

Issue Brief

Issue: U.S.EPA approval needed of the Biotic Ligand Model (BLM) for the marine environment to ensure accurate measurement of the effect of copper anti-fouling paints.

Background

From recreational boats in the water for a season to commercial ships that are in the water year round, antifouling paint on the underwater part of the boat is fundamental to the proper maintenance and performance of almost all watercraft. The uncontrolled growth of marine organisms on boats significantly degrades performance, increases fuel consumption, contributes to the spread of aquatic invasive species and can even lead to a vessel sinking in extreme cases.

Many antifouling paints contain cuprous oxide, a form of copper, as the licensed pesticide that is their primary active ingredient. These antifouling paints, approved by the U.S. Environmental Protection Agency (U.S.EPA), are designed for the copper to gradually leach into the water from the boat. Paints containing copper are currently the most effective, affordable and available antifouling products for all vessels, including recreational boats.

The U.S.EPA has identified several California water bodies as impaired by copper (303(d) listed.) This has led Regional Water Quality Control Boards (RWQCBs) with authority over San Diego's Shelter Island Yacht Basin and Los Angeles's Marina del Rey to set Total Maximum Daily Loads (TMDLs) for copper. In order to meet the TMDLs, they have proposed to ban the use of copper antifouling paints on recreational boats. Newport Harbor is considering setting a copper TMDL as well, with the possibility of a copper antifouling paint ban being a likely outcome.

The U.S.EPA has established a toxicity standard of dissolved copper in salt water of 3.1 µg/L. Within this standard, however, is the acknowledgement that site-specific testing of water bodies should be performed to determine if local water chemistry or other factors mitigate the toxicity of copper. The EPA currently recognizes only one test protocol for salt water, the Water Effects Ratio (WER), an extremely laborious and costly test. In fact, the WER test was conducted in San Francisco Bay and while copper levels in the area were three times greater than the 3.1 µg/L standard, the results showed no toxic impacts on the marine environment¹. This led the U.S.EPA to remove all of San Francisco Bay from the 303(d) list of impaired water bodies for copper.

WER testing is prohibitively expensive for the numerous other marine harbors and water bodies in California. The U.S.EPA has developed another test protocol called the **Biotic Ligand Model (BLM)** that is considerably less costly. The U.S.EPA has approved the BLM for use in fresh water (<http://www.epa.gov/wqs-tech/copper-biotic-ligand-module>.) U.S.EPA approval of the BLM for use in marine waters is still pending however.

Several of the current California watershed management TMDL plans assume that the major source of copper is from recreational boats and use copper antifouling paint bans as the proposed

¹ [RWQCB-SF Resolution R2-2007-0042](#)

method to reduce the amount that enters the water in the basins. However, since dissolved copper rapidly binds with organic material most of its toxic effects are rendered inert. Use of the BLM would determine what actual level of copper must be reached in a particular water body before toxicity to benthic organisms occurs.

There is good reason to believe that harbors and water bodies in the rest of California will prove to be no more impaired from copper than San Francisco Bay. Unfortunately, the harbor authorities and marina operators where limits on copper antifouling paint are proposed have not been able to use the reliable, affordable **BLM** tool to demonstrate the actual impact of copper in their areas.

The Recreational Boaters of California and BoatU.S encourage the U.S. EPA to expedite the approval of the Biotic Ligand Model for marine waters. This will allow for accurate measurement of the copper's effect on particular locations and provide RWQCBs with information to determine if bans on copper antifouling paints are needed to protect water quality.