

A survey on data collection and evaluation petroleum hydrocarbons in water, sediment and biota in the Persian Gulf and assessment the extracted data from environmental protection point of view

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Abstract

The results of investigation show that Bandar Imam Khomeini and Bushehr are partly affected by oil pollution transferred via Nowrouz oil terminal. However Persian Gulf War (1991) affected these two areas as two oil polluted areas in the Northern part of the Persian Gulf, but the results of our investigation demonstrated a decline in oil rates over time, due to controlling the oil leakage in the areas. In general oil pollution level in the northern part of the Persian Gulf waters is in moderate level in comparing with international scale.

Imam Khomeini port (2009) with 19 to 52 ppm and Khore Mosa estuary (2008-2012) with 703 to 4800 ppb of PAH was in the range of very polluted and polluted areas, respectively. At the same period sediments of Bushehr (845 to 4790 ng/g) and Morgues forest (259 to 5376 ng/g) of PAH were in the range of semi polluted to polluted areas, while PAH level in the sediments of Strait of Hormoz (72 to 192 ng/g) were almost unpolluted.

The result of our investigation showed that the oil pollution level decrease from west to east in the Northern parts of Persian Gulf. According to international guidelines, oil pollution levels in Imam Khomeini port, KhoreMosa estuary and Bushehr were higher than Threshold Effect Level, which probably has detrimental impact on biota in these areas. It is recommended to establish Environmental Management System to protect these areas.

Although Hormozgan province had less oil pollution level in comparing with the other provinces in the Northern parts of the Persian Gulf, but comparing the results demonstrated that in a period, less than one decay, the level of Benzo Pyrene accumulated in sediments of eastern parts of the Persian Gulf has significantly increased. It is recommended the increasing rate and its sources to be more considered.

The PAH pollution level in the water of Bushehr, as one of the most polluted areas is higher than that in east Mediterranean Sea, Danube estuary, comparable with Baltic Sea, less than that in Yeong Gulf in Korea, Seine Estuary in France and Chaspik estuary in America and highly less than Bohai Sea, Xiamen Sea, Welles and England.

Keywords

Aromatic hydrocarbons, PAH, Persian Gulf, Water, sediment, Biota, Evaluation, Survey