

HISC Resolution on Vessel In-Water Cleaning (IWC) and Next Steps

By Jules Kuo, Ballast Water & Hull Fouling Coordinator

AAOTF Brown Bag @ Plant Quarantine

Friday, February 2nd, 2018



HAWAII INVASIVE SPECIES COUNCIL

1151 PUNCHBOWL ST., #025
HONOLULU, HAWAII 96813

VOTING MEMBERS
SUZANNE CASE
DEPARTMENT OF LAND & NATURAL
RESOURCES
SCOTT ENRIGHT
HAWAII DEPARTMENT OF AGRICULTURE
KEITH KAWAOKA, D.Env.
DEPARTMENT OF HEALTH
NICHOLAS COMERFORD, Ph.D.
UNIVERSITY OF HAWAII
LEO ASUNCION
OFFICE OF PLANNING, DEPARTMENT OF
BUSINESS, ECONOMIC DEVELOPMENT &
TOURISM
DAVID RODRIGUEZ
DEPARTMENT OF TRANSPORTATION

DRAFT 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

WHEREAS studies have shown biofouling on vessels to be an important means of transferring aquatic invasive species which, if established in new ecosystems, may pose threats to the environment, human health, property and resources; and

WHEREAS the Hawaii Interagency Biosecurity Plan 2017-2027 (Biosecurity Plan) recognizes that vessel biofouling has contributed between 35% and 78% of Hawaii's introduced and cryptogenic species and is ranked highest among all vectors of initial introduction in Hawaii; and

WHEREAS the Biosecurity Plan calls on the Department of Land and Natural Resources (DLNR), the Department of Health (DOH), and the Department of Transportation (DOT) to develop best ballast water and hull husbandry practices and proactive ballast water and hull cleaning standards for all nonmilitary vessels to minimize movement of AIS into Hawaii's ports, harbors, and marinas; and

WHEREAS Hawaii Revised Statutes section 187A-32 designates the DLNR as the lead state agency for preventing the introduction of alien aquatic organisms through the regulation of hull fouling organisms; and

WHEREAS the DOH is tasked with administering water pollution control regulations and enforcing water quality standards under Chapter 342D, Hawaii Revised Statutes; and

WHEREAS Hawaii Revised Statutes section 266-1 requires that all vessels and shipping within the commercial harbors and roadsteads of Hawaii shall be under the care and control of the DOT; and

RECOGNIZING that a high level of coordination between various state agencies will be required to develop and implement safe and effective measures for biofouling management in Hawaii's harbors; and

FURTHER RECOGNIZING that, due to the highly transitory nature of the shipping industry, interstate and international coordination in development, testing, and approval of best management practices, technologies, and regulations for biofouling management is essential; and

FURTHER RECOGNIZING that the Alliance for Coastal Technologies and the Maritime Environmental Resource Center have developed a program and protocol for testing full-capture

biofouling removal technologies and have formally requested that Hawaii represent isolated tropical island climates for its program; and

WHEREAS, Chapter 194, Hawaii Revised Statutes, authorizes the Hawaii Invasive Species Council to advise and coordinate invasive species-related efforts with and between state, federal, international, and private programs, and to coordinate the State's position with regard to invasive species; now, therefore,

BE IT RESOLVED that the Hawaii Invasive Species Council recognizes that biofouling management in Hawaii's harbors is an important regulatory tool in preventing the introduction and spread of aquatic invasive species in Hawaii's harbors and nearshore waters; and

BE IT FURTHER RESOLVED that the members of the Hawaii Invasive Species Council direct relevant staff within their individual 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; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports Hawaii's involvement in the Alliance for Coastal Technologies and the Maritime Environmental Resource Center's program for evaluating biofouling management technologies, including the addition of Hawaii as a study site for evaluation of these technologies; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports implementing evaluated best management practices and technologies that are scientifically demonstrated as safe and effective for managing biofouling on vessel hulls in Hawaii harbors; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Governor of Hawaii, the President of the State Senate, the Speaker of the State House of Representatives, and to the directors or chairpersons of each HISC agency.

Adopted by the Hawaii Invasive Species Council on the following date:

Suzanne D. Case, Department of Land & Natural Resources

Scott Enright, Department of Agriculture

Keith Kawaoka, D. Env., Department of Health

David Rodriguez, Department of Transportation

Leo Asuncion, Office of Planning, Department of Business, Economic Development, and Tourism

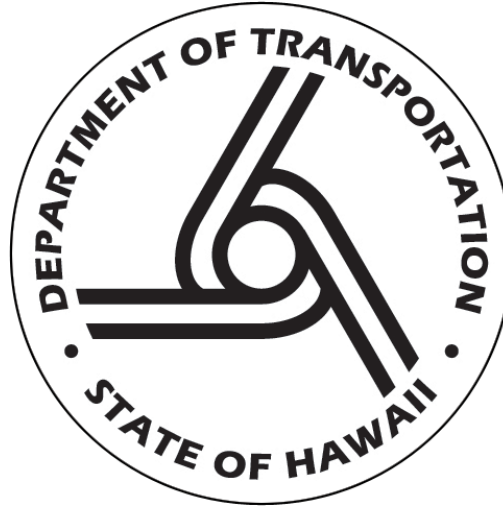
Nicholas Comerford, Ph.D., University of Hawaii

Overlapping Jurisdictions on In-Water Cleaning



Hawaii Department of
Health (DOH)
Clean Water Branch

HRS Ch. 342D
HAR Ch. 11-54
Water Quality Control



Hawaii Department of
Transportation (DOT)
Harbors Division

HRS 266-1
Harbor Operations



Hawaii Department of Land and
Natural Resources (DLNR)
Division of Aquatic Resources

HRS 187A-32
Biosecurity Control
related to BW & BF

HISC Resolution on Biofouling Management

Multi-agency collaboration on:

1. Intrastate agency agreement on in-water cleaning (IWC) of vessels that pose minimal biosecurity and hull paint-release risks
 - a) Removal of microfouling (ie: algae slime layer) using non-abrasive cleaning techniques without IWC debris capture technology

Factors affecting Biofouling growth:

- **Microfouling** precedes **macrofouling**
- It attracts macro-organisms via chemical cues
- Biofilms are complex dynamic systems that contribute to biofouling

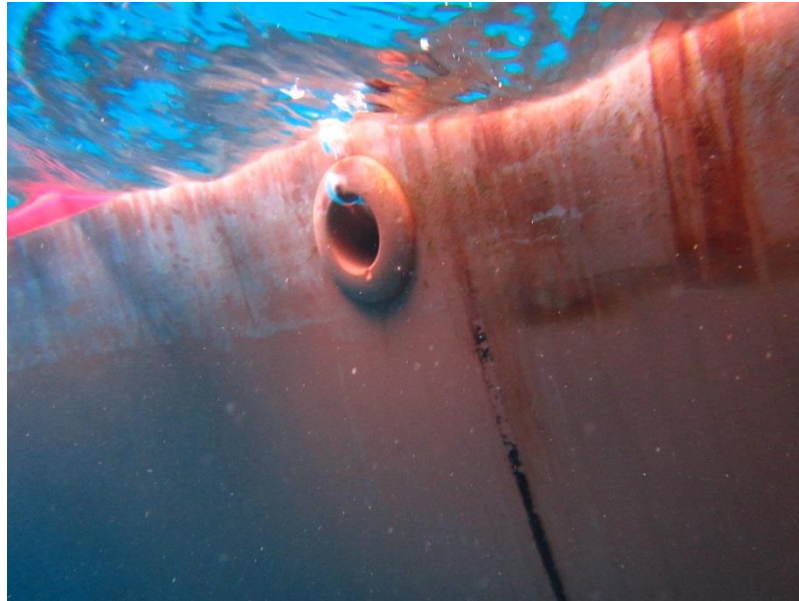
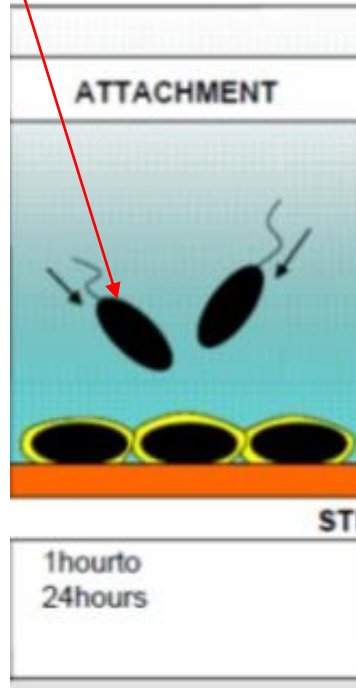
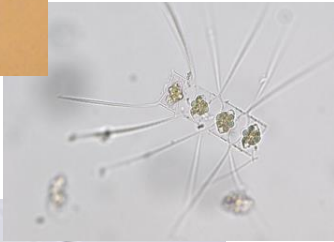
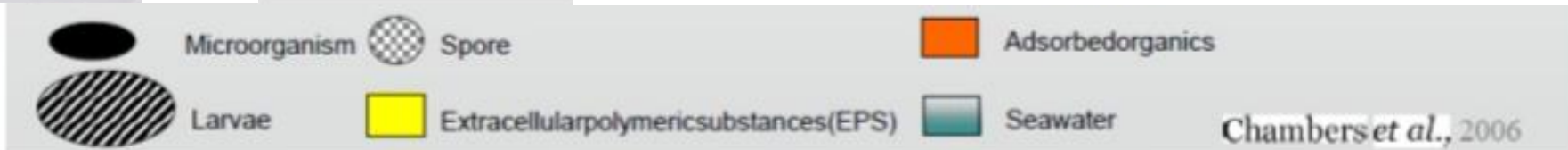


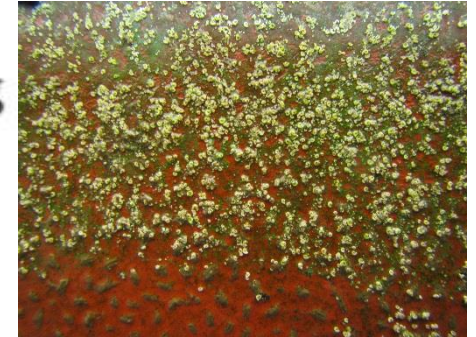
Photo credit: DLNR



Factors affecting Biofouling growth:

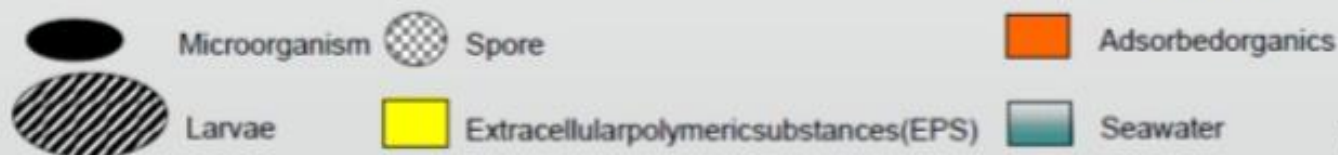
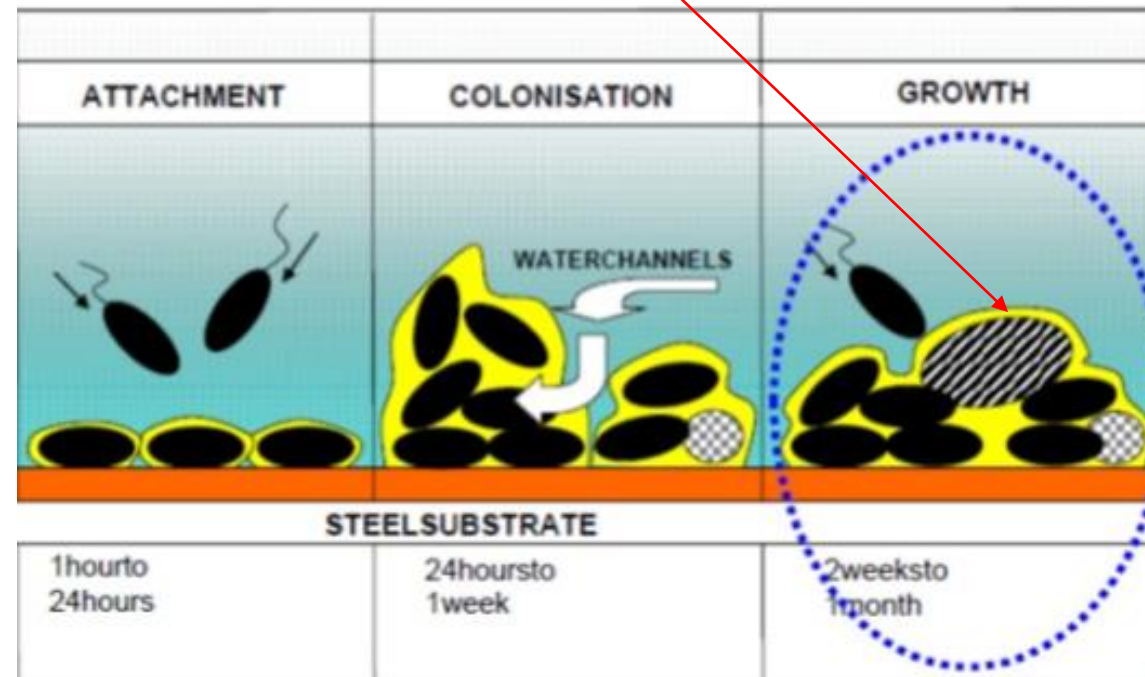
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Photo credit: DLNR



*Complex
Community*

BIOFOULING



Chambers *et al.*, 2006

HISC Resolution on Biofouling Management

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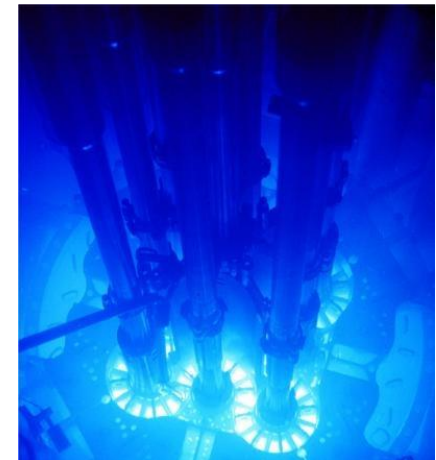
Tentative Timeline on Intrastate Agency Agreement on Allowable IWC conditions

	Estimated Range of Time	Status
Inform department heads of overlapping jurisdictions, stakeholder concerns over biofouling management, and the need for IWC Resolution	Many meetings across 2017	Completed
Develop Resolution	2017	Completed
Department heads to adopt HISC Biofouling Management Resolution	January 18, 2018	Completed
Initial meeting with POCs from DOH	February 1	Completed
AAOTF Stakeholder Update on Reso	February 2	Completed
Initial meeting with POCs from DOT	February 5	Completed
Draft IWC conditions with DOH & DOT using NZ & AUS template& DOT updates	January – April	In development
Acquire stakeholder input (individual & group)	January –	Ongoing

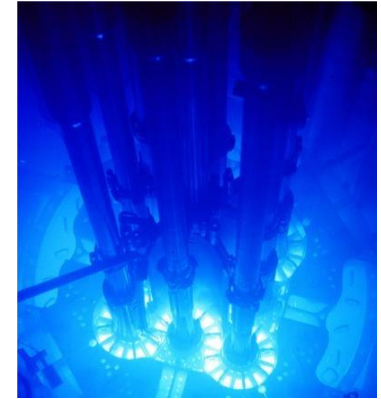
HISC Resolution on Biofouling Management

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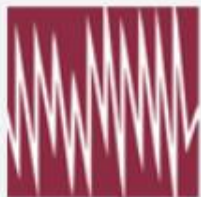
1. Allowing in-water cleaning (IWC) of vessels that pose minimal biosecurity and hull paint-release risks
 - a) Removal of microfouling (ie: algae slime layer) using non-abrasive cleaning techniques without IWC debris capture technology
 - b) Removal of macrofouling (ie: oysters, encrusting tubeworms, barnacles) using IWC debris capture technology



HISC Resolution on Biofouling Management



2. Support data collection and testing of IWC debris capture technology in Hawaii by Alliance for Coastal Technologies (ACT)



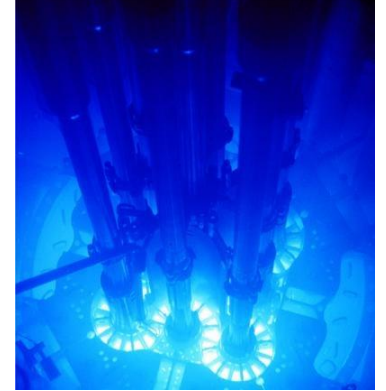
ALLIANCE FOR COASTAL TECHNOLOGIES

SUPPORTING INNOVATION TO BETTER UNDERSTAND, PREDICT AND MANAGE COASTAL, OCEAN AND GREAT LAKES ENVIRONMENTS.



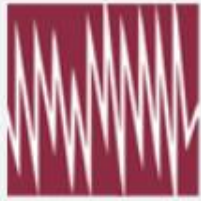
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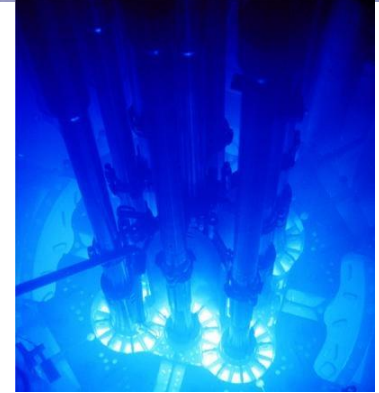
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- ACT is non-profit platform for testing innovative technologies where data is available to public (NOTE: ACT does not provide certifications or approvals on tested tech)



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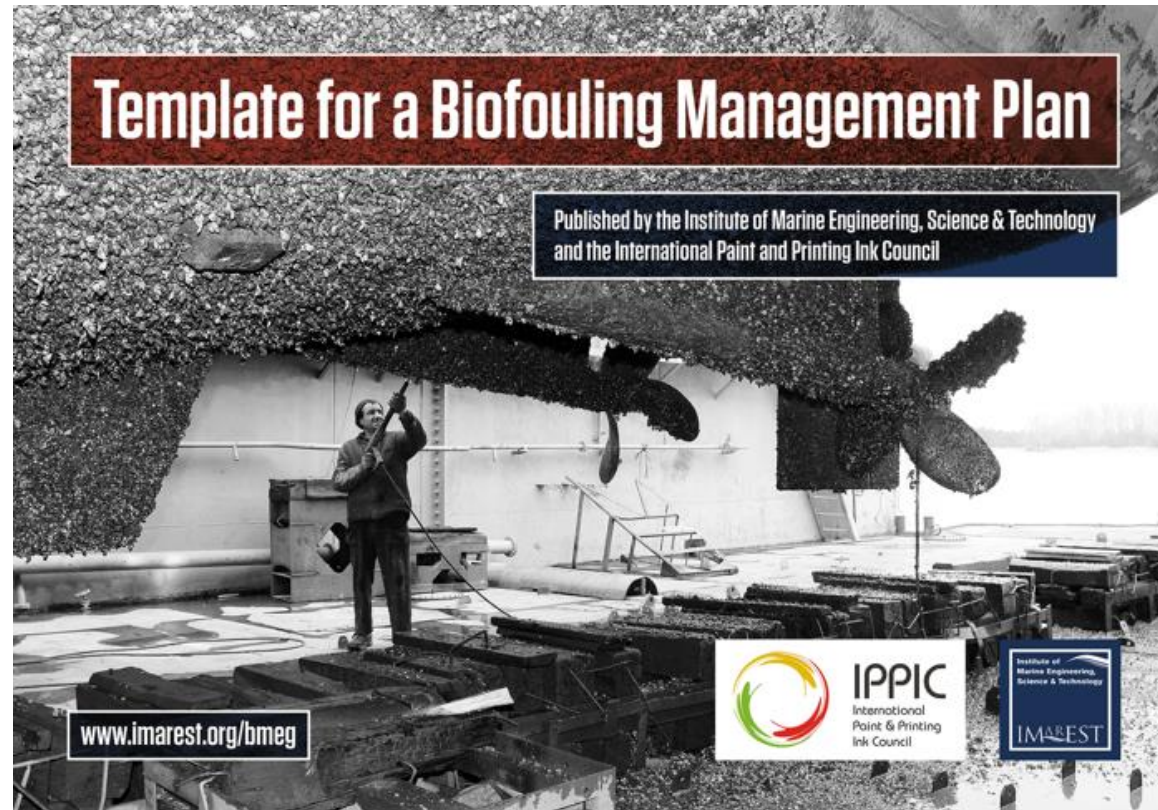
- ACT is non-profit platform for testing innovative technologies where data is available to public (NOTE: ACT does not provide certifications or approvals on tested tech)
- Agencies involved: US Maritime Administration, US NRL, SERC, CSLC, Maryland Port Administration, Maritime Environmental Resource Center, and HI DOT, DOH, DLNR

Tentative Timeline on ACT Project

- Request for Technology (RFT) posted last winter
 - Another RFT may be posted later in the year
- Testing to occur in Maryland (Summer 2018) and California (Fall 2018)
- Received official invitation from ACT to join
- Waiting for DLNR and DOH department heads to officially accept
 - Ideal testing in Hawaii early 2019
- Test protocols would follow NZ MPI's template
- Testing in Hawaii estimated to cost \$400,000 - \$500,000
 - Unofficially, we've identified ~\$200,000

How Can Stakeholders Aid in HISC Resolution Implementation?

- Start practicing BEST MANAGEMENT PRACTICES
 - Develop BIOFOULING MANAGEMENT PLAN specific to your vessel operations and paint type



How Can Stakeholders Aid in HISC Resolution Implementation?

- Start practicing BEST MANAGEMENT PRACTICES
 - Develop BIOFOULING MANAGEMENT PLAN specific to your vessel operations and paint type
 - Implement BIOFOULING MANAGEMENT PLAN
 - Keep an organized BIOFOULING RECORD BOOK
- Help us identify funding sources for IWC debris capture system testing and non-abrasive technique testing
- Join and participate in meetings
- Provide testimonies/comments during meetings and legislative hearings

When Can Vessels be IWC?



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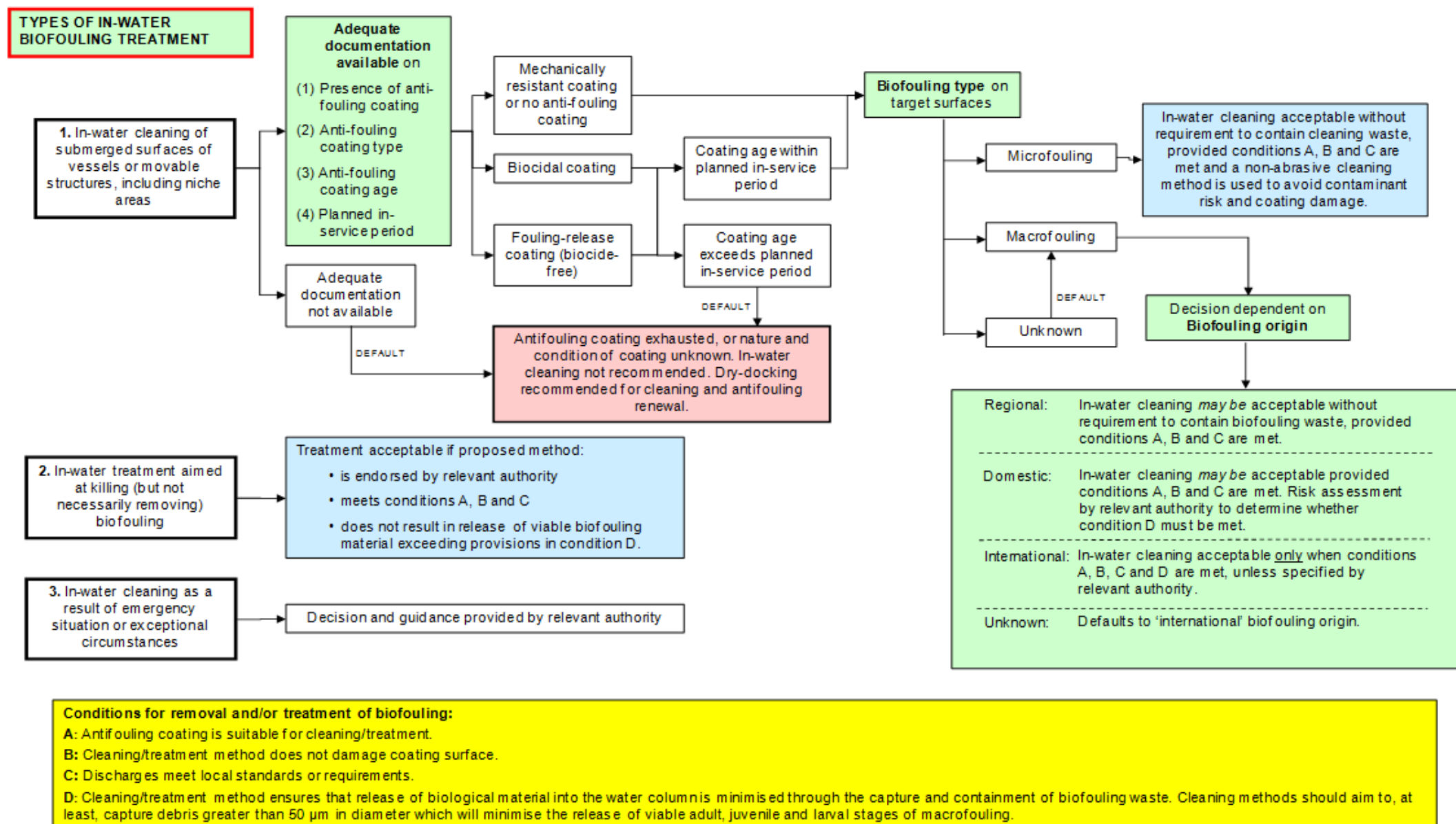
Mahalo! Questions



Supplemental slides

Decision-Support Tool for in-water cleaning

This tool is designed to assist relevant authorities with making decisions about in-water cleaning practices in their jurisdictions. The tool is a part of, and must be used in conjunction with, the main text of the *Anti-fouling and in-water cleaning guidelines*. The terms used in this tool are defined in the guidelines.



What Level of Biosecurity Risks are Associated with Each Option?



Biofouling Management Options	Microfouling 	Macrofouling 
No Management	High biosecurity risk	High biosecurity risk



Photo Credit: <http://lovesail.com/lis-news/2017/02/biofouling/>

What are the biofouling biosecurity risk assessment criteria?



Australian Government
Department of Agriculture
and Water Resources

Ministry for Primary Industries
Manatū Ahu Matua



NEW ZEALAND

- *1) Vessel operational profile and itinerary history
- *2) Vessel biofouling management history/record book
- 3) Ground –truth documentation with ROV or SCUBA inspections



Hawaii Biofouling Questionnaire for commercial vessels

Vessel Information & Particulars

Vessel Name	
Official / IMO Number	
Vessel type (containership, barge etc)	
Responsible Officer's Name and Title (Person filling this form)	
Vessel/Company/Agent Email address	
Date of Submission (Day/Month/Year)	
Vessel Age (years)	
Vessel typical speed (laden speed in knots over the last four months)	
Vessel typical port residence time (hours or days)	<input type="text"/> hours OR <input type="text"/> days


Previous Dry Docking

Since delivery, has the vessel been removed from water for maintenance?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If YES, enter the date and location of the <u>most recent</u> out-of-water maintenance:	Date (Day/Month/Year): 04/15/2015 City/Port: <input type="text"/> Country: <input type="text"/>
If NO, enter the delivery date and location where the vessel was built:	Delivery Date (Day/Month/Year): <input type="text"/> City/Port: <input type="text"/> Country: <input type="text"/>

Anti-Fouling Paint (A/F Paint)

Were the vessel's <u>submerged portions</u> coated with an anti-fouling paint (includes foul-release paint) during the out-of-water period listed above?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
If <u>not</u> , when was the last anti-fouling coating applied to the vessel?	Date of A/F paint application (Day/Month/Year): <input type="text"/>
For the most recent anti-fouling coating, what product (top coat A/F paint) was used for hull surfaces? Please list more than one if necessary and indicate what parts of the hull each product was used on?	For the <u>hull bottom</u> Manufacturer/Company: <input type="text"/> Product Name: <input type="text"/> For the <u>hull sides</u> Manufacturer/Company: <input type="text"/> Product Name: <input type="text"/>
Were additional anti-fouling coatings used for other submerged surfaces (e.g. rudder, thrusters, sea-chests)?	No <input type="checkbox"/> Don't know <input type="checkbox"/> Yes <input type="checkbox"/>
	If yes, what products were used Manufacturer/Company: <input type="text"/> Product Name: <input type="text"/> Manufacturer/Company: <input type="text"/> Product Name: <input type="text"/>

- § 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.

<u>Pollutant</u>	<u>Freshwater</u>		<u>Saltwater</u>		<u>Fish</u>
	<u>Acute</u>	<u>Chronic</u>	<u>Acute</u>	<u>Chronic</u>	<u>Consumption</u>
Cadmium	3+	3+	43	9.3	ns
Carbon tetra- chloride*	12,000	ns	16,000	ns	2.3
Chlordane*	2.4	0.0043	0.09	0.004	0.00016
Chlorine	19	11	13	7.5	ns
Chloroethers- ethyl (bis-2) *	ns	ns	ns	ns	0.44
isopropyl	ns	ns	ns	ns	1,400
methyl (bis) *	ns	ns	ns	ns	0.00060
Chloroform*	9,600	ns	ns	ns	5.1
Chlorophenol (2)	1,400	ns	ns	ns	ns
Chlorpyrifos	0.083	0.041	0.011	0.0056	ns
Chromium (VI)	16	11	1,100	50	ns
Copper 	6+	6+	2.9	2.9	ns