



Ballast Water & the Chesapeake Bay

www.mpasafepassage.org

Keeping unwanted critters out of the Chesapeake Bay has become a goal of major importance for water quality managers as well as for those who use the Bay for commerce.

Organisms that don't belong in the Bay—known as non-native aquatic species—can cause extensive ecological and economic damage. Two examples are the Rapa whelk from Asia, which eats oysters and clams, and the bacteria *Vibrio cholerae*, which can cause cholera in humans.

These and other non-native species arrive in the Bay primarily in the ballast water carried by large ocean-going ships. Foreign ports send approximately 1,500 commercial ships to the Bay each year, mostly from Asia and Europe. According to the Smithsonian Environmental Research Center, the Port of Baltimore receives more ballast water—both domestic and foreign—than any other port on the Atlantic Coast and ranks seventh in the entire nation.

This water has brought many of the 150 non-native aquatic species to the Bay, some of which have wreaked havoc on the ecological balance of the estuary.

Combating Non-Native Species in Ballast Water

Invasions of non-native aquatic species are a worldwide problem, and the international shipping industry has worked on a variety of strategies to manage and reduce their transportation through ballast water.

A ballast water treatment system usually employs ultraviolet light, filters and chemicals to destroy any invasive species that have been inadvertently transported in the



The Maritime Environmental Resource Center uses the M/V Cape Washington, located in the Port of Baltimore, to test ballast water treatment systems.

ship's ballast tanks. Treatment usually takes place at entrance to the ship's destination. Ballast water is directed from the holding tanks into the treatment system. The ballast water must then meet standards set by the International Maritime Organization before being discharged from the ship. The United States is currently developing a set of discharge standards that are even more stringent than the existing ones.

Designing effective treatment systems, however, is a challenge. Every water body is different, with different types of organisms, so treatments that work under one set of circumstances may not work elsewhere. In the Chesapeake, for example, water temperature varies greatly by season, from a low of about zero degrees centigrade to a high of 32 degrees. Salinity is also highly variable, from full-salinity ocean water at the mouth of the Bay to fresh water just north of the Port of Baltimore. Systems to effectively treat ballast water must account for these variations.



Test facilities of the Maritime Environmental Resource Center, onboard the M/V Cape Washington in the Port of Baltimore.

The Maritime Environmental Resource Center

To address ballast water in the Chesapeake Bay, the Maryland Port Administration entered into an agreement in February 2008 to create the Maritime Environmental Resource Center (MERC).

The Center is a cooperative effort between the Maryland Port Administration and the University of Maryland Center for Environmental Science, as well as the U.S. Maritime Administration and the National Oceanic and Atmospheric Administration. Other partners include the Smithsonian Environmental Research Center, University of Maryland College Park, American Bureau of Shipping, and the shipping industry.

The Maritime Environmental Resource Center will provide test facilities, information, and decision-making tools to address ballast water issues facing the international maritime industry, especially as they impact the Chesapeake Bay. The objectives are to:

- Provide technology developers and vendors with facilities and expertise for pilot-scale and shipboard testing of ballast water treatment systems;
- Help shipbuilders and shipping lines select the most appropriate ballast wa-

ter treatment options for particular sizes and types of vessels; and to

- Speed the adoption of new treatment technologies by removing as much uncertainty as possible from the emerging market.

The Maritime Environmental Resource Center facilities include real-world ballast systems on two U.S. Maritime Administration vessels located in the Port of Baltimore—the *M/V Cape Washington* and *M/V Cape Wrath*. In addition, a converted barge with four large ballast tanks will serve as a mobile test platform to evaluate the performance of various treatment systems under the diverse conditions in the Bay.

The creation of the Maritime Environmental Resource Center is partly due to the leadership of Maryland Representative Elijah Cummings in the U.S. Congress. To provide some permanence, the Maryland Port Administration entered into a five-year partnership agreement and provided funding to launch the Center.

The Center's many partners aim to make it a reliable asset in preventing the introduction of invasive species into the Chesapeake Bay's fragile ecosystem. For more information, visit www.maritime-enviro.org. ■



A testing team collects and analyzes water samples to determine how well shipboard treatment systems remove or kill non-native organisms found in the ballast water of ships.