Title

*Chronostratigraphic data constraining Holocene glacial readvance from the Fildes Peninsula, South Shetland Islands, northern Antarctic Peninsula.*

Abstract

*The dataset comprises of chronostratigraphic data from the Fildes Peninsula, King George Island, South Shetland Islands. The data have been used to constrain deglaciation and climate-glacier dynamics on the Fildes Peninsula.*

Funding source

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Keywords

*Deglaciation; geomorphological mapping; radiocarbon dating; South Shetland Islands; stratigraphy; glacial readvance*

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Lineage/methodology

***Chronostratigraphic data***

*1.1 Radiocarbon (C-14) dating:*

*Moraines adjacent to the BIC were mapped and interpreted from field observations and satellite images (DigitalGlobe, Catalogue ID: 1030010020C0C900; Google Earth, 2006 and 2011). Contour lines are derived from the Antarctic Digital Database with elevation data (±5 m) obtained from the Instituto Antártico Uruguayo (1997). Radiocarbon ages from moraines and stratigraphic sections were obtained by Accelerator Mass Spectrometry (AMS) dating of marine mollusc shells, terrestrial mosses and seaweed layers embedded in sediments and represent maximum ages for BIC glacier readvance Calibration of marine sample radiocarbon ages (marine shells) was undertaken in Oxcal v. 4.4 using the Marine20 calibration curve (Bronk Ramsey, 2009; Heaton et al., 2020), and a newly recalculated local marine reservoir age offset (ΔR) of 666±76 C-14 years, which represents the weighted mean ΔR of four radiocarbon-dated marine samples collected prior to 1950 CE from the northern Antarctic Peninsula and Signy Island in the online Marine20 database (*[*http://calib.org/marine/*](http://calib.org/marine/)*). Terrestrial and aquatic moss samples were calibrated using the Southern Hemisphere SHCal20 calibration curve in Oxcal v. 4.4 (Hogg et al., 2020). Post-bomb (>1950 CE) ages were corrected according to 13C/12C isotopic ratios from measured pMC with the ‘present day’ pMC value defined as 107.5% (2010 CE) and calibrated using the SHCal13 SH Zone 1-2 Bomb curve in CALIBomb (Reimer and Reimer, 2004; Hua et al., 2013).*

*1.2 Cosmogenic Helium-3 (He-3) nuclide surface exposure dating (CSED):*

*Large boulders >50 cm in diameter on the NW Bellingshausen Ice Cap (BIC) glacial foreland were surveyed and classified. Three samples were collected for He-3 CSED using a hammer and chisel to remove the upper few centimetres of exposed surfaces. Surface shielding due to snow cover was minimised by sampling from wind-exposed localities (cf. Johnson et al., 2012, 2017, 2020; Glasser et al., 2014; Lindow et al., 2014). Laboratory analysis for 10Be cosmogenic nuclide surface exposure dating followed the procedures of Kohl and Nishiizumi, (1992) and Binnie et al., (2015)*

*Code, data, all packages used, and package references, can be found at:* [*https://github.com/stever60/Fildes\_Peninsula*](https://github.com/stever60/Fildes_Peninsula)

Instrumentation

*1.1 Cosmogenic data: Quartz purity was determined prior to dissolution by ICP-OES*

*1.2**Radiocarbon data: Samples were prepared at the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research and British Antarctic Survey. AMS measurements were undertaken at ETH Zürich and Beta Analytical, Miami, and 13C/12C isotope ratios were used to calculate Conventional Radiocarbon Ages.*

Quality

*1.1 Cosmogenic data: Differential GPS (dGPS; WGS84 ellipsoid) data for erratic boulders were obtained using a GPS Trimble Pathfinder ProXH. As geodetic reference, we used the landmark DALL 66019M002 (S62°14′16.335″, W58°39′52.364″, ellipsoidal height 39.376 m) at the Argentine Carlini base, c. 17 km from the sampled erratics. Post-processed uncertainties for the samples were less than 0.1 m in altitude and in the horizontal. Sample concentrations are relatively low but the maximum blank subtraction was <6%. Analytical uncertainties for the 10Be concentrations were derived by summing in quadrature the uncertainty in the mass of Be added during sample processing (estimated to be 1% at 1 sigma) and the AMS measurement uncertainties of both the samples and blank.*

*1.2 Radiocarbon data:**Pre-bomb calibrated ages have been rounded to the nearest 10 years, and to the nearest hundred years in the manuscript text to reflect realistic total (internal and external) uncertainties. Post-bomb ages have been rounded to the nearest year.*

Related datasets

*Compilation data from the Fildes Peninsula, South Shetland Islands.*

*Data from Kiteschsee Lake, Fildes Peninsula.*

*Chronological and sedimentological data from stratigraphic sections on Potter Peninsula, South Shetland Islands.*

*Chronological, geochemical and sedimentological data from a lake sediment record extracted from Lake L5 (Matias Lake) on Potter Peninsula, South Shetland Islands.*

*Chronological, geochemical and sedimentological data from a lake sediment record extracted from Lake L15 (GPS Lake) on Potter Peninsula, South Shetland Islands.*

Related URLs

Code is available on: [www.github.com/stever60](http://www.github.com/stever60)/Fildes\_Peninsula

Temporal coverage

*Data collected between November 2011 and 2015 and covers the last 8000 years*

Spatial coverage

*Fildes Peninsula, South Shetland Islands*

Resolution

*N/A*

Location

*Fildes Peninsula, South Shetland Islands*

*Cosmogenic samples are from ~62° 08’ S - 62° 10' S and 58° 55' - 58° 57' W*

*Radiocarbon dating samples are from ~62° 10’ S - 62° 11' S and 58° 51' - 58° 57' W*

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Data structure and data format

**1. New chronostratigraphic data**

*1.1 Cosmogenic Data*

*CSED\_data.csv – cosmogenic surface exposure dating (CSED) data for erratics sampled from the Fildes Peninsula*

*1.2 Radiocarbon data*

*Fildes\_C14\_data.csv – radiocarbon ages from moraines and stratigraphic sections on the Fildes Peninsula*

Access constraints

*None after publication but a log in for reviewers to access an embargoed dataset is needed.*

Use constraints

*NERC-funded data, so the* [*Open Government Licence*](http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/) *applies.*