



## **One year experimental investigation of the atmospheric deposition in the Varna region - Black Sea coastal zone**

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In the frame of the UNOPS-NIMH pilot project SCBU03/09-011 an extensive investigation of the atmospheric deposition of some important biogenic elements and radionuclides was performed during the period September 2003 – September 2004 in the region of the Black Sea town of Varna. The project is a part of the larger BSEP Project “Control of eutrophication, hazardous substances and related measures for rehabilitating the Black Sea ecosystem”. To achieve the goals of the project the methodology of sampling, analyses and complex data evaluation was established and applied in Bulgaria and Ukraine.

The results obtained include pH values, sulfates and nitrates concentration in every daily and combined 10-days precipitation samples and data from phosphates analyses in 10-days samples, collected at the NIMH meteorological observatory Varna placed close to the shore. The influence of some meteorological parameters on the NO<sub>2</sub> and SO<sub>2</sub> concentration and deposition of sulfates and nitrates is evaluated. Some of the combined precipitation samples were analyzed for macro and micro-components by ICP analyses.

Cross evaluation of the concentration and deposition of some of the components obtained by different analytical techniques and by different sampling approaches is done and shows that the results are comparable for Potassium, Sulfur and Phosphorous deposition.

The first results for phosphate deposition in the coastal region of Bulgaria are close and slightly higher compare to the values obtained by Ozsoy and Kubilay (2000), Ozsoy (2003) for the Eastern Mediterranean. The concentration of sulfates in precipitation samples is in the range of the averaged observed over Europe. Estimation of

the contribution of dry deposition of dust material is about 30-40% from the value of the wet deposition in the Varna region for years 2003-2005. Gamma-spectrometric measurements of 10 days assembled aerosol and deposition samples are performed in attempt to trace the air masses origin.

Comparison of the observed and modeled concentration and deposition of Pb, SO<sub>2</sub> and NO<sub>2</sub> was performed and the results are encouraging for further application of the long range model EMAP, Syrakov (1994) for atmospheric impact estimation of the pollutants over the Black Sea.