

Abstract

Mercury Budget and Scenario Analysis for the Marano-Grado Lagoon, Using Modelling and Observations [†]

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Abstract: The Marano-Grado Lagoon (MGL) is extensively contaminated by mercury (Hg) from local sources and long-term (500 years) tidally delivered inputs from the Idrija Hg mine (Slovenia) through Isonzo River suspended loads. Mercury-polluted coastal sites, often become sites of increased mercury methylation and act, in the long term, as secondary mercury sources for the Mediterranean Basin. Methylmercury (MeHg) produced upon Hg methylation bioaccumulates and biomagnifies in the trophic webs, and it is eventually transferred to humans via fish intake. We implemented a dynamic model released by US-EPA (WASP-Merc7) to the MGL (North Adriatic Sea, Italy) in order to assess the concentration of mercury species in water, sediment and particulate, and to quantify the mercury fluxes and budget within the lagoon itself and between the lagoon, the atmosphere and the Adriatic Sea. Furthermore, the model was used to simulate the mercury long-term dynamics to estimate the recovery time for Hg in lagoon sediment (about 600 years) and to explore future scenarios of climate change and rivers capping. Still several gaps exist in the knowledge on mercury species concentration and kinetics, the model results take also into account the major sources of uncertainty.

Keywords: mercury; water; budget



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