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Assessing and Mitigating the Global Freshwater Crisis (6)

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DETECTING AND MONITORING POLLUTION IN THE CASPIAN SEA BY USING REMOTE  
SENSING TECHNOLOGIES

**Abstract**

The Caspian Sea is the Earth's largest inland body of water, with no natural outlets, surrounded by the five countries: Azerbaijan, Iran, Turkmenistan, Kazakhstan and Russia. The isolation of the Caspian basin and its brackish waters have created a unique ecological system. Nearly 2,000 species and subspecies of animals live in and around the Caspian Sea. About 400 of them are endemic to the area, including the Caspian gull, Caspian white fish, Caspian salmon and Caspian seal, the smallest of all existing varieties of seal. Most notably, six sturgeon species are found in the Caspian Sea and its drainage basin. Caspian Sea is historically the most caviar-rich location on the planet. More than 90% of the world's black caviar is obtained from the Caspian Sea. The Caspian Sea region is one of the oldest oil-producing areas in the world. The area has significant oil and natural gas reserves from both offshore deposits in the Caspian Sea itself and onshore fields in the Caspian basin. Today the Caspian Sea environment faces significant environmental pressure:

Pollution by wastewater: all the rivers flowing into the Caspian sea bring tons of human and household waste.

Oil pollution – is the major ecosystem problem. Oil film on the surface of water prevents development of the phytoplankton. And this leads to lowering of oxygen level in water and death of marine inhabitants.

Overfishing and poaching.

Decline in the water level: due to the active construction of dams and power plants on the rivers that feed the Caspian Sea and also because of the excessive extraction of water from the rivers to irrigate the fields.

Penetration of foreign organisms: the active reproduction of the mnemiopsis crest is one of the main problems of the Caspian Sea. It destroys the food base of the Caspian fish, consuming a huge amount of plankton.

The main purpose of this paper is to review pollutants in the Caspian Sea environment and to provide broad overview of existing remote sensing platforms and sensors which could be applied to investigation, mapping and monitoring of these different types of pollutants.