



Modelling study of potential contamination of chemical warfare agents (CWA) from collapsing shipwreck hull in Skagerrak region

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It is well known, that after World War II, during the Potsdam Conference, the decision was made to demilitarize Germany, resulting in ammunition containing Chemical Warfare Agents (CWA) being dumped into the selected dumpsites area of the Baltic Sea. In some other region, such as Skagerrak, ammunition was loaded on ships that were sunk. Some ships have been damaged in sinking at sea, causing munitions to be scattered on the seabed, while others are still relatively intact (Tørnes et al., 2020). Some of the bulk ammunition has been observed to be opened by corrosion (Hansen RE, et al. 2019)

A few decades later, scientists wondered what consequences a leak from such dumped munitions could have on the marine ecosystem. Although, more than 70 years have passed since World War II, the impact of a potential leak of the CWA has not been properly assessed yet.

The main goal of this work is to assess pollution from a CWA release from a collapse of the entire shipwreck's hull in the Skagerrak area. As a main tool High Resolution Dispersion Model (HRDM, Jakacki et al. 2020) has been used for estimating the leakage from the wreck. The horizontal resolution of this model has been increased to about 10 meters for properly holding the release processes and currently, the domain of the model covers an area about 525 km². In our work we will take into account three chemical agents: sulfur mustard, Clark I and tabun. It is planned to make different scenarios that will represent different hydrodynamic conditions in shipwreck area. The calculations will also include the degradation processes of sulfur mustard and tabun, which are not stable in sea water.

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Tørnes J. Aa., Vik T., Kjellstrøm T.T., Leakage rate of the nerve agent tabun from sea-dumped munition, Marine Environmental Research, doi: 10.1016/j.marenvres.2020.105052

Calculations were carried out at the Academic Computer Centre in Gdańsk