Geophysical Research Abstracts,
Vol. 11, EGU2009-8905, 2009
EGU General Assembly 2009

A monolithic Lysimeter Station at the mountain Stoderzinken (Austria) - technical equipment and first results

A. Bohner, M. Herndl, and M. Kandolf

Agricultural Research and Education Centre Raumberg-Gumpenstein, Raumberg 38, A-8952 Irdning, Austria, (andreas.bohner@raumberg-gumpenstein.at)

The Northern Limestone Alps contribute by their high annual precipitation and amount of snow considerably to groundwater recharge and thus to drinking water supply in Austria. Climate parameters such as amount and distribution of precipitation as well as amount of snow, wind, and air temperature are the most important influencing factors to evaluate quantity and seasonal distribution of seepage water in mountain regions. To analyse water and nutrient cycles in a grassland ecosystem at a mountain site in the Northern Limestone Alps, a Lysimeter Station was built at the mountain Stoderzinken (1830 m a.s.l.) in 2005. Soil type at the site is a chromic Cambisol, soil depth is about 1 m. The vegetation belongs to a Crepido aureae-Festucetum commutatae. Soil water regime is periodically moist in topsoil. The Lysimeter Station is situated in a slight hollow, therefore snow is accumulating. Nevertheless, the site is representative of the subalpine belt in the Northern Limestone Alps. To prevent grazing by cattles the Lysimeter Station is fenced. Futhermore, there is no fertilizing and the above-ground biomass is cut once a year. Technically, the Lysimeter Station consists of a weightable monolithic lysimeter, a monolithic seepage water collector, and a field measuring profile. The weightable monolithic lysimeter is made of a stainless steel cylinder with 1 m^2 surface and 1 m depth. In four different depths (5 cm, 30 cm, 60 cm, and 90 cm) tensiometers, sensors for soil temperature, and FD-sensors are installed. The monolithic seepage water collector has a surface of 0.071 m^2 and 0.6 m depth. The field measuring profile consists of FD-sensors, tensiometers, and soil temperature sensors in the same depths like in the weightable monolithic lysimeter. A weather monitoring station completes the system, measuring precipitation, global radiation, relative humidity, air temperature, wind speed, and wind direction. Furthermore, nutrient input by wet deposition is measured. In autumn 2008, additionally a snow-depth sensor and a snow pillow were installed. With this equipment it is feasible to quantify snow height, duration of snow cover, amount of water bound in the snow cover, and quantity of snow meltwater. First results show that the amount of snow and the course of snow melting are the most important factors for the groundwater recharge rates. During the period of snow melting (from March to May) we found more than 50 % of the yearly amount of seepage water (2590 respectively 2900 l m-1). Data regarding nutrient input by wet deposition and nutrient losses by leaching (natural background load) will be presented.