

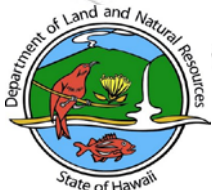
# Hawaii's Update on Ballast Water & Biofouling Management



Pacific Ballast Water Group Meeting

April 2015, Seattle, WA

Kevin Richardson – Invasive Species Legal Fellow



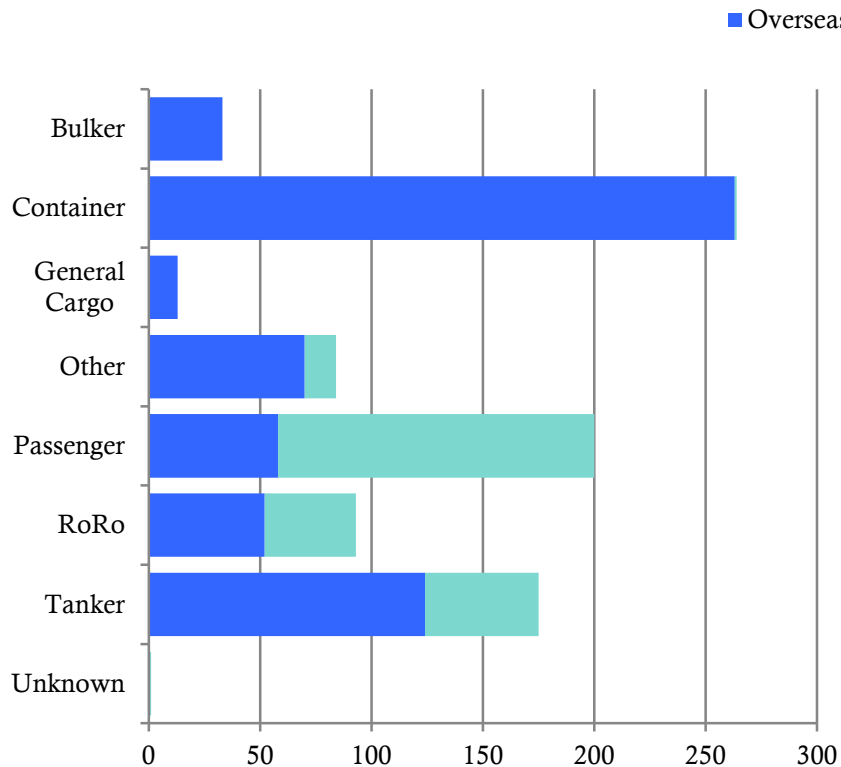
# Hawaii's Ballast Water Rules

- **Hawaii Revised Statutes Ch. 187A-32**
- **Hawaii Administrative Rules Ch. 13-76**
  - Qualifying vessels conduct mid-ocean exchange by flow through/empty refill or equipped with a functioning ballast water treatment system that is designed to kill all living aquatic organisms or fresh water ballast water exchange
  - Exemptions: tankers in coastwise trade, USCG & DOD vessels, operations exclusively within the MHI EEZ (inter-island) or outside of the MHI EEZ but conducts all ballast operations exclusively in the MHI EEZ, innocent passage
  - Requirements to submit a BW management report and hold a management plan
- **Issues with current administrative rules**
  - Outdated
  - Not in conformity with the IMO and USCG
  - Exempts inter-island vessels

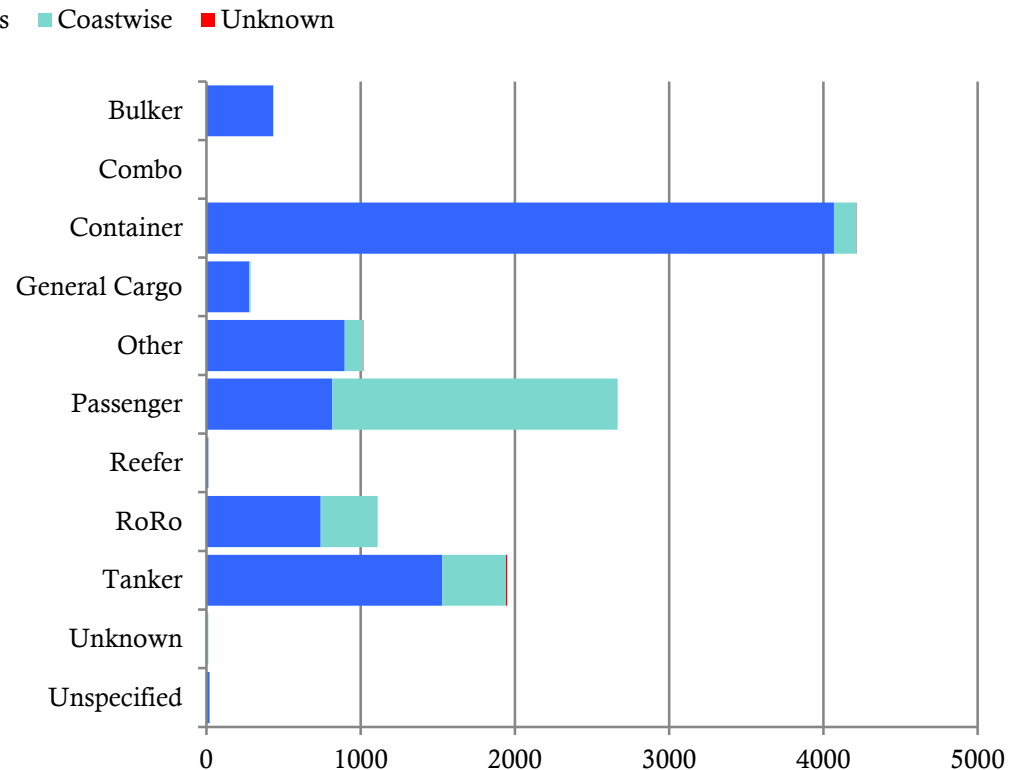


# Total Vessel Arrival Patterns

2014 Total Arrivals (836)

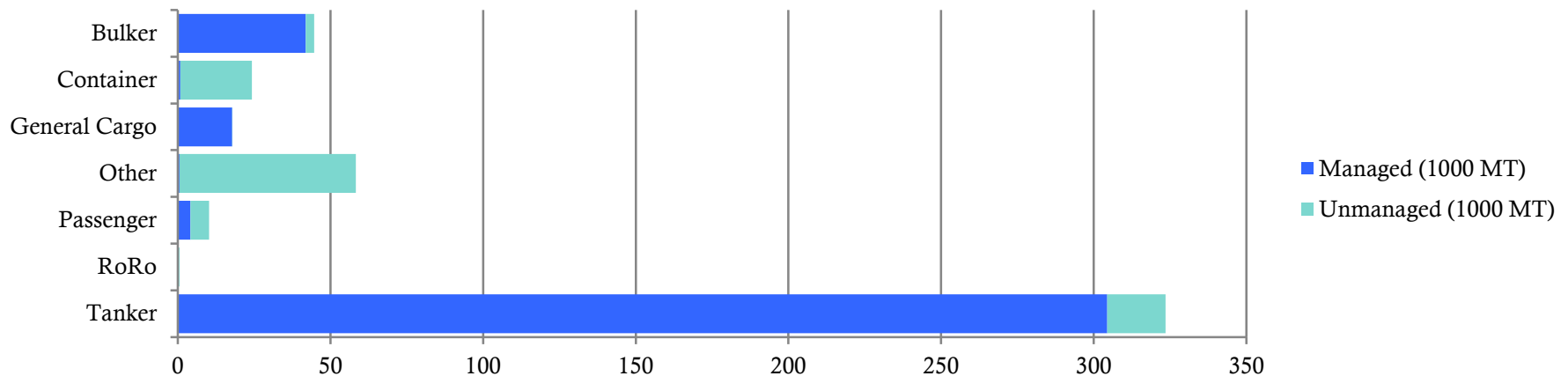


2004 – 2014 Total Arrivals (11,733)



# 2014 Ballast Water Discharge Patterns

## Overseas Ballast Water Management by Ship Type (479.49 Total)



## Coastwise Ballast Water Management by Ship Type (54.02 Total)





# Next Steps for Ballast Water

- Increase compliance for unmanaged ballast water
- Re-assess rules and proposed amendments at the end of 2015
- Address management gaps and opportunities



# Vessel Biofouling Overview

1. Where we began and where are we now (2011-2015)
2. Biofouling Project outline and results
3. Policy implications
4. Other projects – vessel in-water cleaning
5. Proposed next steps



## Vessel biofouling in Hawaii: current patterns of a potent marine bioinvasion vector and potential management solutions

### FINAL REPORT

Ian Davidson & Greg Ruiz  
Smithsonian Environmental Research Center

Sonia Gorgula  
Ballast Water & Hull Fouling Coordinator  
Division of Aquatic Resources  
Hawaii State Department of Land and Natural Resources

December 2014



# Report Overview

1. Marine invasion history of the state
2. Shipping traffic to Hawaii
3. Current hull husbandry practices adopted by vessels that call to Hawaii (commercial and recreational)
4. Research and monitoring priorities for marine biofouling invasions in Hawaii and the range of management options that the state could consider to tackle the risk of biofouling-mediated introductions

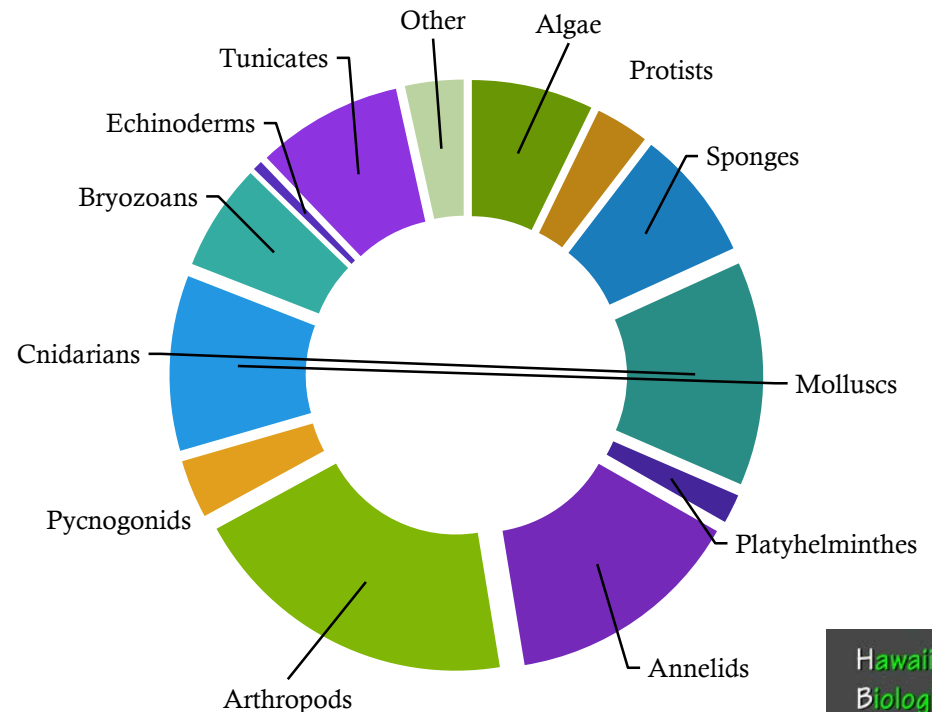


# Marine Invasion History

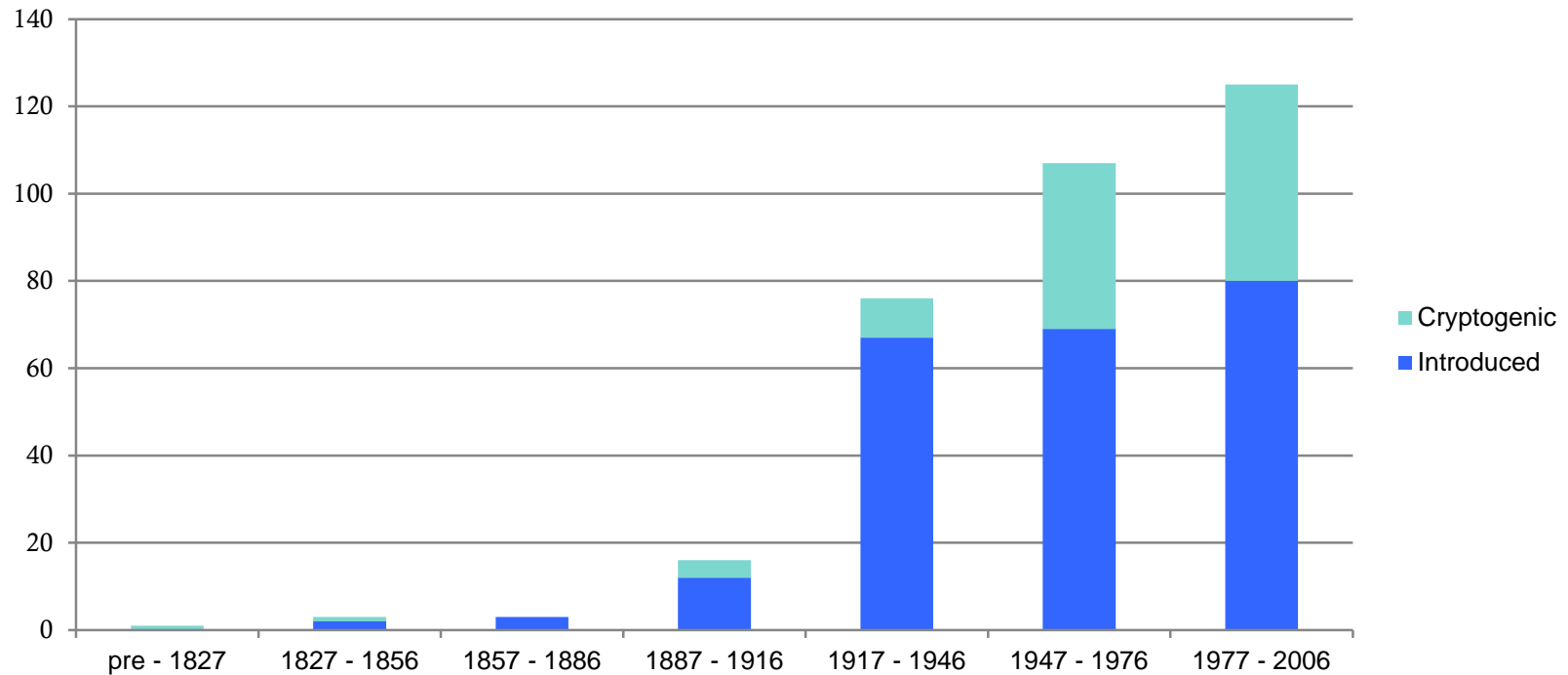
Monograph of Marine Bioinvasions of Hawaii (Carlton and Eldredge, 2009)

- Assessed:
  1. Taxonomic breakdown of Hawaii's invasions
  2. Timing of initial introductions
  3. The native regions for Hawaii's introduced marine biota
  4. The vectors likely to be responsible for transferring the species to Hawaii
- Out of 417 species described as established in Hawaii's waters, 346 were marine invertebrates and algae

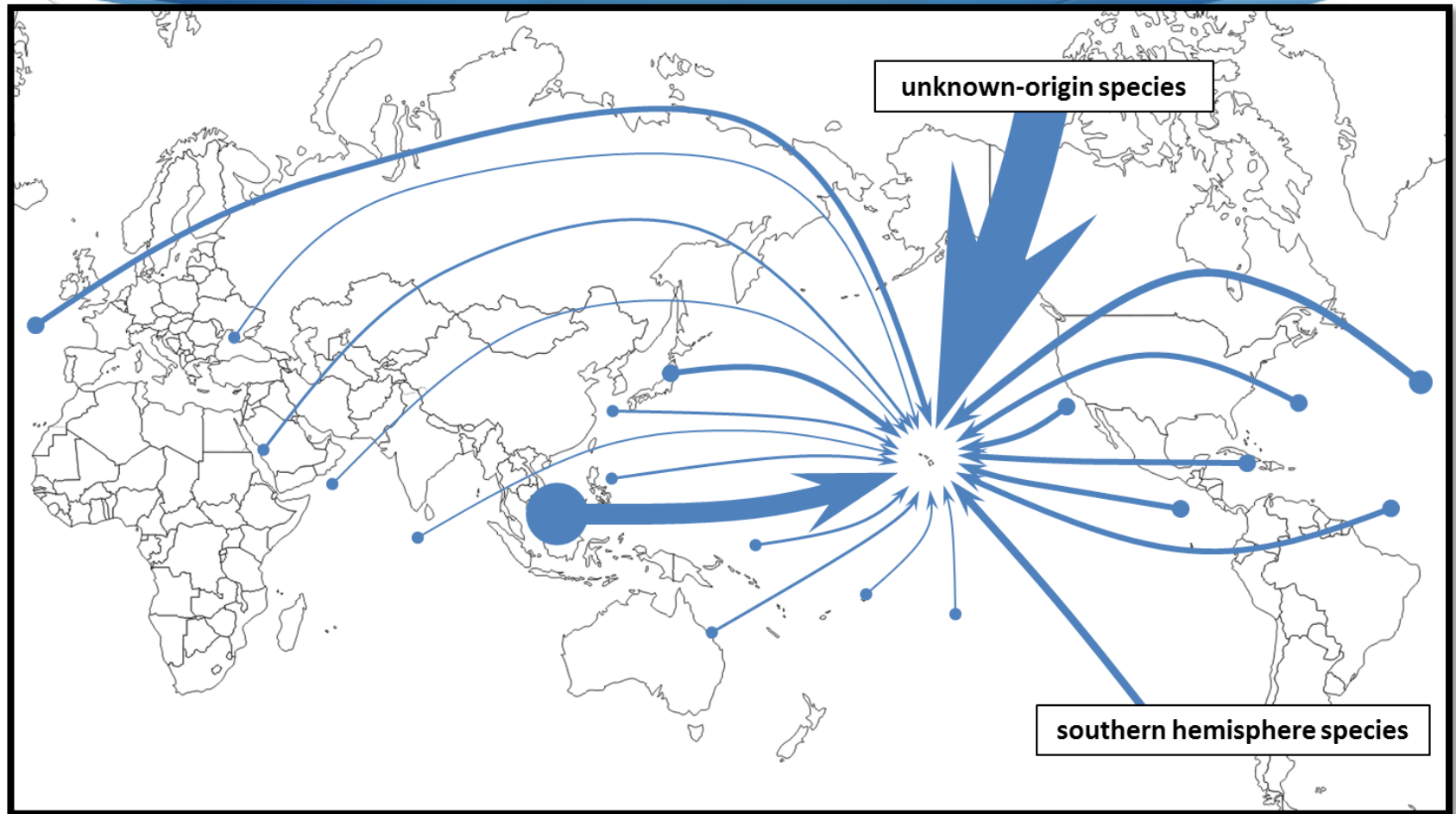
**Hawaii invertebrate and algae invasions (n=346)**



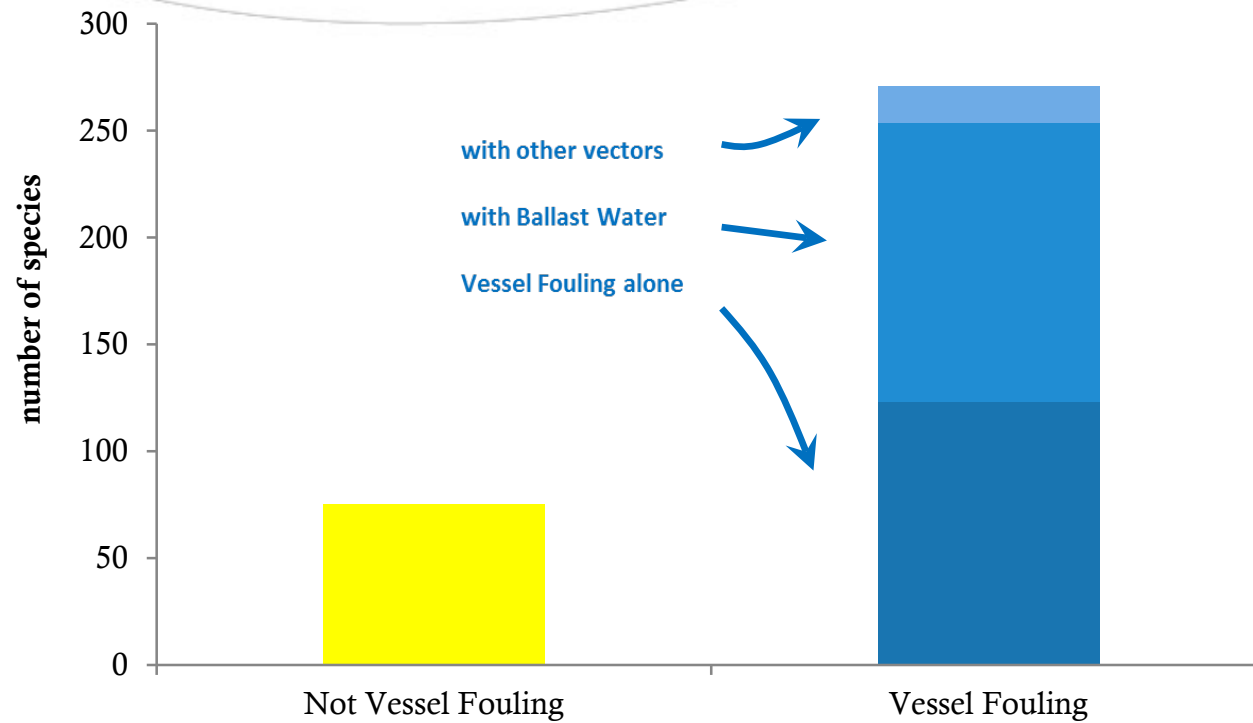
# Timing of Introductions



# Origin of Invaders

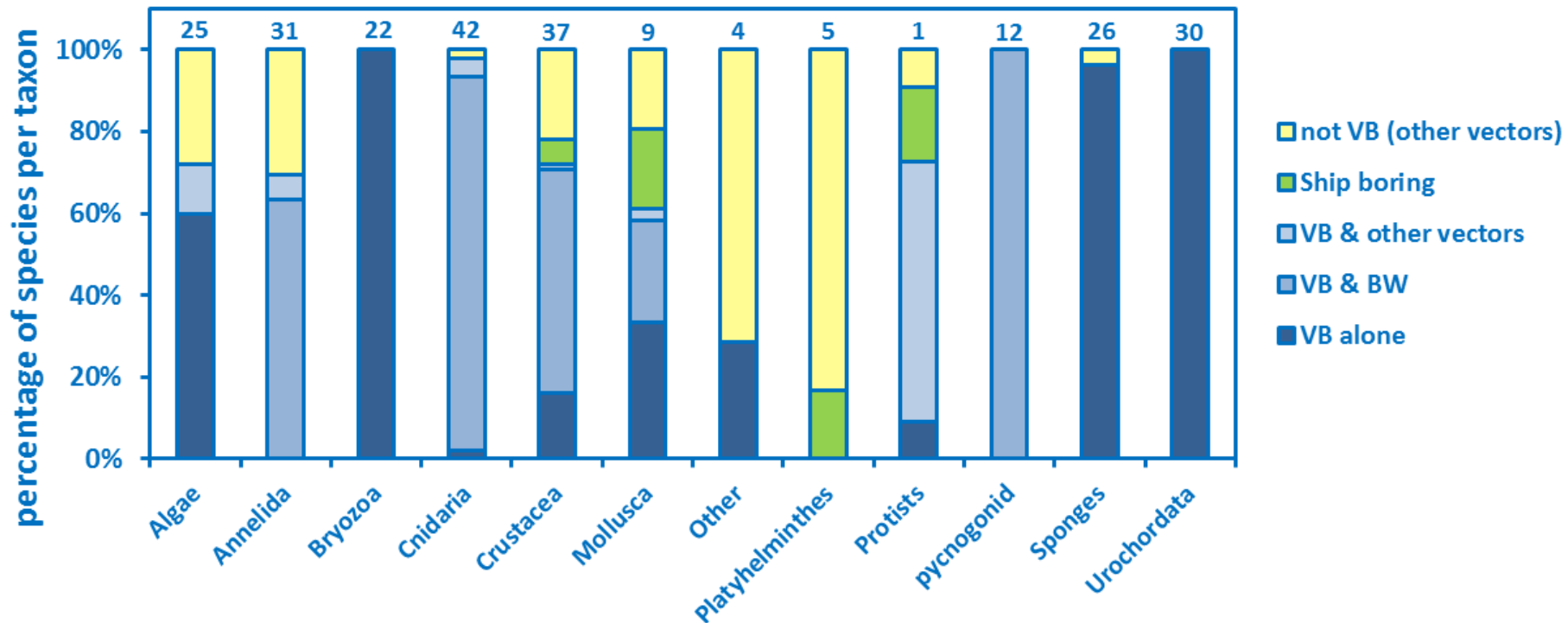


# AIS Vectors



**\*Up to 78% of HI introductions  
attributed to vessel biofouling**

# Role of Biofouling by Taxonomic Group

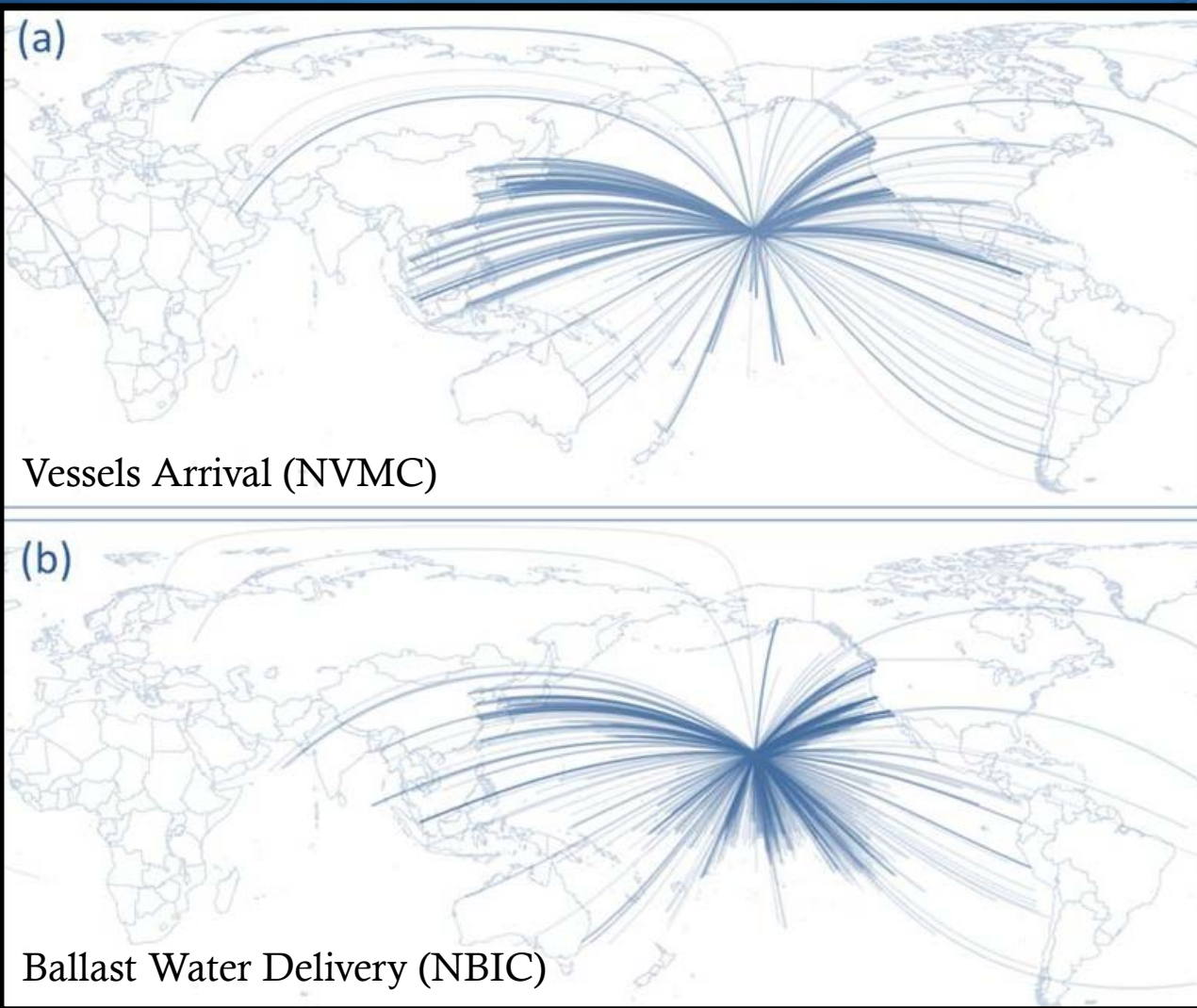




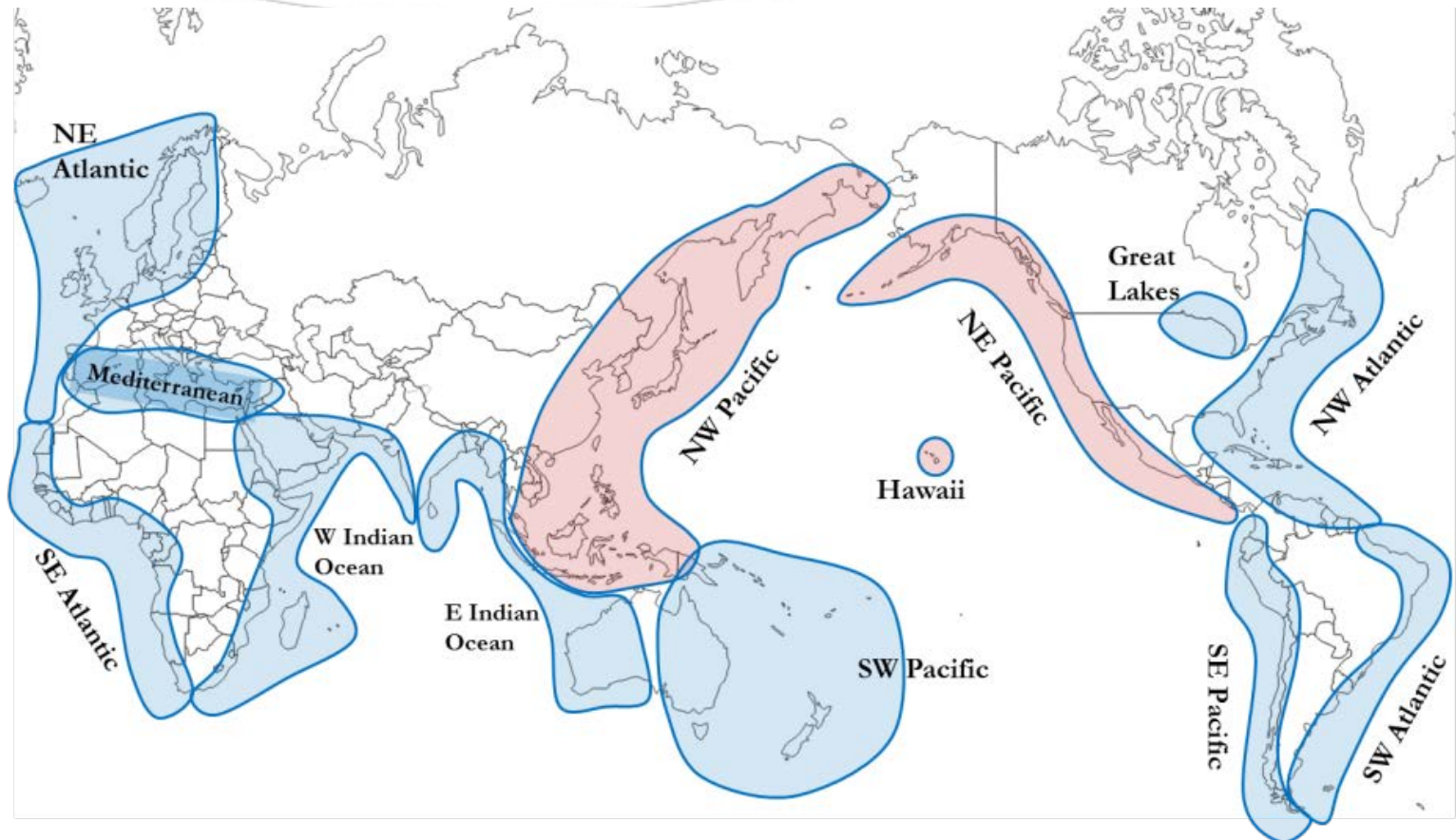
# Marine Invasion Key Points

1. Vessel biofouling is the top ranking vector for non-indigenous & cryptogenic marine introductions into Hawaii
2. Number and diversity of invaders is high
3. Non-indigenous species native ranges are distributed globally
4. Strong signal of increased introductions over time

# Shipping Traffic



# Top Three Donor Regions



# Mean Arrivals by Source Region

## NE & NW Pacific

➤ 85%

## Interisland

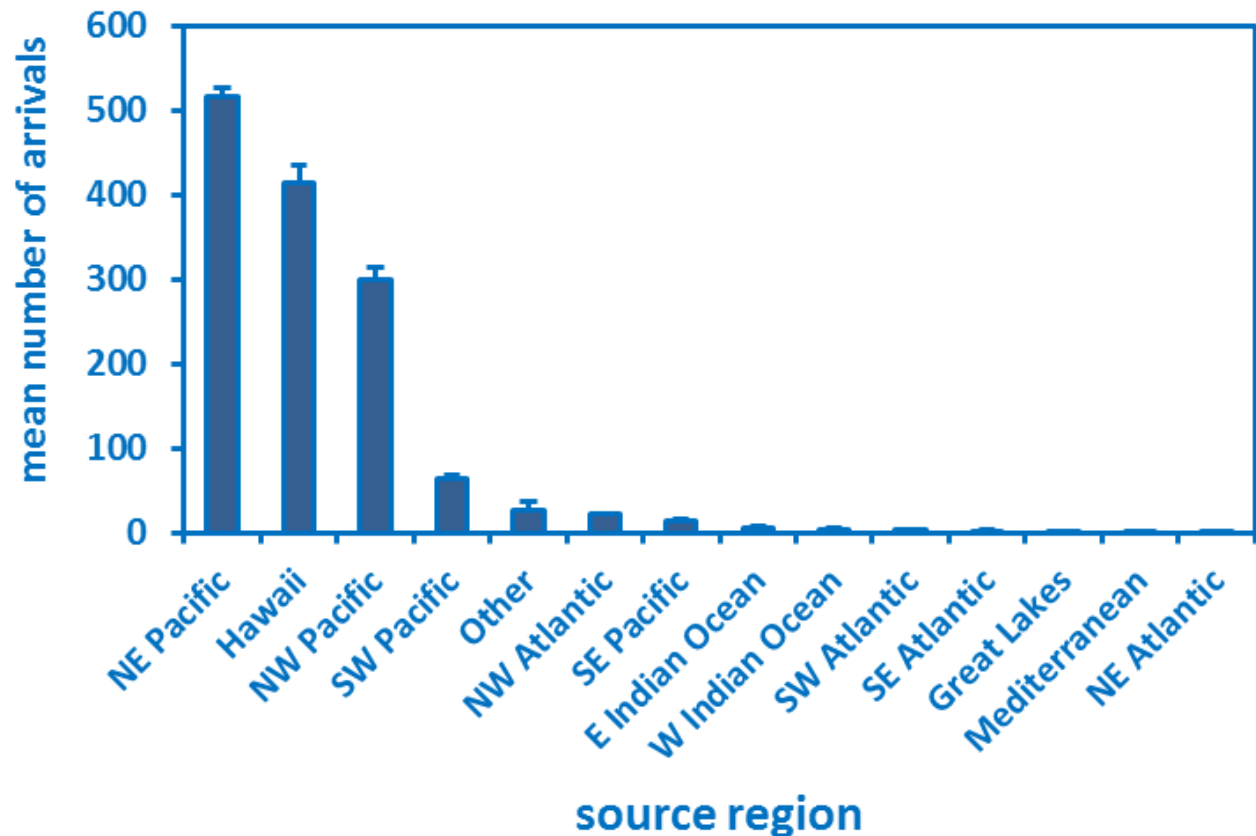
➤ 30%

## SW Pacific

➤ 6.75%

## Outside of Pacific

➤ 6.4%





# Summary of Shipping Traffic



1. Analyses of incoming traffic restricted to last port of call (does not fully capture the range of potential biofouling sources)
  - Therefore, this is a minimum estimate for biofouling connectivity (analysis limited to 350+ locations over four years)
2. North Pacific dominates arrival patterns. Environmental mismatch not well understood
3. High number of unique vessels, dominated by a few repeat arrivals
4. Containerships dominate out-of-state arrivals; passenger ships dominate within state movement



# Hull Husbandry Practices

- Questionnaire with eight parts
- Response:
  - Passenger ships = 76% (25 of 33)
  - Containers = 39%
  - Tankers = 29%
  - Bulkers = 15%
  - RoRos = 12%
  - All other vessel types = 42%
- 125 unique vessel forms, representing one-third of annual arrivals

Hawaii Biofouling Questionnaire for non-commercial boats

Vessel Information & Particulars	
Today's date (MM/DD/YYYY)	
Your boat's name:	
Type of boat (check the appropriate box):	Sailboat/Yacht <input type="checkbox"/> Motorboat <input type="checkbox"/> Other <input type="checkbox"/> Specify _____
Boat length (feet):	
Where is the boat's home harbor? Check not applicable if stored on land when not in use.	Home harbor marina name: Home harbor town/city: Home harbor State/Country: Not applicable <input type="checkbox"/>

Maintenance & Anti-Fouling Paint	
When was the <u>most recent</u> occasion that the boat was hauled out for anti-fouling paint application?	Date (Month/Year): Don't know <input type="checkbox"/>
What antifouling paint is currently coating the hull of the boat? If you don't know the brand of paint, check don't know and provide a more generic description if possible (e.g. copper abative, foul-release etc.) If the boat has no anti-fouling paint at present, check the appropriate box.	Manufacturer/Company: Product Name: Don't know <input type="checkbox"/> Generic Description (if possible):  This boat does not have anti-fouling paint <input type="checkbox"/>
Since the last application of anti-fouling paint, has the boat been manually cleaned (scrubbed or brushed)?	Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
If it has been manually cleaned, what method was used? And where did this cleaning occur? (check all that apply)	Date of most recent cleaning(M/Y): In-water by a diver at my home marina <input type="checkbox"/> In-water by a diver at another marina <input type="checkbox"/> Location (city/country): Out-of-water / On land <input type="checkbox"/> Other <input type="checkbox"/> (specify): _____
During a typical year, how often do you clean your boat?	Number of <u>summer</u> cleanings: Number of <u>winter</u> cleanings:

# Hull Husbandry Results



- **All major vessel types provided responses and range of voyage histories (local, Pacific, extensive travel)**
- **Dry-docking**
  - 85% dry-docked within the last 3 years, 5% docked more than 4 years ago
  - Corresponded to age of antifouling coating
  - Most reported a planned dry docking duration of 3 years
  - ~30% had their last dry-docking in Hawaii (11% of vessels based in Hawaii)
- **Anti-fouling coatings**
  - 76% used anti-fouling coatings
  - Majority of vessels used the same coating on all parts of the vessel

# Hull Husbandry Key Points

- Encouraging that vessels tend to dry-dock every three years (rather than five) – similar trend observed in CA
- Increases likelihood of coatings being within effective lifespan
- Overall awareness of international standards (IMO) encouraging
- Risky behaviors:
  - Long durations between dry dockings
  - Long lay ups in foreign ports
  - Poor responses regarding in-water cleaning
- Invasion history suggests biofouling is still a strong invasion risk

# Biofouling Management Strategies

1. Retain the status quo (no action)
2. Conduct outreach to promote biofouling management
3. “Wait and see” approach and require biofouling record keeping
4. Propose voluntary biofouling standards
5. Propose mandatory standards (using IMO/NZ standards)
6. Expand PNMN policy to the rest of the state

# Option Five – Supporting Data

- **Vector management approach:**
  - Number and diversity of non-indigenous species in Hawaii is high
  - Non-indigenous species native regions are distributed globally
- **Consistency with IMO and California:**
  - NE Pacific greatest donor (for last port of call)
  - Containerships dominate out-of-state arrivals
  - High Pacific influence
- Voluntary approach = 30% of the fleet (Did the riskier vessels participate?)



# Vessel In-Water Cleaning Project

- Investigate the methods of in-water cleaning (IWC) that are currently available
- Determine their availability among service providers in Hawaii
- Assess the risk of various IWC methods
- Convene an information-sharing workshop on the topic in Hawaii
- Assist DLNR to finalize a data gathering form on IWC activities in Hawaii
- Evaluate options/recommendations for IWC in Hawaii going forward



# Proposed Next Steps

- Recommendations:
  1. Progress a mandatory biofouling requirement for all vessels
  2. Consider an intra-state movement vessel biofouling policy
  3. Monitor ports, high value areas, and sample vessels
- We need support for:
  1. Ballast water administrative rule amendments
  2. In-water cleaning policy development
  3. Biofouling rule development and implementation
  4. A cost recovered program via inspection fees
  5. Increased federal support for state programs

Thank You

Questions?

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