

## **Reconstructing contemporary and past atmospheric deposition using both peat cores and herbarium specimens of *Sphagnum* moss.**

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Historical reconstructions of atmospheric deposition of trace elements are important from both environmental and public health perspectives. Several methods exist for reconstructing trace element deposition in historical contexts; herbarium records of plants and peat core analyses are just two methods available. Both approaches depend on samples collected in ombrotrophic bogs, since the inorganic plant nutrients and the contaminants are exclusively derived from the atmosphere. Each method has advantages and disadvantages, and the two approaches are rarely compared. Peat cores often lack the temporal resolution to recreate detailed histories, especially in older, deeper peat layers. Using herbarium materials, atmospheric deposition records are well resolved since the exact date of collection is known. However, these provide scattered records with non-continuous data. Herbarium specimens do not extend as far back in time as peat cores. However, herbarium specimens are not subjected to burial and diagenesis in acidic bog water, minimizing the risk of post-depositional migration of contaminants. In this study we are proposing using trace element concentrations from both peat cores and herbarium records to create the best possible recreation of atmospheric deposition. Using both peat cores and herbarium moss samples from the same location would result in improved historical reconstructions of atmospheric deposition. To compare peat cores and herbarium specimens, appropriate sample processing and high-quality analytical data is essential. In this study, we take advantage of the methods used in the metal-free, ultraclean methods at the SWAMP lab. Peat cores were sliced into 1 cm sections and trimmed to remove contamination from the coring equipment; using a combination of dating tools, age-depth models were created. Trace element concentrations were determined using ICP-MS. The herbarium samples were obtained from existing collections, and the top 2 cm taken off the individual *Sphagnum* stems and capitulum for analysis. The depositional trends from selected peat cores in northern Alberta and southern Ontario are compared with herbarium specimens from the same regions, provided by the Canadian Museum of Nature and the University of Alberta Herbarium. These comparisons will develop more detailed reconstructions of the atmospheric deposition of trace elements in both regions, than either method alone.