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A GIS Database of Submarine Glacial Landforms and Sediments on High-Arctic Continental Shelves

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A new digital database compiling glacial landforms and sediments in the High Arctic was created in order to facilitate and underpin new research on palaeo-ice sheets and tidewater glacier dynamics. The database is in a geographic information system (GIS) format and will be available for web download when published. It documents evidence of previous glacial activity as visible on the contemporary seafloor of fjords and continental shelves around all of Svalbard, Greenland, and Alaska, and north of 66°30′ N in Russia, Norway, and Canada. Extensive literature research was conducted to create the database, compiling a large number of glacial landforms at a range of scales, sediment cores, and radiocarbon dates. Glacial landforms included in the database are cross-shelf troughs, trough-mouth fans, grounding-zone wedges, overridden moraines, glacial lineations, drumlins, crag-and-tails, medial moraines, terminal moraines, debris-flow lobes (including glacier-contact fans), recessional moraines, De Geer moraines, crevasse-fill ridges, eskers and submarine channels. Sediment core locations are attributed with a description of the sampled lithofacies and sediment accumulation rates where available. Radiocarbon dates were included when thought to be relevant for constraining the timing of large-scale palaeo-ice dynamics. Outlines of bathymetric datasets published before December 2020 were also mapped to give an overview of previously investigated research areas. The database will aid researchers in the reconstruction of ice dynamics during and since the Last Glacial Maximum and in the interpretation of High-Arctic glacial landform-sediment assemblages. Moreover, apart from providing a comprehensive bibliography on Arctic glacial geomorphological and sedimentological research, it is intended to serve as a basis for future ice sheet modelling of High-Arctic glacier dynamics.