The iGlass Consortium - Using interglacials to assess future sea-level scenarios

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I. The iGlass consortium
The iGlass consortium brings together scientists from different fields to look at the past and future developments of global sea-level. Together with the academic and non-academic partners the projections for plausible future sea-level change should be improved and brought to the target community.

The major aims are to quantify the sea-level variations in past interglacials and to investigate relationships between the global ice volumes and the climatological control processes.

For this the consortium members use four main steps to reach these aims:
1. Acquisition of new relative sea-level data
2. Modelling of the isostatic effects
3. Synthesis of palaeoclimatic data and modelling of interactions between climate and ice sheets
4. Synthesis and modelling of future sea level change

Members:
University of Southampton
National Oceanography Centre
University of York
Durham University
University of Bristol
National Oceanography Centre Liverpool
British Antarctic Survey

Partners:
academic: University of Ottawa, Australian National University
non-academic: UKCIP, Environmental Agency, Willis Ltd

II. Acquisition of new and old Data
An important part of the project is the acquisition of new palaeoclimatic sea-level indicators. New sea-level information are gathered from the UK, Bermuda, Sardinia and the Red Sea. The used archives are sediments from estuarine environments, corals and foraminifera gathered from marine sediment cores and speleothems from cave deposits.

Furthermore, it is the aim to collect and qualify assure already published datasets from these fields. All of the data is used, to compile a global synthesis of sea-level indicators of the times of the last interglacials.

III. GIA modelling
To analyse the sea level on longer time scales, the response of the earth and oceans to the developing ice sheets has to be considered. This process is called glacial isostatic adjustment (GIA). It shows how crustal deformation and changes to gravity affect sea-level.

To model the Greenland and Antarctic ice sheets during the past interglacials, climate parameters are collected and used. These parameters are gained from proxy information contained in ice cores and marine sediments.

A main aim is to model the ice sheets during the last five interglacials at the Marine Isotope Stages (MIS): 1 (~111 kyr BP), 5e (~130 kyr BP), 7 (~244 kyr BP), 9 (~334 kyr BP) and 11 (~427 kyr BP).

IV. Modelling of ice sheets

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With the help of GIA models a given global ice sheet configuration is used to calculate the local sea-levels over the globe. The results depend not only on the ice-sheets, but also on the parameterised reaction on glaciation and deglaciation reaction of the earth.

VI. Contributions of NOC Liverpool

The NOC Liverpool contribution is the GIA modelling component of the project. These modelling results will be connected statistically to the sea-level observations during the last interglacials.

A main focus is the influence of the different ice-sheets on the sea-level variations during the last Interglacial. With an ensemble approach, different ice sheet configurations are calculated and compared statistically to the available observations. An aim is to identify the main source for the sea-level rise during the interglacials.

Literature:
Otto-Bliesner et al (2006), Science, 311, 1751-1753