

# **Total mercury in the water column of the coastal zone in the Red Sea, the Gulf of Aqaba, and the Arabian Gulf**

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The aim of this study is to provide a baseline assessment for the environmental status of the Saudi Arabian Red Sea and Arabian Gulf coastal zone, including the Gulf of Aqaba, related to mercury (Hg) pollution. Under the framework of the Field Surveillance Task (Task 6) conducted by the Marine and Coastal Environment Protection Initiative (MCEP; <https://mcep.kaust.edu.sa>), 15 coastal sites and 1 offshore were selected in the Red Sea along with 3 hotspot areas in the Arabian Gulf [1]. Total Hg (THg) concentrations in the water column, determined according to EPA Method 1631 [2] were obtained from overall 81 sampling stations during a campaign in the summer of 2021 and are presented herein. This survey constitutes the first geographically comprehensive study of Hg within the Saudi Arabian coastal waters providing baseline information in this developing area. The THg levels in the Arabian Gulf were significantly higher than those in the Red Sea. Among the Red Sea sites, the Jeddah Lagoon System, the adjacent area Jeddah Mena, and the King Fahd Port in Yanbu presented the highest concentrations. A significant positive relationship ( $p < 0.001$ ) was detected between Hg and other anthropogenic metals (Pb, Cd, Cu, Ni, As, Zn) analyzed by the Hellenic Centre for Marine Research (HCMR) [3]. The concentration of Hg in the surveyed areas fall well below the threshold values set by both the Saudi Arabia National Environmental Standards for Ambient Water Quality (< 0.1-0.4 µg/L) and the EU standards (< 70 ng/L, Directive 2013/39/EU) [4].

## References:

- [1] C. Schröder, A. Sánchez, D. Rodriguez, & D. Abdul Malak, A Report Prepared by ETC-UMA for the King Abdullah University of Science and Technology (2021) 118
- [2] EPA, Method 1631, Revision E, (2002) ([https://www.epa.gov/sites/default/files/2015-08/documents/method\\_1631e\\_2002.pdf](https://www.epa.gov/sites/default/files/2015-08/documents/method_1631e_2002.pdf))
- [3] E. Tzempelikou, C. Parinos, C. Zeri, I. Hatzianestis, Y. Abualnaja, I. Hoteit, E. Plakidi, S. Chourdaki, S. Iliakis, V. P. Papadopoulos, & A. Pavlidou, Mar. Pol. Bul. 194 (2023) 115379
- [4] Directive 2013/39/EU (<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32013L0039>)