### Background

Oil spills, for example due to tanker collisions and groundings or platform accidents, can have huge adverse impacts on marine systems. The impact of an oil spill at sea depends on a number of factors, such as spill volume, type of oil spilled, weather conditions, and proximity to environmentally, economically, or socially sensitive areas. Oil spilled at sea threatens marine organisms, whole ecosystems, and economic resources such as fisheries, aquaculture, and tourism in the immediate vicinity. Adequate response to an oil spill to minimize damage is therefore of great importance. The common response is to remove all visible oil from the water surface, either mechanically or by using chemicals to disperse the oil into the water column to biodegrade. This is not always the most suitable response to an oil spill as it could result in worse effects, or no chemical response may be needed thus possibly saving costs.

### Objective

Review advantages and disadvantages of using chemical treatments to reduce the impact of an oil spill in relation to the conditions of the spill and characteristics of the oil and of chemical treatment agents. This information is needed for a rational NEEBA (Net Environmental Economic Benefit Analysis).

### Results

For different spill scenario's and location of the oil (depicted in the fig.) the available chemical oil spill responses are reviewed. A summary is presented in the tables.

---

### Figure

Location and fate of oil according to different oil spill scenarios: (a) spilled from a tanker, the oil is inside a tanker and on the water surface. (b) spilled from a well at the seashore, the oil is in the water column and on the water surface. In time, the floating oil slick could (c) reach the coastline by wind and currents, or (d) disperse into the water column, where it could end up in the sediment and/or biodegrade.

### Tables

Options for application of chemical agents in response to the oil spill scenarios depicted in the figure. More info on limitations for use, advantages, and disadvantages are discussed in the review paper.

### Conclusions

- There are several combinations of oil type and environmental conditions for which application of oil spill chemicals will not be effective or even adverse.
- Preparing a NEEBA including crucial location-specific and season-dependent information is important to allow fast and rational responses to reduce the adverse effects of an oil spill in a cost-effective way.

### Remarks

- In a current research project (C-IMAGE) we are studying the consequences for oil fate, biodegradation and ecotoxicity with and without the application of oil spill chemicals.
- These results will be applied for a location-specific NEEBA to be prepared for making rational response choices for maximal reduction of the damage to ecosystem services.

### Reference


### Acknowledgements

The present study was partly funded by the North Sea Directorate of the Dutch Ministry of Transport, Public Works and Water Management.