

The ecological impacts of nutrients contributed by dry deposition on lake ecosystems are under-researched and its relative effects are undervalued with respect to total nutrient budgets. Dry deposition is particulate matter carried through the air from upwind sources. This influx is usually estimated from a few published studies rather than measured directly. Remote lakes with clean beginnings are hard to find, so Spirit Lake located at the base of Mount Saint Helens, has been the focus of ongoing studies to elucidate chemical, biological, and ecological changes after its re-creation following the 1980s eruption. In the last decade, researchers constructed a nutrient budget and measured all fluxes directly except for wet and dry deposition. We hypothesize that dry deposition may be considerably higher than average regional values and significantly contribute to nutrient inputs in Spirit Lake. We collected samples from 10 sites from July to September and analyzed total nitrogen and phosphorus concentrations in each sample to estimate the average inputs of N and P in dry deposition. We found total measured summertime N deposition was 1,326 kg N higher than the previously estimated value, and conversely, P deposition was 18 kg P lower than previous estimates. We suggest that the disturbed landscape surrounding Spirit Lake is subject to greater movement of pollen, soil, and insects resulting in a greater influx of nitrogen than estimated by regional data. This will help to fully assess the nutrient budget and lead to an understanding of the potential for eutrophication or harmful algal blooms in Spirit Lake.