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Modelling of Marine Oil Spill: A Case Study

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The early stage of oil spill in marine environment is critical because we need to predict the behaviour of the spill in terms of its spread and fate. To this end several software packages are available to handle this problem. GNOME, a modeling software, generated simulated scenarios for an oil spill in the Galveston Bay, US, under different water current intensity, wind intensity, and types of crude. GNOME-predicted impacts of different types oil spill under various weather and oceanic conditions. Under all conditions, the spilled oil reached the shoreline after 12h. However, strong current caused significantly larger quantity (69 bbl) of oil to accumulate ashore compared to that accumulated due to medium currents (45 bbl). Moreover, wind affected spilled oil diffusion by wave movement. The beached amount under light wind and strong wind were 255 and 575 barrels, respectively, at the end of the simulation (72 hours). This means that strong wind caused 2.25 times more oil to reach the beach compared to light wind. The changing wind resulted in completely different diffusion when compared to constant wind. The latter presented the prominent influence of wind on oil surface dispreading. The effect of crude-type has been simulated through the evaporation rate. A round 9600 barrels of gasoline evaporated in 24 hours after spilling compared to 3730 and 6390 barrels for medium crude and diesel, respectively.

Biography

Zheng Li is a PhD student at the Memorial University of Newfoundland, and at Wood Environment & Infrastructure solutions.

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