Geophysical Research Abstracts
Vol. 12, EGU2010-3377, 2010
EGU General Assembly 2010

The effects of climate change on chemical and physical properties of snow and soil in a forest ecosystem

Davide Viglietti, Gianluca Filippa, Antoine Brulport, Michele Freppaz, and Ermanno Zanini
Di.Va.P.R.A. - LNSA, Chimica Agraria e Pedologia, University of Torino, Italy.

Among the potential effects of climate change in the Alpine environment during the winter, of particular interest are the shift of the snowline toward higher altitude and the increase in frequency of rain events on the snowpack. Here, we present the implementation of a new, mid-to-long term study site to simulate these changes in precipitation regimes and determine their influences on soil carbon and nutrient cycles in forest environment.
The study site is located in a forest (Larch stand), at 2020 m a.s.l., in Piedmont (NW-Italy) and includes tree plots equipped with soil moisture and temperature sensors: in the first plot the snow is removed, during December and January, to simulate a winter with late snowfall; in the second plot the snow is drizzle, in January, with liquid water chemically comparable to rain; in the control plot, the snowpack is left undisturbed. Tree repetitions for each treatment are equipped, at 30 cm of depth, with two suction lysimeters in order to weekly sample the soil solution where dissolved organic matter, inorganic N, microbial biomass C and N will be determined.
Additionally, tree repetitions for each snow treatment are used as snow fields, for snow chemical analyses, to quantify ionic input to the soil, and physical characterization, in order to evaluate the influence of treatment-induced changes in snow density and grain composition on soil temperature and moisture regimes. Data will be collected during the ongoing winter (2009-2010), but we also attempt to get a mid-term effect by repeating the experiments during next winter seasons.

KEYWORDS: Climate changes, forest environment, lysimeters, soil solution, SOM and nutrients, snow.