The last British-Irish Ice Sheet: A data-rich environment for ice sheet modelling

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In order to simulate the future dynamics of the Greenland and Antarctic ice sheets, robust numerical models validated by observations of past ice sheet behaviour are required. The extent and dynamics of contemporary ice sheets have been observed at a decadal scale. But a much longer record of ice sheet behaviour (10 ka) can be collated by studying the evidence left behind by palaeo-ice sheets. Extensive geomorphological and geochronological evidence for the past behaviour of the last British-Irish Ice Sheet has been gathered through over 150 years of research and BRITICE-CHRONO, a recent consortium project. This large volume of empirical evidence makes the last British-Irish Ice Sheet one of the best constrained palaeo-ice sheets in the world, and a data-rich environment for ice sheet modelling experiments. Yet, integrating this data and its associated uncertainty and abstraction into ice sheet modelling experiments remains challenging. Here we summarise the available geomorphological and geochronological data and discuss how this will be integrated into ice sheet modelling experiments. Several packages of data, each with its own associated level of interpretation (ranging from raw data to empirically reconstructed ice sheet margins), will be made available to the ice-sheet modelling community. Furthermore, we demonstrate our approach to simulating the empirically reconstructed behaviour of the British-Irish Ice Sheet through a series of ice sheet modelling experiments which account for relative sea level change, and uncertainty in empirically reconstructed ice sheet extent.