

## PHOSPHOROUS IN WATER, SEDIMENT AND POREWATER OF THE RIVERS MOSKVA AND OKA (RUSSIA)

*Andresen, Höpke; Yahya, Alfred; Institute of Earth Sciences, Heidelberg  
Metzger, Ulrich; Engler-Bunte-Institute; Karlsruhe  
Höpke Andresen  
Institute of Earth Sciences  
Im Neuenheimer Feld 236  
69123 Heidelberg  
Hoepke.andresen@ugc.uni-heidelberg.de*

Phosphorus is a key element acting as a limiting factor in many environments. As such it governs the rate of growth of many organisms like algae, e.g. in aquatic ecosystems an excess of phosphorus may cause eutrophication and algae bloom. Furthermore phosphorus can exist in many species which differ in their bioavailability. Therefore it is most important to find reliable methods to analyse phosphorus species in aquatic samples and sediment.

Total P-analysis of sediment cores of the rivers Moskva and Oka showed concentrations above background levels (0.16% P<sub>2</sub>O<sub>5</sub>) in sediment depth of 12 cm (Oka) and 12 cm and below (Moskva). P-binding species (easily exchangeable; soluble under anoxic conditions; exchangeable against OH-ions; soluble in acid; organically bound; unsieved; fresh sediment) were sequentially determined. The results of the sequential extraction show that the main part of the phosphorus (40-95%) is bound in species which can not be released from sediment under natural conditions.

To analyse phosphorus species in aquatic samples both qualitative and quantitative a flow injection analysis system (FIA) is developed. By means of size exclusion chromatography (SEC) organic and inorganic compounds are separated. After digestion these compounds are analysed photometrically using the molybdenum blue method. The advantage of the molybdenum blue method is the low detection limit (~10 µg/L).

The combined application of both methods will allow gaining a better understanding of the distribution, exchange and conversion of phosphorus in the rivers of Moskva and Oka.