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A Comparison of event-based precipitation collected during 1 year showed that samples from a Yankee Environmental Systems collector had significantly higher volume, higher concentrations, and higher deposition of all ions analyzed except PO_4^{3-} and NH_4^+ compared to samples collected simultaneously with an Aerochem Metrics collector.

K L Precipitation chemistry · Acid rain · Acid deposition · pH · Ammonium · Nitrate · Sulfate

1 A

The efficiency of precipitation collectors can affect the concentrations and measured deposition of acidic

perches, there were no trees or structures within 25 m of the samplers. The bird perches were located about 3 m from the collectors. In total, 130 precipitation events were collected from each collector and 94 events were analyzed for this study; 36 events were eliminated from this comparison because of debris, bird feces, or other forms of visible contamination in the samples. The precipitation types included rain (71 events, 76% of the annual volume), snow (12 events, 6% of the volume), or mixed rain and snow (11 events, 19% of the volume). Samples were collected on an event basis; an event was defined as continuous precipitation that had not been interrupted by more than 6 h. Occasionally, events were combined into one sample because it was not possible to collect the sample before another event began. For this analysis, we refer to each event as a sample. At the end of each event, the samples were collected, weighed, transferred to clean, labeled sample bottles, and analyzed at the Cary Institute of Ecosystem Studies Analytical Laboratory for pH, SO_4^{2-} , Ca^{2+} , Mg^{2+} , K^+ , Na^+ , and Cl^- . A 60-ml aliquot of sample was preserved with two drops of chloroform and refrigerated (sensu Weathers et al. 1988). This aliquot was analyzed for NH_4^+ , NO_3^- , and PO_4^{3-} . The NH_4^+ and PO_4^{3-} concentrations were analyzed using an

cannot rule out the possibility that the differences in chemistry were due to contamination that was not visible or to dry deposition. However, examination of open and close cycles for the YES sampler for some of the events revealed that, although the sampler sometimes cycled open and closed during the beginning and end of events, it remained open during

steady precipitation and closed during dry periods, so dry deposition seems unlikely to be a major factor for samples collected with the YES sampler.

Neither collector was 100% efficient in collecting total precipitation compared to independent measures using a Geonor gauge. In fact, the difference between the collectors (0.4 cm of precipitation) was smaller than the difference between each collector and the independent measure. Nonetheless, the total deposition estimated using the YES collector was 5–8% higher than deposition estimated using the AM collector for the ions H^+ , NO_3^- , and SO_4^{2-} , but for Ca^{2+} , Mg^{2+} , K^+ , Na^+ , and Cl^- , the difference ranged from 12% to 27%. While the differences in concentration and deposition were small for 1 year, consistent positive differences over a longer time period may represent important ecosystem inputs that are missed using an AM collector. On the other hand, the YES collectors are more subject to contamina-

tion. The con is a greater potential for contamination, which should be addressed in further development of this instrument.

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