

Staff Summary of:
“Ozone, Seawater and Aquatic Nonindigenous Species: Testing a Full-Scale Ozone
Ballast Water Treatment System on an American Oil Tanker”

This report summarizes research conducted on the Tonsina using ozone gas to destroy the foreign organisms found in ballast water. Shipping is a major route for nonindigenous species introductions, and Port Valdez is the largest receiver of ballast water in the United States. This research was sponsored in large part by BP Exploration, Inc. and conducted by federal, state, and private researchers.

The research involved testing a prototype system to produce ozone gas on the ship and then “bubble” it through the ballast water on the Tonsina. Ozone has been used widely as a disinfectant in water. When the seawater in the tanks was ozonated, toxic chemical reactions occurred from the ozone. After a 10-hour dose of ozone, the toxicity generated was enough to kill most of the bacteria, zooplankton, and phytoplankton. Shore crabs and amphipods proved to be resistant to the introduction of ozone.

This study also compared the ozone results to ballast water exchange studies. The ballast water exchange experiments were significantly less efficient at removing the organisms, with an average removal rate of 64%.

The next phase of this research is already underway. The goal is to develop a more portable and cheaper ozone system for the tankers. The Tonsina has already been fitted with sample tubes to allow better scientific monitoring of the experiments. More work will take place in the laboratory and on the Tonsina this fall.

The Scientific Advisory Committee was encouraged by this report and the development of this tool to combat non-indigenous species. We will continue to monitor this research.