Ocean Pollution Bulletin

Bulletin on the FSO Nabarima threat

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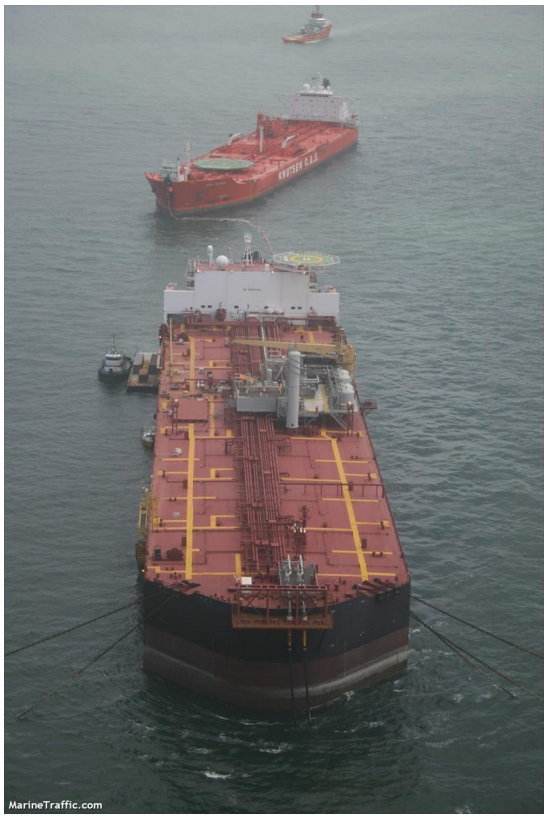
Foreword

FSO *Nabarima* is a floating storage and offloading vessel that is permanently moored in the Gulf of Paria, Venezuela. The FSO is found abandoned in the Gulf of Paria since January 2019 following United States sanctions on the Venezuelan state oil company Petroleos de Venezuela (PDVSA). With a capacity of 1.4 million barrels of oil, FSO *Nabarima* currently stores 1.3 million barrels of crude oil. The cargo offload has been planed and about 550,000 tons of crude will be brought to land.



Transferring the oil currently stored in the FSO *Nabarima* to another vessel involves risks potentially resulting in oil spills. The oil spill trajectory and fate of a potential spill originated at the FSO *Nabarima* was simulated using the MEDSLIK-II oil spill model coupled with Copernicus Marine Service (CMEMS) oceanographic and ECMWF (provided by Aeronautica Militare Italiana) meteorological products. The spill evolution was simulated with MEDSLIK-II for the period between 30/10/2020 18:00 and the 05/11/2020 18:00.

Oil spill scenario and forcing

Simulation starting date: 30/10/2020 18:00 UTC
Simulation length: 120 hours,
Duration of the spill:

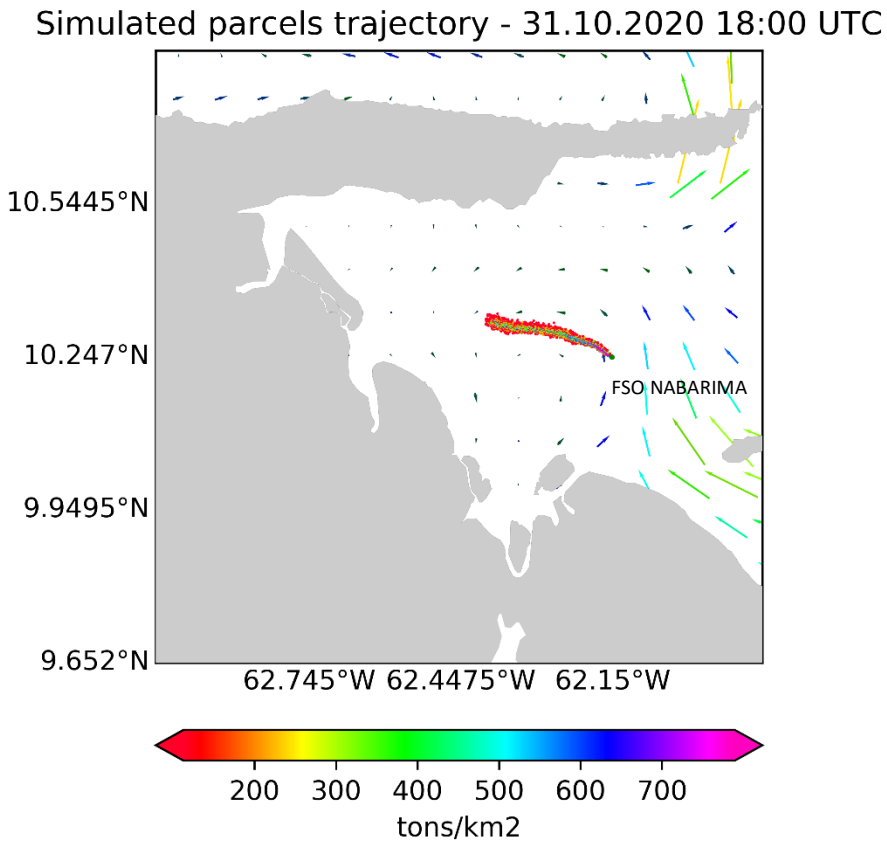
- continuous (120h) spill originated at the present vessel position

Spill rate: 608 tons/h (total 73,000 tons)
Type of oil: API=16.8 (Fuel oil),
Meteo-oceanographic forcings:

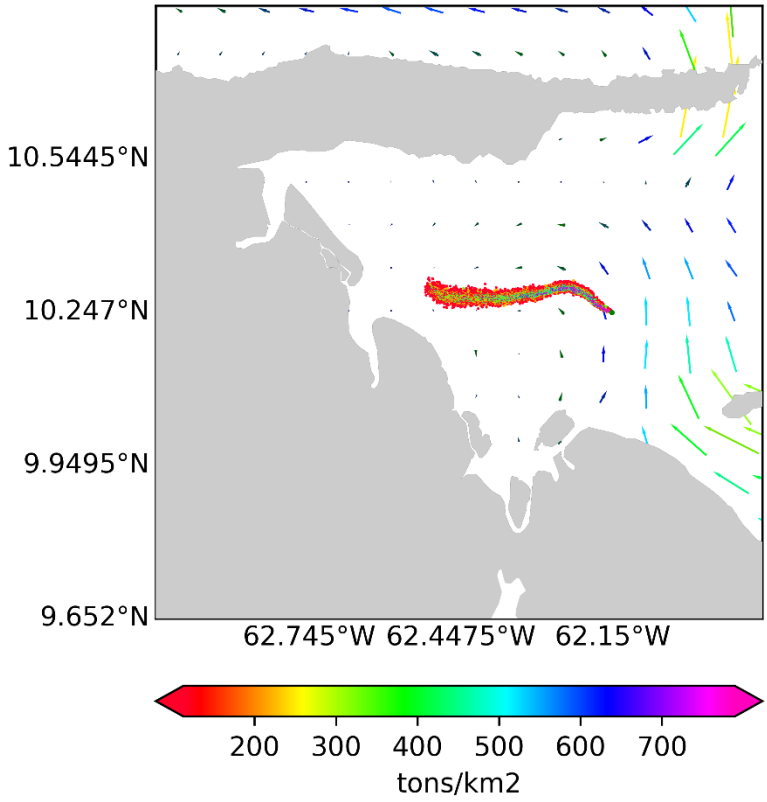
- CMEMS GLOBAL OCEAN 1/12° current fields for areas outside the coral reef
- ECMWF winds at a resolution of 1/10°

Wind correction coefficient: 3.5%
Stokes drift: not computed

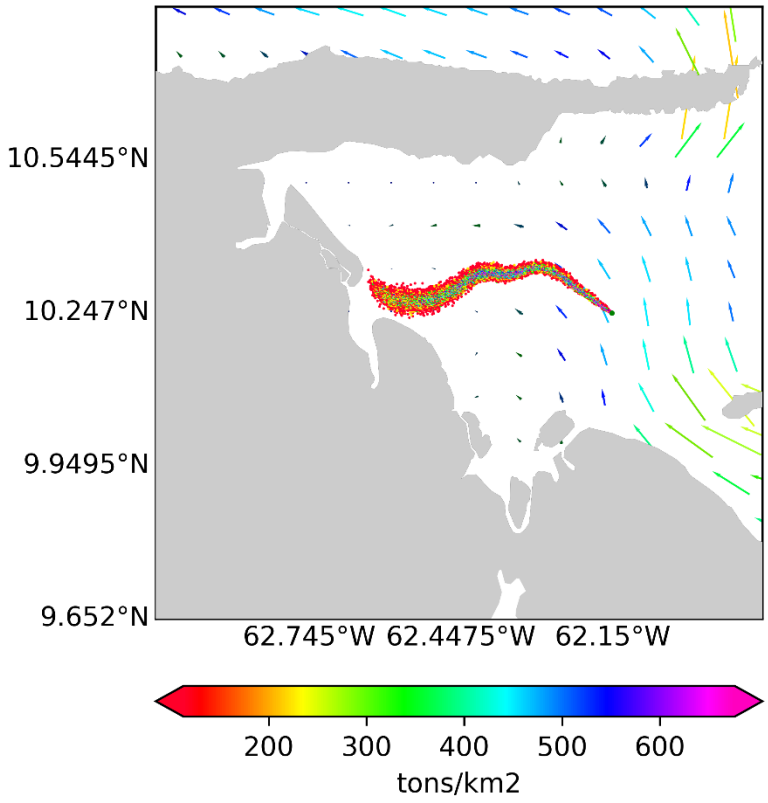
Modelled oil spill evolution between October 30th and November 4nd, 2020



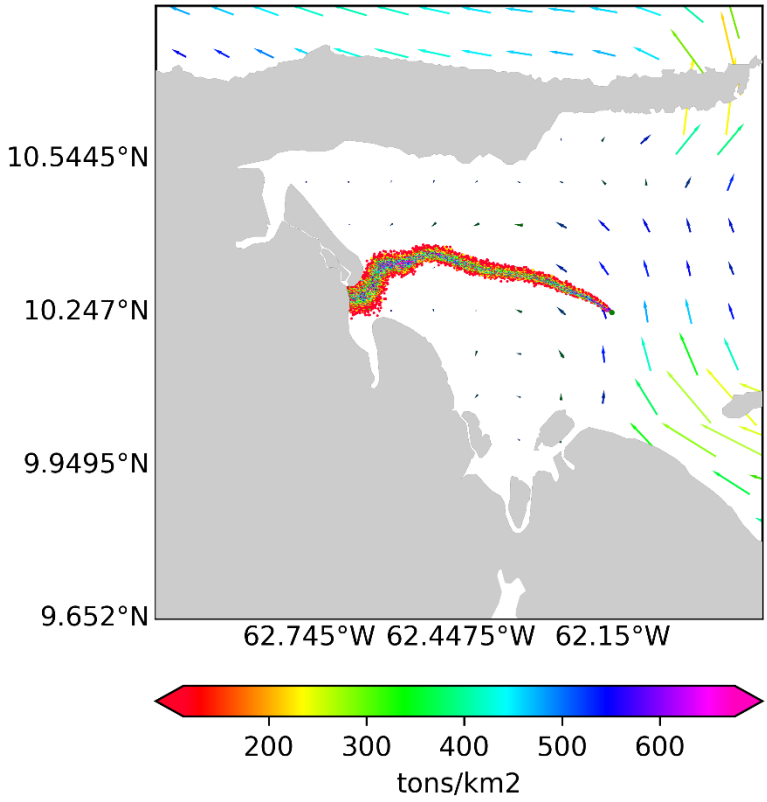
Simulated parcels trajectory - 01.11.2020 18:00 UTC



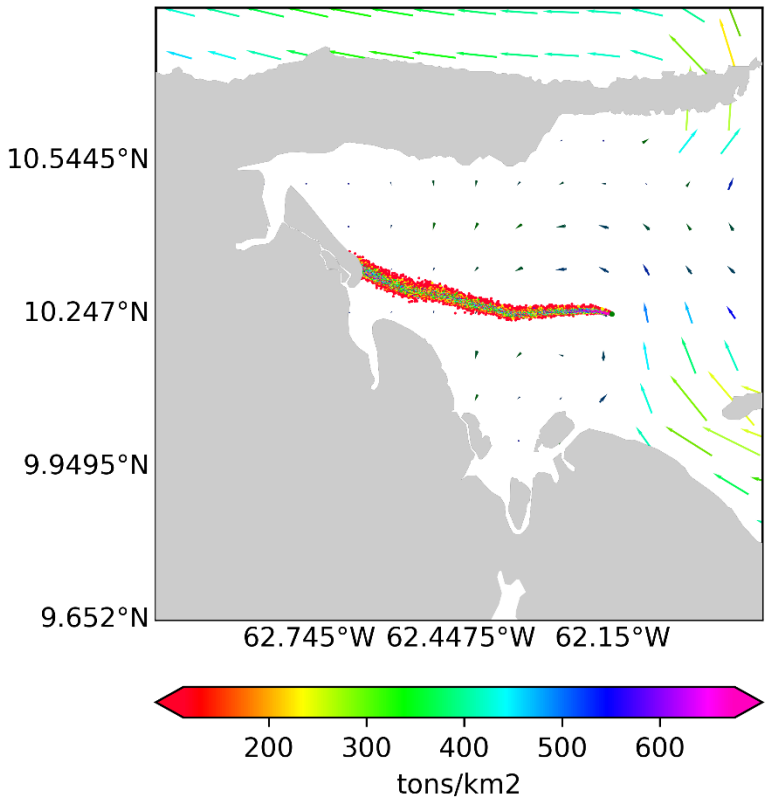
Simulated parcels trajectory - 02.11.2020 18:00 UTC



Simulated parcels trajectory - 03.11.2020 18:00 UTC



Simulated parcels trajectory - 04.11.2020 17:00 UTC



Spill evolution forecast

No oil spill originated at the FSO *Nabarima* has been observed so far. The present analysis has been carried out considering and *eventual* spill and its aim is limited to supporting local decision making.

In the next 5 days (30/10 18:00 to 04/11 17:00), potentially spilled oil at FSO *Nabarima* is likely to move westwards impacting the Monagas natural shoreline on the November 2nd. An eventual spill could reach the Sucre river delta, impacting both its southern and northern margins. The northern margin is likely to be the most impacted by a potential spill due to the dominant meteo-oceanographic conditions.

Uncertainties in the present report are expected as meteo-oceanographic models might not be capable to fully resolve the coastal dynamics and riverine inputs.