



Biodegradation of oil and chemical dispersants in marine environment

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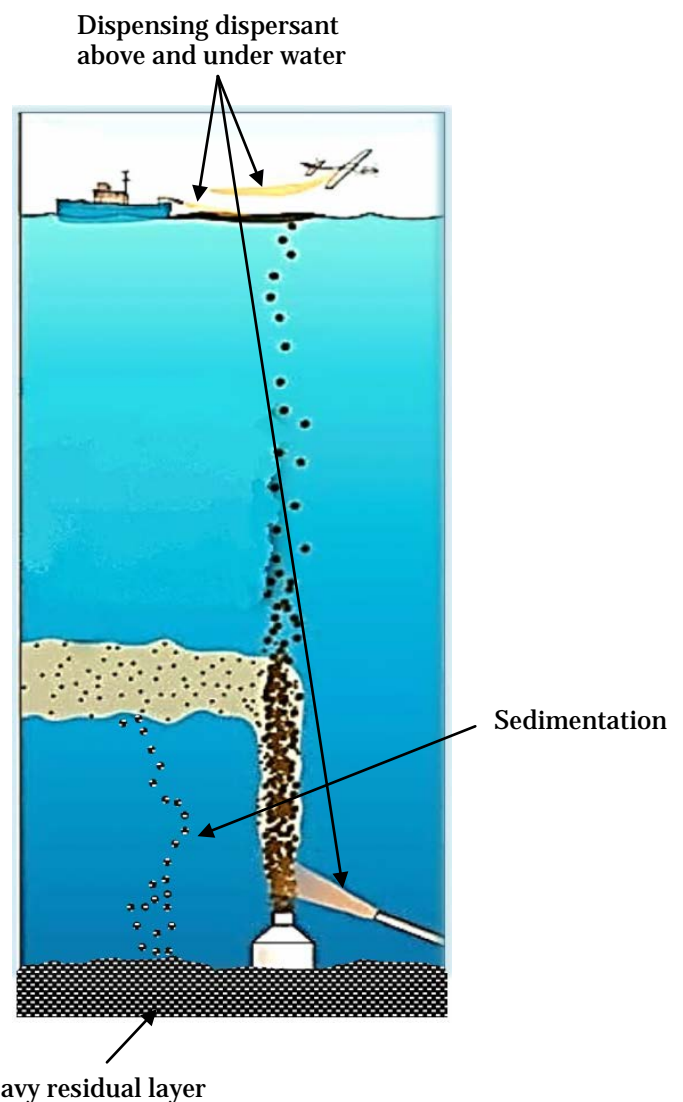
Motivation

Oil spills occur due to exploitation, transportation and storage of oil. These spills might have serious impact on the marine environment, both on marine ecosystems and economic resources such as fisheries, aquaculture, and tourism. To minimize damages adequate response to an oil spill is of great importance. Every oil spill is unique as parameters such as oil spill volume, type of oil, and marine environmental parameters vary in different locations. To optimize the effect of the response, we need to understand the processes after an oil spill and try to understand how these processes can be influenced to reduce and minimize the harmful effect of an oil spill. This project is part of the C-IMAGE (<http://cimage.rc.usf.edu/>) and the IPOP program TripleP@sea dealing with the consequences of the Deepwater Horizon oil spill in 2010.

Technological challenge

The aim of this research is to investigate how oil biodegradation is affected by dispersant (addition) and the presence of suspended solids. Mass transfer of contaminants (oil) and other essential compounds for biodegradation such as electron acceptors and nutrients will be studied. Especially the consequences of dispersant addition, the presence of suspended solids, and the sedimentation process on the formation of heavy residue layer (HRL) will be of interest. Environmental conditions (pH, Eh, electron donor/acceptor, salinity, etc.) will be varied to mimic the oil degradation and sedimentation on different locations. The results of this project will be used to improve the decision support system to select the most effective response

option. An overview of the processes is presented in the figure below.



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