## Polycyclic aromatic hydrocarbons and hopane in Malacca Coastal Water: 130 years of evidence for their land-based sources

## Abstract

Massive development over the past century has led to environmental oil-related pollution around the Malaysian city of Malacca. To characterize the concentration, sources, and origins of polycyclic aromatic hydrocarbons in Malacca's coastal water in the Strait of Malacca, sediment cores from near shore and offshore were collected and analyzed. The highest concentration of total polycyclic aromatic hydrocarbons (PAHs) in the Near Shore station core was 4447 ng/g dry weight (dw) (1963-1969), and the lowest was 177 ng/g dw (1949-1955). The lowest concentration of PAHs in the Near Shore sample was 452 ng/g dw (1991 to 1997). In general, the Offshore core showed lower concentrations of total PAHs than did the Near Shore core, ranging from 1.71 (1914-1920) to 714.37 ng/g dw (1963-1969). Diagnostic tools such as specific compound, isomer ratio, and hopane characteristics indicate pollution by petroleum and combustion of oils from Southeast Asia and the Middle East in the study area since the1940s.