



Impact of urbanisation on a lacustrine environment through sediment analysis

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Urban stormwater runoff is of major concern considering anthropogenic pollution in water bodies. In order to evaluate this source of contamination, surface sediments were collected in August 2005 from the Geneva Lake. Sediment samples were analysed for trace metals (Cu, Zn, Pb) and polycyclic aromatic hydrocarbons (16 PAHs from the EPA's priority substances list). The highest concentrations of PAHs were found in sediments sampled in Evian harbour (total PAHs 21.76 mg/kg dw). PAHs contamination, originating chiefly from incomplete combustion of fossil fuels as inferred from ratios of congeners, is dominated by the presence of fluoranthene and pyrene. The good correlation ($r^2 > 0.99$) between total PAHs and benzo(ghi)perylene concentrations might be significant of two possible sources of contamination: boat emissions and/or road runoff/traffic emissions. The trace metals distribution seems to be representative of an urban influence. The highest concentrations were measured in Thonon harbour sediments (Cu 73.3 mg/kg dw, Zn 287.6 mg/kg dw, 35.7 mg/kg dw) which is located in the most populated sector of the sampled area. Those first results validate the technical procedure. Our objective is now to discriminate within the different sources of contamination: urban runoff, atmospheric deposition, motor boat emissions. . . A comprehensive study on Lake Bourget (Savoie, France), coupling sediment analysis, measurement of atmospheric deposition and measurement of water quality at the main entrances of water bodies in the lake is envisaged. Markers of urban runoff will be analysed in dated sediment core, trap sediments, and surface sediments in order to obtain the vertical and horizontal extent of urban pollution in the lake.