

GGOS Theme 3

Understanding and Forecasting Sea-Level Rise and Variability

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The sea level and its change is measured for more than a century. Especially, for nations with long coastlines and important coastal industry observations of tides, extremes, and long-term changes have strong impacts on coastal societies and coastal economics.

Today, the observed sea level rise (SLR) is largely associated with climate related changes. To find the patterns and fingerprints of those changes, different monitoring techniques have been developed. Some of them are local, e.g. tide gauges, others are global, e.g., radar altimetry. In many areas, the slow long-term rise in sea level is superimposed by artificial and sometimes natural changes, which might have much higher rates in relative sea level rise. Reasons for that are e.g., groundwater, gas or oil extraction in near-shore areas or changes in the coastal habitat.

GGOS and its services contribute in many ways to the monitoring of the sea level. This ranges from tide gauge observations, estimation of gravity changes, GNSS control of tide gauges or the maintenance of the International Reference Frame. Theme 3 (Understanding and Forecasting Sea-Level Rise and Variability) of GGOS establishes a platform and will be a forum to researchers and authorities for estimating and predicting global and local sea level changes in a 10- to 30-year time horizon. It presents an excellent opportunity to emphasize the global, through to regional and local, importance of GGOS to a wide range of sea-level related science and practical applications.



GGOS Theme 3 Sea-Level Change, Variability and Forecasting has identified actions to be undertaken to advance geodetic techniques and technologies applied to sea level research. These are

- Identification or (re)-definition of the requirements for a proper understanding of global and regional/local sea-level rise and its variability especially in so far as they relate to geodetic monitoring provided by the GGOS infrastructure, and their current links to external organizations (e.g., GEO, CEOS, and other observing systems).
- Identification of organizations or individuals who can take forward each requirement, or act as points of contact for each requirement, where they are primarily the responsibility of bodies not related to GGOS.
- Identification of a preliminary set of practical or application (as opposed to scientific) pilot projects, which will demonstrate the viability, and the importance of geodetic measurements to mitigation of sea-level rise at a local or regional level. This identification will be followed by construction of proposals for pilot projects and their undertaking.
- In the long-term, the aim is to support forecasting of global and regional sea level for the 21st century with an expected forecast period of 20 to 30 years or longer.



In 2012 GGOS Theme 3 opened a **Call for Participation** for projects demonstrating the value of geodetic techniques to sea level science and applications. This CfP is still open for new responses. Special emphasis is given to local and regional projects which are relevant to coastal communities, and which depend on the global perspective of GGOS. The aim of this CfP is to build a GGOS community network and to share knowledge and expertise.

The first selected projects address major aspects of the sea level research in Britain ("The Use of Continuous GPS and Absolute Gravimetry for Sea Level Science in the UK", lead R. Bingley, University of Nottingham), subsidence monitoring in Bangkok ("Revisiting the Threat of Southeast Asian Relative Sea Level Rise by Multi-Disciplinary Research", lead: Wim Simons, Delft University of Technology (DUT), Delft, Netherlands), and Bangladesh ("Bangladesh Delta Relative Sea-Level Rise Hazard Assessment (BanD-Aid)", lead: C.K. Shum The Ohio State University, USA). All projects have a major focus on the combination of sea level and geodetic monitoring in an integrative approach.

We are continuing to encourage the development of new proposals. **OSTST plays an important role in providing global and regional sea level information.**



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