



Water Quality Monitoring and Assessment in the Estuaries of Caspian Sea

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Abstract

Lakes and seas are final receiving bodies of different pollutants discharged into the surface waters. Caspian Sea in south, receives various contaminations discharged alongside the shore line or transferred by rivers mostly accumulated in estuaries. This study aims to find out which estuary is polluted and requires more environmental attention. Consequently, three estuaries of Babolrood, Chaloos, and Sefidrood are sampled and analyzed. The experimental results show that Babolrood has low ORP and high TSS, Coliform and nitrate values. Therefore, it is highly polluted as a matter of untreated domestic wastewater discharged. This may threaten the recreational applications and sanitations of the residents. However, Sefidrood and Chaloos, are more detrimental in heavy metal concentrations. Ni and Cr are high in Sefidrood while Cd and Co are mostly observed in Chaloos. This may be due to the activities of mining and road constructions upstream of Chaloos and industrial discharges upstream of Sefidrood.

Keywords: Caspian Sea, Environment, Water quality, Estuary, Monitoring

1. Introduction

Surface waters, such as rivers, are the main receiving water bodies for pollution discharged from different point and non-point sources. Domestic and industrial activities are the main source of point discharges while agriculture and decentralized rural residential areas are the examples of non-point sources. Typically, the treated and untreated effluents of sources are discharged to the environment in regard to the national standard limits, remediation potential and the results of environmental impact assessments. However, some may not follow the regulations. Yet, the dilute or concentrated pollution would finally be transferred by rivers and sediments to the lakes, estuaries and open seas.

The accumulation of pollution in lakes and estuaries can cause adverse effects on living beings. For example, the accumulation of nutrients discharged by agricultural and domestic activities may lead into Eutrophication. This reduces oxygen level of water bodies and may result in death of fish and other water livings. On the other hand, the accumulation of heavy metals may not kill fish or vegetations nearby but may enter the humans' food cycle and cause secondary problems. Since lakes and seas play a key role on people lives, they should be monitored and analyzed continuously for pollution detection. Estuaries can show that how much pollution is transferred by rivers for a long time and may indicate the priority for environmental management. This research aims to assess the quality of three estuaries attributed to the rivers of Babolrood, Chaloos and Sefidrood in the north of Iran. They can represent the pollution transferred by these rivers and may show which is more polluted. Therefore, best management practices can be determined based on this evaluation.

2. Materials and methods

Case study

This research focuses on three estuaries of Babolrood, Chaloos and Sefidrood that ends up to the Caspian Sea in north of Iran.

Sampling and analysis

The sampling was carried out in two periods, summer and winter, from different depths with a specified distance from the shore line. The whole samples are obtained from depths between 0.8 to 11 meters by boats.