

A sea level data archive for assessing and constraining ice sheet reconstructions

*Evan James Gowan^{1,2}, Jun'ichi Okuno³, Atsuko Yamazaki^{4,2}, Alessio Rovere⁵

1. Department of Earth & Environmental Sciences, Kumamoto University, 2. KIKAI institute for Coral Reef Sciences, 3. National Institute of Polar Research, 4. Graduate School of Environmental Studies, Nagoya University, 5. Department of Environmental Sciences, Informatics and Statistics, Ca' Foscari University

The most important constraint on past ice sheet volume is spatial and temporal variations in sea level. Through glacial isostatic adjustment modelling, it is possible to deduce how ice sheets evolved in the past by comparing the modelled sea level with observations of past sea level. We present an ongoing effort to incorporate a global dataset of past sea level observations into an interface that makes comparisons with models possible. As of February 1, 2023, the database contains 9673 fully referenced sea level observations from Eastern North America, the Baltic and North Seas in Europe, southeastern Asia, Australia, various tropical islands, and Antarctica. Most of these data points come from highly scrutinized compilations, for instance from the HOLSEA project. The database contains observations for the past 80,000 years, covering the MIS 4 and MIS 2 glaciations, the MIS 3 interstadial and the Holocene. Radiocarbon dates may be recalibrated using OxCal. A set of scripts, written in BASH, Python and Generic Mapping Tools, automatically plots comparisons of up to six models. The scripts can also be used to create a report that contains all of the plots to make it easy to display all of the results. In this presentation, we show the utility of this dataset by comparing the modelled sea level with the PaleoMIST ice sheet reconstruction. The database is open source and available at: https://github.com/evangowan/paleo_sea_level

Keywords: sea level, ice sheets, paleoclimate, data science

