Geophysical Research Abstracts
Vol. 14, EGU2012-12046, 2012
EGU General Assembly 2012

A paleo- and environmental magnetic record from Prince William Sound, Alaska

L. B. Ziegler and J. Stoner
College of Oceanic and Atmospheric Sciences, Oregon State Univ., Corvallis, OR, USA

The dynamic changes in the Earth's magnetic field, caused by fluid motions in Earth's outer core, can be captured in global marine sediments. The fidelity of the paleomagnetic record depends on sediment characteristics, governed by environmental factors. Here we extend recent efforts to reconstruct Holocene paleomagnetic secular variation and environmental conditions in the mid-high latitude North Pacific with analyses of a marine sediment core taken from Prince William Sound, southern Alaska. Natural and laboratory remanent magnetizations were studied by progressive alternating field (AF) demagnetization of u-channel samples from jumbo piston core EW0408-95JC (60.66278N, 147.70847W, water depth 745m). The lithology is monitored by physical properties measurements, including CT Scans and core descriptions. Initial stratigraphic estimates suggest that this core spans the Holocene into the late glacial. The lithology of the upper 8.5 m of the 17.6 meter core consists of magnetically homogenous bioturbated muds. Component directions calculated by PCA analysis are characterized by low MAD values (<4°) with inclinations consistent with GAD predictions and declinations varying in a manner consistent with PSV. Normalized remanences are comparable using a variety of normalizers and show minimal scatter through demagnetization suggesting that reliable paleointenisty estimates may be preserved. In contrast, the lower half of core 95JC is marked by glacial-proximal sediment, with significant variations in the sediment matrix, making it less suitable for geomagnetic studies as indicated by higher MAD values of 4-15°, inclinations that deviate greatly from GAD, and a marked decrease of and greater variability in magnetic susceptibility. However, the complete core should prove useful for environmental magnetic reconstructions of regional glacial history. Preliminary chronological constrains are assigned through paleomagnetic tuning to nearby records and global models, and will be tested and further constrained with radiocarbon dating.