Geophysical Research Abstracts
Vol. 16, EGU2014-4266, 2014
EGU General Assembly 2014

BRITICE-CHRONO: Constraining rates and style of marine-influenced ice sheet decay to provide a data-rich playground for ice sheet modellers

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Uncertainty exists regarding the fate of the Antarctic and Greenland ice sheets and how they will respond to forcings from sea level and atmospheric and ocean temperatures. If we want to know more about the mechanisms and rate of change of shrinking ice sheets, then why not examine an ice sheet that has fully disappeared and track its retreat through time? If achieved in enough detail such information could become a data-rich playground for improving the next breed of numerical ice sheet models to be used in ice and sea level forecasting. We regard that the last British-Irish Ice Sheet is a good target for this work, on account of its small size, density of information and with its numerous researchers already investigating it.

BRITICE-CHRONO is a large (>45 researchers) NERC-funded consortium project comprising Quaternary scientists and glaciologists who will search the seafloor around Britain and Ireland and parts of the landmass in order to find and extract samples of sand, rock and organic matter that can be dated (OSL; Cosmogenic; 14C) to reveal the timing and rate of change of the collapsing British-Irish Ice Sheet. The purpose is to produce a high resolution dataset on the demise on an ice sheet - from the continental shelf edge and across the marine to terrestrial transition. Some 800 new date assessments will be added to those that already exist. This poster reports on the hypotheses that underpin the work. Data on retreat will be collected by focusing on 8 transects running from the continental shelf edge to a short distance (10s km) onshore and acquiring marine and terrestrial samples for geochronometric dating. The project includes funding for 587 radiocarbon, 140 OSL and 158 TCN samples for surface exposure dating; with sampling accomplished by two research cruises and 16 fieldwork campaigns. Results will reveal the timing and rate of change of ice margin recession for each transect, and combined with existing landform and dating databases, will be used to build an ice sheet-wide empirical reconstruction of retreat incorporating Bayesian analysis to assess uncertainty. We invite and encourage ice sheet modellers to use our data for modelling experiments and in particular to explore the role of bed topography in modulating ice retreat.