

# Using Lichens as Spatial Indicators of Trace Metal Distribution

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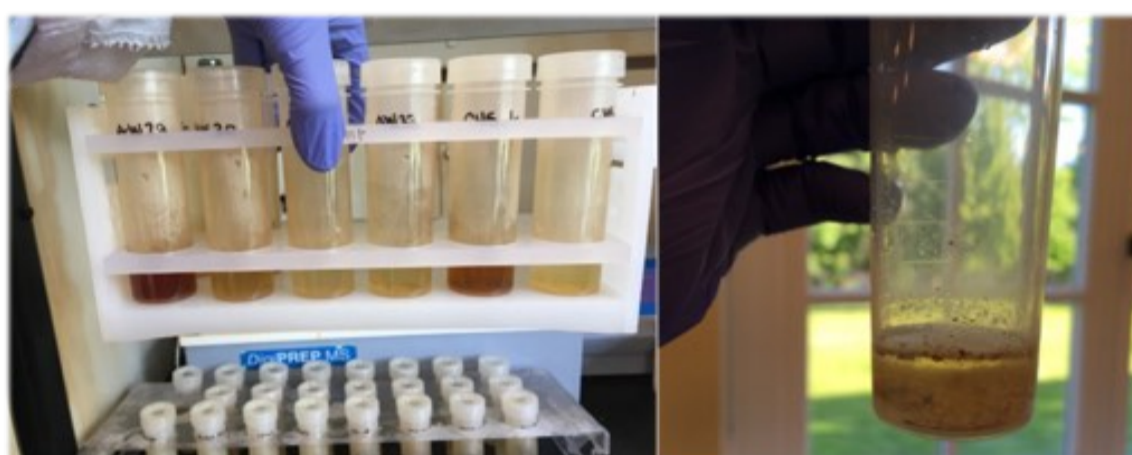
*Usnea Thalli*

Tracking trace metal air pollution over large areas is a very difficult and complicated process. Natural passive samplers, such as lichens are an alternative to commercial sampling devices and present several advantages, including: 1) Reduced cost of sampling, and 2) wide spatial distribution.

One metal of particular interest is mercury. Mercury is a contaminant that accumulates in ecosystems and ultimately humans. Nova Scotia wildlife have some of the highest mercury concentrations in North America. Anthropogenic activities can increase the mobility of mercury and other trace metals.

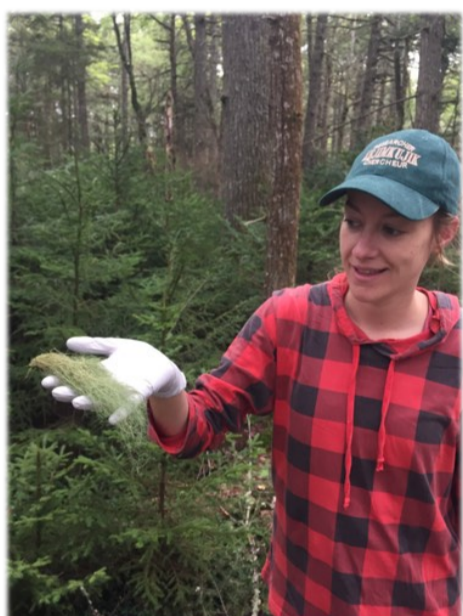
*Usnea* spp. lichens were collected across Nova Scotia. Lichens were analyzed directly for mercury and were analyzed for other trace metals native to Nova Scotia (including arsenic, chromium, nickel, lead, and selenium) following an acidic digestion.

C.A.R.E. lab equipment in Dr. O'Driscoll and Dr. Murimboh's labs was used.



Acidic digestion for extraction of trace metals from lichen

Spatial analysis of trace metals in lichens can help illustrate patterns in air quality and help decipher the source of the metals: a) metals arriving in Nova Scotia through air currents from more industrialized areas (e.g. likely the predominant signature for mercury), b) metals liberated through mining activities, or c) the lichens are recording background metal signatures.



Dr. Klapstein collecting *Usnea* in Kejimikujik National Park



Collection locations for lichens

Lichens can be used as biomonitors of average air quality conditions over a long time period (years versus months) and can help elucidate air quality across the province with good spatial resolution.

