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Remote sensing for risk analysis of oil spills in the Arctic Ocean

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The observed decrease in sea-ice and change from multi-year ice to first-year ice in the Arctic Ocean opens up for increased maritime activities. These activities include transportation, extraction of oil and gas, fishing and tourism. The expected growth in marine shipping in the Arctic region also increases the potential threat of accidents. Within this project we aim to provide information about the potential geographical distribution of oil pollution along prospective future shipping lanes in the Arctic.

Using a combination of remote sensing products and a risk analysis thought-process we develop a method that tracks a potential oil spill from release to clean-up. We use synthetic aperture radar (SAR) images to provide input data about the changes in the Arctic sea ice cover, including sea ice drift, sea-ice concentration and information on the wind patterns over open water at 10 meters height. Combining this data with information about ocean currents we make estimates on the redistribution and spread of oil pollution scenarios. Furthermore, the method includes the biogeochemical impact of the spill on the environment. Different size of oil spills and spills with different type of oil will be included and we will include ecotoxicological effects of low concentrations of oil for possible future economic assessment of the environmental impact.