UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

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Dipartimento di Ingegneria Civile, Edile ed Ambientale

Tesi di laurea magistrale in

"Mercury concentrations in water and sediments of the Botic creek, Czech Rep."

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In the last decades, industrialized countries, registered a significant increase of heavy metal concentration. This happened as consequence of both exponential growth of industrial activities and bad management of waste disposal.

Nowadays pollution arising from heavy metals, has got hard to estimate effects on the environment and on human health. Among other heavy metals Mercury plays a prominent role being one of the most toxic element existing on the earth.

Mercury pollution affects all environmental compartment, including the lithosphere, the hydrosphere, the atmosphere and the biosphere. Nonetheless it is in the aquatic environment that we find the most important toxic issue arising from Mercury concentration.

The objective of this elaborate is to monitor Mercury pollution in Botič creek in Czech Republic, analysing both components of the aquatic environment, i.e. water and sediments.

The Botič is the largest affluent of the Vltava River in Prague and, in the studied stretches, it is affected by Combined Sewer Overflows (CSOs) and Storm Water Drains (SWDs).

Mercury concentration was measured using an Advanced Mercury Analyzer (AMA). To reduce uncertainties of analysis, two measurements (re-samples) of each sample were performed and the mean value and the relative standard deviation (RSD) were calculated.

The concentrations obtained from water samples were compared with the EQS Italians and Czechs. The concentrations from sediment samples were compared with the EQS Italian and with three other American benchmarks:

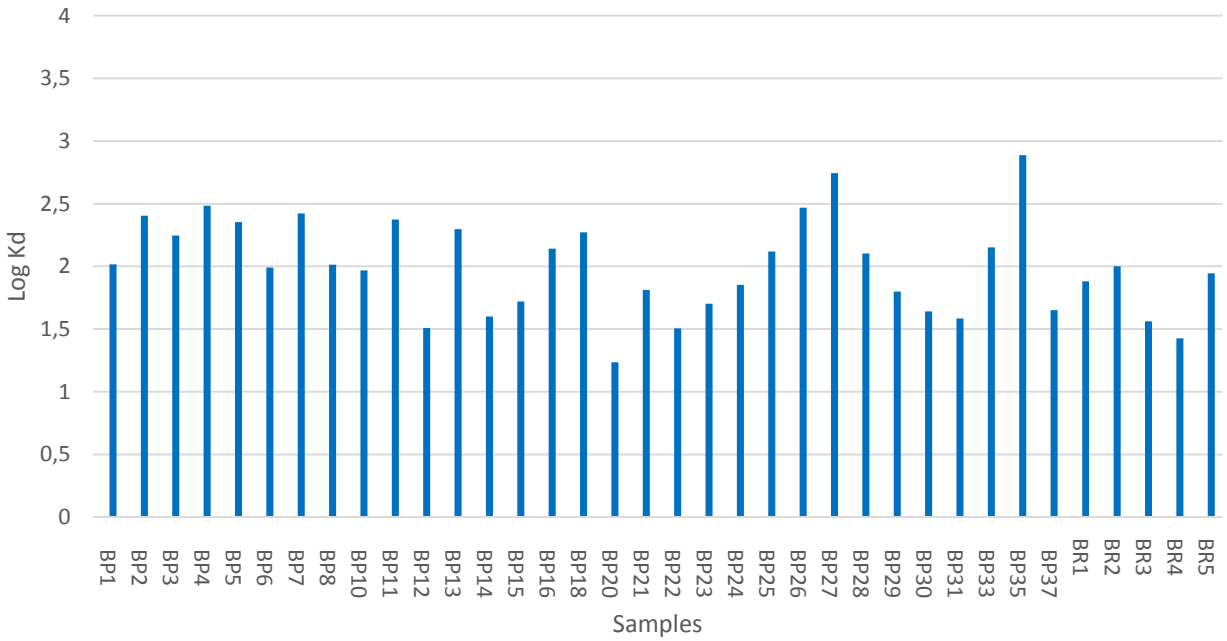
- PEL (probable effect level);
- ISQG (Interim sediment quality guidelines);
- ERL (Effect Range - Low).

Obtained results demonstrate that the water body is affected by Mercury pollution. Both the initial stretch (rural area) and the one crossing the urban area are clearly suffering from point and non-point sources of pollution.

Water samples show a strong presence of Mercury, especially downstream of the inlet.

Solid samples have values stably low except in vicinity of the delta, where Mercury concentration becomes quite high. This result can be justified by the continued contamination caused by road traffic, which is the main source of pollution.

This work shows the mobilization in liquid phase by the Mercury. Main cause maybe lack of fine size sediment in Botič creek, which allows a high concentration of Mercury in the water, even though it has a strong affinity with the solid phase (sediment). The calculation of the solid-liquid partition coefficient (Kd) for Hg seems to confirm this hypothesis.



Partition coefficient Kd in sediment at Botič creek