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### SUBMITTAL

TO: Co-chairs and Members  
Hawaii Invasive Species Council  
State of Hawaii

FROM: Julie Kuo, Ballast Water and Biofouling Coordinator, Department of Land and  
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SUBJECT: Requesting a resolution supporting evaluation and implementation of best  
management practices and technologies for vessel biofouling management and  
collaboration by HISC agencies in the development of biofouling management  
regulations for Hawaii harbors

### Background

The Hawaii Interagency Biosecurity Plan prioritizes the need for managing the risk of aquatic invasive species (AIS) introduction and spread stemming from biofouling, and names the Department of Land and Natural Resources (DLNR) as the lead agency, in coordination with the Department of Health (DOH) and the Department of Transportation (DOT).

Vessel biofouling is the growth of marine species on the hulls and in the niche areas of vessels. A recent report conducted by the Smithsonian Environmental Research Center (SERC) found that up to 78% of the marine alien algae and invertebrate species in Hawaii waters arrived through this vector, and that this unregulated pathway remains high risk for the arrival and spread of invasive marine species. Many vessel operators take actions to mitigate or remove the growth of biofouling, including scraping vessel hulls during dry-dock, use and re-application of anti-fouling coatings during dry-dock, as well as conducting “underwater hull husbandry”, via in-water cleaning activities several times each year for safety, fuel efficiency, and preventative maintenance between dry-dockings. Furthermore, SERC discussed in their report that vessels that followed consistent and frequent management of vessel biofouling, utilizing in-water cleaning operations on the microfouling layer (i.e., algae, slime layer), actually posed minimal biosecurity risks and water quality concerns. However, when not removed, the microfouling provides the substrate that enables larger, encrusting organisms to settle, which increases biosecurity risk, thereby increasing difficulty in the removal of fouling organisms without impact

to the anti-fouling coating. Fouling organisms also decrease fuel efficiency, and may impede the safe operation of the vessel. SERC also assessed the current availability of technologies and possible biofouling thresholds that could be used in tandem with a permit system and regulations to mitigate these risks while protecting water quality. These new technologies use magnetic suction heads that remove biofouling organisms without abrading the vessel coating. The water and material suctioned from the vessels is captured and treated to levels that meet or exceed water quality discharge standards in several countries and jurisdictions.

### Discussion

Though in-water cleaning provides clear biosecurity benefits and can be beneficial for vessel operations, DOT currently prohibits all in-water cleaning in Hawaii State harbors based on DOH water quality standards found in HAR § 11-54-4. The standards specifically state that:

- § 11-54-4 Basic water quality criteria applicable to all waters. (a) All waters shall be free of substances attributable to domestic, industrial, or other sources of pollutants, including:
1. Materials that will settle to form objectionable sludge or bottom deposits;
  2. Floating debris, oil, grease, scum, or other floating materials;
  3. Substances in amounts sufficient to produce taste in the water or detectable off-flavor in the flesh of fish, or in amounts sufficient to produce objectionable color, turbidity, or other conditions in the receiving water;
  4. High or low temperatures, biocides, pathogenic organisms, toxic, radioactive, corrosive, or other deleterious substances at levels or in combinations sufficient to be toxic or harmful to human, animal, plant, or aquatic life, or in amounts sufficient to interfere with any beneficial use of the water;
  5. Substances or conditions or combinations thereof in concentrations which produce undesirable aquatic life; and
  6. Soil particles resulting from erosion on land involved in earthwork, such as the construction of public works; highways; subdivisions; recreational, commercial, or industrial developments; or the cultivation and management of agricultural lands.

In addition, the water quality standards set both acute and chronic toxicity levels for copper, an element that was previously used in vessel anti-fouling paint, in salt water at 2.9 micrograms per liter.

HRS § 187A-32 mandates that DLNR address the introduction and movement of AIS through ballast water and hull fouling (biofouling) and authorizes the department to establish an interagency team to address these concerns and conduct rulemaking to mitigate the risk. DLNR has not yet developed rules related to biofouling, which will also require amendments to DOH administrative rules regarding water quality standards. Many (but not all) types of non-recreational vessels are voluntarily providing information including hull husbandry and biofouling management data with mandatory ballast water reporting forms. While this allows DAR to assess risk and take preventative actions when necessary, there are no rules or procedures for safely removing biofouling other than during dry-dock. The Environmental Protection Agency regulates vessel discharges through the Vessel General Permit (VGP), which allows vessels to discharge in compliance with the National Pollution Discharge Elimination System. The VGP requires that vessel owners/operators must minimize the transport of attached living organisms when traveling into U.S. waters from outside the U.S. economic zone or between Captain of the Port (COTP) zones. The VGP also requires that:

[v]essel owners/operators who remove fouling organisms from hulls while the vessel is waterborne must employ methods that minimize the discharge of fouling organisms and antifouling hull coatings.

The DOH water quality standards listed in HAR § 11-54-4 are included in the section 6 Hawaii state certification of the VGP and, therefore, become an integral part of the VGP in Hawaii harbors.

The water quality standards and VGP are extremely valuable for protecting the environment, and many vessel operators now use the new coatings which do not rely on copper and other toxic metals to reduce fouling. Most vessels also schedule dry-docking to re-apply coatings and conduct work on often inaccessible niche areas. To meet the international demand for safely mitigating biofouling between expensive and infrequent dry-docking, there are a variety of relatively new in-water cleaning technologies available. Over the past ten years, New Zealand, and more recently Western Australia, have developed and used testing protocols for evaluating the efficacy and environmental compliance for the approval of these in-water cleaning technologies, and have developed regulatory frameworks for how and when they can and should be used.

The U.S. is also moving forward on assessing these technologies, building from the work of New Zealand and Australia. A number of these in-water cleaning systems will be tested and evaluated by the Alliance for Coastal Technologies (ACT) and Maritime Environmental Resource Center (MERC), in collaboration with SERC, the US Naval Research Laboratory (NRL), California States Land Commission (CSLC), US Maritime Administration (MARAD), and Maryland Port Administration (MPA), in Baltimore, Maryland in the spring of 2018, and in Long Beach, California in the fall of 2018. Hawaii representatives have been invited to participate in these tests. As all current test sites are located in temperate waters, there is interest in adding Hawaii to the sites used for equipment evaluation in order to assess performance in areas with different physical parameters such as warmer water.

Because the issue of biofouling and in-water vessel cleaning relates to the mandates of DLNR (in the regulation of aquatic organisms introduced by biofouling), DOH (in the regulation of water quality standards) and DOT (in the regulation of activities at harbors), the Hawaii Invasive Species Council (HISC) may be an appropriate forum for developing mutually agreeable processes for the removal of microfouling on vessels and overseeing the addition of Hawaii to the ACT evaluation of in-water vessel cleaning technologies, which may inform future permissible cleaning activities in Hawaii harbors.

#### Legal Authority

- HRS 187A-32: Designates DLNR as the lead state agency for preventing the introduction and carrying out the destruction of alien aquatic organisms through the regulation of ballast water discharges and hull fouling organisms. Authorizes the department to establish an interagency team to address these concerns and adopt rules.
- HAR 11-54-4: Establishes water quality standards set by DOH, regulating the presence of materials in water.
- HRS 266-1: Places all vessels within the commercial harbors and roadsteads under the care and control of DOT.
- HRS 194-2 (a): Establishes the HISC for the purpose of cabinet-level coordination and planning among state departments, federal agencies, and international and local initiatives

- HRS 194-2 (a)(2): Advise, consult, and coordinate invasive species-related efforts with and between the departments of agriculture, land and natural resources, health, and transportation, as well as state, federal, international, and privately organized programs and policies.

Recommendation:

1. That the HISC adopt a resolution, substantially similar to the attached draft resolution, supporting evaluation and implementation of best management practices and technologies for vessel biofouling management and collaboration by HISC agencies in the development of biofouling management regulations for Hawaii harbors, in order to:

- a. Direct staff at relevant agencies to participate in an interagency team to review current findings and risk for the in-water cleaning of the slime layer on certain vessels, and create a process and conditions to allow low risk vessels to apply for an in-water cleaning permit;
- b. Participate in the planning and assessment for the Maryland and California in-water cleaning technology research;
- c. Participate as a host for the third phase of testing for one or more of these technologies in Hawaii in Spring 2019 to focus and maximize expert assistance on Hawaii, and ensure that local needs are met.

Attachments:

1. Draft HISC Resolution 18-1: Supporting evaluation and implementation of best management practices and technologies for vessel biofouling management and collaboration by HISC agencies in the development of biofouling management regulations for Hawaii harbors