



University of California Delivers

Agricultural Experiment Station and Cooperative Extension Working for Californians

Staying Afloat with Nontoxic Antifouling Strategies for Boats

The Issue

Boat owners use copper paints to control hull fouling that slows sailboats and increases powerboat fuel consumption. Copper leached from these paints harms marine life. The Regional Water Quality Control Board's Total Maximum Daily Load regulations require 2,000 San Diego Bay boat owners to cut 76 percent of copper discharges by 2022. In addition, regulatory agencies are sampling marinas statewide for copper. Boat owners and businesses need effective alternatives to maintain California's \$16 billion per year boating business, while protecting water quality.



Nontoxic, ceramic-epoxy hull coating in very good condition after 13 months

What has ANR done?

Marine advisor Leigh Johnson and program representative Jamie Gonzalez conducted San Diego Bay field trials of nontoxic epoxy and ceramic-epoxy hull coatings in 2002 and 2003. The nontoxic coatings were placed on two powerboats and two sailboats. The coatings were cleaned twice monthly by professional hull cleaners who reported coating condition, fouling level, and aggressiveness of cleaning tools and effort. All the coatings performed well and were in good to very good condition after 13 months. Nontoxic coatings were cleaned 26 times per year (twice as often as is typical for cleaning copper paint on San Diego Bay boats). Frequent cleaning allowed hull cleaners to use gentler tools and less effort, reducing damage to the coatings. Johnson and Gonzalez have extended their findings to 3,500 boat owners, boating and coating businesses, agency staff, policy makers and scientists. For details, see their technical report, "Staying Afloat with Nontoxic Antifouling Strategies for Boats" on their Web site - <http://seagrant.ucdavis.edu>.

The Payoff

Non-toxic Strategies Pay Off in the Long Run

The nontoxic coatings cost more than copper paint to apply and keep clean, but the cost is offset by the nontoxic coatings' longer service life. Boat owners who participated in the study were asked in 2006 about long-term performance of the nontoxic coatings. One owner who had an epoxy coating on his boat for eight years (it was applied before the study began) reported the coating was still in good condition. Nontoxic coatings remained on the other three boats after 4.5 years and the owners were satisfied. In contrast, copper paints must be replaced after 2 to 3 years in San Diego (yearly in some parts of the U.S.). Long-lasting, nontoxic epoxy and ceramic-epoxy coatings will enable San Diego Bay boat owners to avoid cost increases from complying with new regulations, and reduce discharges of toxic, heavy metals into this sensitive ecosystem. Coastal boat owners in other areas can help improve water quality without incurring extra costs by using nontoxic coatings.

Contact

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