Geophysical Research Abstracts
Vol. 14, EGU2012-5987-1, 2012
EGU General Assembly 2012

Development of new geoinformation methods for modelling and prediction of sea level change over different timescales - overview of the project

T. Niedzielski (1,2), M. Włosińska (1), B. Miziński (1), M. Hewelt (1), P. Migoń (1), W. Kosek (2,3), and I. G. Priede (4)

(1) University of Wrocław, Wrocław, Poland (tomasz.niedzielski@uni.wroc.pl), (2) Space Research Centre, Polish Academy of Sciences, Warsaw, Poland, (3) University of Agriculture in Kraków, Kraków, Poland, (4) University of Aberdeen, Oceanlab, Newburgh, United Kingdom

The poster aims to provide a broad scientific audience with a general overview of a project on sea level change modelling and prediction that has just commenced at the University of Wrocław, Poland. The initiative that the project fits, called the Homing Plus programme, is organised by the Foundation for Polish Science and financially supported by the European Union through the European Regional Development Fund and the Innovative Economy Programme.

There are two key research objectives of the project that complement each other. First, emphasis is put on modern satellite altimetric gridded time series from the Archiving, Validation and Interpretation of Satellite Oceanographic data (AVISO) repository. Daily sea level anomaly maps, access to which in near-real time is courtesy of AVISO, are being steadily downloaded every day to our local server in Wroclaw, Poland. These data will be processed within a general framework of modelling and prediction of sea level change in short, medium and long term. Secondly, sea level change over geological time is scrutinised in order to cover very long time scales that go far beyond a history of altimetric and tide-gauge measurements.

The aforementioned approaches comprise a few tasks that aim to solve the following detailed problems. Within the first one, our objective is to seek spatio-temporal dependencies in the gridded sea level anomaly time series. Subsequently, predictions that make use of such cross-correlations shall be derived, and near-real time service for automatic update with validation will be implemented. Concurrently, (i.e. apart from spatio-temporal dependencies and their use in the process of forecasting variable sea level topography), threshold models shall be utilised for predicting the El Niño/Southern Oscillation (ENSO) signal that is normally present in sea level anomaly time series of the equatorial Pacific. Within the second approach, however, the entirely different methods are proposed. Links between sea floor topography and sea level change will be quantified, with a particular emphasis placed on the hypsometric curve and its semi-empirical modelling. Very long-term projections of sea level change will be based on testing statistical hypotheses and trend analyses, but input data will be calculated from theoretical models. Slightly apart from this topic is a notion of nonlinearity that was earlier shown to be present in gridded sea level anomaly time series. Thus, the list of intermediate tasks concludes with a need for a comprehensive interpretation of such irregularities.