The Lamont-Doherty Tritium/^{3}He Dataset for Age Dating of Groundwater

RONNY FRIEDRICH[1]*, PETER SCHLOSSER[1], BRENT TURRIN[1], ROBERT NEWTON[1], MARTIN STUTE[1] AND L. NIEL PLUMMER[2]

[1]Lamont-Doherty Earth Observatory, Columbia University, 61 Route 9W, Palisades, NY, 10964, USA (*correspondence: friedrich@ldeo.columbia.edu)

[2]U.S. Geological Survey, 432 National Center, 12201 Sunrise Valley Drive, Reston, VA, 20192, USA

Between 1996 and 2008, the Lamont-Doherty Earth Observatory Noble Gas Laboratory has measured approximately 4,000 groundwater samples for tritium/^{3}He age analysis. The samples are drawn mainly from the continental United States, several thousand of them as part of water quality studies under the auspices of the U.S. Geological Survey. Taken as a whole, the data represent a broad survey of continental waters, and indicate the range of noble gas sampling environments that are encountered on the scale of a continental survey including a variety of hydrogeological settings and climatic zones. The measurements expose an interesting range of methodological issues related to sampling sites, sample integrity, laboratory procedure, and analytic technique. Our poster will explore these issues, and will present summary results on data (including tracer age) ranges, distributions and quality from this unique tritium/^{3}He data resource.

Geochemistry of Early Triassic crater lake sediments in the Tunguska basin, Siberia: Implications for extinction and recovery

KIRSTEN FRISTAD[1], HENRIK SVENSEN[1], SVERRE PLANKE[1,2] AND ALEXANDER G. POLOZOV[1,3]

[1]Physics of Geological Processes (PGP), University of Oslo, PO Box 1048 Blindern, 0316 Oslo, Norway (Kirsten.Fristad@fys.uio.no)

[2]Volcanic Basin Petroleum Research (VBPR), Oslo Research Park, 0349 Oslo, Norway

[3]Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry of Russian Academy of Sciences (IGEM RAS), 119017 Moscow, Russia

Svensen *et al.* [1] have investigated the existence of hundreds of phreatomagmatic breccia pipes located in the Tunguska Basin which formed contemporaneously with the Siberian Traps. They suggest a violent formation history caused by sill intrusions into organic rich sediments, which would have enabled the release of gigatonnes of greenhouse gases to the atmosphere with serious implications for the end-Permian environment. Some of these pipes have crater lake deposits and thus contain a record of the local terrestrial environmental conditions and biota in the vicinity of the Siberian Traps during the end-Permian crisis. We are studying the upper 550m of a core drilled through the center of a former crater lake and underlying brecciated pipe in the southern reaches of the Tunguska Basin. The core consists of fine to coarse grained sediments of diverse composition (siliclastic, volcanoclastic, and evaporitic origin) and various calcareous and organic fossils (including pollen). We report on the evolution of the geochemistry and organic content throughout the sequence of crater lake sediments. Ongoing work attempts to understand the crater lake formation, subsequent diagenesis, the influence of degassing from the underlying breccia pipe, and the isotope geochemistry of the organic matter as a proxy for the atmospheric evolution.

[1] Svensen *et al.* (2009) *EPSL*.