

Impact of Climate Change on N-cycling in colder climates

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High latitude ecosystems are undergoing rapid change as climate warms, precipitation patterns change and extreme weather events increase in frequency. These changes may significantly impact boreal agriculture and will eventually lead to new cropping strategies in the North. Little is known about how Climate Change will affect nutrient cycling and losses in managed soil-plant systems in cool climates. At the same time, improved understanding of nutrient use efficiency is at the heart of sustainable crop production needed for food, fiber and renewable energy in a new “green economy” to come. In this lecture I will focus on soil nitrogen (N) cycling and its sensitivity to changing climatic perturbation regimes at high latitudes. Soil N cycling is known to be temporarily disrupted by drought, soil freezing and other climate-induced perturbations, resulting in measurable losses of reactive N to waters and the atmosphere. At high latitudes, Climate Change is expected to be most pronounced during winter. Recent data on over-winter N losses in Norwegian grassland systems will be presented and discussed in the context of N use efficiency and anticipated Climate Change.