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BOOK OF ABSTRACTS

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ENVIRONMENTAL ENGINEERING AND ECOLOGY

POLLUTION INDICES AS A USEFUL TOOL FOR MONITORING SEDIMENT CONTAMINATION IN THE LAST TWO DECADES IN BOKA KOTORSKA BAY, ADRIATIC SEA

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Abstract

The sediment was collected at forty locations in the Boka Kotorska Bay, in different seasons and years (October 2005, June 2007, April 2013, December 2019), and analyzed using the EDXRF method. The aim of this work was to evaluate the potential risk and compare heavy metal pollution (As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, Fe) of surface sediments in the period 2005-2019. Environmental risk assessment was performed by comparative analysis of pollution indices, such as pollution load index (PLI), potential ecological risk index (RI), mean ERM quotient (MERMQ), toxic risk index (TRI), and contamination severity index (CSI). The average contribution of individual metals in the total environmental risk showed the following order: Cd > Hg > As > Pb > Ni > Cu > Cr > Zn. Accordingly, Cd represented a concern of the highest priority for the Bay ecosystem due to its high toxicity. The results indicated that Hg concentrations showed a declining trend in the period from 2005 to 2019. Referring to the results of all applied pollution indices, it was established that the highest pollution was identified in 2019, particularly at the shipyard site S4, while the lowest pollution was recorded in 2005 and 2013. The spatial distribution of pollution indices for each investigated year revealed the most polluted sediments at sites S4 and S10 in Tivat bay. These findings provide insight into the comparison of different indices in assessing the sediment quality in the Boka Kotorska Bay over the last two decades.

Keywords: Sediment quality, heavy metals, pollution indices, risk assessment, Adriatic Sea.

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