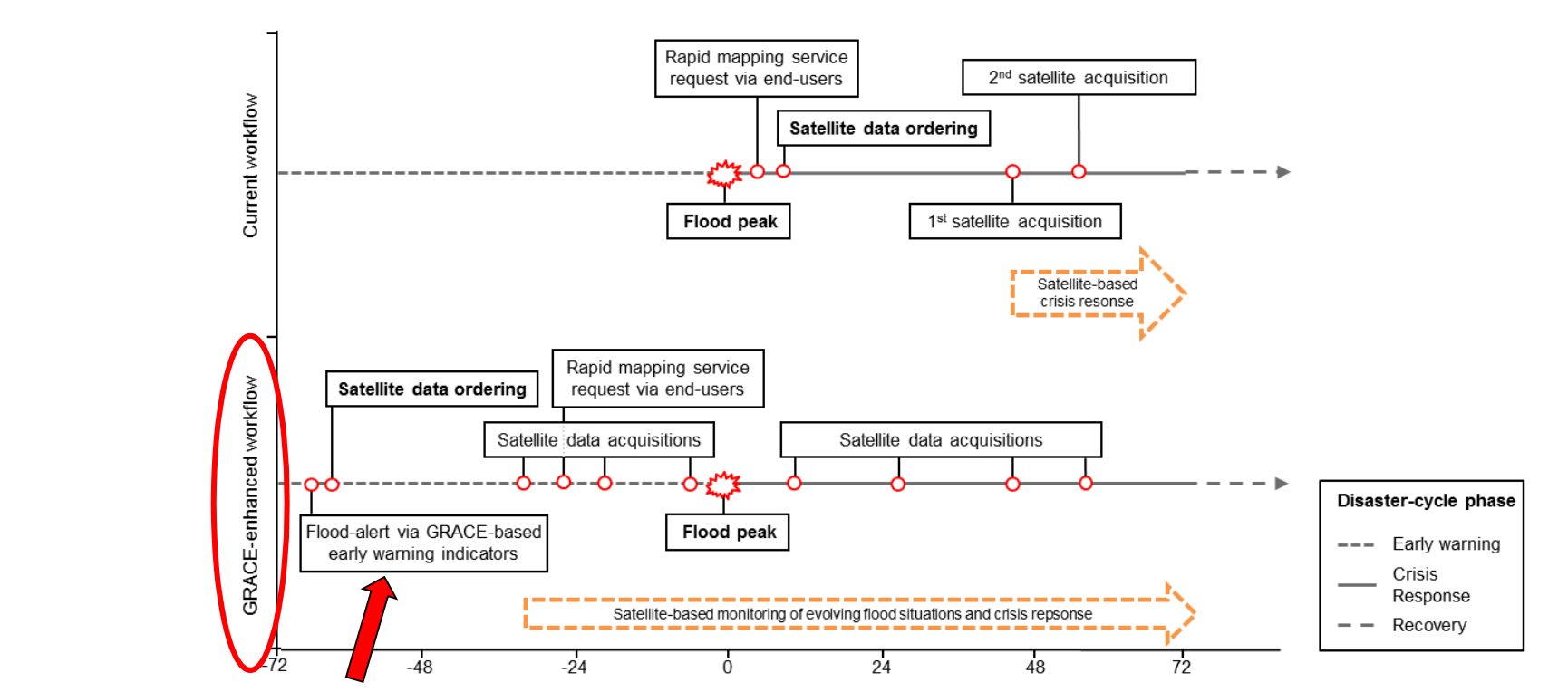
Hydrological Service

Gravity-based flood and drought indicators as descriptors of the integral wetness status of river basins will be developed for early warning of hydrological extreme events at different lead times (several months to near real-time):

- via assimilation into flood forecasting models
- in statistical forecasting approaches

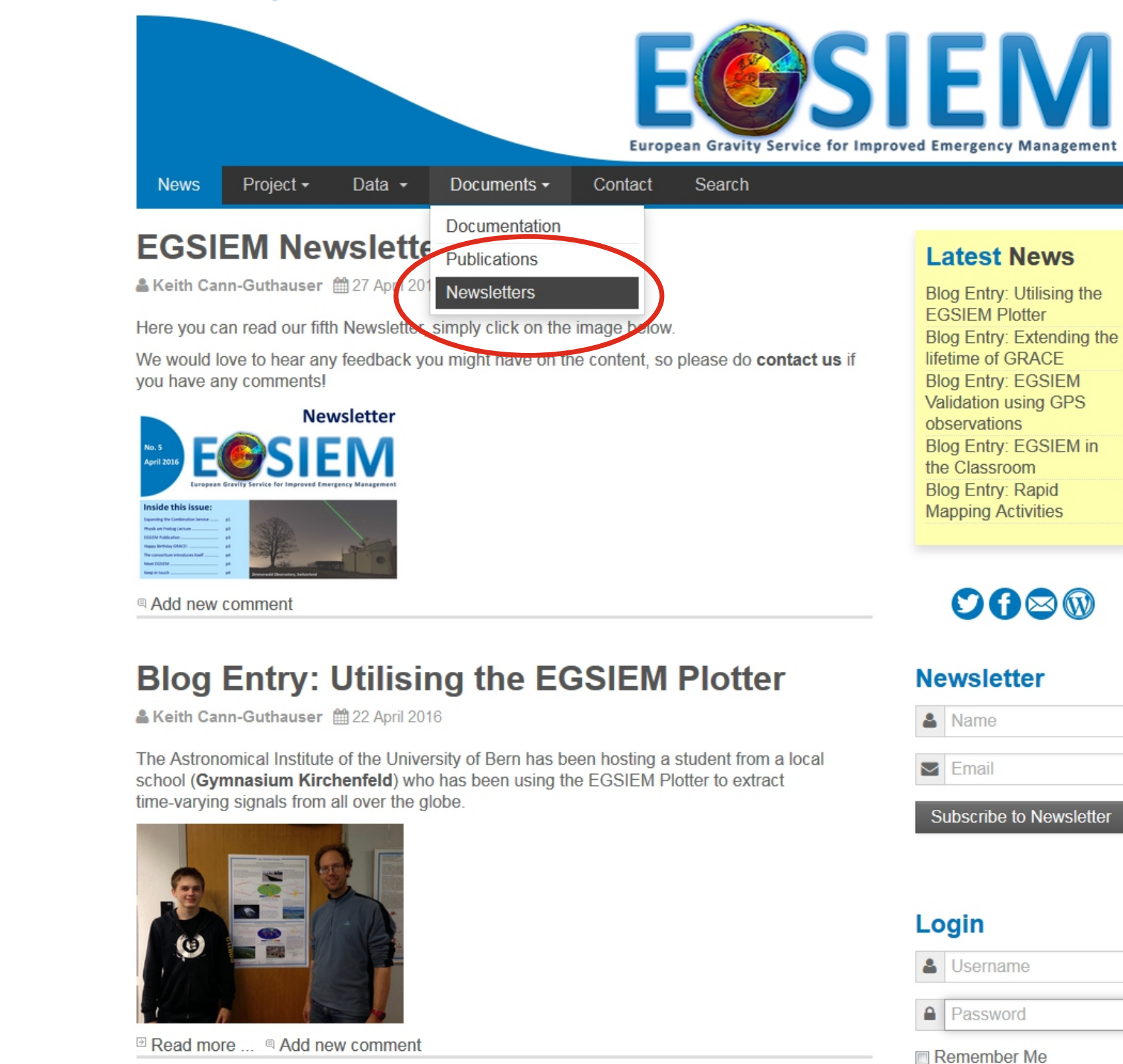


Integration into automatic flood emergency management services is envisaged. An operational test run of half a year is foreseen in the frame of DLR's Center for Satellite Based Crisis Information.



Dissemination and Exploitation

A central component of the EGSIEM dissemination activities is the EGSIEM plotter, which allows easy data access and visualization (examples on the right hand side). EGSIEM has an open data policy with respect to all data generated within the project. Accessibility to all levels is given via the EGSIEM website: <http://www.egsiem.eu>



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

Data selection center, type, version...

Series title	Data center	Version	Area	Address	Latitude	Longitude	Apply
Series 1	CNES/GRACS	BL03-v1	7-Heptagon	Bern, Switzerland	46.947922	7.444008	Apply
Series 2	GFZ	BL05-0005	Phon	Graz, Austria	46.814402	15.382100	Apply
Series 3	CNES	BL05-0005	Danube	Potsdam, Germany	52.390369	13.064473	Apply
Series 4	JPL	BL05-0005	Rectangle	Starnberg, Germany	52.378982	10.732010	Apply
				Toulouse, France	43.845273	8.129583	Apply
				Toulouse, France	43.844827	8.144209	Apply
				Brussels, European Comm	50.842317	4.379471	Apply
				Stari, Province of Axdabai	48.112051	19.949712	Apply
				Kazakhstan, District of Jy	37.381404	68.373454	Apply
					46.937233	53.227348	Apply

Multiple possibilities for extraction areas, custom or predefined

Interactive plots

Summary

- The EGSIEM project started on 1 January 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 has 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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