

What happens to the waste after an oil spill clean up?

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Images of damaged coastlines, oily sheens, containment booms and endangered wildlife are part of every offshore oil spill.

And while a response team arrives and the clean up gets underway, UBC Okanagan researchers are now exploring how to effectively handle the [waste](#) created from that spill.

As part of a Multi-Partner Research Initiative sponsored by Fisheries and Oceans Canada, UBCO engineers are conducting new research to help the oil spill response industry and its regulators enhance response preparedness and efficiency in Canadian waters. A new research study, published recently in the *Journal of Hazardous Materials*, conducts a [lifecycle](#) assessment of oil spill waste mitigation and how to properly dispose of the refuse.

"We never want to experience any sort of spill, but when it happens we need to be prepared," explains Dr. Guangji Hu, a School of Engineering postdoctoral fellow and report co-author. "If a spill is on land, contaminated soil can be removed and remediated off-site, but that simply isn't feasible on the water."

Using a lifecycle assessment approach, the researchers developed a framework to help [decision-makers](#) effectively manage the waste of an offshore oil spill cleanup. The lifecycle assessment quantifies the environmental impacts associated with products and services at different points of their life cycle.

The lifecycle assessment compared various strategies for treating wastes—including its collection, segregation and sorting, [initial treatment](#), secure transportation of waste materials, resource recovery and the final disposal of all soiled materials—as well as the resulting environmental impacts, particularly on scenarios situated in Western Canada.

Addressing maritime oil spills is a complex process with many variables including type of oil, tides and water composition, explains Saba Saleem,

an engineering master's student with UBCO's Lifecycle Management Lab.

"Every spill is unique, but with this new tool we can identify the barriers, gaps and bottlenecks in oily waste management during an offshore oil spill response and enable decision makers to make more informed choices," says Saleem, who is also the study's lead author.

Several techniques such as mechanical containment and recovery, use of chemical dispersants, and in-situ burning are commonly used depending on various factors, such as oil slick characteristics, environmental conditions and the spill location.

"The aspect of oil spill recovery waste is one part of a response, but the management of this waste is the most complex, expensive and time-consuming component of recovery," says Dr. Hu.

The findings point to a strategy of combining centrifugation and landfilling as the most suitable remediation approach for low-impact offshore oil spill waste management, but also highlight the potential of other strategies based on the severity of the spill.

"Analyzing these challenging situations in a holistic manner through lifecycle assessment allows us to develop a framework that encompasses nearly every possible scenario of offshore oil waste management," Dr. Hu adds. "As a result, stakeholders have one more tool to address these spills quickly and effectively."

More information: Saba Saleem et al, Evaluation of offshore oil spill response waste management strategies: A lifecycle assessment-based framework, *Journal of Hazardous Materials* (2022). [DOI: 10.1016/j.jhazmat.2022.128659](https://doi.org/10.1016/j.jhazmat.2022.128659)

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