An automated system to monitor total mercury in MDN precipitation collectors

Joel Creswell [1], Erik Haugaard[1], Mark Johnson [1], Steve Gunther [1,2], Jeremy Divis [1], Colin Davies[1]

Mercury Deposition Network precipitation collectors are currently sampled weekly and samples are shipped to the Mercury Analytical Laboratory for analysis. This system has been rigorously tested and has produced years' worth of reliable data, but has several downsides including a delay between sample collection and the availability of results, weekly time resolution (not individual rain events), and the expense of sending field personnel to the site and shipping samples. Brooks Rand Instruments is developing an automated mercury monitor to address some of the downsides of the current MDN protocol. This instrument will collect samples directly from a modified precipitation collector and will analyze them for total mercury unattended in the field. The instrument will be capable of analyzing at intervals determined by precipitation volume, or be started remotely by a site operator. It will provide results in real time and these will be accessible from anywhere via the internet. Increasing the time resolution of MDN data has benefits for data users, who will gain the ability to monitor individual rain events or even multiple samples within each rain event. Decreasing the cost of generating total mercury data has benefits for site operators, many of whom struggle with tightening state budgets.

Our poster presentation will include conceptual renderings of the instrument and will demonstrate how it will interface with a modified MDN precipitation collector. We will also present a plan for testing and evaluating the instrument following NADP guidelines.

Authors: Joel Creswell (joel@brooksrandinc.com)[1], Erik Haugaard (erik@brooksrandinc.com)[1], Mark Johnson (mark@brooksrandinc.com)[1], Steve Gunther (sgunther@nceelabs.com)[1,2], Jeremy Divis (jeremy@brooksrandinc.com)[1], Colin Davies (colin@brooksrandinc.com)[1]

Institutional Affiliations: [1]Brooks Rand Instruments, 4415 6th Ave NW, Seattle, WA 98107, 206-596-8477; [2]Now at NCEE Labs, 4740 Discovery Drive, Lincoln, NE 68521, 402-323-6233