

# Ballast Water Management Compliance and Enforcement in California

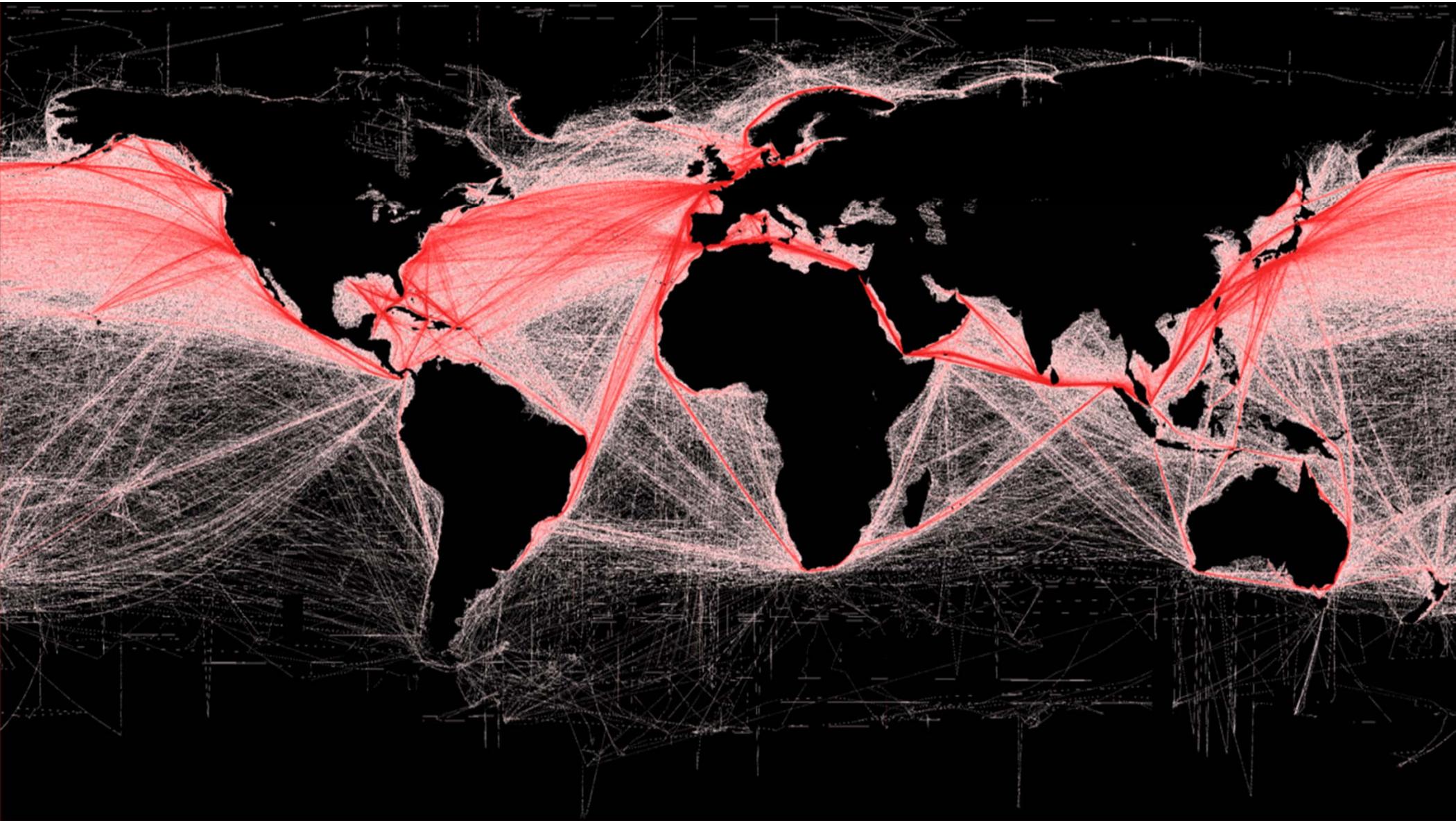
Christopher Brown

Prevention First Symposium September 28, 2016

Marine Invasive Species Program

California State Lands Commission





- Roughly **7000** species are moved around the world in ballast on a daily basis (Carlton 1999).
- Each ballast water discharge event has the potential to release over **21.2** million individual organisms (Minton et al. 2005).



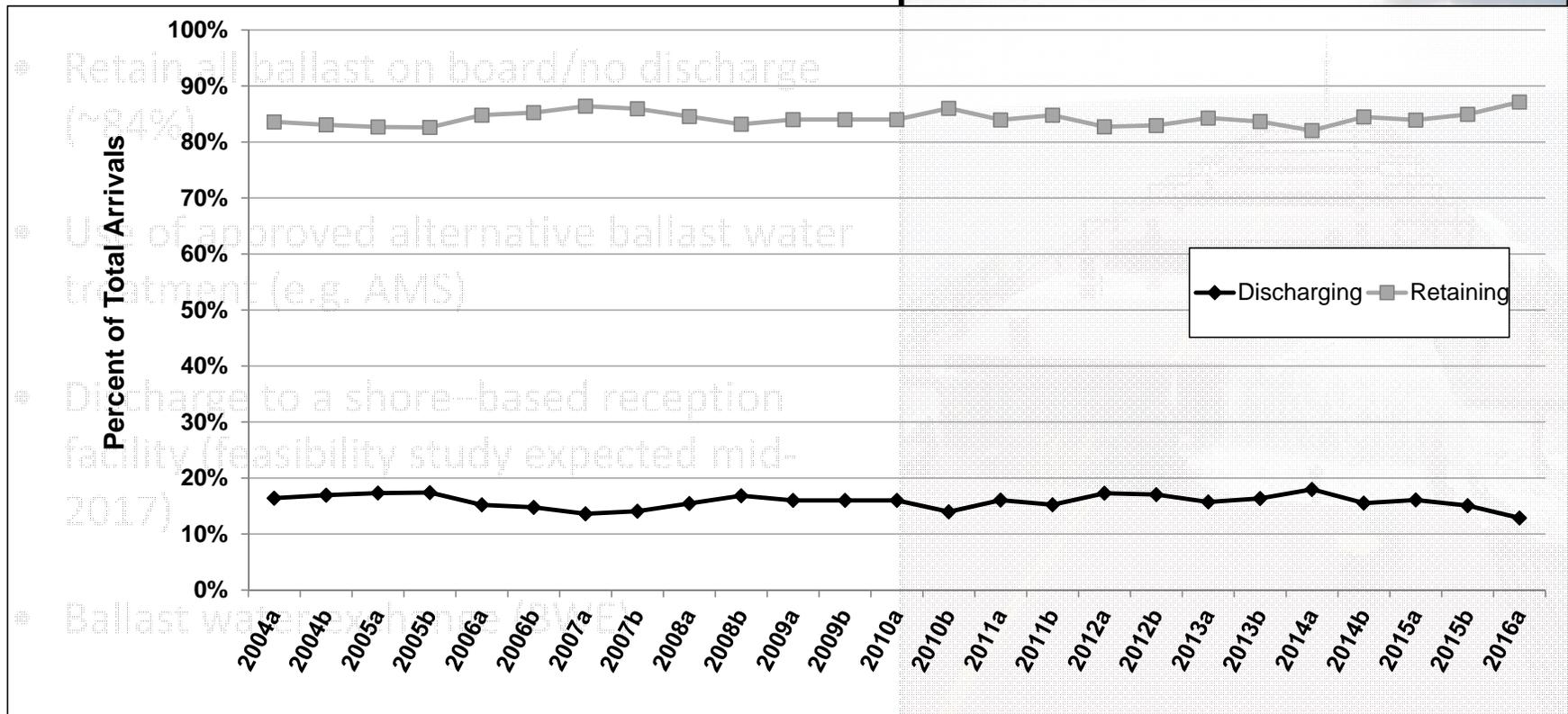
\$120,000,000,000 in losses and damages **per year** in U.S.

[\(Pimental et al. 2005\)](#)



- CA's Ocean-based economy (2013)
  - 1<sup>st</sup> in US ocean-based employment
  - ~\$41 Billion of CA's 2013 GDP
- Many vectors for NIS into CA, but shipping most significant.

## Ballast Water Management Options



- Retain all ballast on board/no discharge (~84%)

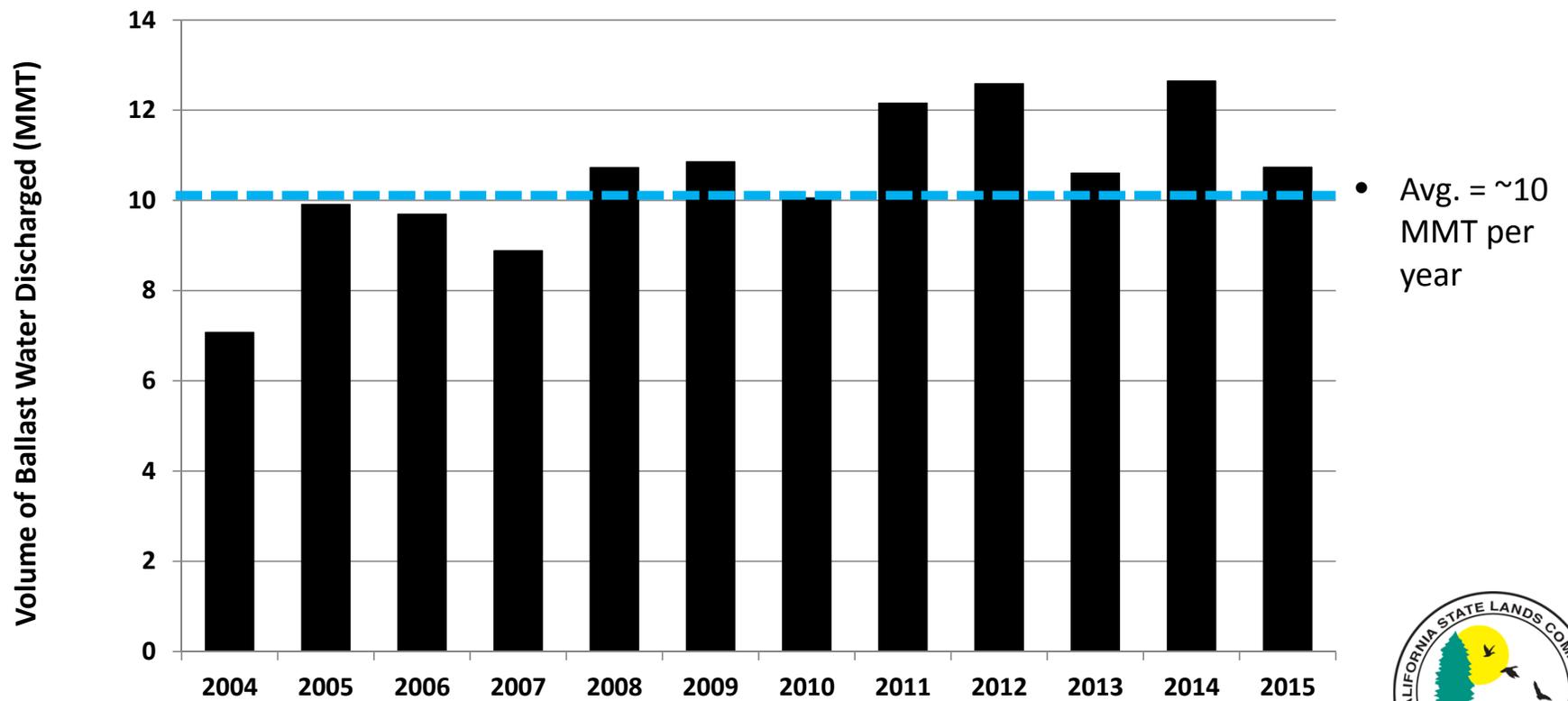
- Use of approved alternative ballast water treatment (e.g. AMS)

- Discharge to a shore-based reception facility (feasibility study expected mid-2017)

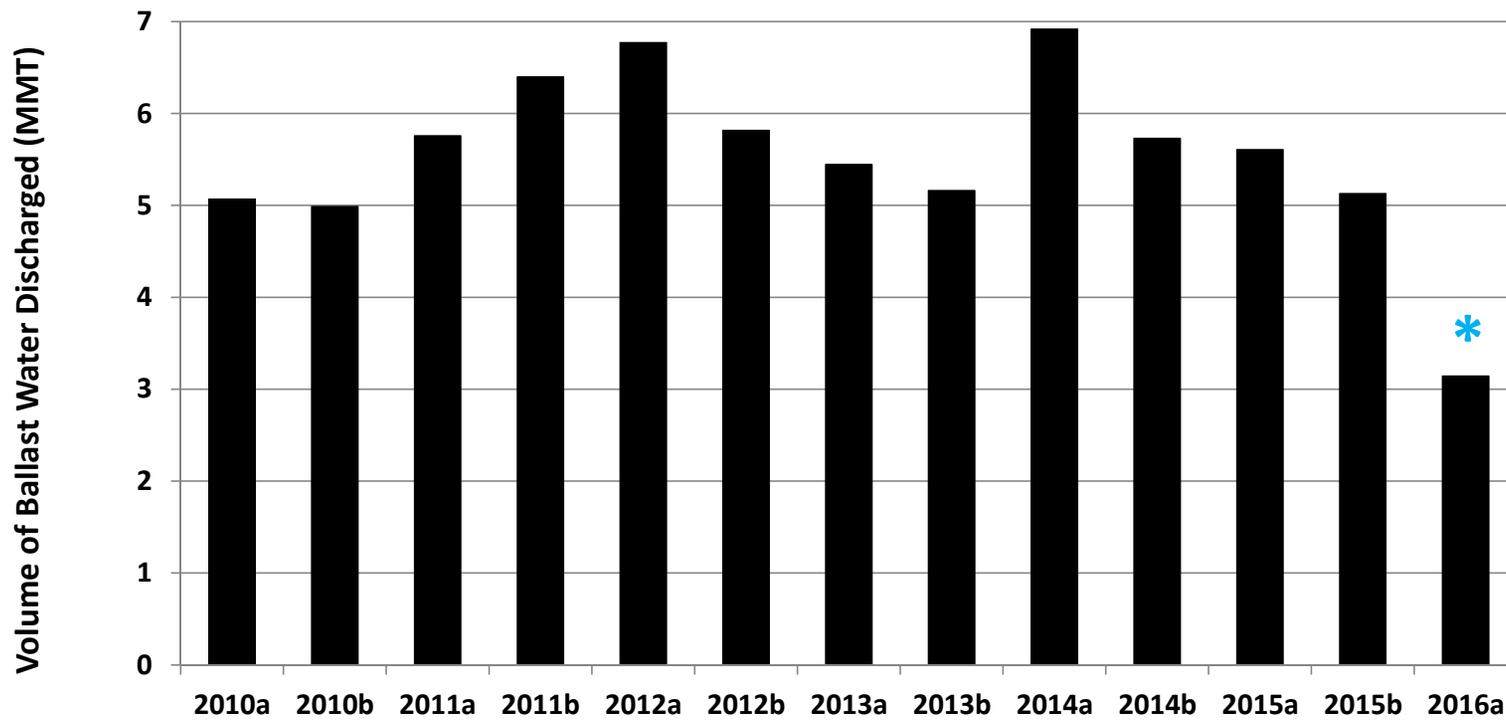
- Ballast water exchange (BWE)



## Total Ballast Water Discharge



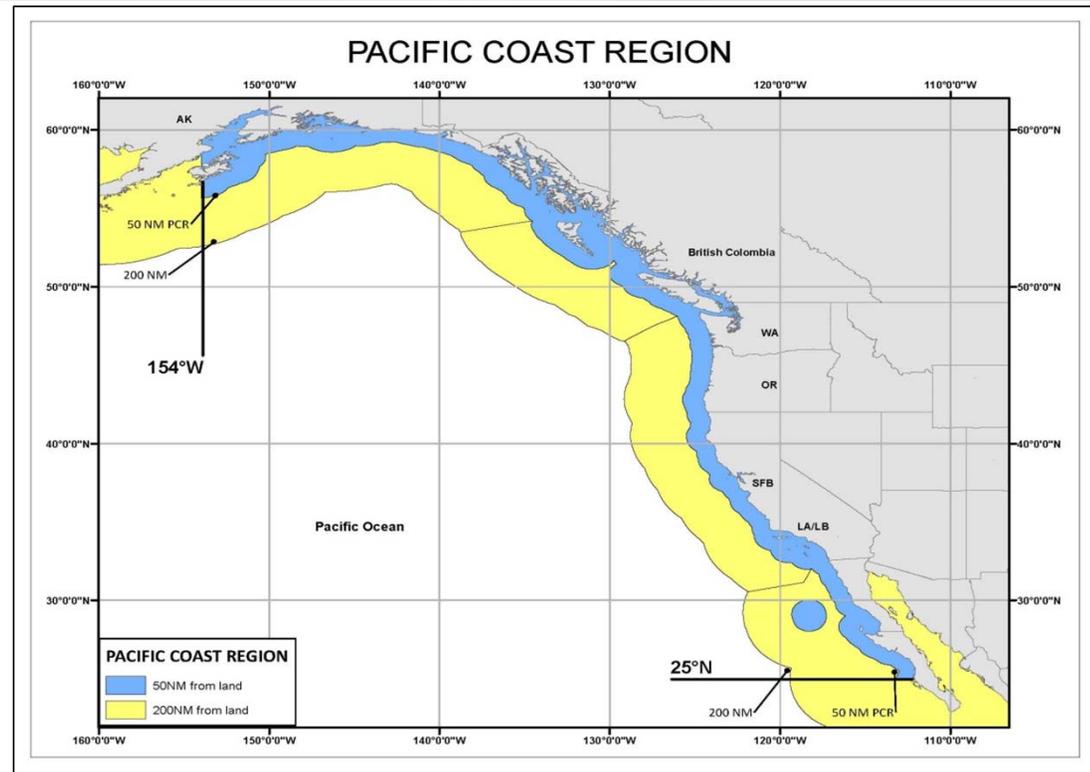
## Total Ballast Water Discharge



- **Ballast Water Exchange Requirements:**

- Vessels needing to discharge exchanged ballast in CA must do so in accordance with the rules of the Pacific Coast Region (PCR)

- Arrivals from within PCR, ballast water from within: Exchange >50 nautical miles (NM)
- Arrivals from within PCR, ballast water from outside: Exchange >200 NM
- Arrivals from outside PCR: Exchange >200 NM



## Assessing Compliance

### ***Ballast Water Management Report:***

- Forms contain information on source, exchange location and type, and discharge port
- Quality controlled database extending back to 2002

### ***On board ship inspections:***

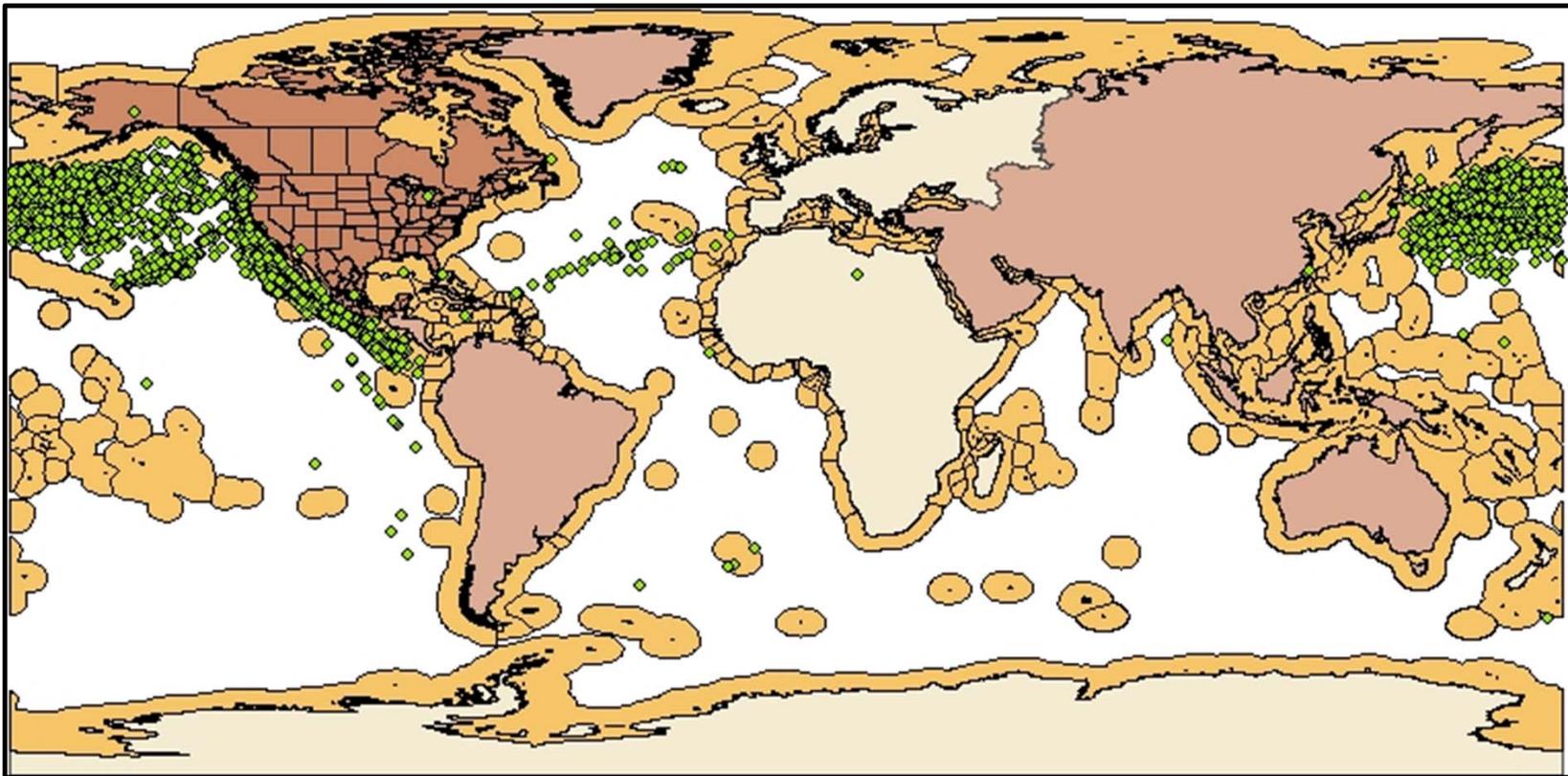
- Marine Safety Personnel from SLC's Marine Environmental Protection Division are mandated to board and inspect at least 25% of all CA arrivals
- Check Ballast Water Logs/Management Plan, verify exchange locations, test ballast salinity, perform outreach

### ***Use of Geographic Information System software:***

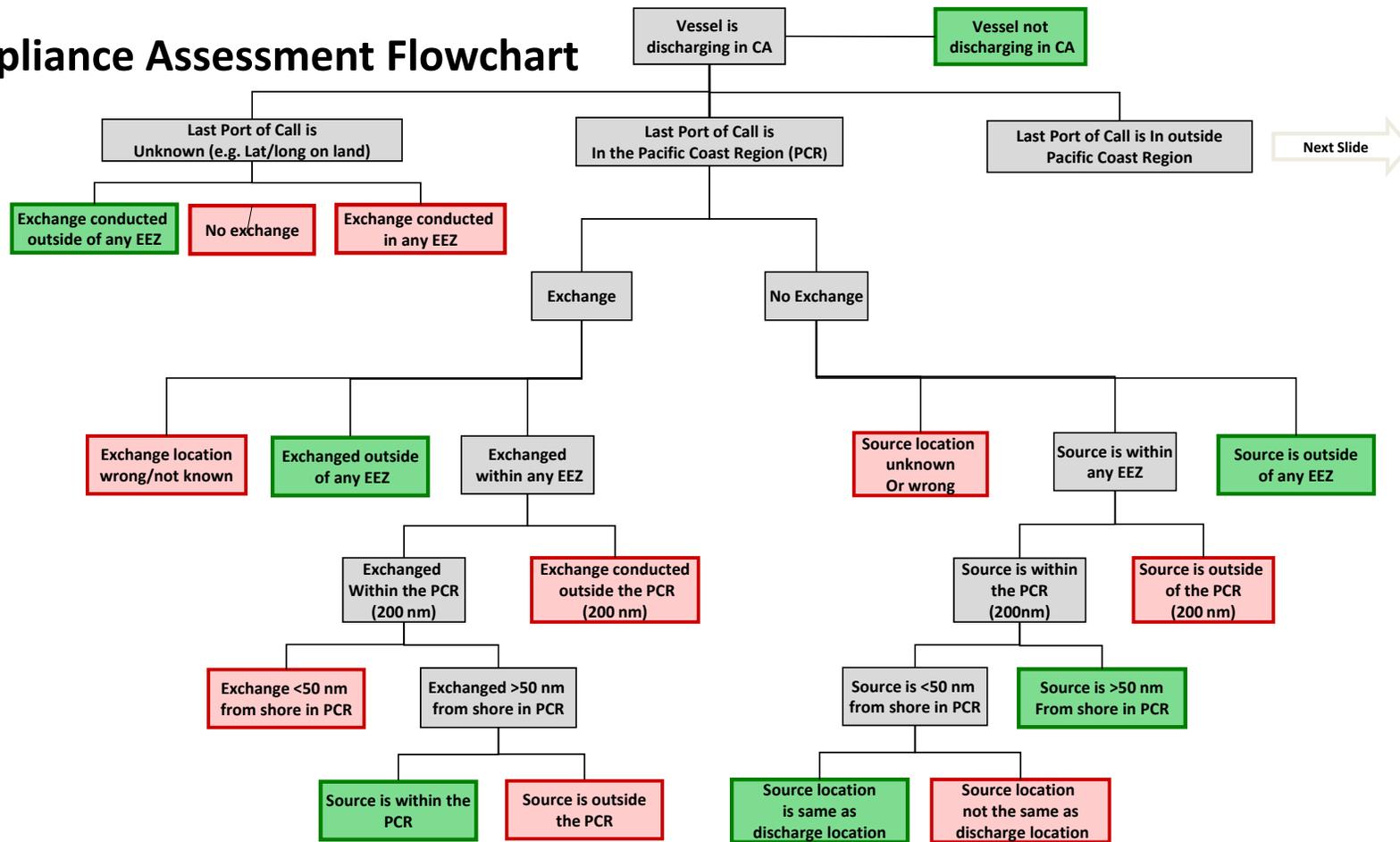
- Evaluates compliance with legal exchange distances
- Helps identify potential underlying reasons for violations
- Allows for analysis of very large datasets



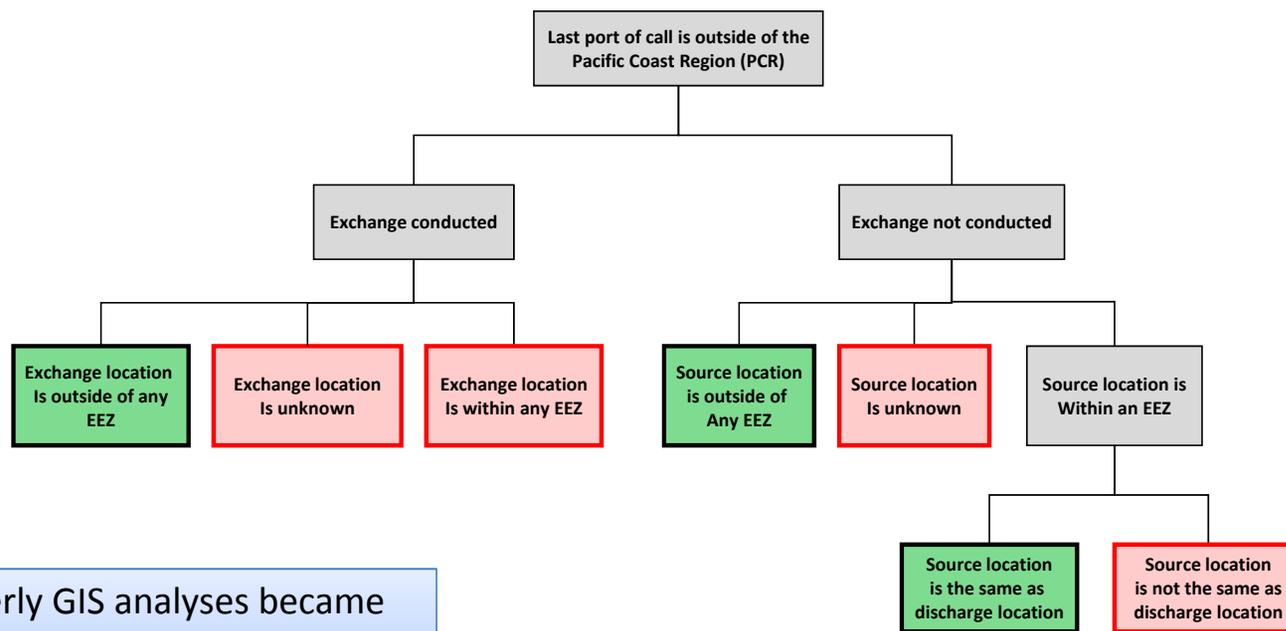
## Using GIS to Assess Compliance



# GIS Compliance Assessment Flowchart



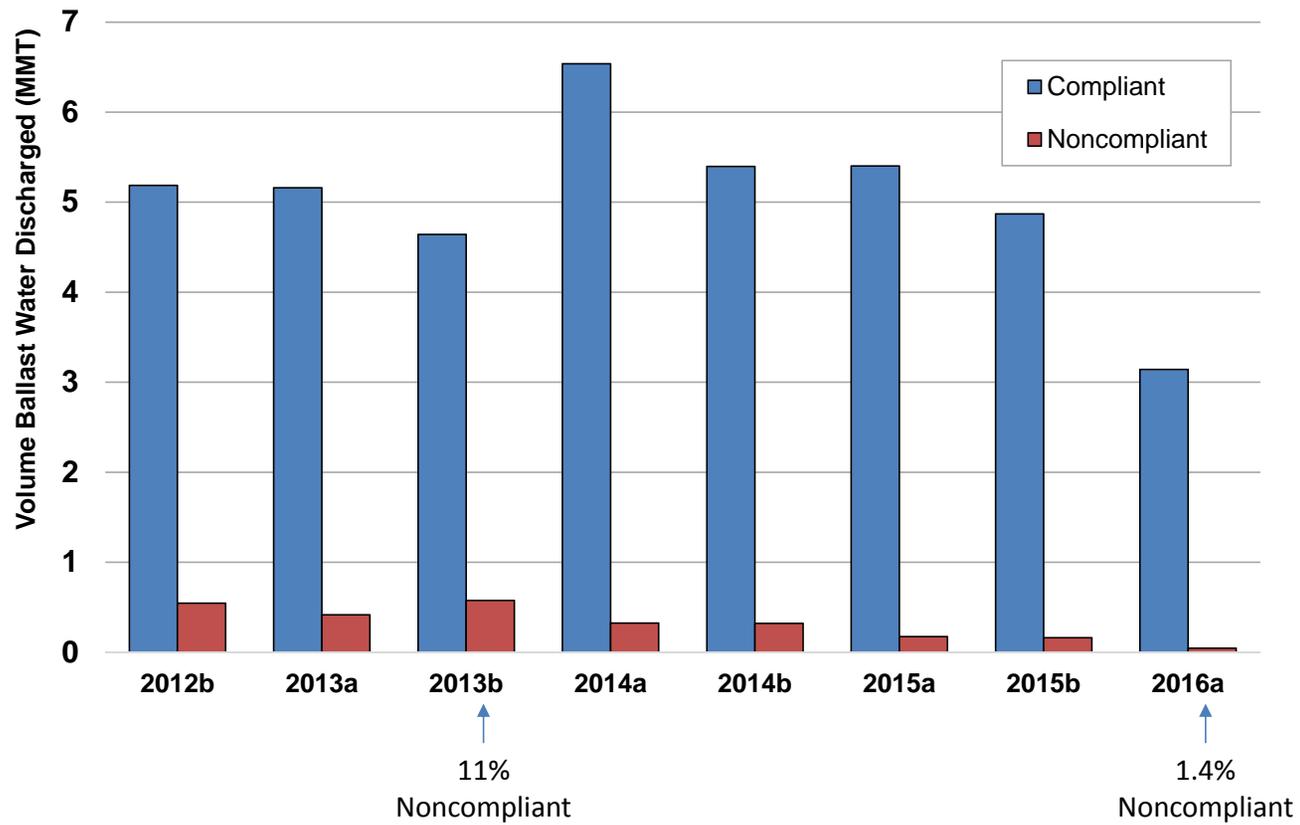
## GIS Compliance Assessment Flowchart



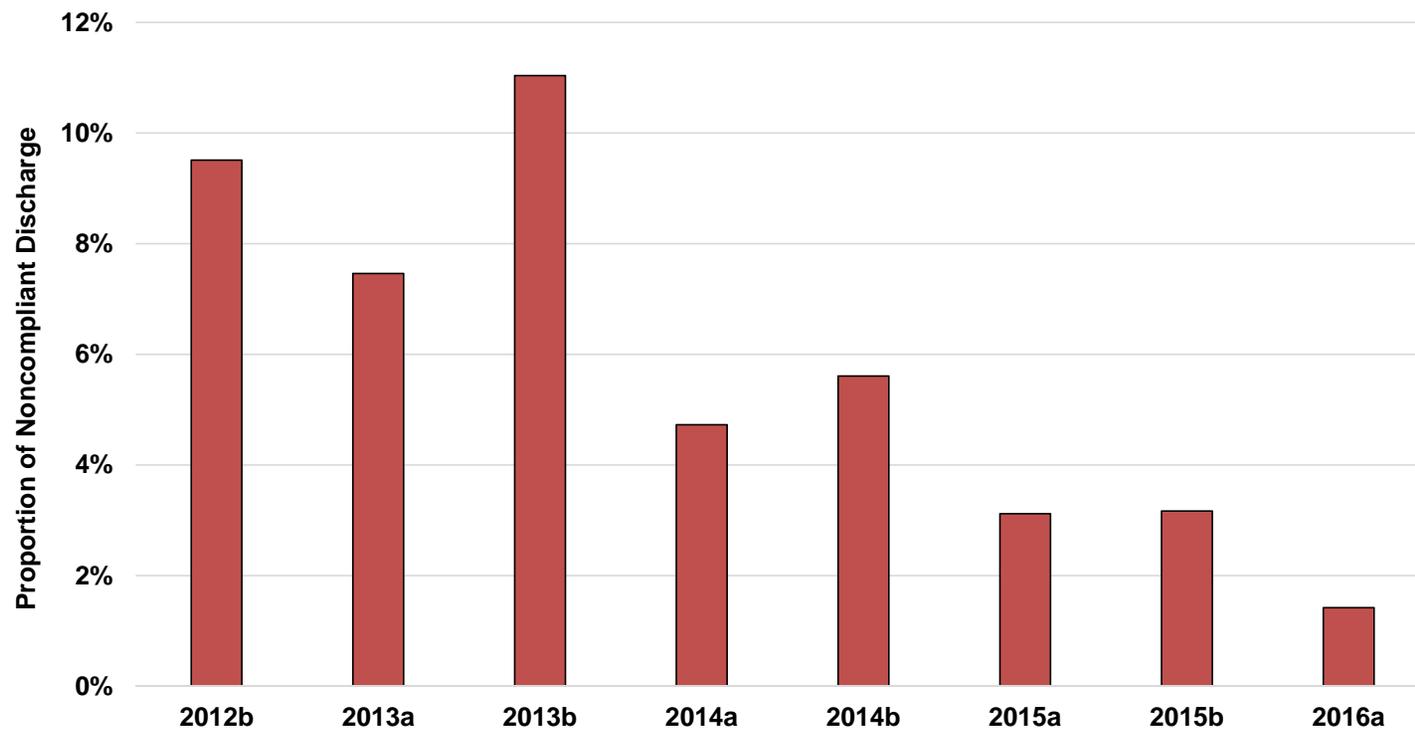
Data from quarterly GIS analyses became part of an enhanced enforcement and notification program in January 2014



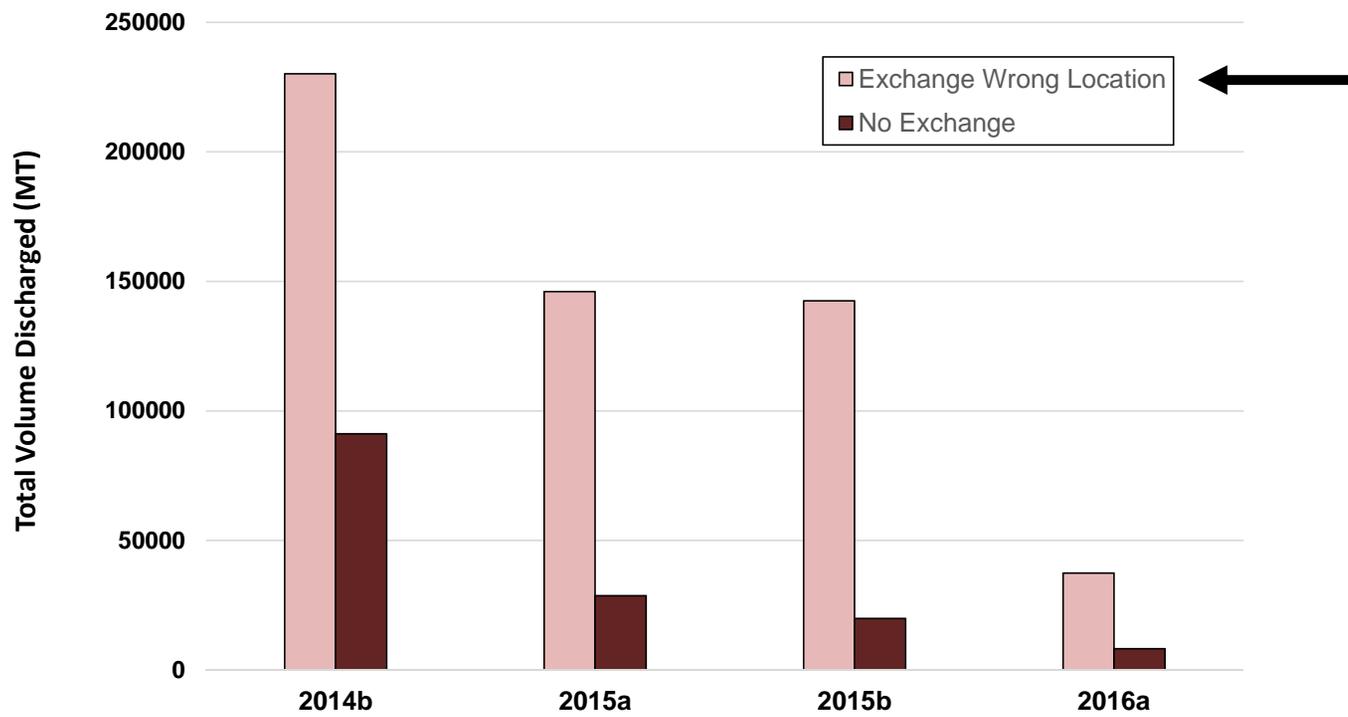
### Compliant vs. Noncompliant



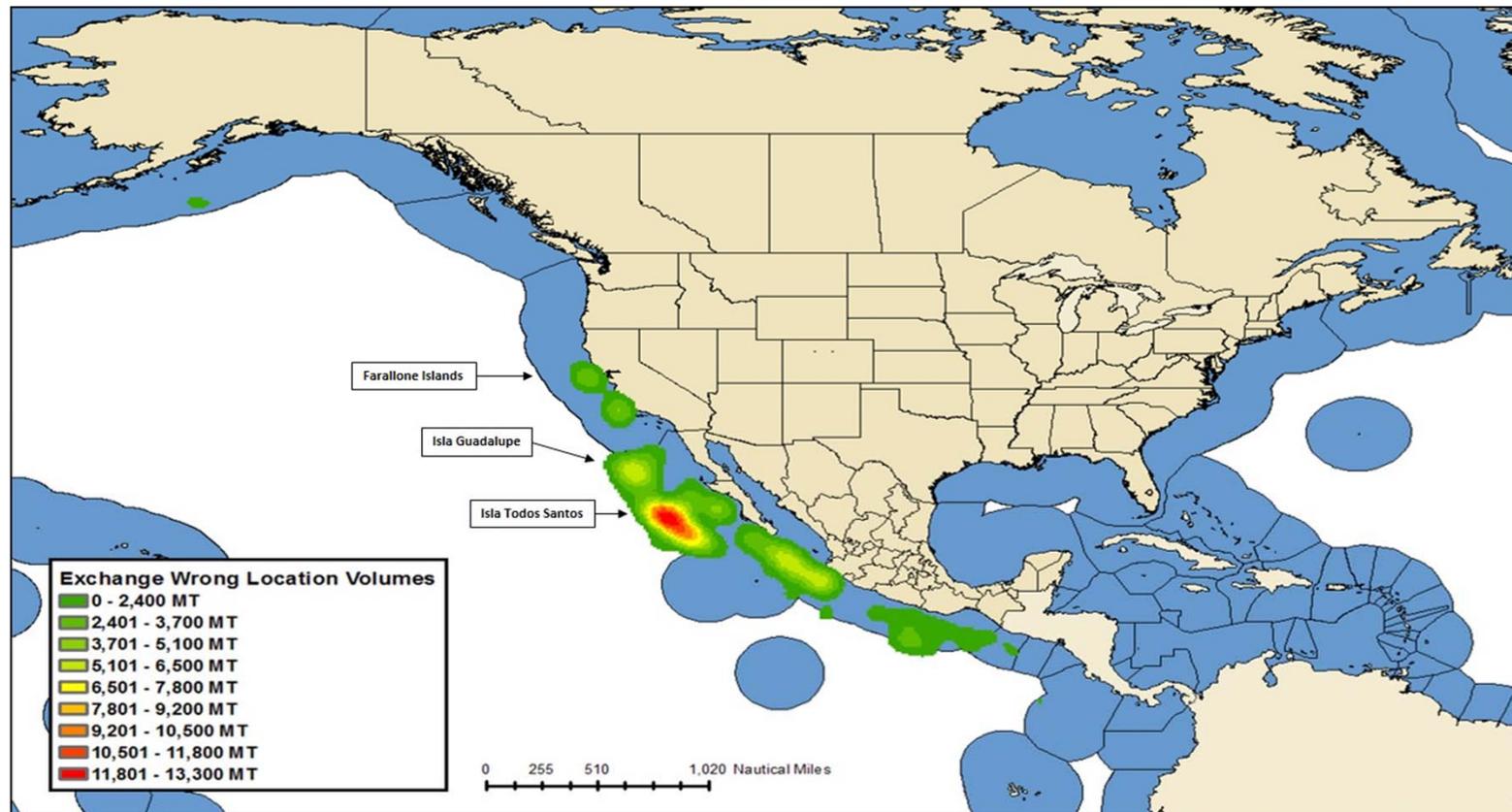
## Noncompliant Discharge Proportion



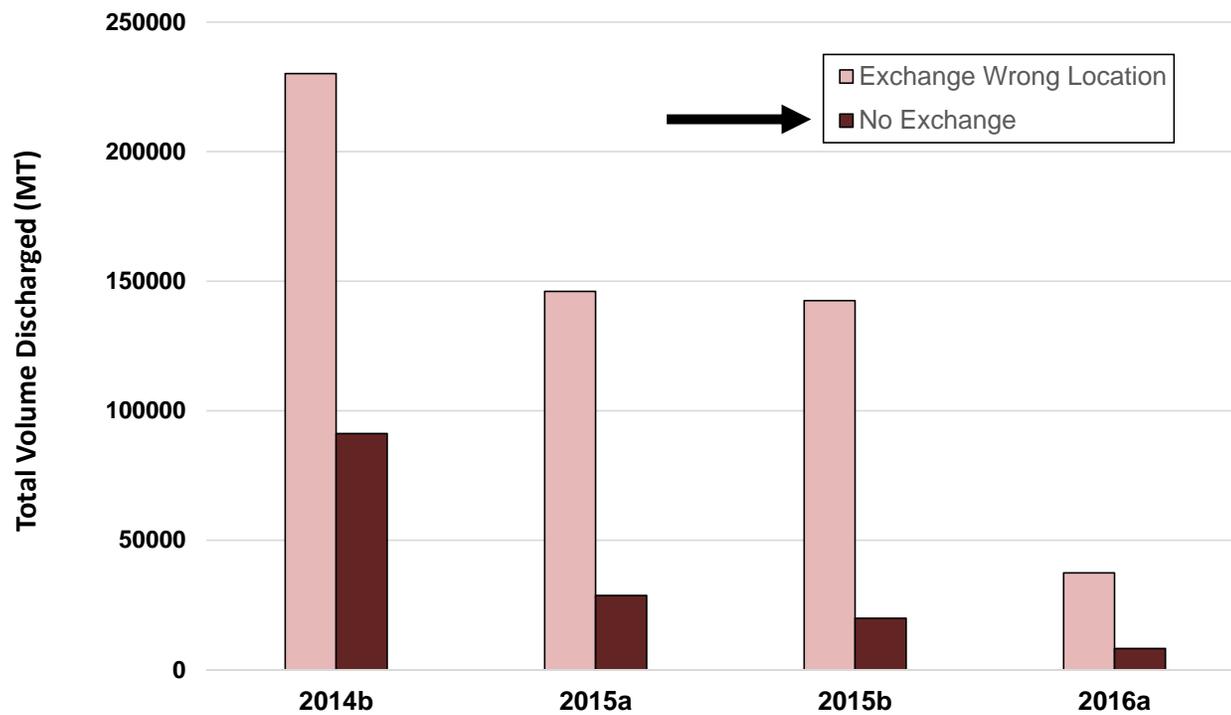
## Noncompliant Discharge Type

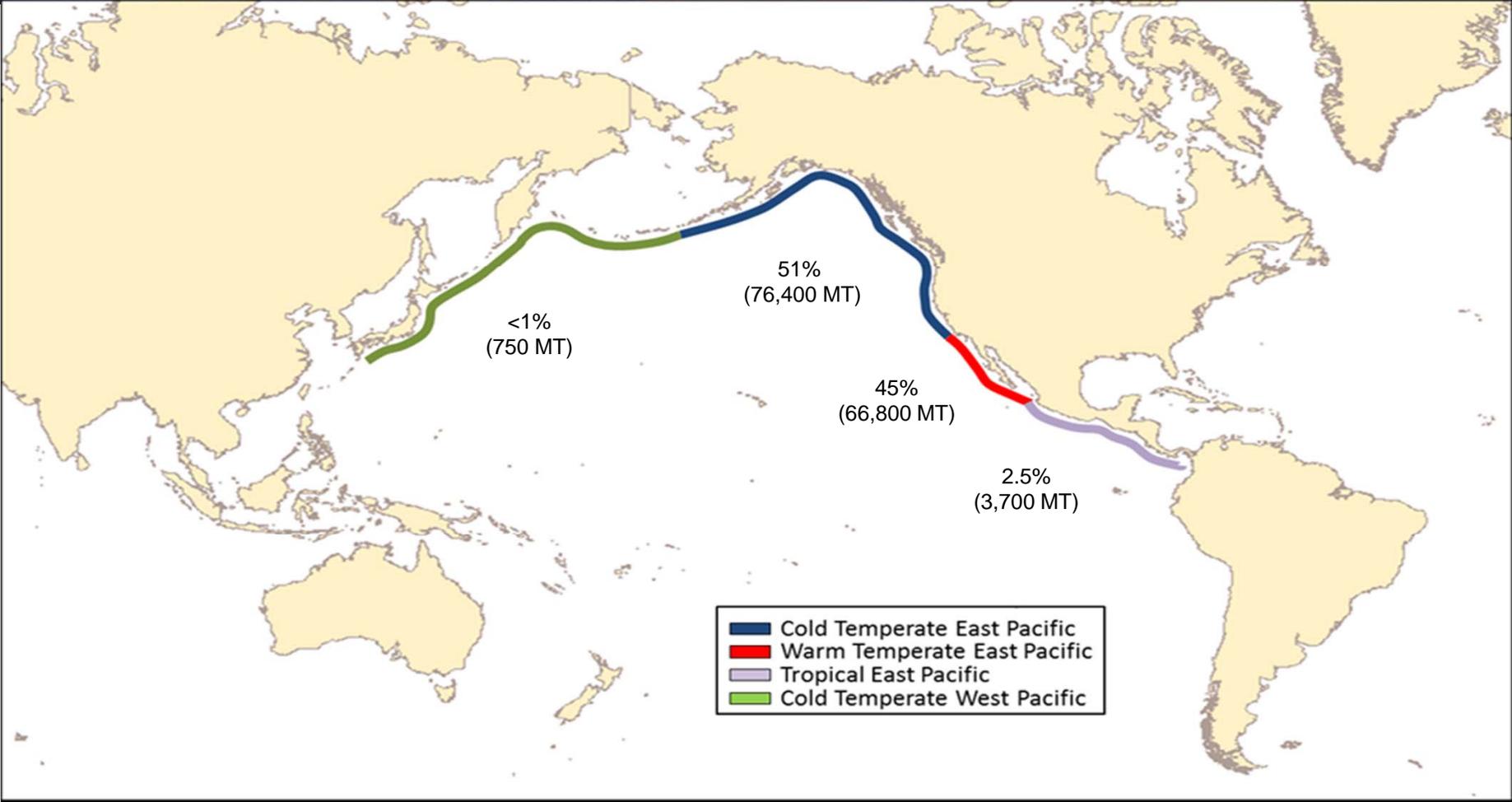


## Exchange in Wrong Location 2014-2015

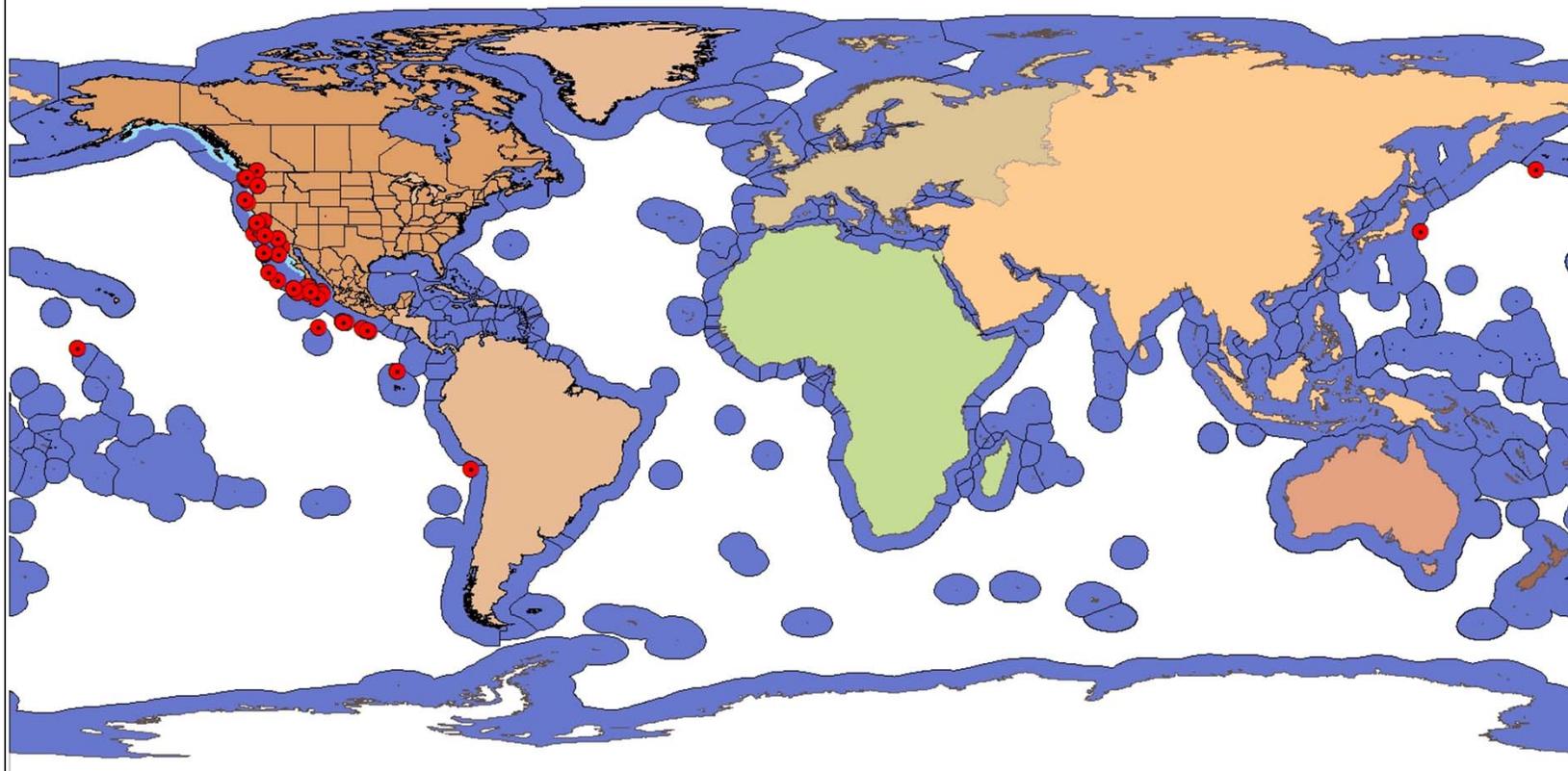


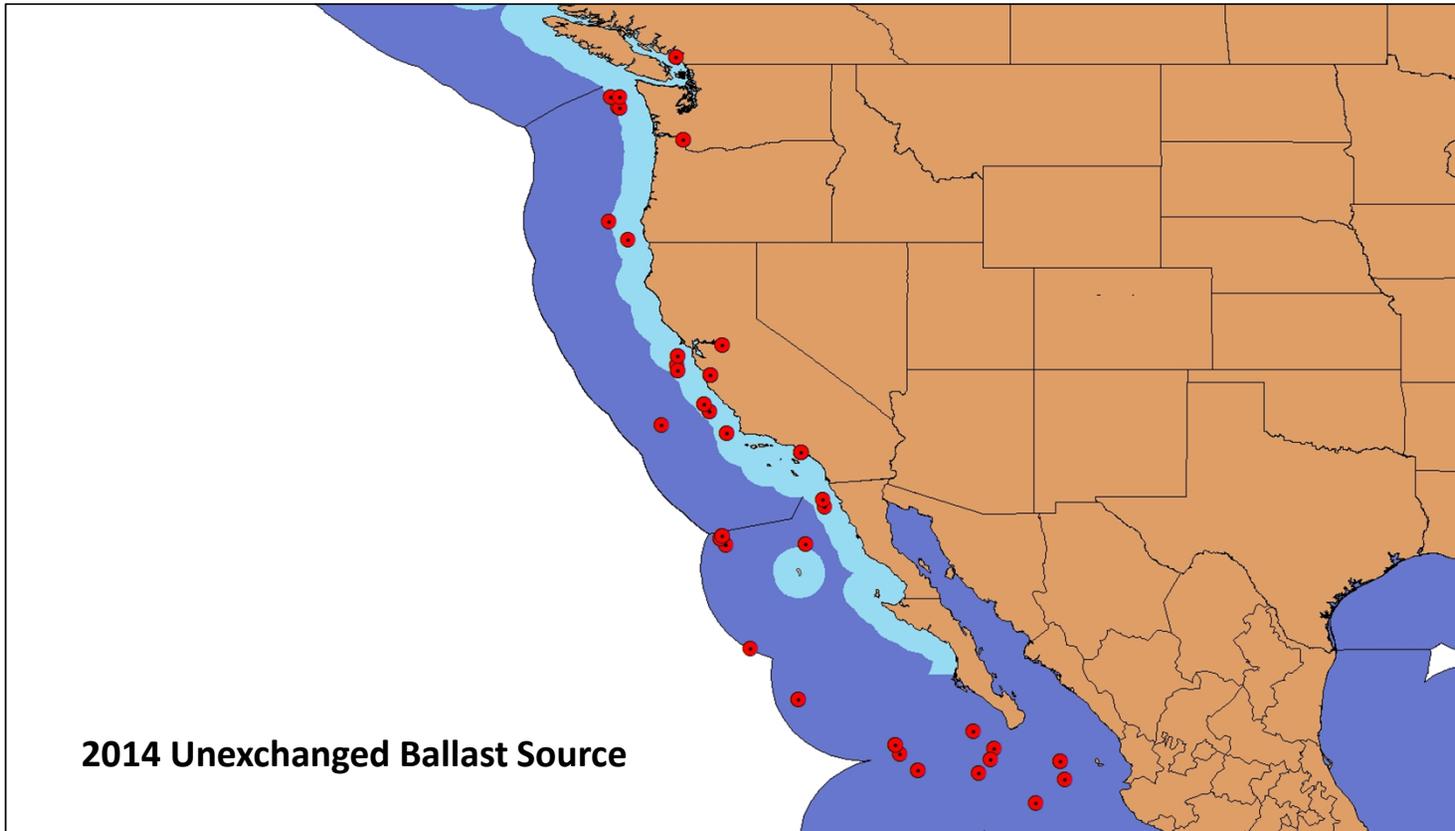
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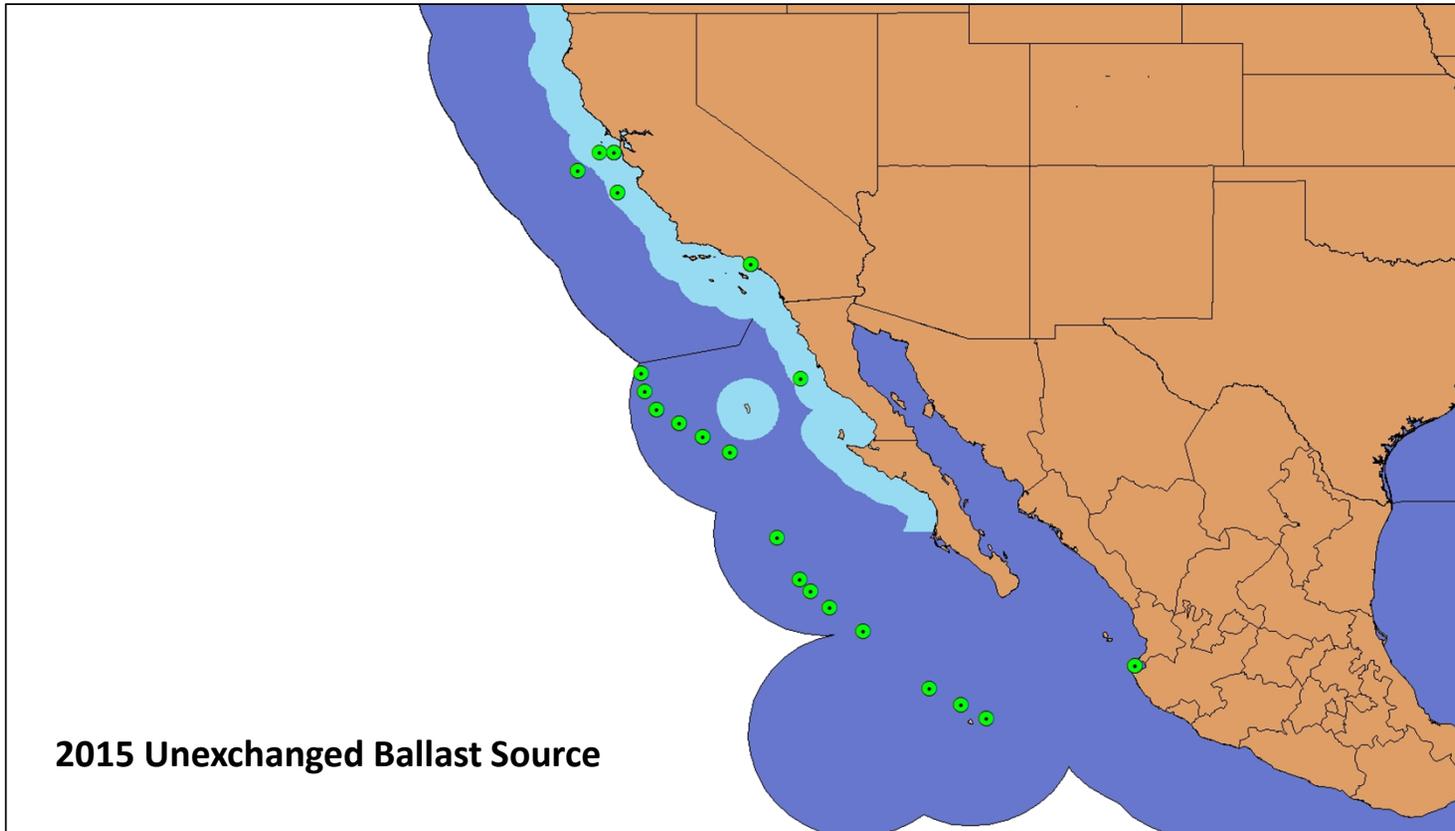




### 2014 Unexchanged Ballast Source

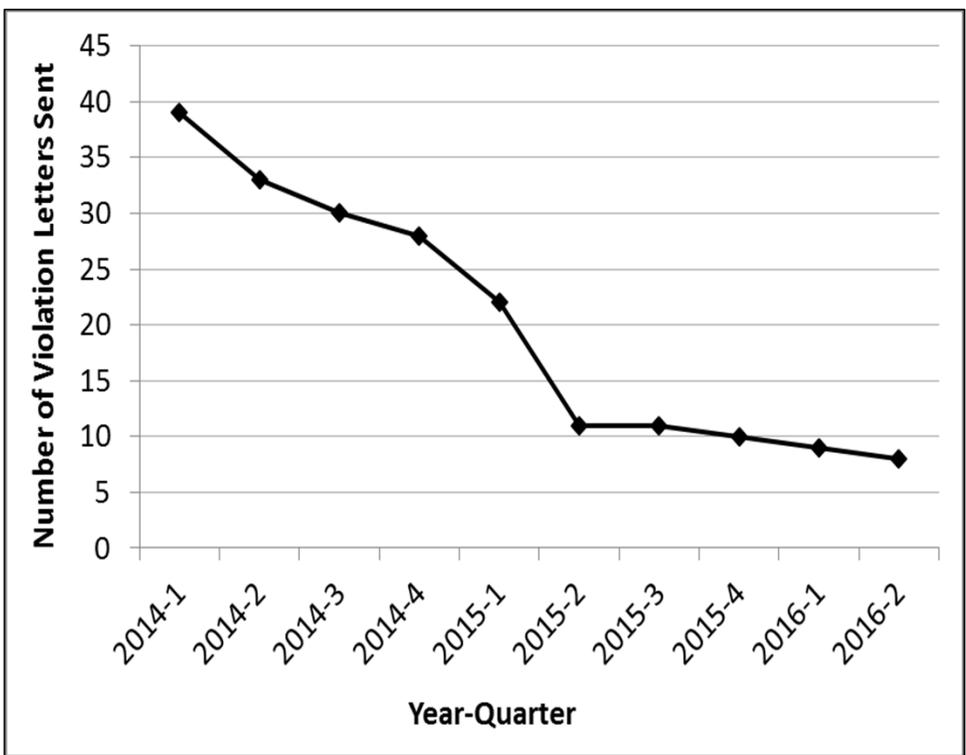
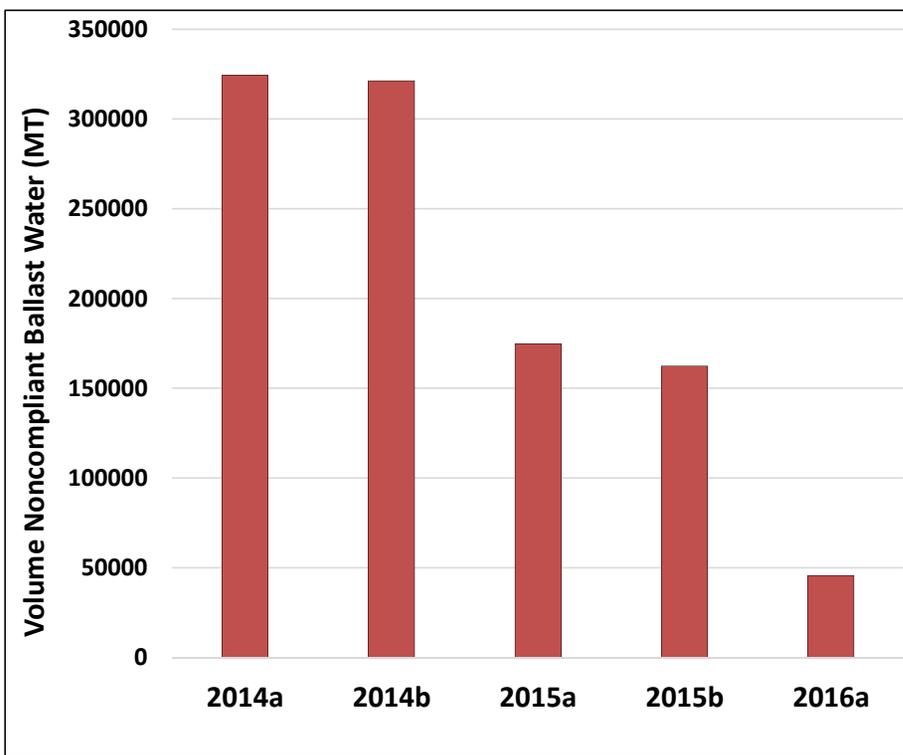






	<u>2014</u>	<u>2015</u>
• Total Arrivals	9,345	9,055
• Discharged	1,510 (16%)	1,349 (15%)
• Operational Violations	104	66
• Field Inspections	28	20
• GIS	76	46
• Repeat Vessels	13	3
• Fixed/Amended BWRF	18	17





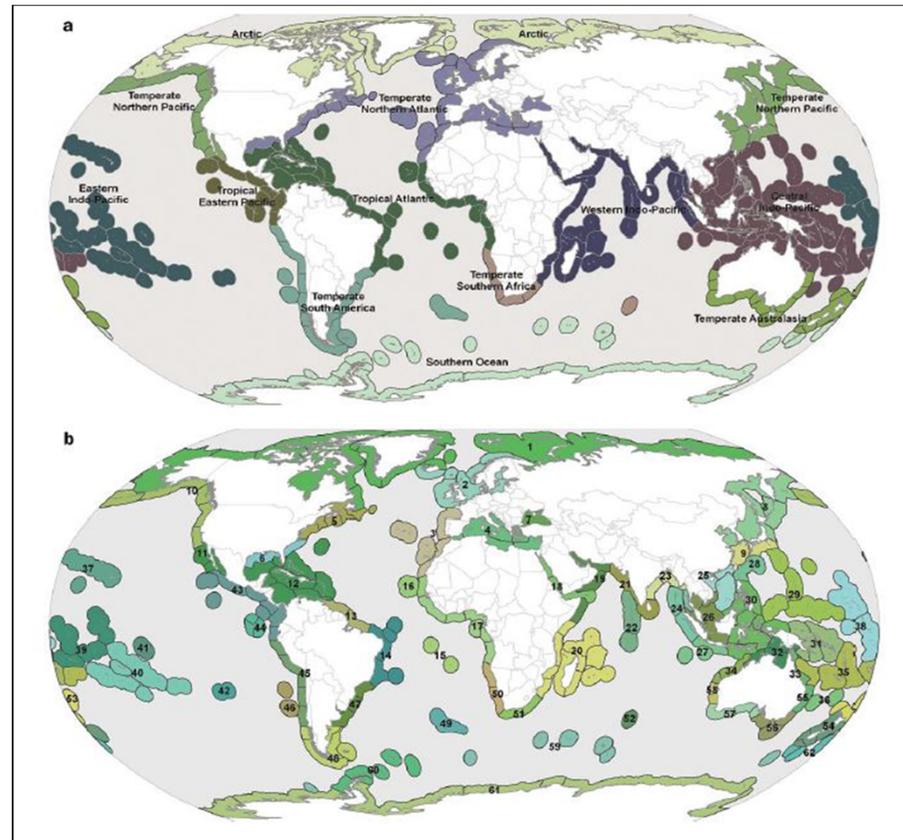
## Next Steps in Marin Invasive Species Program Compliance:

- Enactment of MISA Enforcement regulations (Article 4.9)
- Risk based assessment of ballast water source ports
- Ballast water discharge sampling compliance protocols/regulations (Article 4.7)
  - Continue testing available rapid assessment tools
- Adopt regulations regarding the Commission's process for approving ballast water reception facilities
- Regulations regarding vessel arrivals from outside the Pacific Coast Region (Article 4.6)
- Establish protocols for assessing compliance with biofouling performance standards



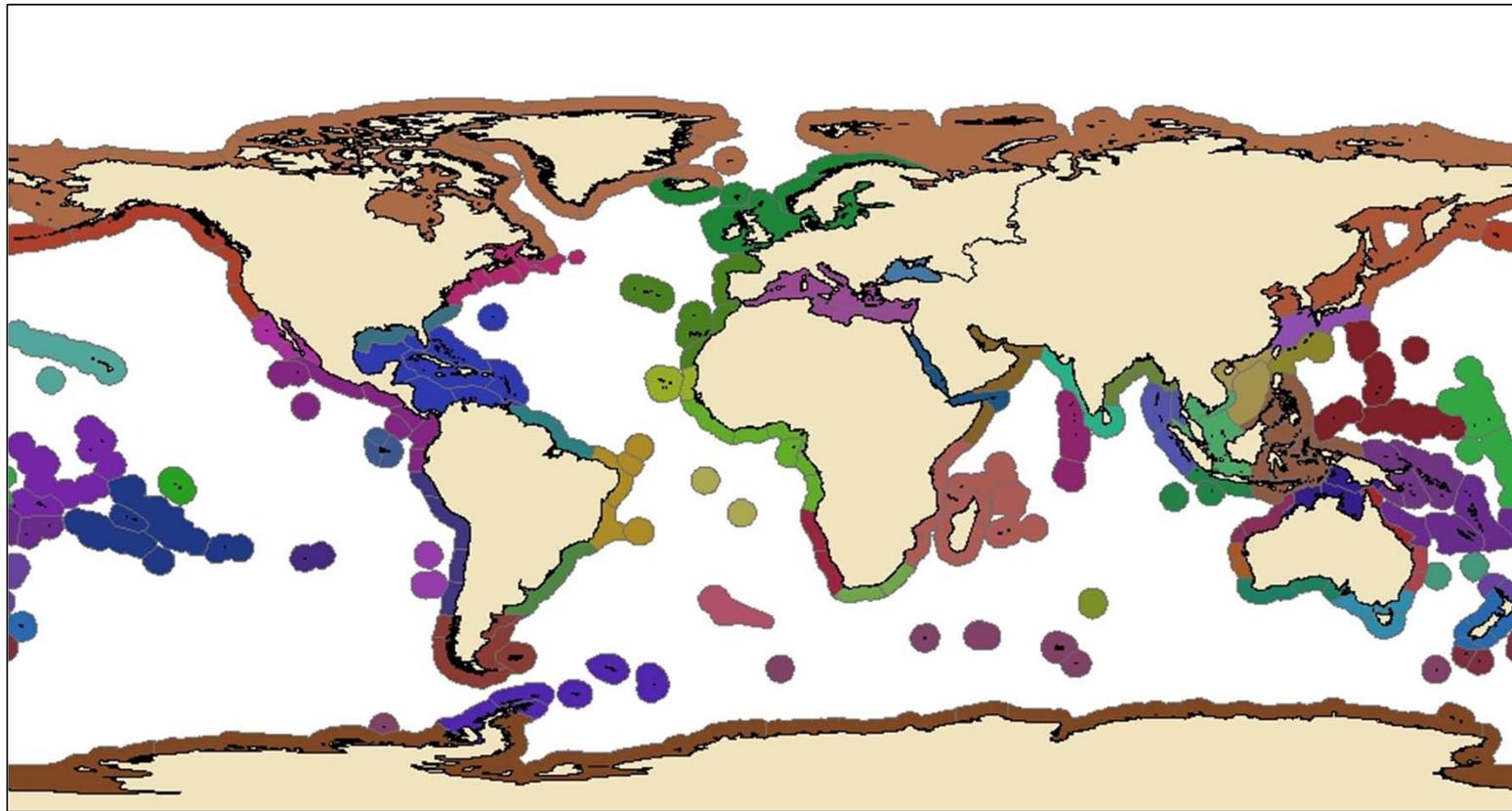
## Expansion of MISP Ports Database (n=~5,000)

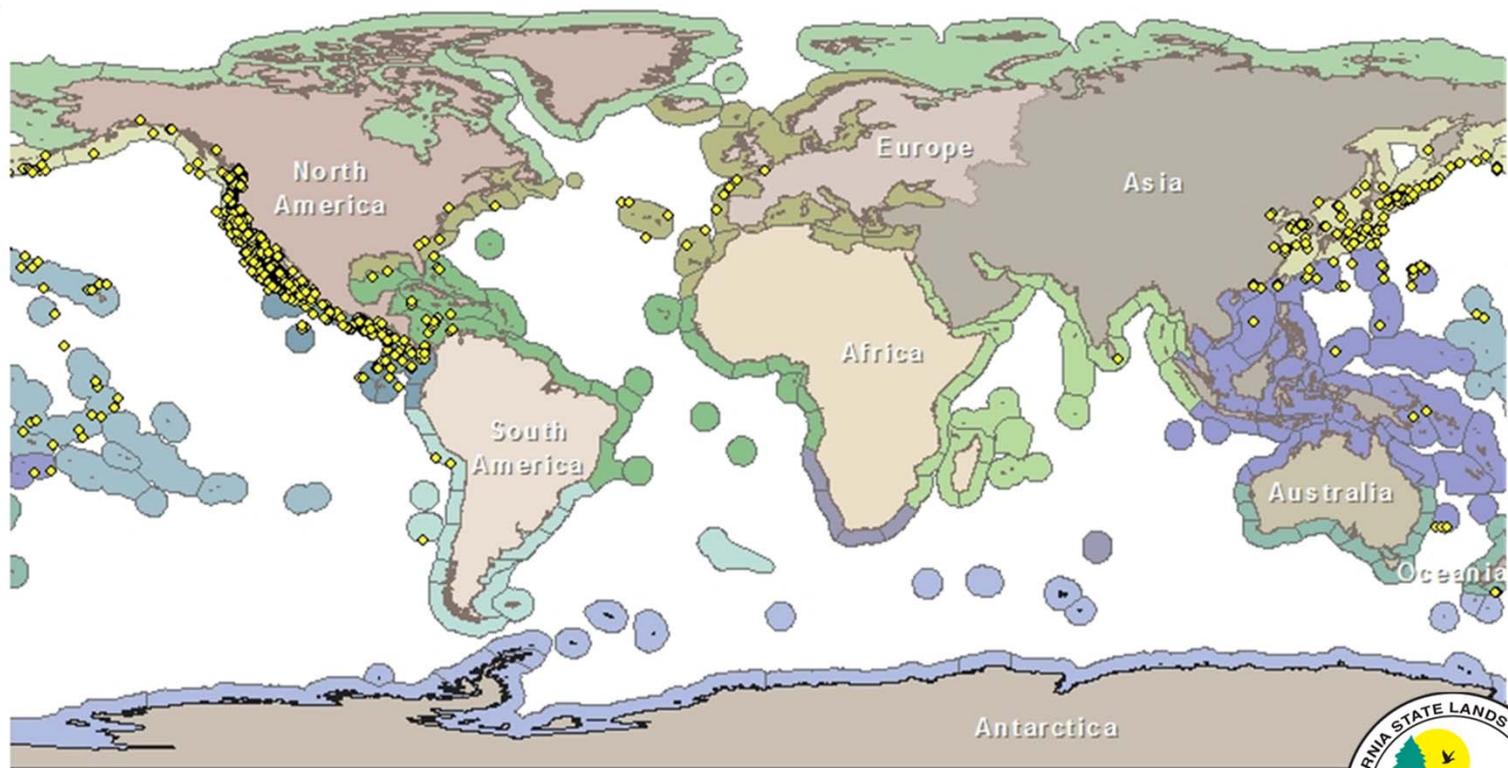
- Classify by
  - Marine Ecoregions
  - Latitude & Longitude
  - General Salinity Levels
    - Marine
    - Brackish
    - Fresh
  - Other environmental data as available



Spalding, M. D., et al. (2007, July/August). Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas. *Bio Science*, 57(7). doi:10.1641/B570707









[www.marinetraffic.com](http://www.marinetraffic.com)



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# Questions?

For more information:

[www.slc.ca.gov](http://www.slc.ca.gov)

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