

## **Minute amounts of Pb in vertical and horizontal deposition in the mountains near Czech-German-Polish-Austrian borders**

N. CIMOVA<sup>1</sup>, M. NOVAK<sup>1</sup>, L. BOHDALKOVA<sup>1</sup>, J. CURIK<sup>1</sup>, F. VESELOVSKY<sup>1</sup> AND E. PRECHOVA<sup>1</sup>

<sup>1</sup>Czech Geological Survey, Geologicka 6, 152 00 Prague 5, Czech Republic

A decade after the ban on leaded gasoline in Central Europe, we studied temporal and spatial changes in Pb concentrations in vertical and horizontal atmospheric deposition. During three winter seasons (2009 – 2012), more than 400 rime (horizontal deposition) and 600 snow (vertical deposition) samples were collected from 10 mountain-top study sites situated throughout the Czech Republic.

Soluble and insoluble Pb concentrations were determined using sector-field ICP-MS. Soluble Pb concentrations in rime (7.0 to 26.0  $\mu\text{g L}^{-1}$ ) exceeded soluble Pb concentrations in snow (1.14 to 10.99  $\mu\text{g L}^{-1}$ ). Insoluble Pb concentrations in rime (0.084 to 3.50  $\mu\text{g L}^{-1}$ ) exceeded insoluble Pb concentrations in snow (0.084 to 0.72  $\mu\text{g L}^{-1}$ ). Across the sites, the total Pb input was from 403 to 3670  $\mu\text{g m}^{-2}$  per winter (November – March).

Our results indicate that horizontal deposition accumulates more Pb, compared to vertical deposition, as a consequence of its larger surface area. Horizontal deposition was slightly higher at sites bordering Poland, where coal mines and thermal power plants are located. The north-eastern part of the Czech Republic is affected by lead emissions from regional anthropogenic sources. In general, Pb pollution levels in remote high-elevation areas of the Czech Republic are extremely low.