

Commercial ship in-water cleaning and comprehensive biofouling management in California



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Problem: Vessel Biofouling



Hull biofouling = ↑ Drag = ↑ Fuel consumption = ↑ \$\$\$\$



Solution: Biofouling Management

Proactive Management



Reactive Management



What is currently being done to manage biofouling?

Hull Husbandry Reporting Form

Print

California State Lands Commission
 Marine Invasive Species Program
 Hull Husbandry Reporting Form
 Public Resources Code – 71205(e) and 71205(f)
 June 6, 2008

Part I: Reporting Form

Vessel Name:
Official / IMO Number:
Responsible Officer's Name and Title:
Date Submitted (Day/Month/Year):

Hull Husbandry Information

1. Since delivery, has this vessel ever been removed from the water for maintenance?
 Yes No

a. If Yes, enter the date and location of the most recent out-of-water maintenance:

Last date out of water (Day/Month/Year):	
Port or Position:	Country:

b. If No, enter the delivery date and location where the vessel was built:

Delivery date (Day/Month/Year):	
Port or Position:	Country:

2. Were the submerged portions of the vessel coated with an anti-fouling treatment or coating during the **out-of-water** maintenance or shipbuilding process listed above?

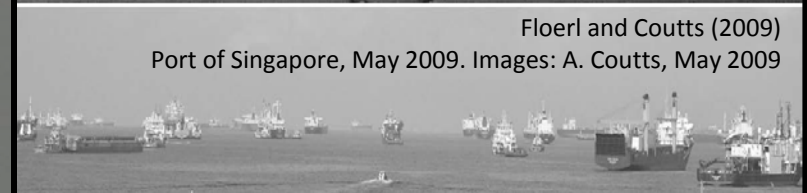
Yes, full coat applied <input type="checkbox"/>
Yes, partial coat <input type="checkbox"/> Date last full coat applied (Day/Month/Year):
No coat applied <input type="checkbox"/> Date last full coat applied (Day/Month/Year):

3. For the most recent **full coat** application of anti-fouling treatment, what type of anti-fouling treatment was applied and to which specific **sections** of the submerged portion of the vessel was it applied?

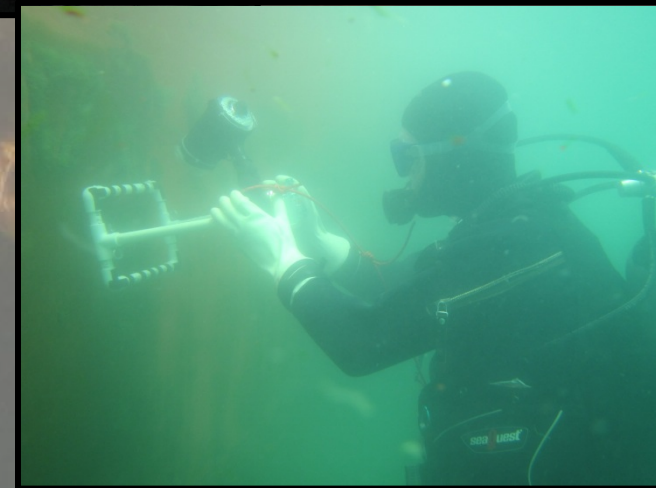
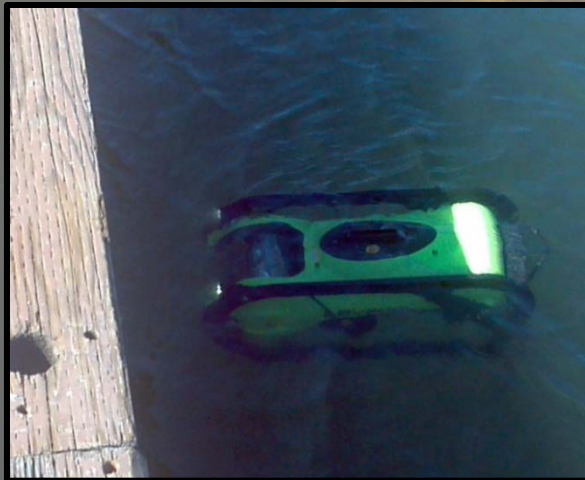
Manufacturer/Company:
Product Name:
Applied on (Check all that apply): Hull Sides <input type="checkbox"/> Hull Bottom <input type="checkbox"/> Sea Chests <input type="checkbox"/> Sea Chest Gratings <input type="checkbox"/> Propeller <input type="checkbox"/> Rope Guard/Propeller Shaft <input type="checkbox"/> Previous Docking Blocks <input type="checkbox"/> Thrusters <input type="checkbox"/> Rudder <input type="checkbox"/> Bilge Keels <input type="checkbox"/>



Floerl and Coutts (2009)
 Port of Singapore, May 2009. Images: A. Coutts, May 2009



Biofouling Research



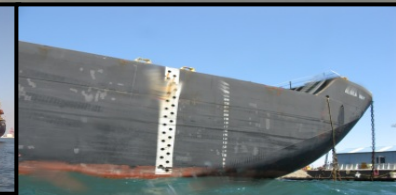
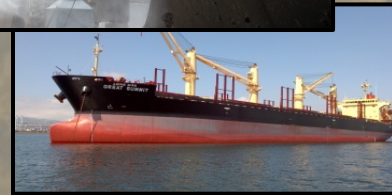
Focused on Ships, not boats



- Operational profiles
- Drag-induced fuel consumption
- Biofouling management strategies
 - Coating types
 - Biocide delivery mechanisms
 - In-water cleaning frequency

2007 Amendments to CA Marine Invasive Species Act (AB 740)

- Statutory mandate to develop biofouling management regulations
- Fill information gaps
 - Hull husbandry practices of vessels operating in California
 - Patterns of biofouling among ships and ship types
 - Patterns of biofouling among different surfaces of a ship



Approach: Comprehensive Biofouling Management

Proactive Management

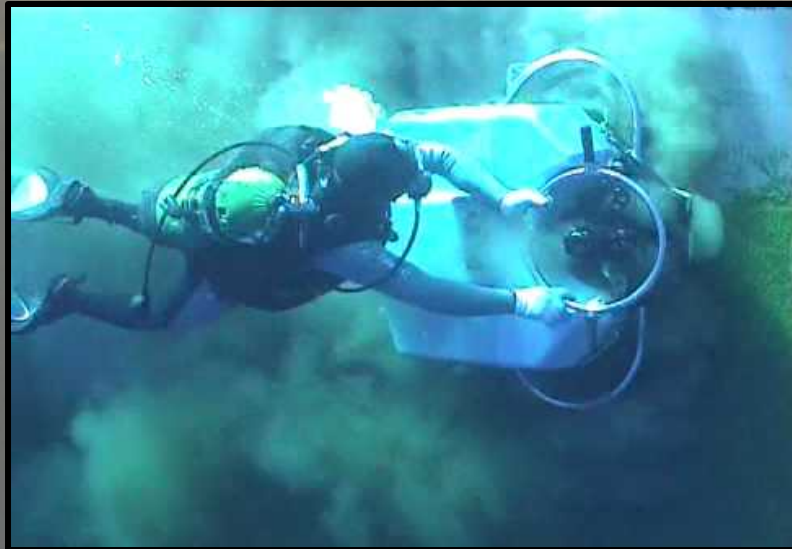
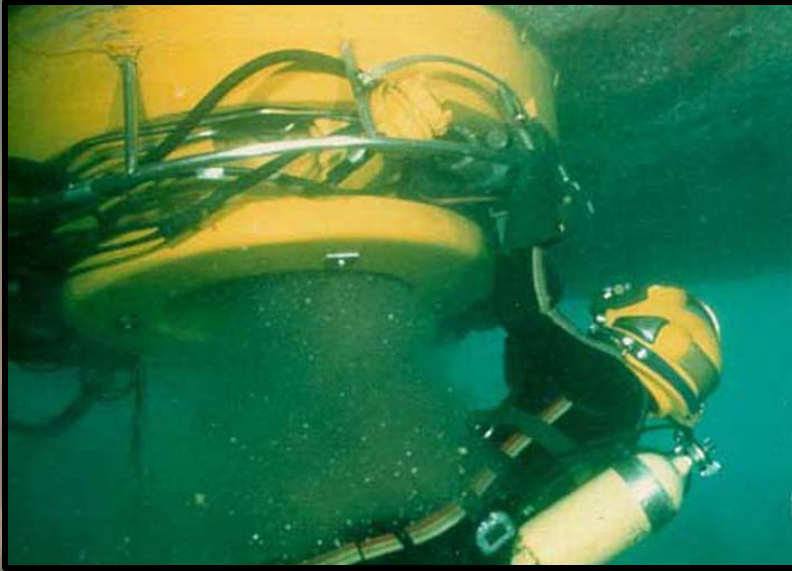


Reactive Management

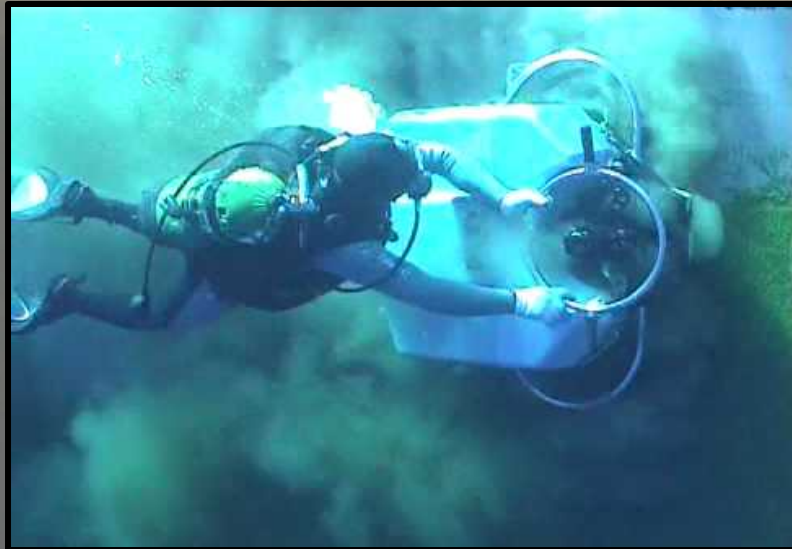
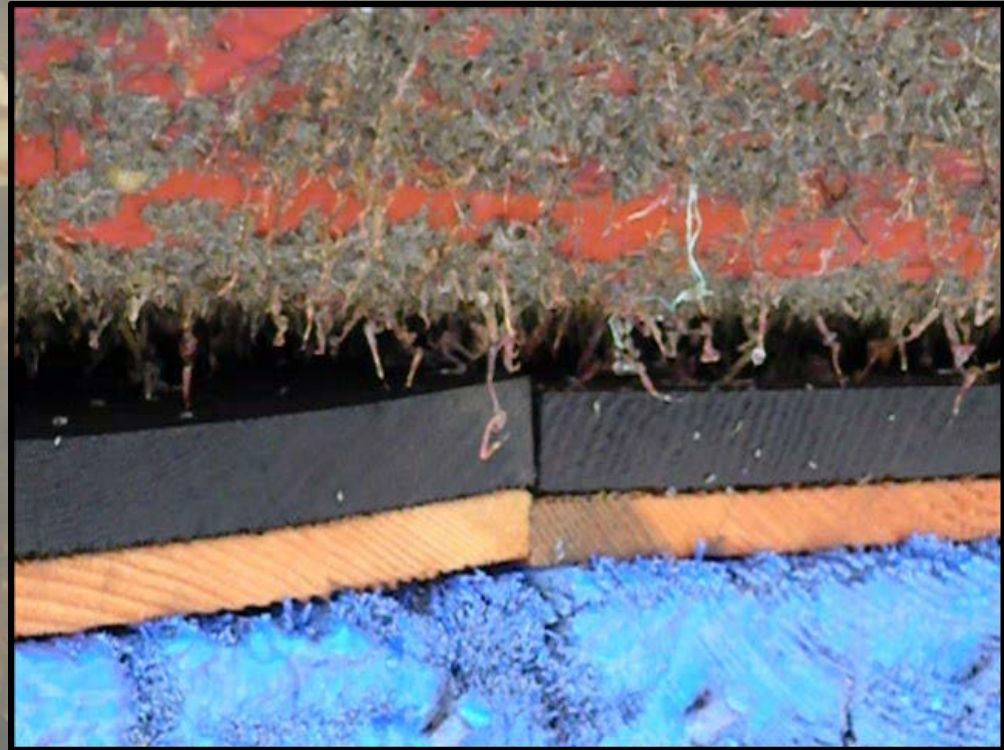
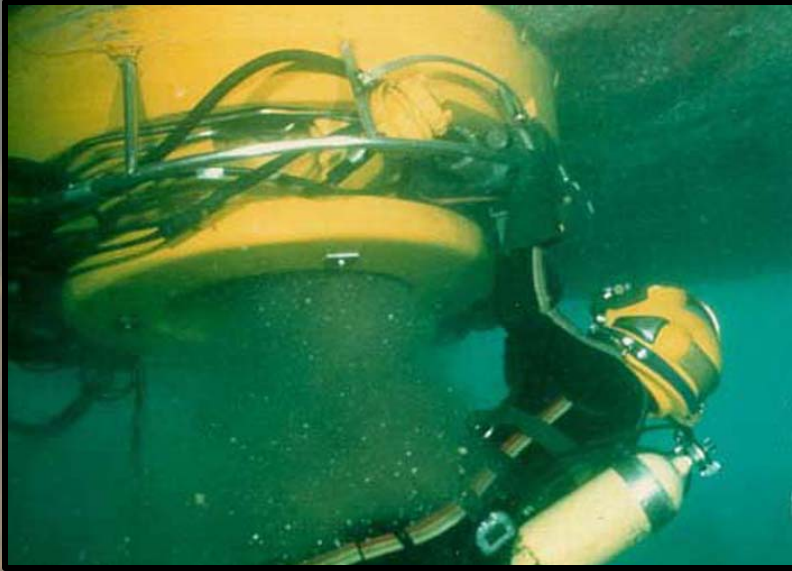


- Both are important components
- Concerns with in-water cleaning

What's the Concern? Nonindigenous Species

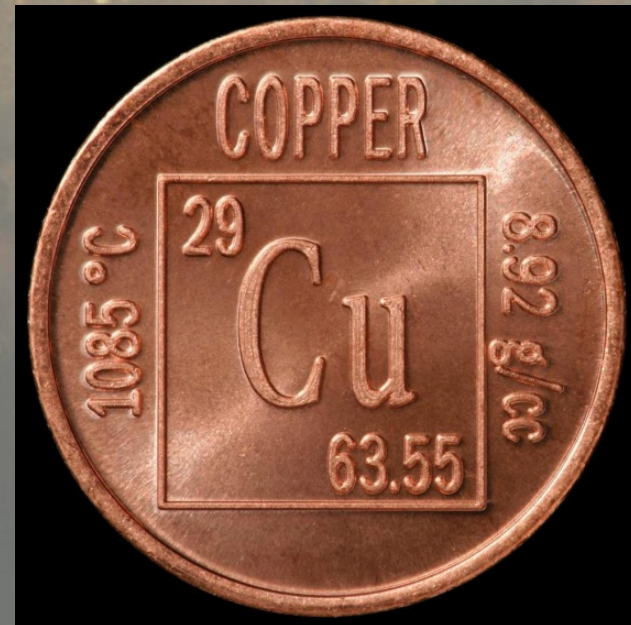
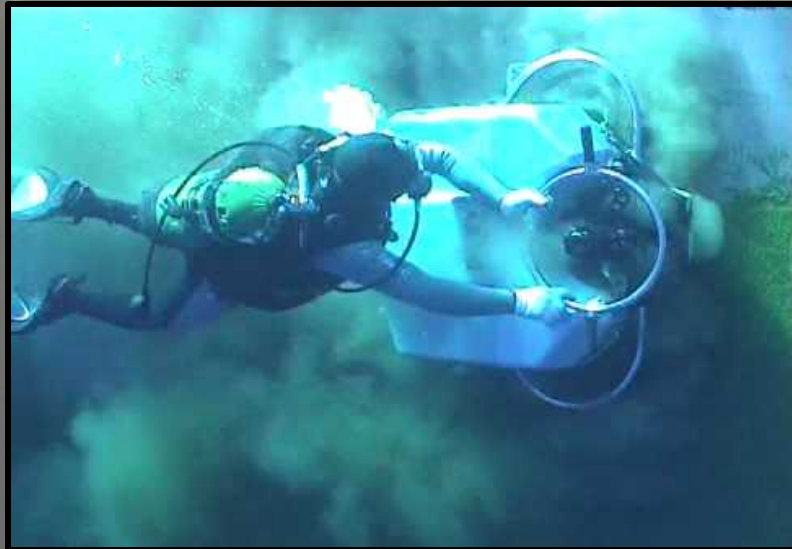
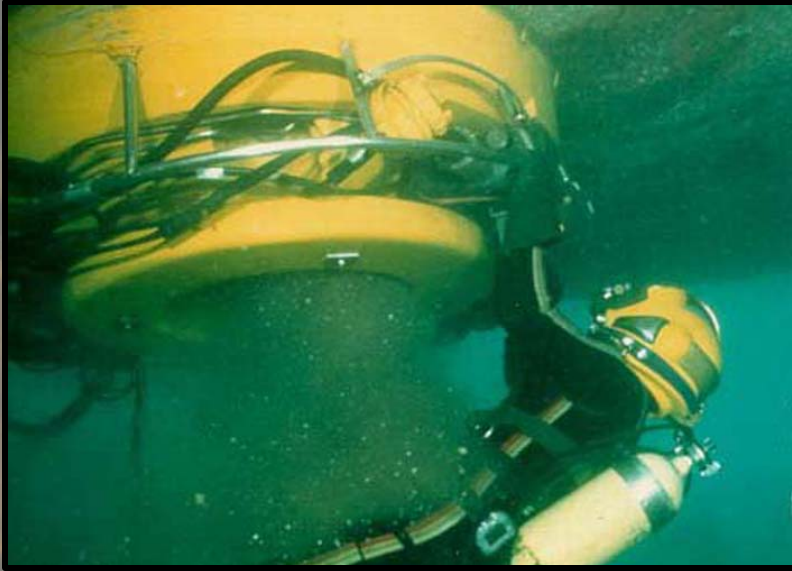


What's the Concern? Nonindigenous Species



What's the Concern?

Heavy Metal Pollution



What's the Concern?

Overlapping Jurisdiction



US: National Invasive Species Act



CA: Marine Invasive Species Act

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD



US: Clean Water Act/
Vessel General Permit



CA: Porter-Cologne Water Quality Control Act
US: Clean Water Act/Vessel General Permit



What's the Solution?



- New in-water cleaning technologies
(NO ENDORSEMENT IMPLIED)
 - Collection/retention & filtration/treatment
 - Heat treatment



What's the Solution?

- Cooperation and collaboration



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Further Discussion

Prevention First 2014



October 7-8, 2014
Long Beach, CA

<http://www.slc.ca.gov/PF2014/PF2014.html>

October 8 Panel: A collaborative discussion on the present and future of regulating in-water cleaning in California

- CSLC MISP
- US EPA
- State Water Board
- SF RWQCB
- LA RWQCB
- Port of Long Beach
- Long Beach IWC vendor
- NZ Ministry for Primary Industries

California's Marine Invasive Species Program

Website:

www.slc.ca.gov

Click "Divisions" Tab,

"Marine Facilities Division" link, and

"Marine Invasive Species Program" link

Thank You

A large white and red ship hull is the central focus of the image. The white upper section has a black cross symbol and the number '3' visible. The red lower section is the waterline. A small person is visible on the water surface near the bottom center. A white arrow points from the email address box below to the person on the water.

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