Analyzing the Oil Pollution Resulting From the Iraqi Oil Ports in the Northern Arabian Gulf Using the GNOME Model

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Abstract. The Arabian Gulf is regarded as a worldwide oil industry center. Iraq's oil ports are one of the major oil transportation hubs in the Arabian Gulf, and any spills might pollute the marine environment. A GNOME model, a physical model that illustrates the motions of oil spills in seawater and probable danger zones, is used to simulate the oil spill trajectory to have a better understanding of the spill's destiny. Oil spill trajectory modeling provides a prediction in advance of the direction of movement of the oil slick and the time it will take to reach the coast. The form requires the input of data on the time of the release of the spill, the duration of the release, the amount of the spill, and the speed and direction of both currents and winds. In this paper, different oil spill trajectory scenarios are simulated From Single point mooring (SPM1) in quantities of 100 and 50 barrels and Basra oil port in quantities of 100 and 50 barrels of medium crude oil In the north of the Arabian Gulf. The model's findings aid competent authorities in developing their emergency management strategies for responding to possible dangerous regions and Rapid treatment of oil spills.

Keywords. Oil Spills. Scenarios. Barrels. Basra. Northwest.

INTRODUCTION

The Arabian Gulf is a tropical arm of the Arabian Sea that is surrounded by eight countries: Iran, Iraq, Kuwait, Saudi Arabia (S.A), Bahrain, Qatar, the United Arab Emirates (UAE), and Oman. It has a surface area of 239,000 km2, an average depth of 36 meters, and a volume of 8,630 km3 on average [1]. Oil spills are a constant hazard to the Arabian Gulf's coastal and marine habitats owing to oil exploration, production, and transportation [2]. Large-scale oil spills have occurred in the Arabian Gulf, resulting in serious environmental consequences. Over 140 medium to big oil leak accidents has happened in the Arabian Gulf in the previous three decades [3]. Fisheries are presently the Gulf's second most significant natural resource, behind oil [4]. In Iraq, One of the most serious threats to the maritime ecosystem is oil contamination. Oil ships, undersea pipelines, and other major potential oil leak sources exist in Iraq, ports and oil terminals, and ship accidents. After two wars in 1991 and 2003, Iraq once again experienced immense damage, the severity has had a huge impact on the environment and had a major influence on the maritime environment, particularly in southern Iraq [5]. Travelling oil from the place of origin to the final of consumer is connected with a danger of unintentional oil spills, which can affect marine habitats and cause a number of societal consequences [6, 7]. Oil spills can occur as a result of accidents, ship groundings, and tanker groundings, causing substantial harm to the maritime environment, fisheries, and animals. Oil spills might have an impact on vital port infrastructure and ocean-going ships [8]. Pollution in the sea is a problem. People's deliberate or unintentional introduction of pollutants into the marine environment has negative implications such as harming living resources and affecting human health [9]. When oil is spread into the environment as a result of human activities, it is known as an oil spill; the phrase is most commonly used to refer to maritime oil spills [10]. Oil spills include crude oil spills from tanker ships, ports during loading and unloading, offshore platforms, wells, and other spills such as gasoline, diesel, and their by-products [11]. The Arabian Gulf is considered to have the world's greatest oil reservoir. GNOME was used in the Arabian Gulf by Marzouk, 2019 [12] for a hypothetical oil spill scenario off the coast of Bahrain.

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