Project Partners

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DAMAST – Monitoring Technologies for Safe and Efficient Operation of Hydropower Reservoirs

New dams are being built worldwide as part of the establishment of a climate-friendly energy and water supply system. In many places, natural or induced seismic activity, especially in combination with extreme events such as heavy precipitation or landslides, can pose a threat to dams and water reservoirs and thus also the local population. In the DAMAST project, German, Georgian and Armenian partners use the Enguri dam as example to investigate the underlying processes and safety-relevant parameters of water reservoirs. The project aims to develop & test transferable and efficient monitoring concepts for dams in tectonically active regions.

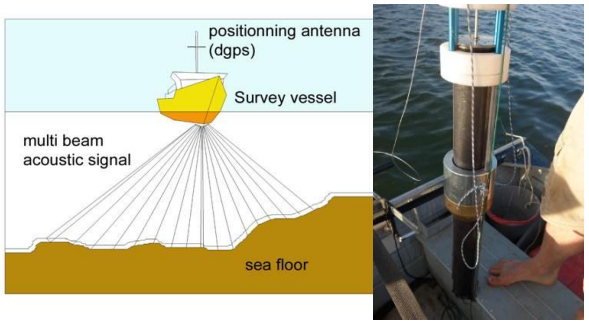
Safe and efficient power and water supply

Worldwide, many dams are located in seismically active regions. Even if the technical installations are designed for such events, operating activities at water reservoirs can trigger seismic activity in their immediate vicinity. If several extreme events occur simultaneously such as earthquakes, landslides or heavy precipitation in combination with an unfavourable distribution of sediments in the reservoir this can lead to sudden displacement of the sediments in the reservoir and perturb the safe exploitation of the resource.

DAMAST project aims to contribute to the systematic reduction of hazards associated with water reservoirs and to their long-term and efficient operation, e.g. the development of monitoring concepts that can be transferred to comparable locations.

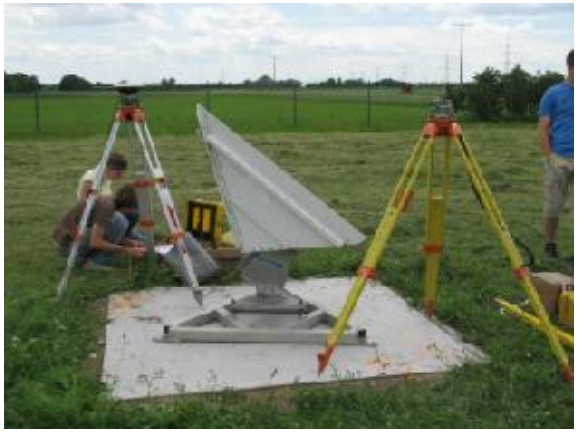
Surveillance on land, at sea and from space

Innovative monitoring technologies are combined to provide observations for calibrating and developing model scenarios of the spatial-temporal development of seismicity as well as the local and regional deformation of the dam and the surrounding terrain.



The acquisition of seismological, meteorological, geodetic and geological data, as well as the measurement and characterization of the lake sediments and changes in the dam structure is carried out.

The monitoring technologies use remote sensing methods, borehole measurements, seismic recording methods, terrestrial radar interferometry, underwater drones, multi-beam bathymetry, multi-frequency echo sounder, sediment characterization and novel mini-sensors.



From monitoring to decision support

The project results should show whether and how improved risk management can be implemented with an early warning system that supports decision-making. In the project, medium-sized companies and scientific institutions work together, logistically supported on site by the operating company Engurhesi. The proposed recommendations should support operational decisions and help authorities and administrations to use suitable monitoring concepts and further reduce the risk for the population. The project results should also benefit to facilities in comparable alpine and seismically active regions.