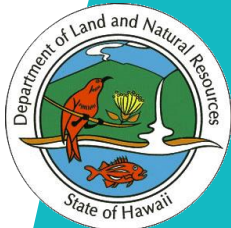


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# Best Management Practices Biofouling, Aquatic Invasive Species and Commercial Fishing Vessels:

## *BE PART OF THE SOLUTION!*

*Linda Shaw, Tammy Davis, Chris Scianni, Julie Kuo*

*Presented by Linda Shaw*

*North Pacific Fisheries Management Council  
Ecosystem Committee*

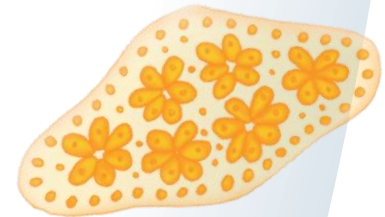
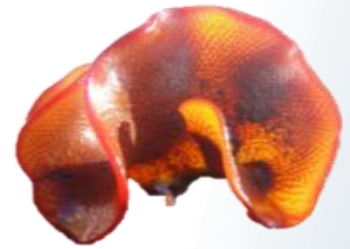
*January 26, 2020*



**WESTERN REGIONAL PANEL**  
ON AQUATIC NUISANCE SPECIES

# Outline

- Who are developing the BMPs
- Why promote their use
- 3 Examples of marine invasive species
- Examples of fisheries collapses from invasive species
- Alaska marine invasive species
- Go through the current BMPs
- Regulatory Status of Biofouling
- How best to promote BMPs?





# WESTERN REGIONAL PANEL ON AQUATIC NUISANCE SPECIES

PRODUCED BY THE COASTAL COMMITTEE  
OF THE WESTERN REGIONAL PANEL  
ON AQUATIC NUISANCE SPECIES

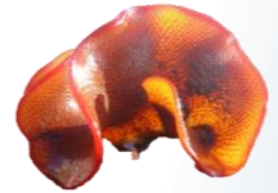
WEBSITE: <http://westernregionalpanel.org>  
EMAIL: [Coastal@westernregionalpanel.org](mailto:Coastal@westernregionalpanel.org)



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- Globally, 55.5 to 69.2 % of non native species are established because they were spread by biofouling



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# Marine Invasive Species Example #1

- The colonial tunicate, *Didemnum vexillum* (*D. vex*), is **established in Sitka, Alaska**.
- *D. vex* is smothering a large seafloor area of the Georges Banks (New England) where it reduces foraging ability of groundfish.
- *D.vex* biofouls hard surfaces and benthic habitats



L. Shaw, NOAA

# Marine Invasive Species Example #2

- European green crab (EGC) , *Carcinus maenas*, **is moving north to Alaska and is now on Haida Gwaii, Canada.**
- EGC eat shellfish, damage eelgrass beds and were documented eating live juvenile salmon in British Columbia.
- Larval dispersal, seafood shipments.



Emily Grason, Washington Sea Grant

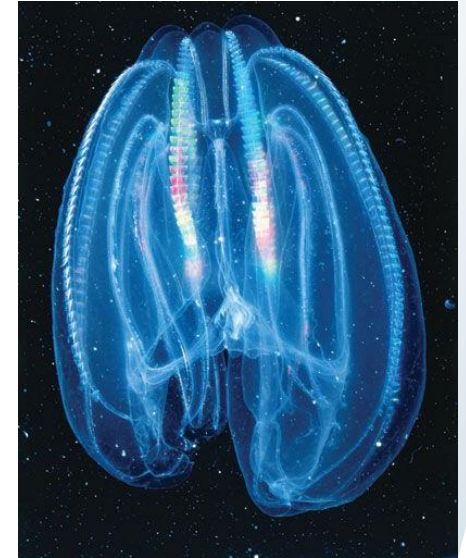
# Marine Invasive Species Example #3

- *Undaria pinnatifida*, also known as Asian kelp or wakame.
- Forms monospecific stands.
- Native to Japan, has colonized many harbors along the California coastline.
- Competes with native species, fouls harbors and damages infrastructure.
- Biofouls hulls, causing drag.



# Fisheries Have Collapsed from Invasive Species

- The **invasion** of the **Black Sea, Caspian Sea and Baltic Sea**, by the **sea walnut** a **comb jellyfish** from North America (*Mnemiopsis leidyi*) through ballast water.
  - The **invasion** contributed to the **near total collapse of Black Sea commercial fisheries** within a few years and **decline of sprat, sturgeon and seals in the Caspian Sea**. **Impacts to the already stressed Baltic Sea are unclear.**
- 
- **Lake trout fishery collapse and closure in 1962** was brought on by the **invasion of parasitic sea lampreys** introduced to the Upper Great Lakes through shipping canals. Control efforts cost over 20 million per year.



Aquarium of the Pacific



USFWS



# Dvex and Fisheries

- Recent research by Kaplan and Sullivan at Cornell shows **negative impacts of Dvex to juvenile scallops**. Unable to attach to sea floor and smothered so unable to swim. **Areas open to fishing with Dvex had lower densities of sea scallops**.
- Also negative impacts to barnacles, sea urchins and tube anenomes
- Increased abundance of crabs, burrowing worms and sea stars.
- Overall reduced biodiversity. In areas where seafloor coated, no other species found. Protection from bottom trawling had no effect.



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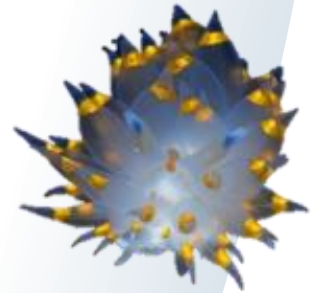
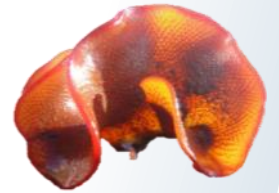
[Lummiislandwild.com](http://Lummiislandwild.com)



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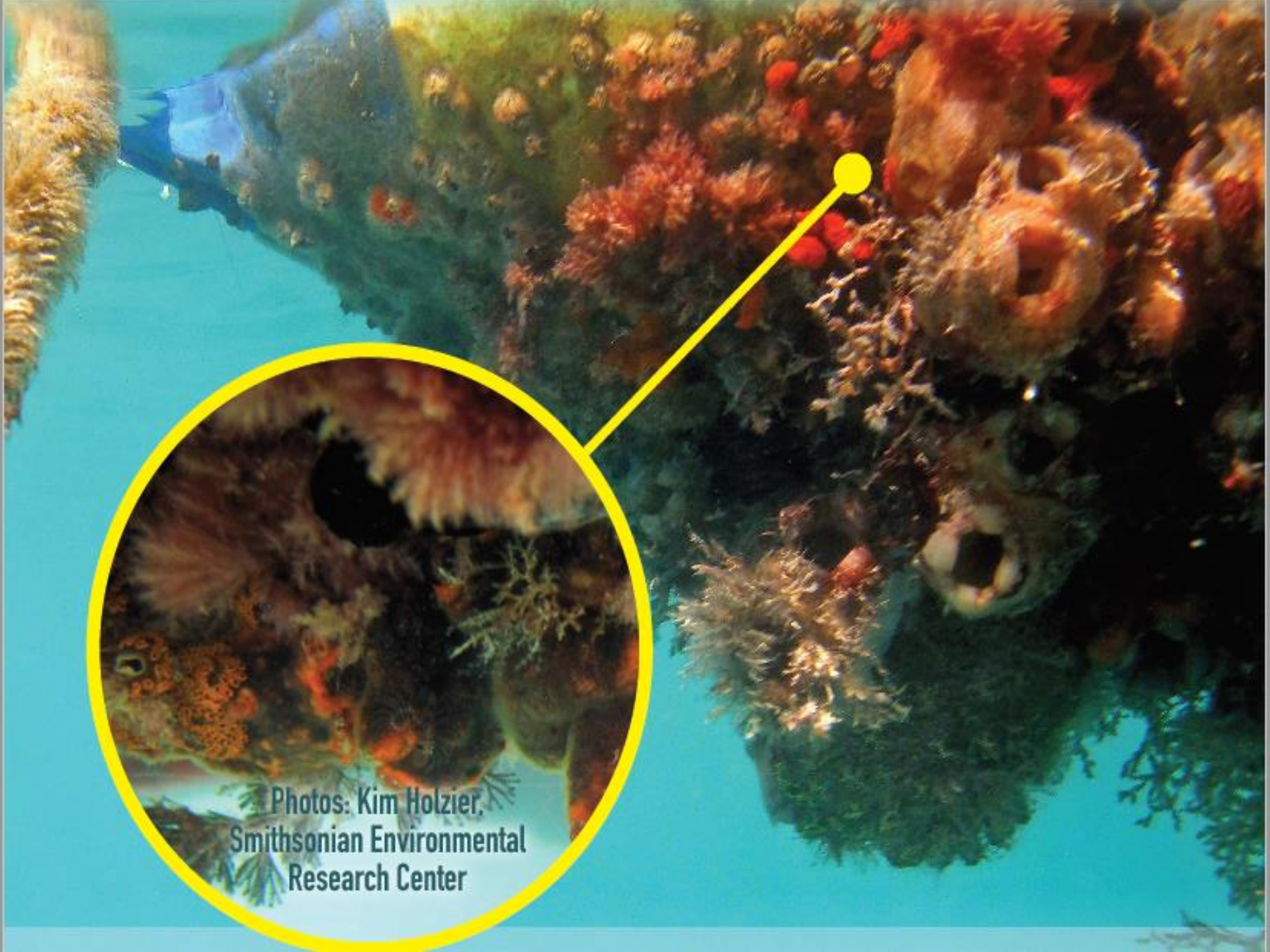
# Alaska and Marine Invasive Species

- **310** established marine and estuarine nonindigenous species on the North American West Coast.
- Of these **40%** are established in Alaska.
- Of these, **40%** were detected in California before being detected in Alaska.
- Alaska is on a west coast northward receiving end for the spread of these species.



## ▶▶▶ WHAT IS BIOFOULING?

Biofouling refers to organisms attached to or associated with underwater or wetted surfaces of a vessel. Your fishing equipment, the hull of your boat, and other boat structures known as niche areas (e.g., propellers, rudders, intakes) can accumulate biofouling organisms.



Photos: Kim Holzier,  
Smithsonian Environmental  
Research Center

# WHY SHOULD YOU MANAGE BIOFOULING? <<<

Managing biofouling saves you money by protecting your equipment and reducing fuel consumption. Managing biofouling further prevents the spread of aquatic invasive species (AIS) that could harm commercially important fisheries.

# BEST PRACTICES

Follow this checklist to become part of the solution!



TO REPLACE W/ FISHING VESSEL IMAGE

HULL SURFACE

PROPULSION GEAR

RUDDER & STERN GEAR

# DURING OPERATIONAL PERIODS

## **CLEAN BEFORE YOU GO ▶**

Cleaning your hull, holds, and niche areas surfaces before moving between regions increases fuel efficiency and reduces the spread of AIS. **DON'T FORGET** – check the local rules before you clean.

## **DEFOUL YOUR GEAR ▶**

Cleaning and drying fishing and mooring equipment reduces weight and damage to your gear and reduces the likelihood of transferring AIS.

## **HAVE A PLAN FOR MANAGING BIOFOULING ON YOUR VESSEL ▶**

Maintain antifouling paint integrity to manufacturer specifications. Keep a logbook to help you plan biofouling treatments and evaluate effectiveness of cleaning and maintenance actions.

## **DISPOSE OF BAIT AND FISH WASTE IN A TRASH CAN ON LAND ▶**

Your bait may include non-native organisms or contain hitchhiking AIS, disposing of all bait in a trash can on land reduces the risk of introducing AIS.

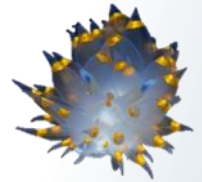
# DURING MAINTENANCE PERIODS

- APPLY AN ANTIFOULING PAINT ▶**  
suited for your vessel's operational profile to the hull and niche areas (see figure above) to minimize biofouling growth, reduce drag, and save on fuel costs.
- USE APPROPRIATE METHODS TO CLEAN YOUR HULL AND NICHE AREAS ▶**  
Preventing and removing biofouling will maintain your paint investment. Consult with your paint manufacturer and hull maintenance company on in-water cleaning best practices and enquire about systems that capture organisms and antifouling paint debris.
- HAUL OUT YOUR BOAT WHEN NOT IN USE ▶**  
This will allow biofouling organisms to dry out and die prior to putting the vessel back into the water. If you clean your boat while hauled out, ensure that the debris doesn't reenter the water.



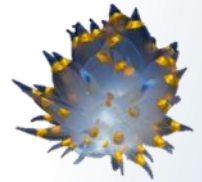
# These best practices are not regulatory

- In water cleaning standards to regulate biofouling will be set by the Environmental Protection Agency (EPA) Vessel General Permit (VGP) under the Vessel Incidental Discharge Act (VIDA) that is currently in process for proposed regulations. The U.S. Coast Guard will implement and enforce.
- Current USCG and EPA regulations are in effect for commercial vessels equal or greater than 79 feet in length until after USCG implementation of the VGP.



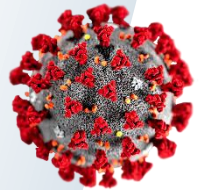
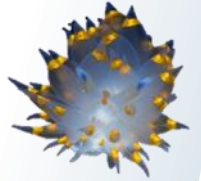
# These best practices are not regulatory

- Fishing vessels of any size are not subject to VIDA or the VGP, except for ballast water. If they carry ballast tanks USCG current regulations under Title 33 Code of Federal Regulations §151.2050 require that they:
  - Rinse anchors and anchor chains when the anchor is retrieved to remove organisms and sediments at their places of origin. And
  - Remove fouling organisms from the vessel's hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.
- There are no State biofouling management regulations specific to commercial fishing vessels in **any** of the US Pacific States or British Columbia



# How best to promote these best practices?

- Wakefield Symposium, May, 2019. Audience feedback asked if commercial fishing vessels have been shown to be directly connected to any invasive species infestations. The answer is no.
- COVID19 analogy. Commercial fishing vessels have the potential to spread invasive species just like all of us can spread COVID19. Best management practices for vessels are the equivalent of us wearing masks, washing our hands and social distancing.



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# Questions?

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