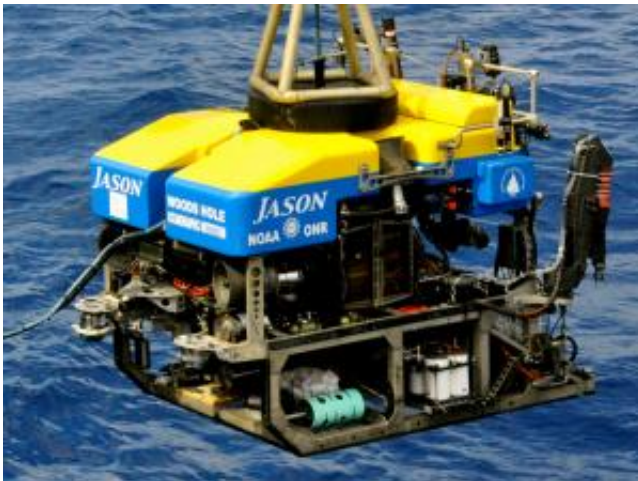


# Researchers continue to investigate effects of military munitions

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Woods Hole Oceanographic Institution's ROV Jason will be used during this expedition. Credit: WHOI

On October 21, the UH Mānoa School of Ocean and Earth Science and Technology (SOEST) will begin the final phase of an Army-funded research effort to further investigate sea-disposed military munitions. This research will take place south of Pearl Harbor at an area designated by the U.S. Department of Defense (DoD) as the Hawaii-05 (HI-05) site.

HI-05 is a deep-water site containing both conventional and chemical military munitions. (Consistent with an internationally accepted practice at the time, DoD disposed excess, obsolete or unserviceable munitions, including chemical warfare materiel, in ocean waters off the U.S. prior

to 1970, at which time DoD discontinued this practice. Congress effectively prohibited sea disposal of waste materials into the ocean in 1972.) UHM is undertaking this research in partnership with the U.S. Army, Woods Hole Oceanographic Institution, and Environet Inc., a local environmental consulting firm.

This effort is a continuation of the Hawaii Undersea Military Munitions Assessment (HUMMA) that used towed sidescan sonars, the Hawai'i Undersea Research Laboratory (HURL) submersibles and remotely operated vehicles (ROVs) to locate and assess the effects of the [ocean environment](#) on sea-disposed munitions and sea-disposed munitions on the ocean environment and those who use it. Four previous field programs imaged thousands of conventional munitions and over a hundred suspected chemical munitions. Additionally, these efforts collected sediment, water and biological samples within two meters of conventional and chemical munitions.

Analyses of sediment samples collected less than two meters from suspected chemical munitions indicated the presence of mustard agent and its degradation products at levels of less than five parts per million. Shrimp scavenging nearby and sea stars living directly on top of suspected chemical munitions exhibited no adverse impact from munitions constituents. The upcoming program will focus on these munitions to determine if there have been any changes in biota, sediment and water chemistry.



Water, sediment and biological samples will be collected near munitions. Credit: UHM/HUMMA

"As the Army team embarks on this final phase of the Hawaii Underwater Military Munitions Assessment, the Army believes this research will close additional knowledge gaps about the potential impact of sea disposed munitions on the ocean environment and those people that use it. One of the key aspects of this research will be to test a different, potentially less expensive, methodology for assessing underwater sites where munitions are present. The expected results will benefit not only the DoD, but the international community," said Hershell Wolfe, Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health.

During this phase, the UH Research Vessel Kilo Moana will deploy the Woods Hole Oceanographic Institution's Jason-2 ROV to collect sediment and biological samples adjacent to selected munitions and at control sites for laboratory analysis. Analysis of the samples for chemical agents and their degradation products (munitions constituents) will be performed on board the ship. This helps ensure personnel safety and that only samples safe for shipment are sent to commercial laboratories for further analysis. The U.S. Army's Edgewood Chemical and Biological Center is providing chemical safety and analytical support

for this effort.

"HUMMA has dramatically increased our understanding of what is happening at historical sea disposal sites," stated Dr. Margo Edwards, UH Principal Investigator. "We've been able to bound the areas affected, characterize the method of disposal to focus on specific types of munitions, and measure the infiltration of munitions constituents into the surrounding sediments at levels on the order of parts per million. We have also collected specimens living in direct contact with the munitions, but have not found evidence to suggest that the munitions constituents are adversely affecting them. In contrast, our research shows that several types of animals use the munitions as habitats."

"We have been sharing the methods developed and results discovered by UH at international meetings in support of an open dialogue for a global problem," said Edwards. In that spirit, the upcoming expedition will host observers from Australia who will gain direct experience with the approaches and tools used to investigate sea disposal in Hawaiian waters. These international partnerships support a primary goal of UH's Hawaii Innovation Initiative (HI2) – broadly transitioning our research and knowledge to enhance global understanding.

A special peer-reviewed, public journal describing the results from HUMMA and comparing them with findings from the Baltic Sea is scheduled for publication by the end of 2014. The Army will make its report of this research publicly available once the data has been evaluated and the report has been approved. The Army anticipates this report being released in 2015.

**More information:** For further information about the project, see [www.hummaproject.com](http://www.hummaproject.com).

Provided by University of Hawaii at Manoa

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