Resin Deposition Data

Ammonium, nitrate, inorganic nitrogen, and sulfate deposition was quantified using ion exchange resin tube collectors. These resin collectors contain pre-rinsed mixed-bed cation/anion exchange resin (Amberlite IRN 150). Collectors were deployed at each site, and within each site, we have 5 plots. Two collectors were placed in each plot: one in the open and one under the tree canopy. Blanks were included at each site (resin tubes constructed with a cap on one end but otherwise treated as the others) with all tube sets collected and exchanged mid-May and mid-October. During the October-May deployment, a 1-m supplementary tube was attached to the top of the precipitation collection funnel to capture snowfall. The retrieved resins were extracted with 1 M KI, filtered, and the extracts were analyzed for NH4+-N (phenate method) on a Seal AA3 Auto Analyzer and for NO3--N & SO4--S by ion chromatography (Dionex IC 5000). We subtracted volume weighted concentrations in blank resins tube extracts from concentrations in extracts from exposed resin tubes and corrected deposition values with laboratory-determined efficiency values.

Veg CNS Data

Vegetation samples were collected at 5 plots at each of our sampling sites at least three times per year (typically June, July, August) between May and October. Five replicates of each species were taken at each site on each sampling date. Protocols for new growth collections were species specific. Surface moss was collected for *Sphagnum fuscum* and *Sphagnum capillifolium*. The entire lichen thalli of *Evernia mesomorpha* and the top 2.5 cm of *Cladonia mitis* thali were collected. Ericaceous shrubs, *Rhododendron groenlanicum* and *Vaccinium vitis-idaea* collections included the topmost leaves from individual plants while all aboveground portions of *Vaccinium oxycoccos* was collected. We collected the current year leaves from the deciduous forbes, *Rubus chamaemorus* and *Maianthemum trifolia*, and the apical shoots of the current year’s growth of the dominant tree *Picea mariana*. Each sample was cleaned to remove debris, oven-dried (60 ⁰C), and ground with a Wiley micromill. Sample were analyzed for total C, N, and S concentrations with a LECO CNS analyzer.

Water Chem Data

To collect peatland porewater as a function of depth, we deployed three samplers at each of our sites. These samplers are made of stacked 20 cm long segments of 2.5 cm-diameter thinly slotted PVC pipe, with Tygon tubing extending to the surface from the bottom of each section. On each sampling date, a 60 mL syringe was used to empty the full volume of water from the topmost segment, water was allowed to slowly return to the segment, and a fresh 60 mL of porewater was collected from that segment. Each of the samples was field filtered through Whatman 41 filters into pre-washed sample bottles. Samples were taken at least 3 times (June, July, and August) during each of the summers of the study. The samples were frozen and shipped to Villanova University for analysis of NH4+-N (phenate method, Seal AA3 AutoAnalyzer), NO3--N and SO42--S (Dionex ion chromatograph), and total dissolved N (Shimadzu TOC-V analyzer with prefiltration through 0.45 µm filters).