Calibration Information

"SHED-Earth"

Tomkins *et al.* (2018)

Website: http://shed.earth

Paper: https://doi.org/10.1016/j.quageo.2017.12.003

Description

This file describes the following data tables:

1. "**Calibration_CRONUS.csv**". This file includes ^{10}Be sample information used for TCN exposure age calculation. These data are listed in the format required for the CRONUS Earth Web Calculator (Version 2.0; Marrero et al. (2016)), available at: http://cronus.cosmogenicnuclides.rocks/2.0/.
2. "**Calibration_Balco.csv**". This file includes ^{10}Be sample information used for TCN exposure age calculation. These data are listed in the format required for the online calculators formerly known as the CRONUS-Earth online calculators (Balco et al., 2008), available at: https://hess.ess.washington.edu/.
3. "**Calibration_Summary.csv**". This file includes sample exposure ages calculated using the above calculators (Balco et al., 2008; Marrero et al., 2016) and using the default globally-calibrated ^{10}Be production rate (Borchers et al., 2016). This file also includes exposure ages calculated using locally-calibrated production rates from Loch Lomond (Fabel et al., 2012), Rannoch Moor (Putnam et al., 2019) and Glen Roy (Small and Fabel, 2015). All ages are calculated using the time-independent "Lm" scaling scheme (Lal, 1991; Stone, 2000) and assuming 0 mm ka^{-1} erosion.

These files are utilised by SHED-Earth (*shed-earth/shedcalc/schmidt.py*) in the construction of the TCN-Schmidt hammer calibration curves. The mean Schmidt hammer R-value (mean of 30 values following Niedzielski et al. (2009)) and its corresponding uncertainty (standard error of the mean) are provided for each sample.

Bibliography

Balco, G., Stone, J. O., Lifton, N. A., and Dunai, T. J. A complete and easily accessible means of calculating surface exposure ages or erosion rates from ^{10}Be and ^{26}Al measurements. *Quaternary Geochronology*, 3 (3):174–195, 2008, doi:10.1016/j.quageo.2007.12.001.

Borchers, B., Marrero, S., Balco, G., Caffee, M., Goehring, B., Lifton, N., Nishiizumi, K., Phillips, F., Schaefer, J., and Stone, J. Geological calibration of spallation production rates in the CRONUS-Earth project. *Quaternary Geochronology*, 31:188–198, 2016, doi:10.1016/j.quageo.2015.01.009.

Fabel, D., Ballantyne, C. K., and Xu, S. Trimlines, blockfields, mountain-top erratics and the vertical dimensions of the last British–Irish Ice Sheet in NW Scotland. *Quaternary Science Reviews*, 55:91–102, 2012, doi:10.1016/j.quascirev.2012.09.002.

Lal, D. Cosmic ray labeling of erosion surfaces: in situ nuclide production rates and erosion models. *Earth and Planetary Science Letters*, 104(2):424–439, 1991, doi:10.1016/0012-821X(91)90220-C.

Marrero, S. M., Phillips, F. M., Borchers, B., Lifton, N., Aumer, R., and Balco, G. Cosmogenic nuclide systematics and the CRONUScalc program. *Quaternary Geochronology*, 31:160–187, 2016, doi:10.1016/j.quageo.2015.09.005.

Niedzielski, T., Migoń, P., and Placek, A. A minimum sample size required from Schmidt hammer measurements. *Earth Surface Processes and Landforms*, 34(13):1713–1725, 2009, doi:10.1002/esp.1851.

Putnam, A. E., Bromley, G. R. M., Rademaker, K., and Schaefer, J. M. In situ ^{10}Be production-rate calibration from a ^{14}C-dated late-glacial moraine belt in Rannoch Moor, central Scottish Highlands. *Quaternary Geochronology*, 50:109–125, 2019, doi:10.1016/j.quageo.2018.11.006.

Small, D. and Fabel, D. A Lateglacial ^{10}Be production rate from glacial lake shorelines in Scotland. *Journal of Quaternary Science*, 30(6):509–513, 2015, doi:10.1002/jqs.2804.

Stone, J. O. Air pressure and cosmogenic isotope production. *Journal of Geophysical Research: Solid Earth*, 105(B10):23753–23759, 2000, doi:10.1029/2000JB900181.