The background features a dark grey field with intricate, light grey circular patterns. These patterns include concentric circles, dashed lines, and radial tick marks, resembling technical diagrams or data visualizations. Numbers such as 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260 are scattered across the design, often aligned with the circular elements.

HAWAII INTERAGENCY BIOSECURITY PLAN: PROTECTING HAWAII FROM ALIEN SPECIES INVASIONS THROUGH COLLABORATION

PREVENTION FIRST SYMPOSIUM

WEDNESDAY, SEPTEMBER 28TH, 2016

JULIE (JULES) KUO

HAWAII BALLAST WATER AND HULL FOULING COORDINATOR (DLNR IN C/O PCSU)

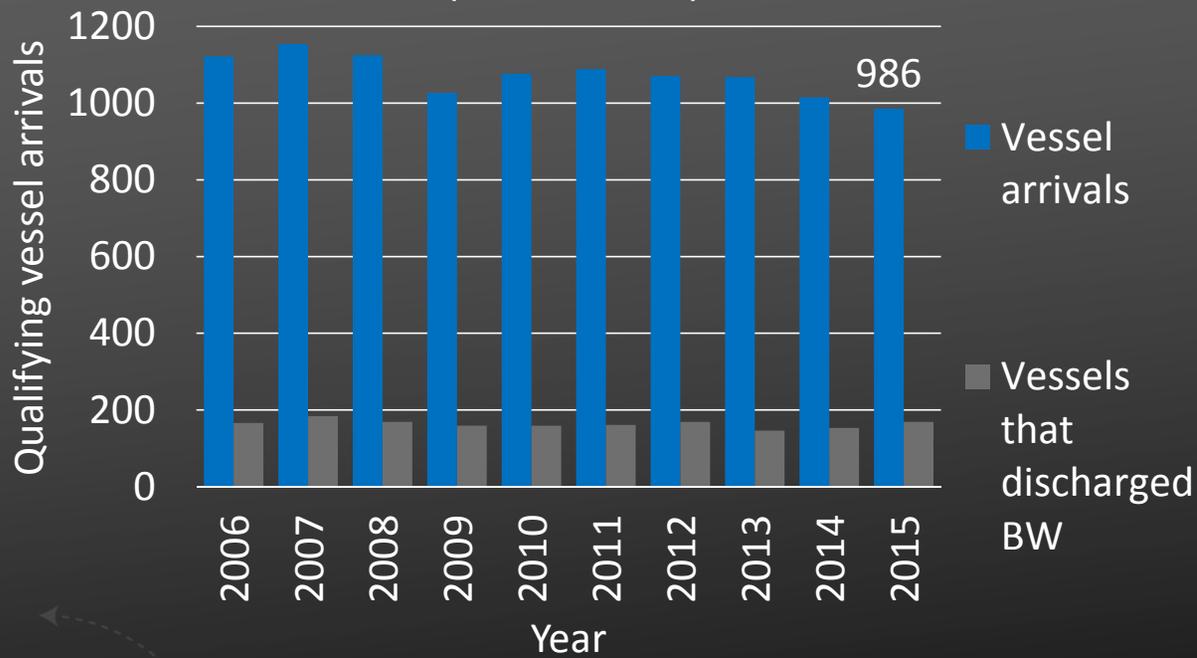
HAWAII'S ALIEN INVASIVE SPECIES PROBLEM



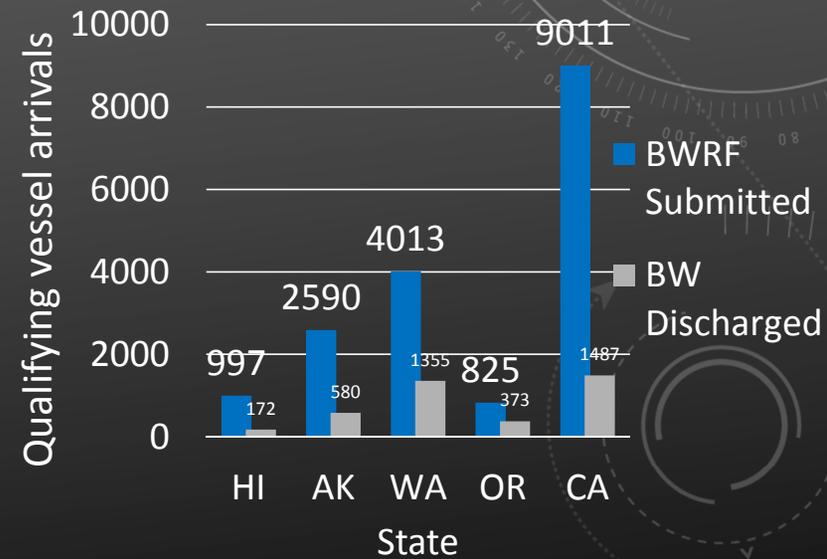
- Hawaii is extremely vulnerable to invasions due to:
 - Consistent temperatures all year
 - Endemic species lack competitive or protective abilities to ward off invaders
 - Structural/chemical defenses, slower growth/reproductive rate, selective food pressures
 - More than 80% of all consumer goods and 90% of foods are imported into Hawaii

Hawaii is highly susceptible to alien invaders.

Number of qualifying commercial vessel arrivals into Hawaii ports (2006-2015)



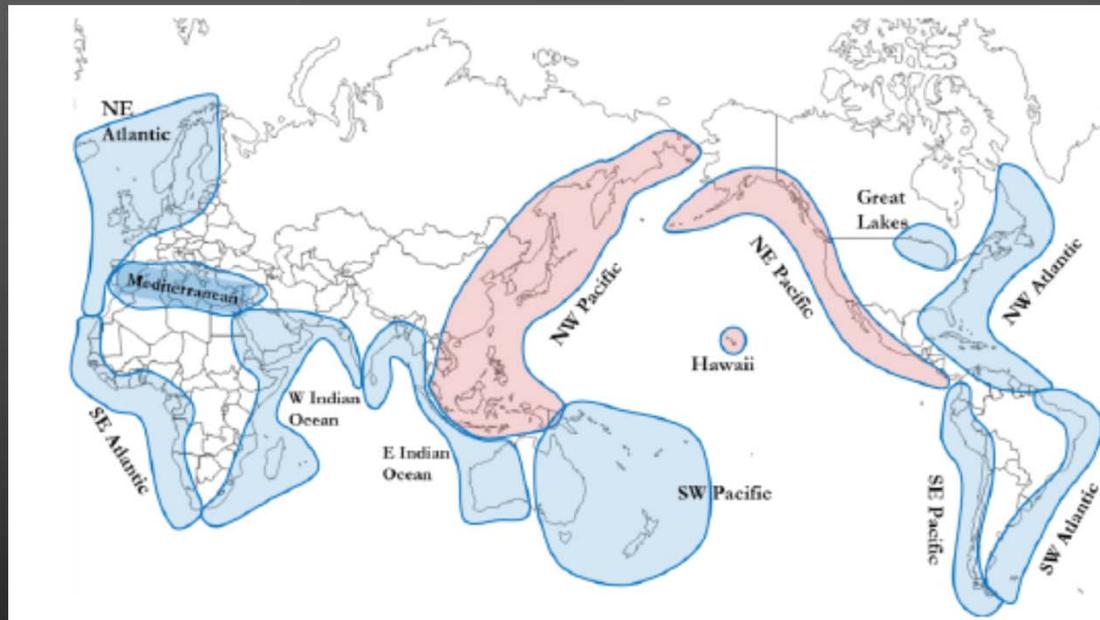
Number of qualifying commercial vessel arrivals into Hawaii ports (2015)



<http://invasions.si.edu/nbic/index.html>

HAWAII'S ALIEN INVASIVE SPECIES PROBLEM

Vessel source regions

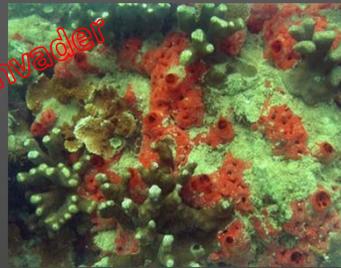


Davidson et al, 2014

Established non-native species are generally arriving from NW and NE Pacific regions and most likely transferred inter-island

HAWAII'S ALIEN INVASIVE SPECIES PROBLEM

Mycale armata



Pennaria disticha



Didemnum spp.



Phallusia nigra



78% of the 346 alien marine algae and invertebrates species were introduced by ballast water and vessel biofouling. Total established aquatic aliens in HI = 463.

HAWAII'S ALIEN INVASIVE SPECIES PROBLEM



THE SOLUTION TO HAWAII'S ALIEN INVASIVE SPECIES PROBLEM



- Defense against invaders in domestic imports
- Mandated to implement an interagency biosecurity program
 - Introduced the Hawaii Interagency Biosecurity Plan for addressing non-indigenous terrestrial and **aquatic species**

What's at Risk?

An infographic titled "What's at Risk?" featuring six hexagonal images arranged in a cluster. Each image is labeled with a sector: "Tourism" (under a coral reef with fish), "Watersheds" (under a waterfall), "Horticulture" (under pink flowers), "Native species" (under a red bird), "Agriculture" (under a field), and "Our health and lifestyle" (under a person on a beach).

Tourism

Watersheds

Horticulture

Native species

Agriculture

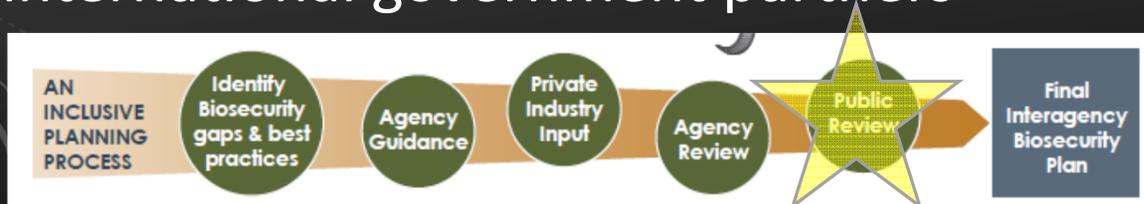
Our health and lifestyle

Draft **Hawaii Interagency Biosecurity Plan**
2017–2027

THE HAWAII INTERAGENCY BIOSECURITY PLAN

41 COLLABORATING LOCAL STATE AND FEDERAL AGENCIES

- Hawaii AG, APHIS, ARS, CBP, CDC, CDFA, CES, CGAPS, CTAHR, **DAR/DLNR**, DOFAW/DLNR, DBEDT, DHS, DOD, HDOE, HDOH, EPA, FAS, FDACS, HAL, HDOA, HDOT, HI-EMA, HISC, HTA, IPPC, ISC, NOAA, NPS, OEQC, OIA, OIE, PBARC, PCSU, PIERC, RCUH, UH, USCG, USDA, USFS, USFWS, USGS
- Among others: Industry and national and international government partners



<http://hdoa.hawaii.gov/>

HAWAII INTER

S

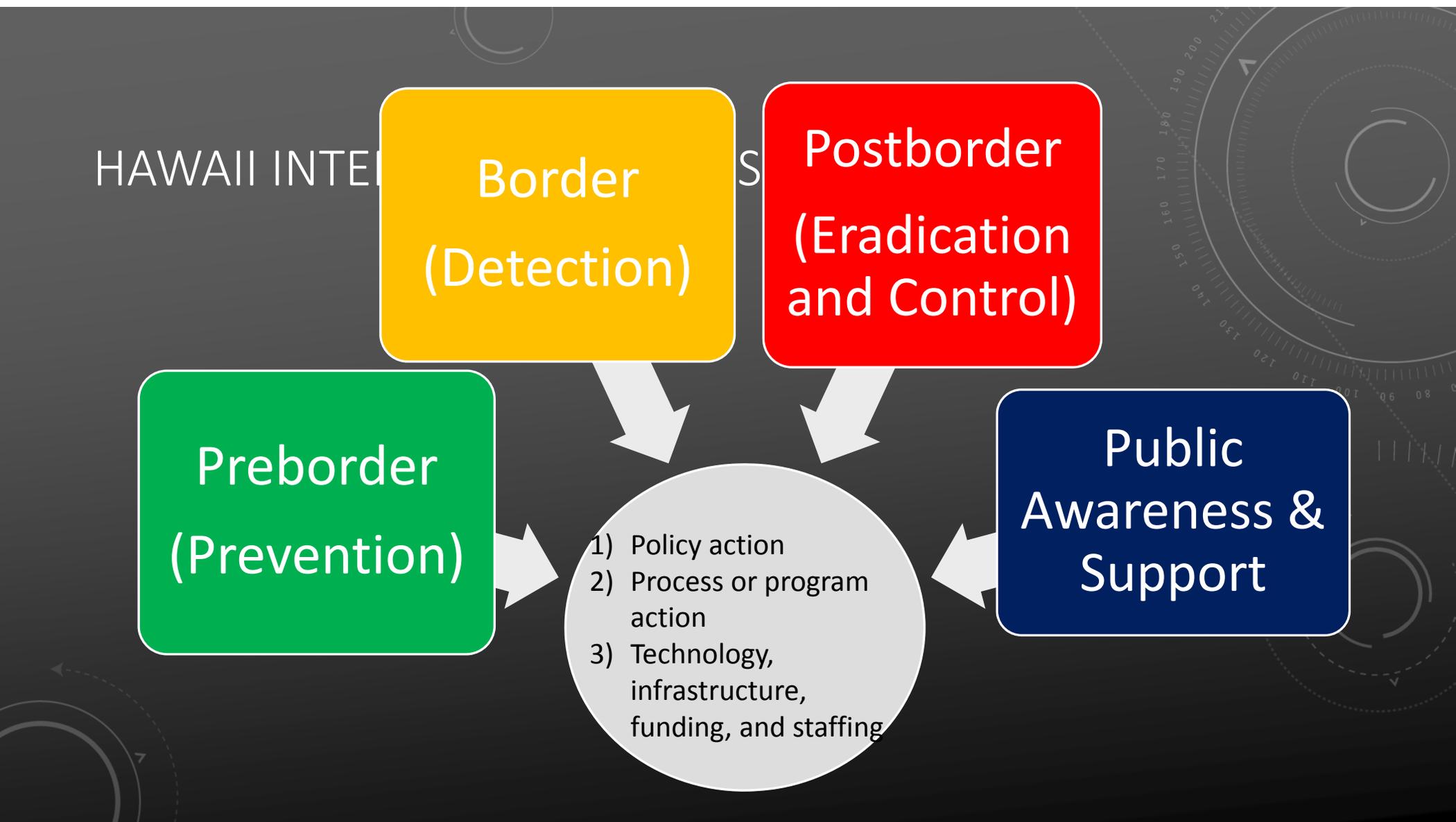
**Border
(Detection)**

**Postborder
(Eradication
and Control)**

**Preborder
(Prevention)**

**Public
Awareness &
Support**

- 1) Policy action
- 2) Process or program action
- 3) Technology, infrastructure, funding, and staffing



HAWAII INTERAGENCY BIOSECURITY PLAN: PREORDER

Preborder

- Goal: **Prevent** the Transport of Invasives Species to Hawaii

- Ballast water (BW) and vessel biofouling (VB)
- Amend BW and develop/implement VB regulations
- Gain Alien Aquatic Organism Task Force Input

Alien Aquatic Organism Task Force (AAOTF) – Military, federal, state agency stakeholders, commercial/recreational maritime industry, scientists, vector management system vendors, national/international experts



HAWAII INTERAGENCY BIOSECURITY PLAN: PREBORDER

Preborder

- Goal: **Prevent** the Transport of Invasives Species to Hawaii

- **Ballast water (BW) and vessel biofouling (VB)**
 - Amend BW and develop/implement VB regulations
 - Gain Alien Aquatic Organism Task Force Input
 - Acquire BW + VB hull husbandry reporting forms
 - Create e-database/algorithm to perform risk assessment for prioritizing inspections

Ballast Water Management Report

OSR number: 1625-0069 Exp. date: 31-Dec-2013

Vessel Information

Vessel name: [redacted]
ID number: IMO number [redacted]
Country of Registry: Albania
Owner/operator: [redacted]
Type: Select vessel type [redacted] Gross Tonnage: [redacted]
Ballast water volume units: Select units [redacted]
Total ballast water capacity: [redacted] Number of tanks on ship: [redacted]
Onboard BW Management System: [redacted]

Voyage Information

Arrival port (port and state): [redacted] Select state [redacted]
Arrival date: [redacted]
Last port (port and country): [redacted] Select country [redacted]
Next port (port and country): [redacted] Select country [redacted]
Total ballast water on board: [redacted]
Alternative BW management conducted, per instructions from CO: [redacted] United States
[redacted] Afghanistan
[redacted] Island Islands
[redacted] Albania
[redacted] Algeria
[redacted] American Samoa
[redacted] Angola

Certificate of accurate information

By checking this box, I attest to the accuracy of the information and management activities were in accordance with the ballast water required by CFR 151.202(a)(2).

Responsible Officer's name and title: [redacted]
Report type: Select report type [redacted]
Submitted by: [redacted] Contact information: [redacted]

Ballast Water History

On the following page(s), provide the ballast water history for each tank to be discharged into the waters of the United States or to a reception facility.

Submit report via e-mail Submit report on-line

Department of Fisheries
Western Australia

Assessment Tool

Step 5 of 12: Vessel Movements

Terms & Conditions

1. Scenario Testing

2. Contact Details

3. Vessel ID

4. Movements

5. Antifouling

6. Clean/Inspect

7. Seawater Systems

8. Time Outside WA

9. Time in WA

10. Upload Documents

Summary

Complete

4. Vessel Movements

* 4.1. Will ANY of your vessel activity occur in Australian waters within the 12 nautical mile (M) limit off Western Australia (WA), or in WA Coastal Waters?
The 12 nautical mile (M) limit marking Australia's Territorial Sea, is the belt of water not exceeding 12M in width measured from the Territorial Sea Baseline (TSB).

Yes
 No

4.2. Will the vessel be, or has it been, transported to Western Australia via dry haulage?
This includes playback transport by heavy lift vessels, barge etc., or as cargo. It does not include in-water towing.

Yes
 No

4.2.1. Prior to dry haulage, were your vessel's internal seawater systems drained and cleaned, and the vessel hull cleaned of any marine growth?
This means cleaned in dry dock for any accumulated aquatic plants and animals, (marine growth or biofouling), which can occur on all submerged surfaces.

Yes
 No

4.2.2. Can you provide a dry docking and / or inspection report?
This information is not mandatory and will not affect your risk assessment calculation. However, if your vessel is audited or inspected these documents may be required.

Yes
 No

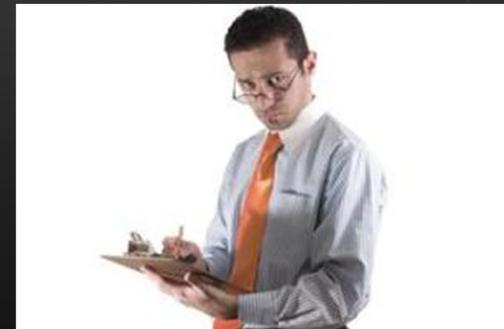
https://vesselcheck.fish.wa.gov.au/form/assessment_tool/introduction

HAWAII INTERAGENCY BIOSECURITY PLAN: PREORDER

Preborder

- Goal: **Prevent** the Transport of Invasives Species to Hawaii

- **Ballast water (BW) and vessel biofouling (VB)**
 - Amend BW and develop/implement VB regulations
 - Gain Alien Aquatic Organism Task Force Input
 - Acquire BW + VB hull husbandry reporting forms
 - Create e-database/algorithm to perform risk assessment for prioritizing inspections
 - **Build capacity: data manager and inspectors**



HAWAII INTERAGENCY BIOSECURITY PLAN: BORDER



HAWAII INTERAGENCY BIOSECURITY PLAN: BORDER

Border

- **Goal: Enhance the Detection and Control of Pests and Diseases at Ports of Entry**

- **Ballast water (BW) and vessel biofouling (VB)**
 - MOU with USCG and HDOA
 - BW and VB compliance assessment
 - BW – 1) rapid compliance, 2) full suite
 - VB – 1) presence /absence, 2) spp. specific
- **Rapid response for unmanaged BW and VB**
 - SOP for rapid response
 - Onshore facility, dry dock, UV, chlorine, tow out >50 nm offshore, HDOA giant autoclave
- **Build capacity**



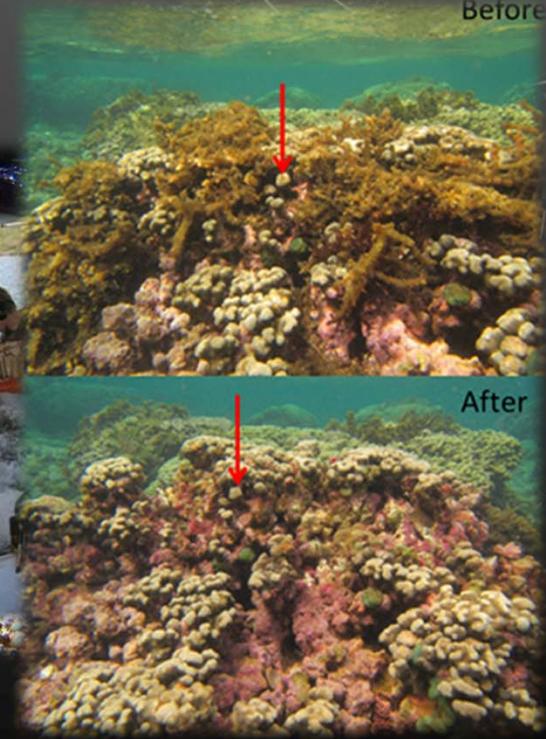
- 300F
- 40 psi
- 0 to x hours of steam
- 26 churning paddles

HAWAII INTERAGENCY BIOSECURITY PLAN: POSTBORDER

Postborder

- **Goal: Protect Hawaii from Invasive Species Already Present within the State**

- **Super Sucker**
 - Invasive algae removal step 1



HAWAII INTERAGENCY BIOSECURITY PLAN: POSTBORDER

Postborder

- **Goal: Protect Hawaii from Invasive Species Already Present within the State**

- Super Sucker
- **Urchin Hatchery**
 - Invasive algae removal step 2

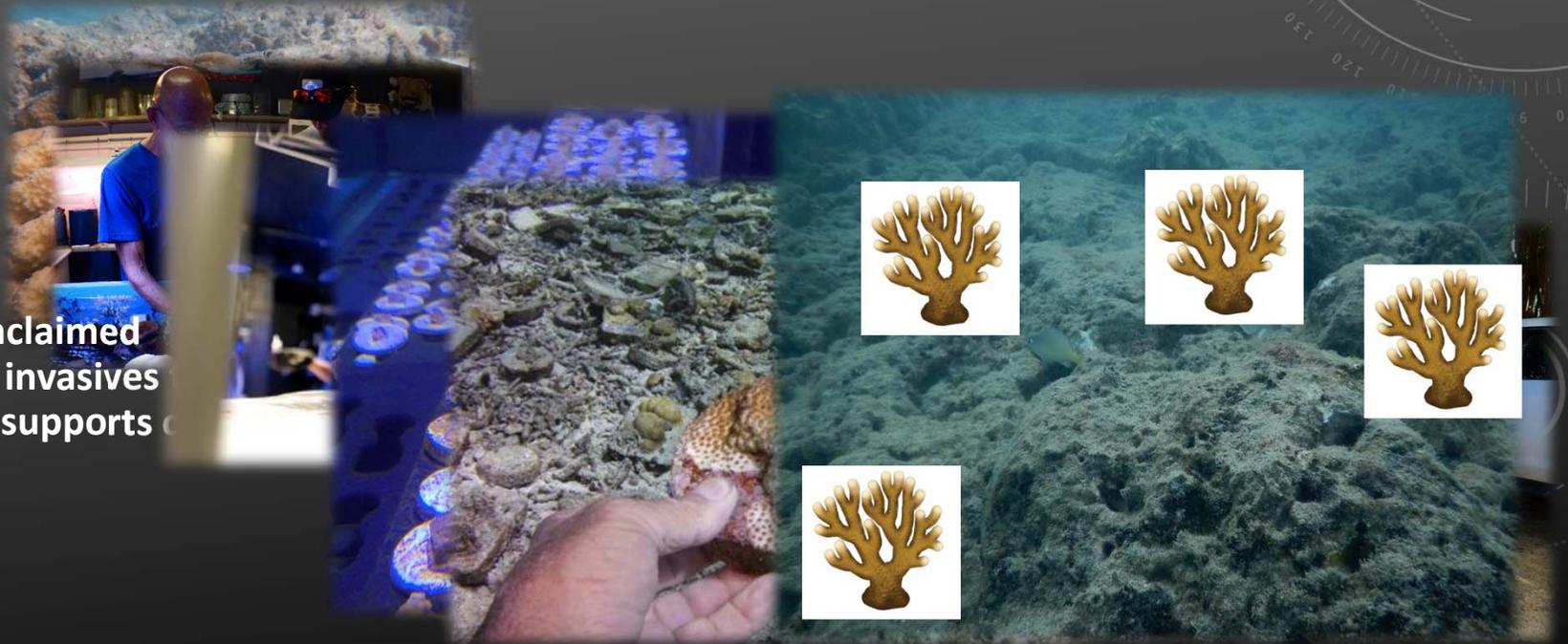


HAWAII INTERAGENCY BIOSECURITY PLAN: POSTBORDER

Postborder

- **Goal: Protect Hawaii from Invasive Species Already Present within the State**

- Super Sucker
- Urchin Hatchery
- **Coral Nursery**
 - **Minimizes unclaimed substrate for invasives to grow on and supports recovery**



HAWAII INTERAGENCY BIOSECURITY PLAN: POSTBORDER

Postborder

- **Goal: Protect Hawaii from Invasive Species Already Present within the State**

Most frequented harbors in Hawaii between 2006-2015

Island	City	Total	Coastwise	Overseas
Oahu	Honolulu	6061	5418	635
	Barbers Point	1099	985	113
Big Island	Hilo	817	415	402
Maui	Lahaina	421	61	360
	Kahului	368	84	284
Kauai	Nawiliwili	378	52	326

- Super Sucker
- Urchin Hatchery
- Coral Nursery
- **Biomonitoring**
 - Molecular techniques
 - Taxonomic identification

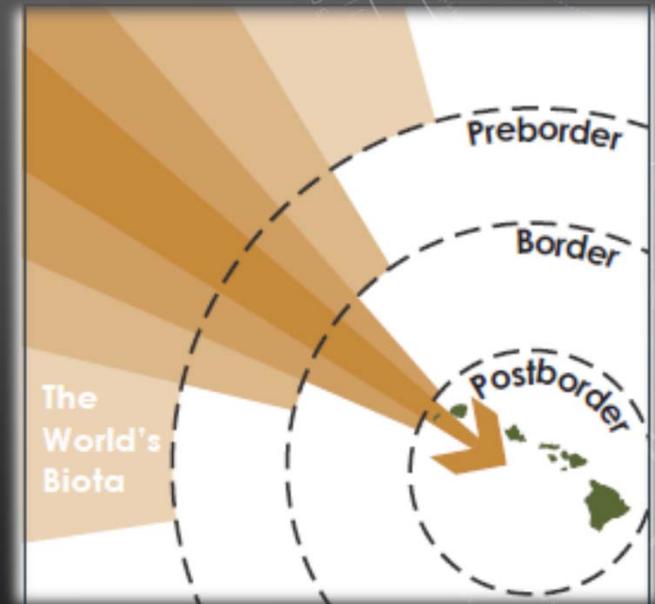


HAWAII INTERAGENCY BIOSECURITY PLAN: OUTREACH & EDUCATION

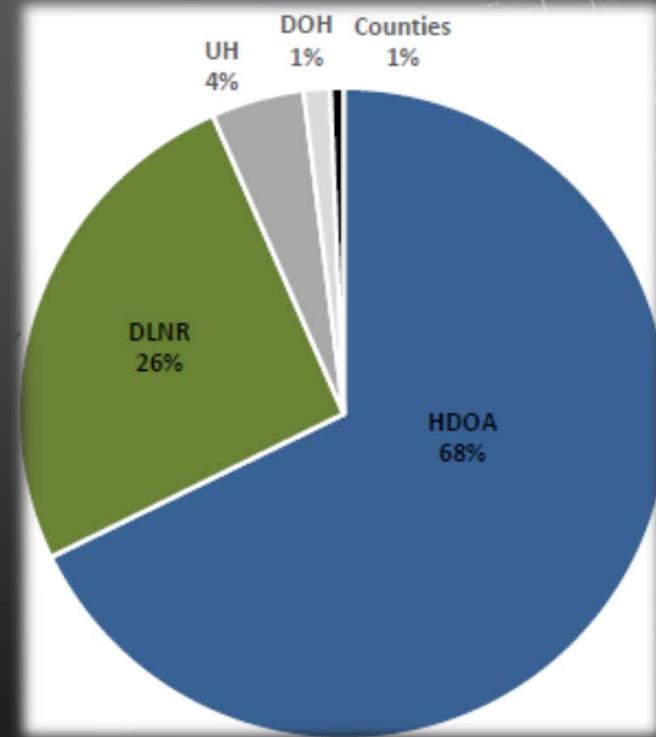
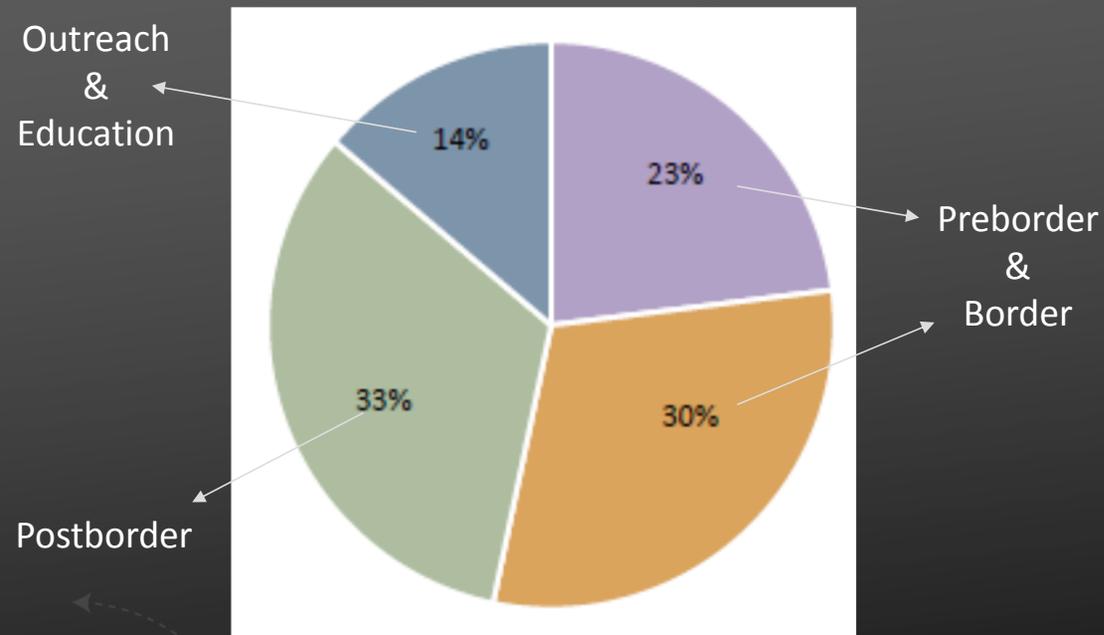
Outreach &
Educat.

- **Goal: Enhance Public Awareness and Support for Hawaii Biosecurity**

- Recreational and commercial vessel operators and managers
- General public
 - K-12
 - College
 - Public events and media outlets
 - Tourists/visitors
- Policymakers
- Local, national, and international government agencies
- NGOs

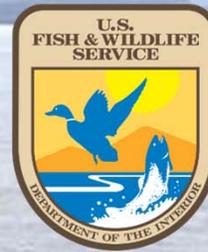


THE HAWAII INTERAGENCY BIOSECURITY STATS



THROUGH COLLABORATION WILL WE ACHIEVE AIS PREVENTION





PARTNER AGENCIES

MAHALO NUI LOA (THANK YOU VERY MUCH) QUESTIONS?



Julie (Jules) Kuo

DLNR in c/o with PCSU, Hawaii Ballast Water and Hull Fouling Coordinator

julie.c.kuo@hawaii.gov

	Arrivals to pop. x10000	Arrivals to general coastline x100	Arrivals to tidal shoreline x100
HI	7	133	95
AK	35	46	8
WA	6	2556	133
OR	2	279	59
CA	2	263	1073