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  - Outdated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)

- Bulker
- Container
- General Cargo
- Other
- Passenger
- RoRo
- Tanker
- Unknown

2004 – 2014 Total Arrivals (11,733)

- Bulker
- Combo
- Container
- General Cargo
- Other
- Passenger
- Reefer
- RoRo
- Tanker
- Unknown
- Unspecified

2014 Ballast Water Discharge Patterns

Overseas Ballast Water Management by Ship Type (479.49 Total)

- Bulker
- Container
- General Cargo
- Other
- Passenger
- RoRo
- Tanker

Coastwise Ballast Water Management by Ship Type (54.02 Total)

- Tanker
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
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
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
Timing of Introductions

- Pre-1827
- 1827-1856
- 1857-1886
- 1887-1916
- 1917-1946
- 1947-1976
- 1977-2006

- Cryptogenic
- Introduced
AIS Vectors

*Up to 78% of HI introductions attributed to vessel biofouling*
Role of Biofouling by Taxonomic Group

Percentage of species per taxon

- Algae: 25%
- Annelida: 31%
- Bryozoa: 22%
- Cnidaria: 42%
- Crustacea: 37%
- Mollusca: 9%
- Other: 4%
- Platyhelminthes: 5%
- Protists: 1%
- Pycnogonid: 12%
- Sponges: 26%
- Urochordata: 30%

Legend:
- not VB (other vectors)
- Ship boring
- VB & other vectors
- VB & BW
- VB alone
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

(a) Vessels Arrival (NVMC)

(b) Ballast Water Delivery (NBIC)
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:
  o Passenger ships = 76% (25 of 33)
  o Containers = 39%
  o Tankers = 29%
  o Bulkers = 15%
  o RoRos = 12%
  o All other vessel types = 42%

• 125 unique vessel forms, representing one-third of annual arrivals
Hull Husbandry Results

• All major vessel types provided responses and range of voyage histories (local, Pacific, extensive travel)

• Dry-docking
  o 85% dry-docked within the last 3 years, 5% docked more than 4 years ago
  o Corresponded to age of antifouling coating
  o Most reported a planned dry docking duration of 3 years
  o ~30% had their last dry-docking in Hawaii (11% of vessels based in Hawaii)

• Anti-fouling coatings
  o 76% used anti-fouling coatings
  o 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:
  o Number and diversity of non-indigenous species in Hawaii is high
  o Non-indigenous species native regions are distributed globally

• Consistency with IMO and California:
  o NE Pacific greatest donor (for last port of call)
  o Containerships dominate out-of-state arrivals
  o 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

Images Courtesy of Seward Marine
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?

kevin.m.richardson@hawaii.gov