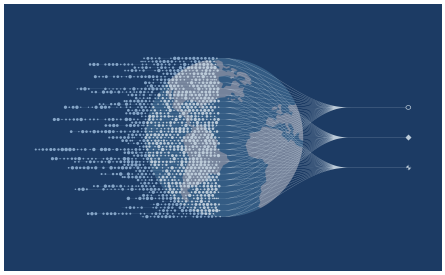

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# of dispersion of nuclear device explosion debris in the ocean

We present ocean modelling work aimed at detecting the debris from nuclear detonations in the ocean. By following the dispersion of near-surface warm pools of radionuclides from specific starting positions, we assess their likely spreading rates and pathways for some months after the explosions, enabling on-site monitoring or sample collection to take place with the best chance of detection. Joint work with the UK Ministry of Defence / Atomic Weapons Establishment would then enable the estimation of likely radionuclide concentrations and detectability timescales.

In the modelling program, tracers are inserted at specified locations into high-resolution (1/4° and 1/12°) simulations of the global ocean state over the last 50 years using the NEMO ocean model. Starting from the near-surface warm pools of contaminated water expected to be left behind after the explosions, we consider two cases: (i) that there is no interaction between the nuclear explosion and the sea floor and that the radionuclides all go into solution, so they are just advected and diffused without any settling, and (ii) the nuclear explosion interacts with the sea floor, and nuclear debris is adsorbed onto particulates raised from the seafloor that will gradually settle as they are advected and diffused.

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