

# Vessel Biofouling Management in California: Current Practices and the Development of Comprehensive Policies



Chris Scianni  
CSLC Marine Invasive Species Program  
Prevention First 2014  
Long Beach, CA  
8 October 2014





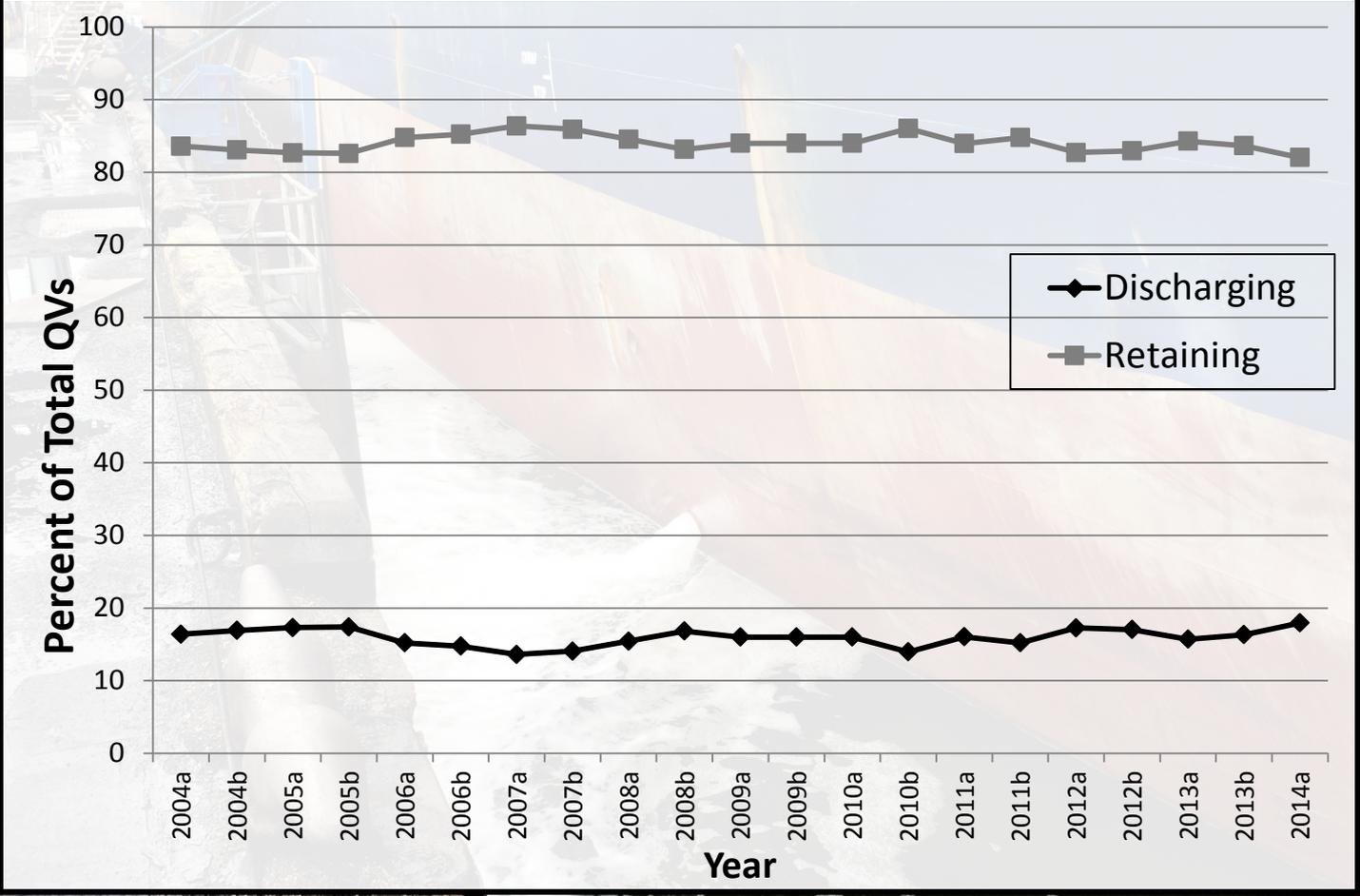
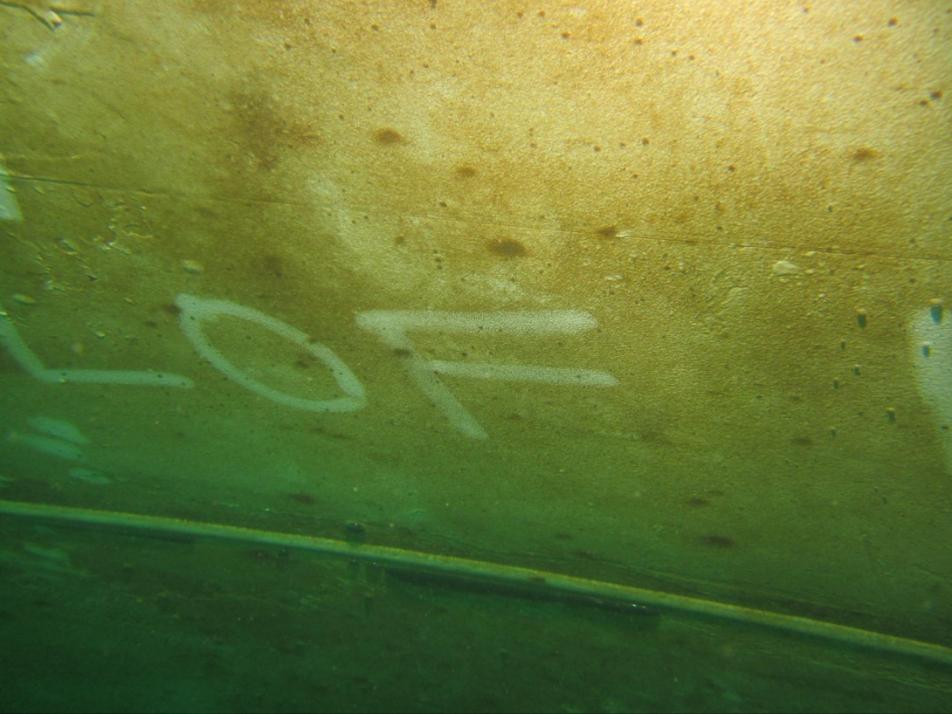


Photo courtesy of  
Tiong Gim Aw  
(MSU)







Location	% of NIS Associated with Biofouling	Reference
Global	42.6 %	Hewitt and Campbell 2010
★ California ★	up to 60%	Ruiz et al. 2011
Hawaii	74%	Eldredge & Carlton, 2002
North America (USA)	70%	Fofonoff et al., 2003
Japan	42%	Otani 2006
Brazil	90%	Farrapeira et al., 2011
New Zealand	69%	Cranfield et al., 1998
Port Phillip Bay, Australia	78%	Hewitt, et al., 1999, 2004
Australia (national port surveys)	59%–69%	Hewitt and Campbell 2010
North Sea	> 50%	Gollasch, 2002
Scotland	59%	Ashton et al. 2006





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



# Solution: Biofouling Management

## Proactive Management



## Reactive Management



# 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  Hull Bottom  Sea Chests   
 Sea Chest Gratings  Propeller  Rope Guard/Propeller Shaft   
 Previous Docking Blocks  Thrusters  Rudder  Bilge Keels



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

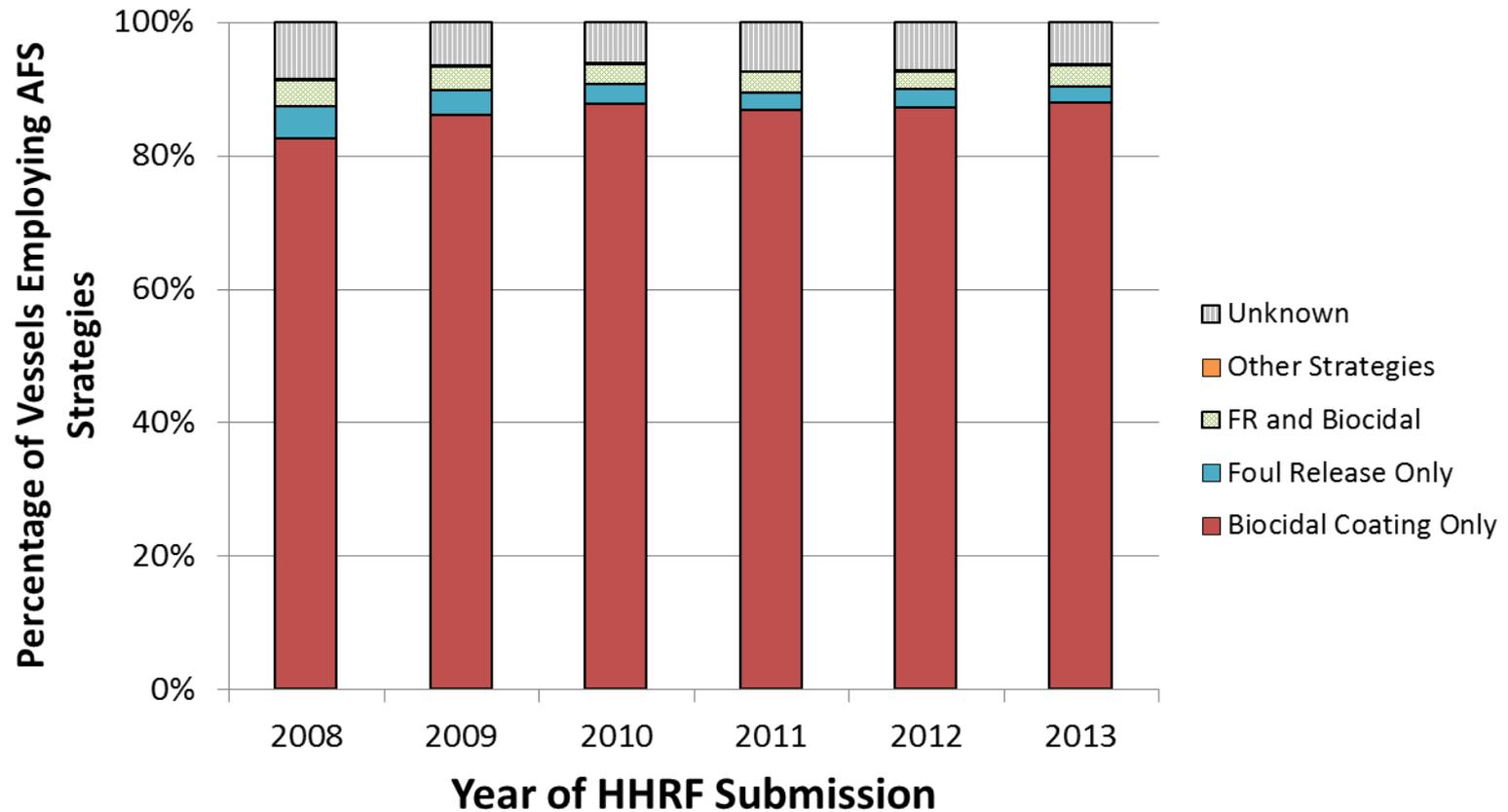


# Antifouling System Strategy

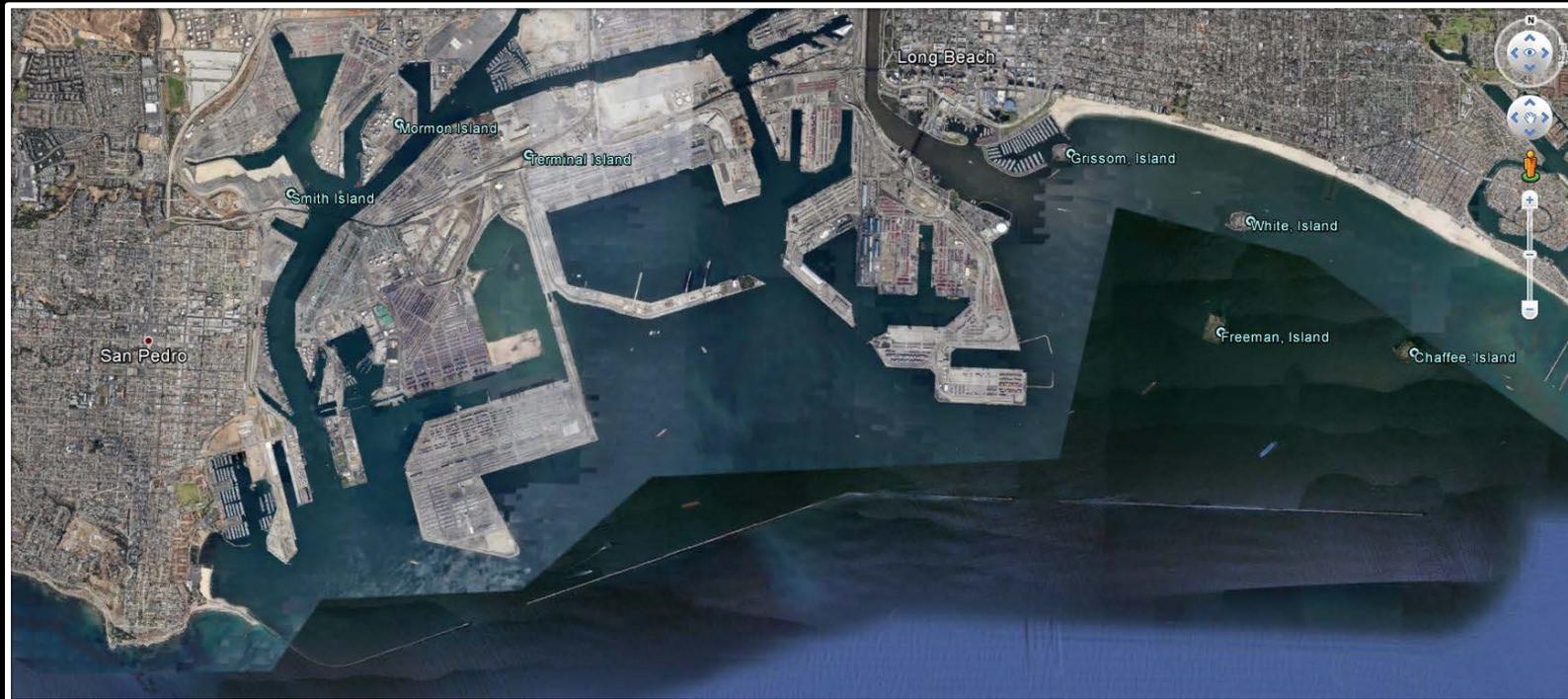
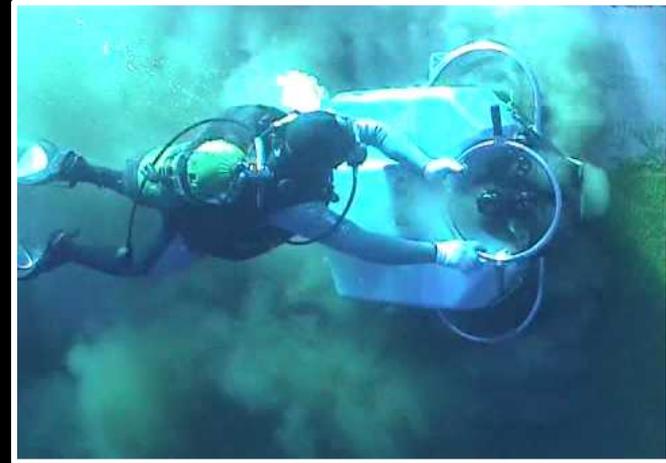
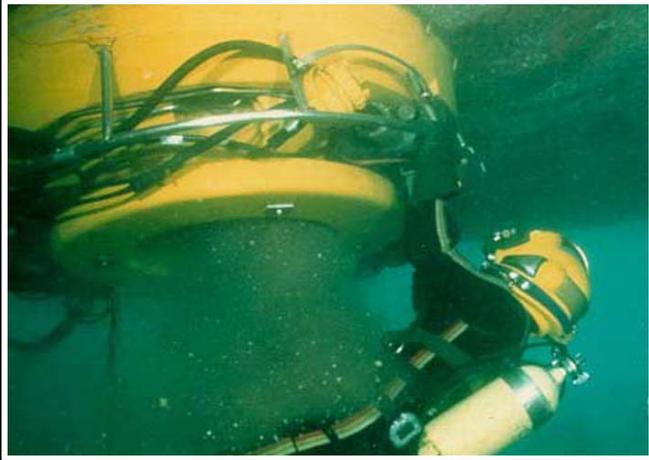


Disclaimer: No  
Endorsement  
Implied

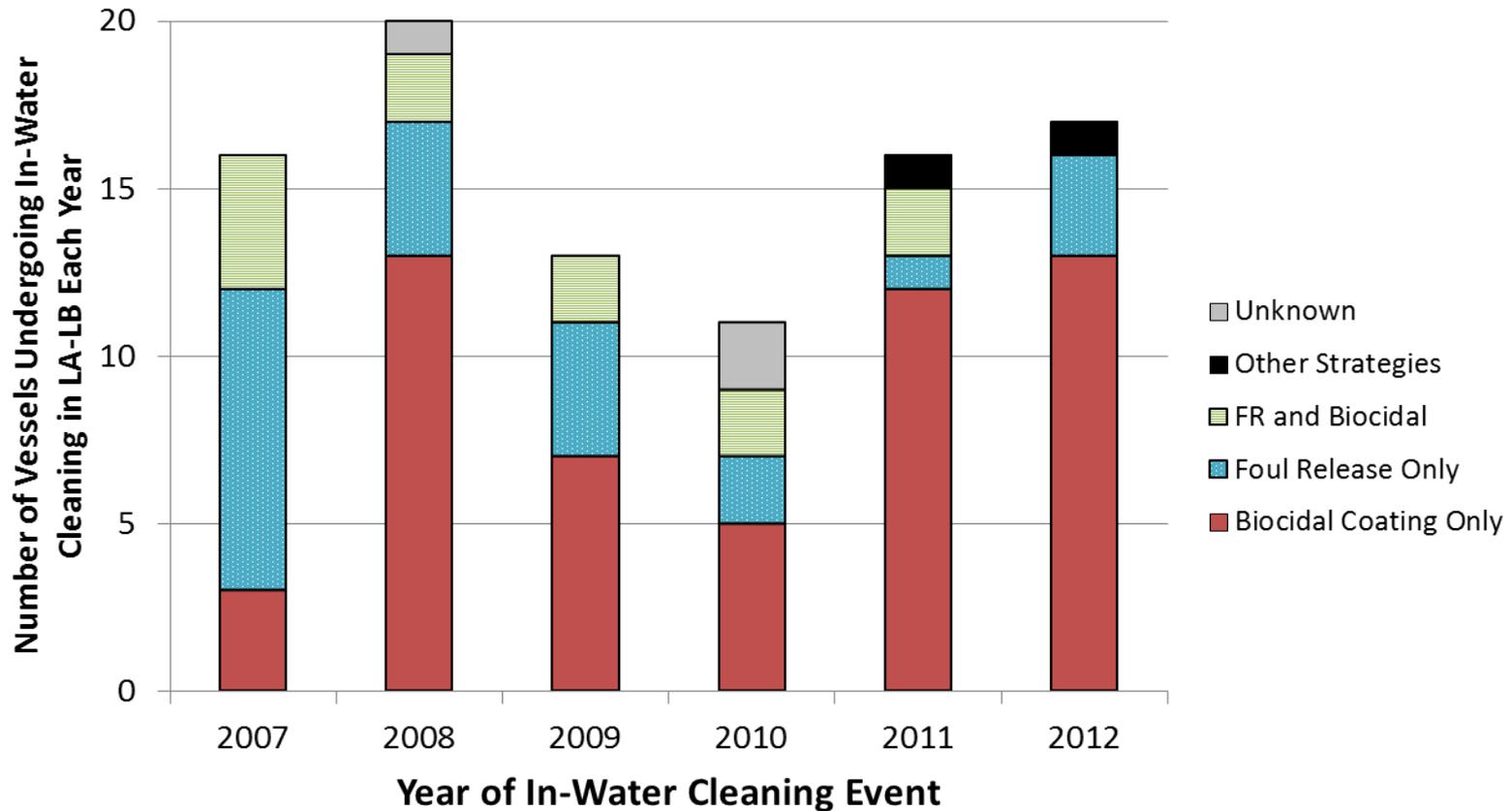
# Antifouling System Strategy



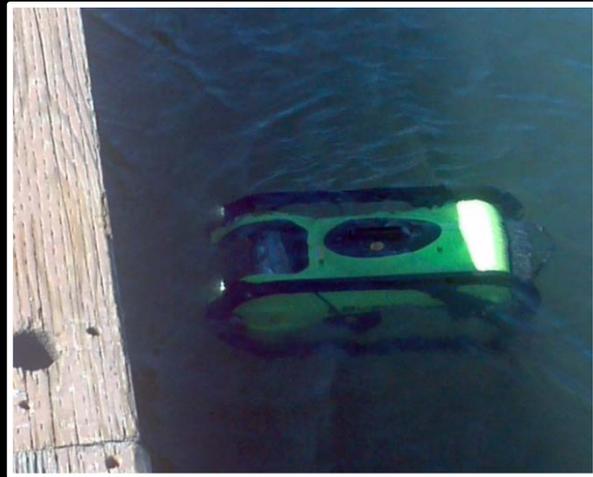
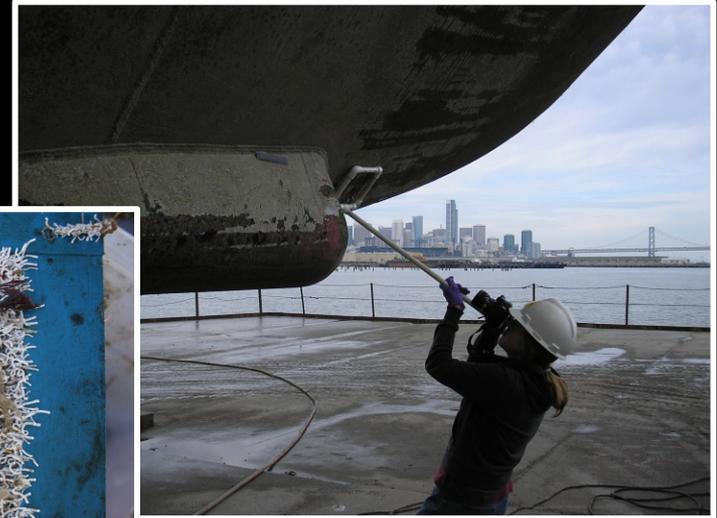
# In-Water Cleaning



# In-Water Cleaning In and Around LA-LB



# Biofouling Research

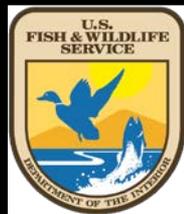
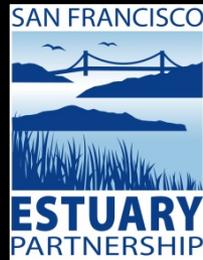
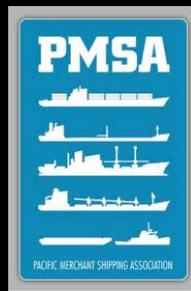


# 2007 Amendments to CA Marine Invasive Species Act (AB 740)

- 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

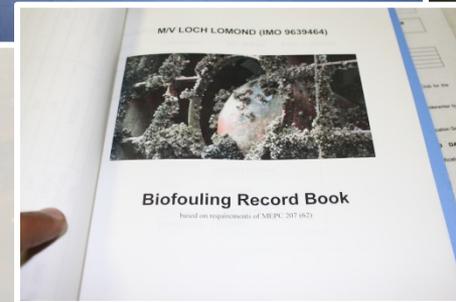
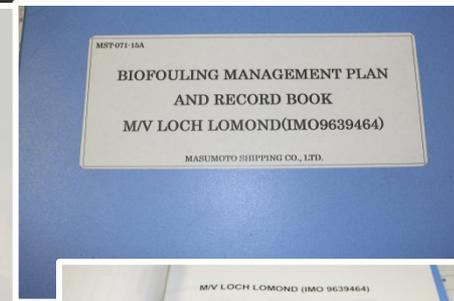


# Regulation Development Process

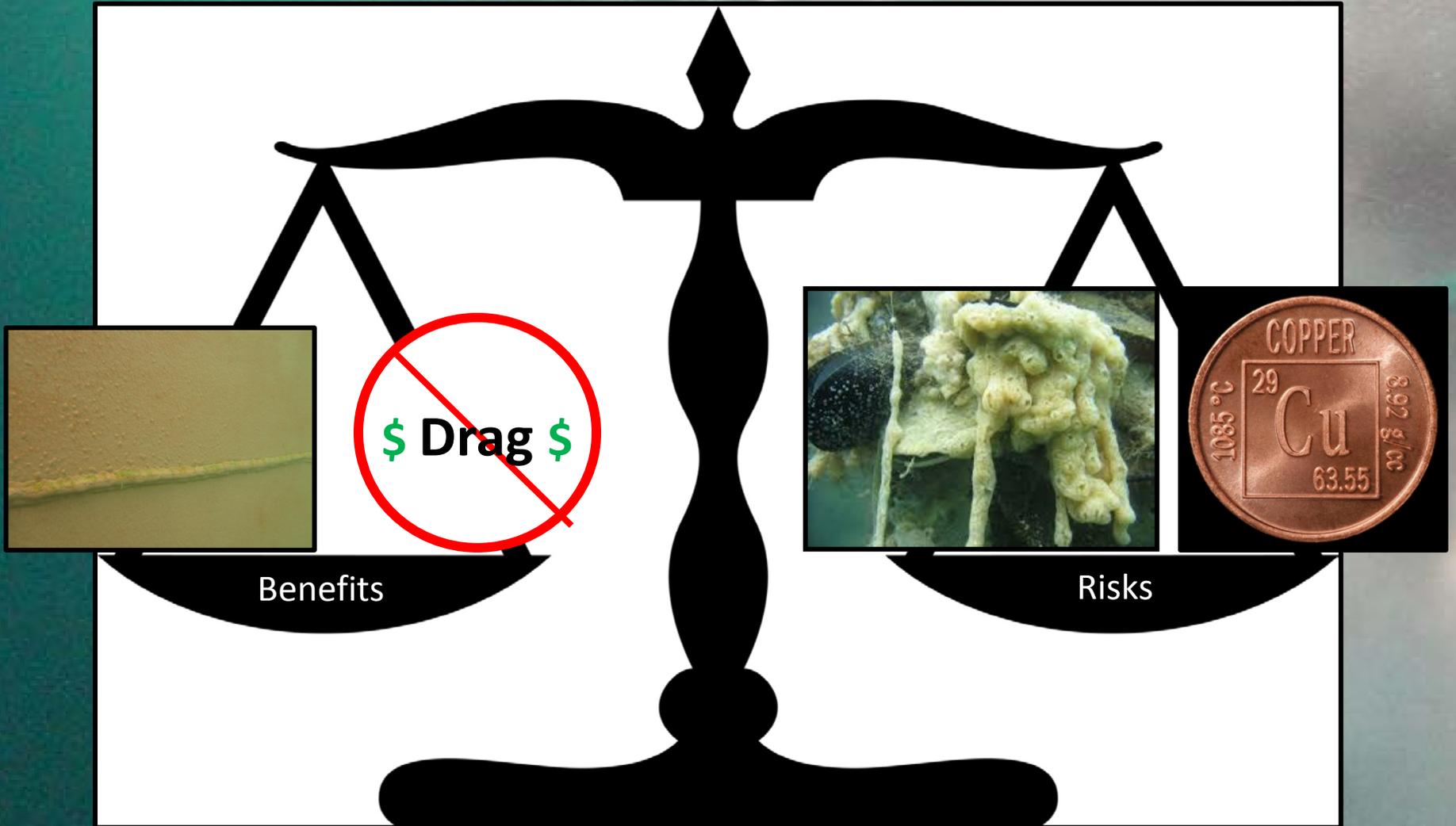


# Draft Regulations – Main Components

- Biofouling Management Plan
- Biofouling Record Book
- Hull and Niche Area Management
  - Technology-based, best practices
- Provision for excessive biofouling
- Extended Residency Periods



# In-Water Cleaning



# Come Back After Lunch

11:30 - 1:00 BUFFET LUNCH

1:00 - 3:00 AFTERNOON BREAKOUT SESSIONS

*A Collaborative Panel Discussion on  
The Present and Future of Regulating In-Water Hull Cleaning in California*

1E

Moderator: Chris Scianni, *California State Lands Commission*

Paul Hann, *California State Water Resources Control Board*

Jenny Newman, *Los Angeles Regional Water Quality Control Board*

David Elias, *San Francisco Bay Regional Water Quality Control Board*

Dylan Porter, *Port of Long Beach*

Richard Barta, *Muldoon Marine Services*

Kathryn Kelley, *U. S. Environmental Protection Agency*

Eugene Georgiades, Ph.D., *New Zealand Ministry for Primary Industries*

3:00 - 4:00 DOOR PRIZE DRAWING IN TECHNOLOGY EXHIBITION

# Thank You

An underwater photograph showing a bright orange, textured surface, possibly a ship's hull or a large piece of coral. Below this surface, several small, fan-shaped marine organisms, likely nudibranchs or similar mollusks, are visible. The background is dark, creating a high-contrast scene.

chris.scianni@slc.ca.gov

California's Marine Invasive Species Program  
Website:

[www.slc.ca.gov](http://www.slc.ca.gov)

Click "Divisions" Tab,  
"Marine Facilities Division" link, and  
"Marine Invasive Species Program" link