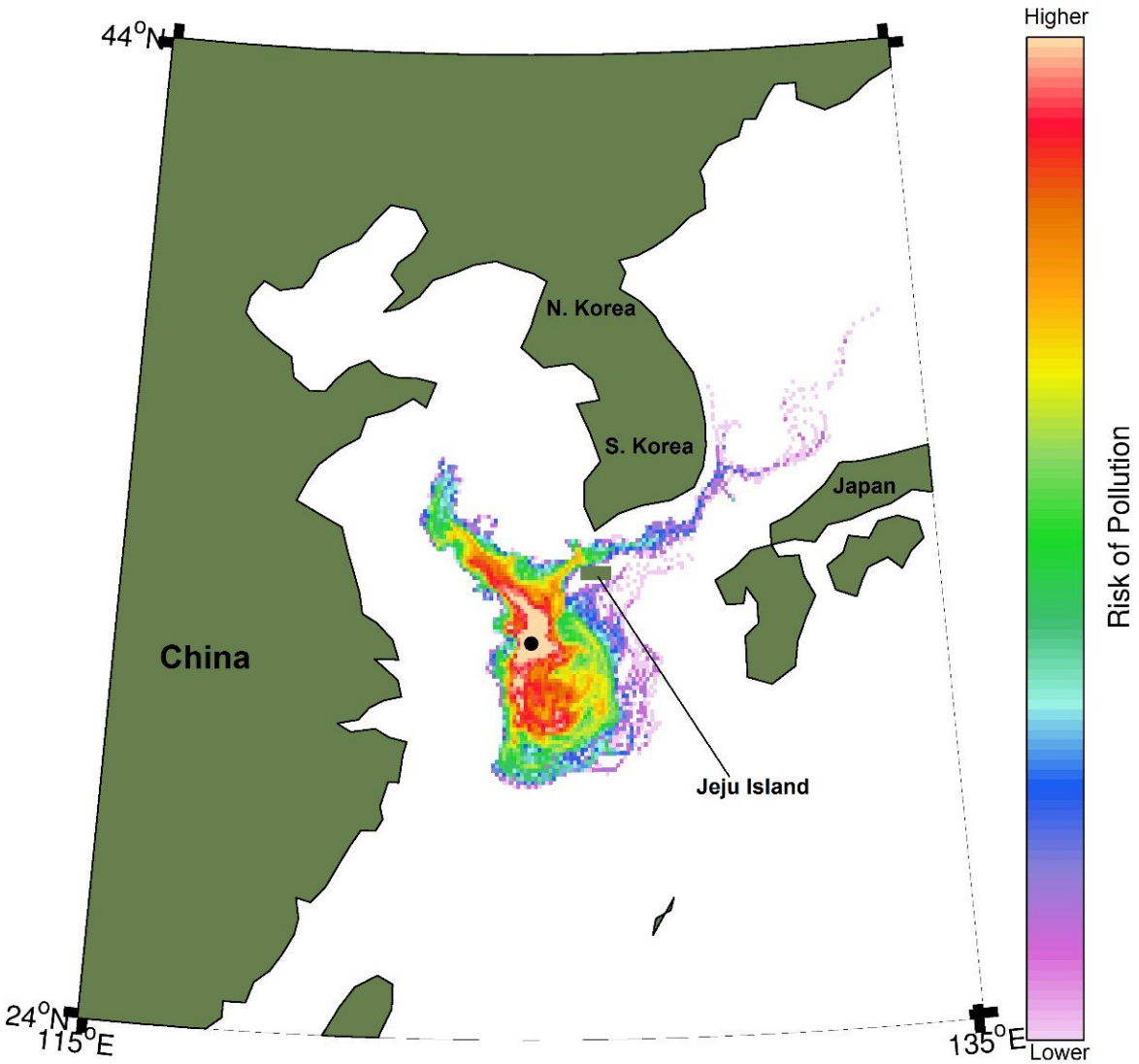
Sanchi oil spill contamination could take three months to reach mainland

January 15 2018



600 Particles released each January 2006–2015

This figure shows the pollution risk based on virtual oil particle distribution. Colours indicate the risk of pollution with warmer colours indicating increasingly high risk. The impact of the Sanshi oil spill is estimated to be greatest in the vicinity of the tanker collision itself, and in the Yellow and East China seas, but there is a clear spread of oil to other areas, including coastal zones. Credit: National Oceanography Centre (NOC)

Water contaminated by the oil currently leaking into the ocean from the Sanchi tanker collision is likely to take at least three months to reach land, and if it does the Korean coast is the most likely location. However, the oil's fate is highly uncertain, as it may burn, evaporate, or mix into the surface ocean and contaminate the environment for an extended duration.

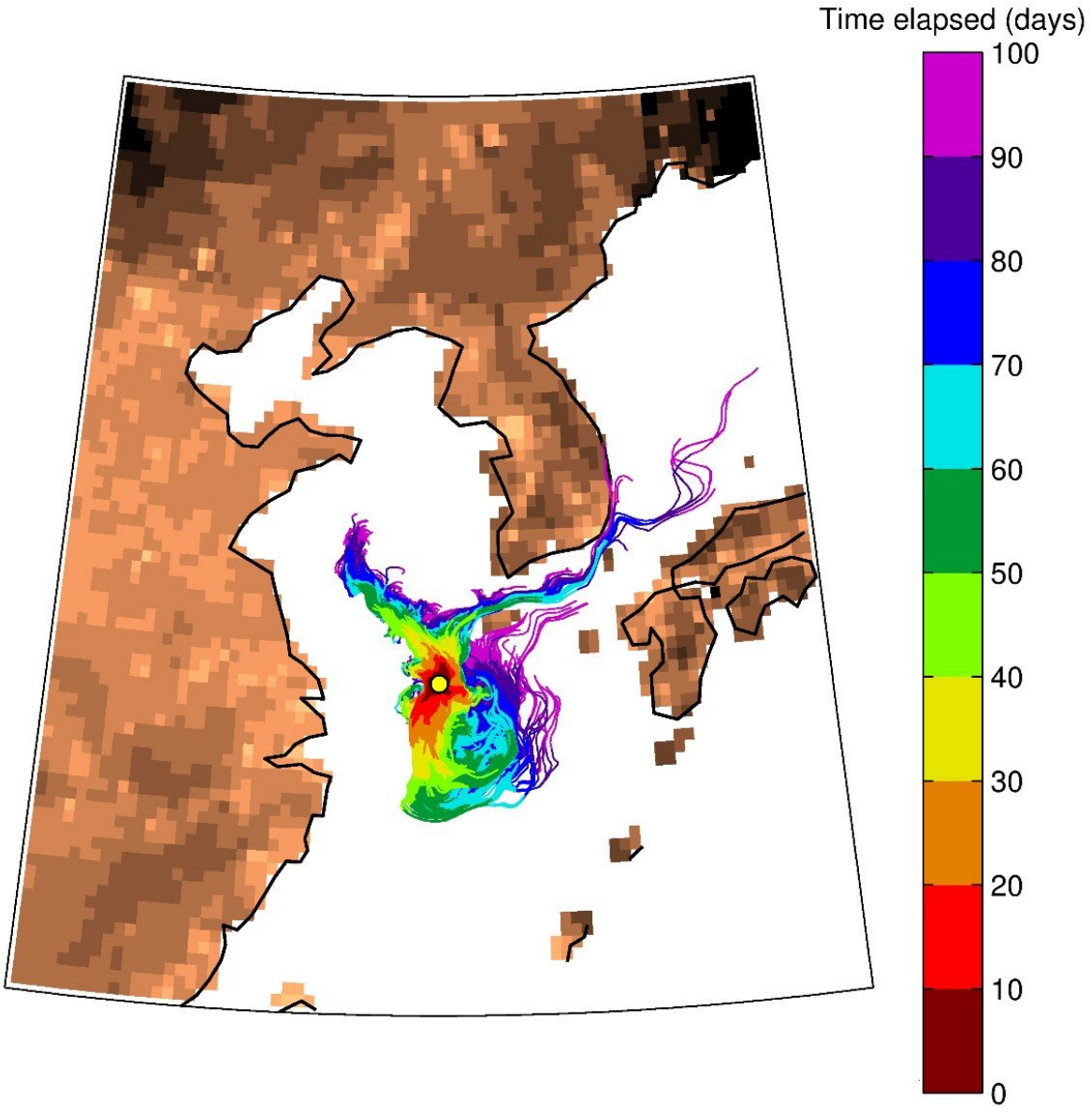
This is according to emergency ocean model simulations run by scientists at the National Oceanography Centre (NOC) and The University of Southampton to assess the potential impact of local ocean circulation on the spread of pollutants. These simulations were run using the leading-edge, high-resolution global ocean circulation model, NEMO.

The Sanchi tanker collision occurred on the border between the Yellow and East China seas, an area with complex, strong and highly variable surface currents.

Leading this research, Dr. Katya Popova, from the National Oceanography Centre, said "Oil spills can have a devastating effect on the marine environment and on coastal communities. Strong ocean currents mean that, once released into the ocean, an oil spill can relatively rapidly spread over large distances. So understanding ocean currents and the timescale on which they transport ocean pollutants is

critical during any maritime accidents, especially ones involving oil leaks."

The team of scientists involved in this study 'dropped' virtual oil particles into the NEMO ocean model and tracked where they ended up over a three month period. Simulations were run for a series of scenarios of ocean circulation typical for the area the oil spill is thought to have occurred in, and for this time of year. This allowed the scientists to produce a map of the potential extent of the oil spill, showing the risk of oil pollutants reaching a particular part of the ocean.



This figure shows the trajectories of all virtual oil particles across all release scenarios. The colours indicate where particles have reached after specific periods of time, from deep red for the first 10 days after release to magenta for the period 90-100 days. Within the 100 day period sampled, most particles remain within the Yellow and East China seas, but some particles can be seen skirting the coast of South Korea and entering the Japan Sea. The land mask colours indicate human habitation, with lighter colours marking areas with high population density. Credit: National Oceanography Centre (NOC)

However, Stephen Kelly, the University of Southampton Ph.D. student who ran the model simulations, said "There was a high level of variation between different scenarios, depending on a number of factors. Primarily the location of the original oil spill and the way in which atmospheric conditions were affecting ocean circulation at that time."

NOC scientist, Dr. Andrew Yool, who collaborated in this study, discussed how the approach used during these model simulations could help optimise future search and recovery operations at sea by rapidly modelling oil spills in real-time. "By using pre-existing ocean model output we can estimate which areas could potentially be affected over weekly to monthly timescales, and quickly at low computing cost. This approach complements traditional forecast simulations, which are very accurate for a short period of time but lose their reliability on timescales that are required to understand the fate of the spill on the scale from days to weeks."

Provided by National Oceanography Centre, Southampton

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