Evaluation of platinum electrode measurements in wetland soils. (S10-damore173303-Oral)

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Abstract:

Oxidation-reduction (redox) measurements are commonly obtained in soil with platinum electrodes. The electronic signals obtained from platinum electrodes are very uncertain, and the electrode measurement system is subject to many sources of error. This study was conducted to compare redox measurements taken with voltmeters to automated data recorders (dataloggers). Voltmeters have been used extensively to measure redox potentials in soils but are being replaced by dataloggers in many wetland soil studies. The dataloggers in this study were able to obtain and register weak signals in soils with low concentrations of redox sensitive species more effectively than voltmeters. Voltmeters appeared to place a load on the electrode system that diminished the signal strength and led to readings that approached zero. Dataloggers did not load the electrode system and gave stable readings that were in line with the predicted redox environment of the soil. Our results indicate that dataloggers are able to accurately measure redox potentials in soils and are much more sensitive to low voltage signals. Low voltage signals are important in peatlands where the redox sensitive species are present in low concentrations.

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