



## Temporal and spatial distributions of $\delta^{18}\text{O}$ and $\delta^2\text{H}$ in precipitation in Romania

Viorica Nagavciuc (1,2), Carmen-Andreea Bădăluță (2,3), and Aurel Perșoiu (2)

(1) Department of Forestry, Stefan cel Mare University, Suceava, Romania, (2) Stable Isotope Laboratory, Stefan cel Mare University, Suceava, Romania, (3) Department of Geography, Stefan cel Mare University, Suceava, Romania

Stable isotope ratios of meteoric water have an important role in climatic, paleoclimatic, hydrological and meteorological studies. While such data are available from most of Europe, so far, in Romania (East Central Europe), no systematic study of the stable isotopic composition of precipitation exists.

In this context, the aim of this study is to analyze the isotopic composition of rainwater, its temporal and spatial distribution, the identification of the main factors influencing these variations and the creation of the first map of spatial distribution of stable isotopes in precipitation in Romania.

Between March 2012 and March 2014 we have collected monthly samples from 22 stations in Romania, which were subsequently analyzed for their  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  at the Stable Isotopes Laboratory, Stefan cel Mare University, Suceava, Romania.

Precipitation in W and NW Romania plot along the GMWL, while those in the East are slightly below it, on an evaporative trend. The LMWL for Romania is defined as  $\delta^2\text{H}=7,27*\delta^{18}\text{O} + 6,92$ . The W-E gradient in the distribution of  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  are less marked than the N-S ones, with local influences dominating in areas of strong evaporation (intramountain basins, rain-shadow areas etc). In SW, and especially in autumn and winter, Mediterranean cyclones carry moisture from the Eastern Mediterranean, the  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  values in precipitation in the area plotting between the GMWL and the Eastern Mediterranean Meteoric Water Line.

The isotopic composition of rainwater in Romania correlates well with air temperature, and is influenced to a lesser extent by other factors such as the amount of precipitation, topography configuration, the effect of continentalism and season of the year.