Geophysical Research Abstracts, Vol. 7, 00939, 2005
SRef-ID: 1607-7962/gra/EGU05-A-00939

Characterization of PAH sources and organic content in sediment particle size fractions in Gemlik Bay (Sea of Marmara), Turkey

S. Unlu; (1), B. Alpar (1), C. Akbulak (2), S. Aydin (3), N. Balkis (1)

(1) Istanbul University, Institute of Marine Sciences and Management, Istanbul, Turkey (su@istanbul.edu.tr), (2) Istanbul University, Department of Geography, Istanbul, Turkey (cengizakbulak@yahoo.com), (3) Department of Navigation, Hydrography and Oceanography, Istanbul (senolaydin1@yahoo.com).

Even the environmental threat due to the recent increment in levels of Polycyclic Aromatic Hydrocarbons (PAHs) in the sediment of Gemlik Bay, a semi-enclosed marine environment in the Sea of Marmara, is well known; no systematic data was available for evaluating PAH contamination levels and their sources. It was therefore deemed necessary to set up a monitoring program to determine the current concentrations of PAHs in surface sediments. A total of 72 surface samples, mainly scattered along the coastal areas, were recovered and analyzed for parent and alkylated PAH. Analysis was performed by gas chromatography coupled to mass spectrometry (GC/MS). Composition, areal distribution, contamination levels and probable sources of PAHs were determined. The total PAH load changes from 10 to 590 μg/g (dry weight), being higher along the east and south coasts. The highest concentrations were determined in and offshore sea ports of Gemlik and Mudanya and in the inner harbour of a resort village, Tirilye. The PAH concentrations were generally affected by the chemical composition of the sediments such as organic matter and clay content. However, in Gemlik Bay, it is suggested that the distribution and concentrations of PAHs in sediment would be defined by direct inputs, rather than by the sediment type itself. In addition correlations between concentrations of PAHs and the content of organic carbon were established. Pyrolytic and petrogenic sources have been found in the bay. Mostly in front of the industrial harbours it is exhibited a mixed pattern of petrogenic and pyrogenic inputs. The intensive anthropogenic activity leads to the introduction of contaminants in the bay which is subject to high anthropogenic pressure due to inputs

from coasts, rivers, combustion processes through run-off, atmospheric input, industrial and sewage discharges refined products (e.g. petrol) and shipping activities. The results form this first scientific data base on which future works will be constructed and should be utilized in urgent rehabilitation studies especially around the harbours of Gemlik and Mudanya.