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Understanding Hazards of Petroleum and Spill Response Agents in Inland Spills

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Extended Abstract

Introduction

Preparing for and responding to inland oil spills requires an understanding of the hazards and ecological risks of using spill response agents in freshwater environments. The majority of oil products and spill response agents have insufficient toxicity data for assessing hazards of oil spills in inland spills because typically toxicity data are only available for a few marine species. A complicating factor is that the acute toxicity of oil spill response agents can vary over three orders of magnitude across product type and species, and even within specific categories of agents such as dispersants. In the U.S., listing of agents for potential use in oil spills currently only requires testing with two saltwater species, an estuarine fish (*Menidia beryllina*) and crustacean (*Americamysis bahia*). Additional information on the toxicity of oil spill response agents to freshwater organisms is critically needed to assess the hazards and relative risks of agents that may be used in inland spills.

Approach

The U.S. Environmental Protection Agency (EPA) is conducting research, advancing regulation, and is involved in international collaborations that are expanding our understanding of the hazards of petroleum and spill response agents in inland spills. Research includes determining the toxicity of unconventional oils such as diluted bitumens (dilbits) to both fresh and saltwater sediment dwelling organism and to water column organism including fish, crustaceans, and zooplankton. The hazards of surface washing and herding agents are being assessed in toxicity tests with a diversity of species including freshwater algae, zooplankton and fish. EPA is also investigating how in situ burning (ISB) of oil alters the toxicity and chemistry of petroleum using source oil and ISB residues from small and larger scale burns. EPA is proposing changes to the current U.S. National Contingency Plan (Subpart J) requirements for oil spill monitoring, agent testing, and product listing that are intended to reduce the hazards of oil spills in both inland and marine environments. EPA is involved in a number of international collaborations that are improving our understanding of the hazards of petroleum and spill response agents, including

round robin testing of low sulfur fuel oils, advanced chemical analysis of burn residues and other oils, and standardizing oil and agent toxicity testing protocols through a series of expert workgroups.

Conclusions

The results of EPA research and development will be used to assess the relative hazards of different classes of oil spill agents (e.g., dispersants compared to surface washing agents and herders), the sensitivity of freshwater organisms compared to saltwater organisms more routinely used in toxicity assessments, and if agent applications alter the intrinsic toxicity of oil. Results will be shared with the international science and risk management community through conferences, factsheets, and peer reviewed journal articles. Better understanding the hazards of oil and spill agents will provide for more informed regulation, preparedness, and spill response in inland waters.

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