



Characterizing Underwater Sound Risk Due to Dredging

Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

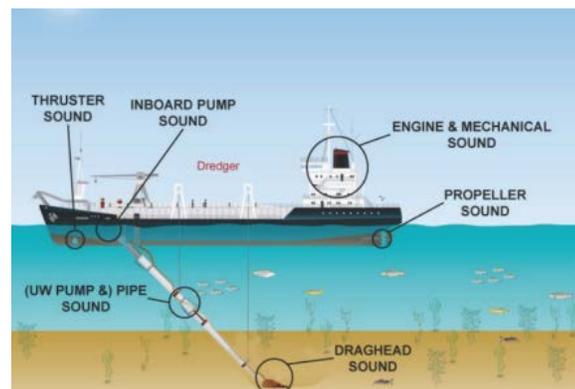
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Problem

Dredging activities, like many other activities, produces underwater sound. Concerns are increasing about the effects of underwater sound on aquatic life originating from dredging activities. There are multiple sources of underwater sound from natural and anthropogenic sources. Natural sounds include vocalizations of marine life, and wind waves, rain, and subsea volcanic and seismic activity. Anthropogenic sources of sound originate from construction of marine infrastructure and industrial activities such as drilling and subsea mining, military activities, and vessel movements, including dredging. An important data gap remaining is the impacts of dredging-induced sounds and the impacts of dredging-induced sound in the context of other anthropogenic sources.

Study Description

This project is documenting the research investigating the effects of dredging-induced underwater sound to aquatic life and developing a framework for how underwater sound risks to aquatic life can be assessed and managed. This research is needed so the effects of underwater noise emanating from dredging activities can be more completely understood and thus dredging projects can be appropriately managed to reduce such risks to marine and other aquatic life. The potential impacts of the recently released NOAA National Marine Fisheries Service "Technical Guidance for Assessing the Effects of Anthropogenic Noise on Marine Mammal Hearing," will also be ascertained. While the guidance initially considers effects to select marine mammal species, it is expected to be updated in future years to include additional receptors and sound sources (including dredging).

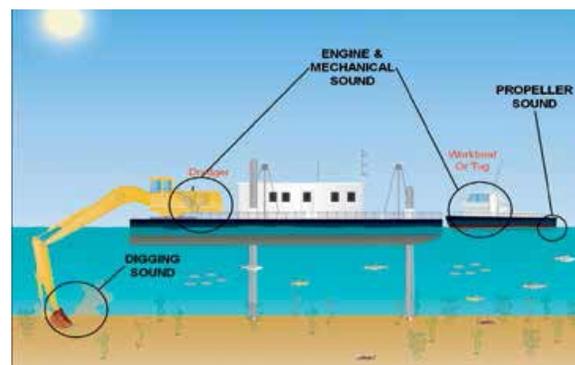


Products

This project will provide a literature review of the available studies to more completely understand the effects of dredging-induced underwater sound on aquatic life. The project will also develop a framework for assessing the effects of underwater sound so that this stressor can be effectively managed in practice by Corps Districts who are being subject to dredging restrictions due to underwater sound issues. These findings will help direct future dredging practices at Corps Districts. (Image of a trailing suction hopper dredge by WODA, 2013).

Summary

Research on the effects of underwater sound on aquatic life has increased over the last decade, but there are still many unanswered questions, especially with regards to the significance of sound risks due to dredging activities. In particular, the extrapolation of effects on an individual to effects at the population or community level is highly uncertain. In situations when sound alone does not pose unacceptable risk at the population level, these combined with factors such as fishery by-catch, pollution and other stressors may yield adverse effects. It is therefore important to develop a framework whereby the assessment of various sources of underwater sound can be made to improve our ability to manage such stressors. Understanding the effects of underwater sound originating from dredging and other anthropogenic activities will allow for USACE Districts to apply this approach at other dredging sites where underwater sound is a concern. The USACE dredges approximately 300 million cubic yards of sediment annually so the framework developed has significant potential to be used by multiple Corps Districts, thereby providing an approach that can be used as part of ongoing dredging activities. (Image of a backhoe dredge by WODA, 2013).



Balancing operational and environmental initiatives and meeting complex challenges of dredging and dredged material placement in support of the navigation mission.

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