Ballast Water Management Compliance and Enforcement in California

Christopher Brown
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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)
  • 1st 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)

Percent of Total Arrivals


Discharging - Retaining
Total Ballast Water Discharge

- Avg. = ~10 MMT per year

Volume of Ballast Water Discharged (MMT)

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<td>10</td>
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<td>11</td>
<td>12</td>
<td>11</td>
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Total Ballast Water Discharge

Volume of Ballast Water Discharged (MMT)

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<tbody>
<tr>
<td>Value</td>
<td>5.00</td>
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<td>5.00</td>
<td>7.00</td>
<td>6.50</td>
<td>5.00</td>
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*Note: The value for 2016a is marked with an asterisk (*) and is lower than the previous years.
• **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

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

Volume Ballast Water Discharged (MMT)

- Compliant
- Noncompliant

2012b: 11% Noncompliant
2013a: 11% Noncompliant
2013b: 11% Noncompliant
2014a: 1.4% Noncompliant
2014b: 1.4% Noncompliant
2015a: 1.4% Noncompliant
2015b: 1.4% Noncompliant
2016a: 1.4% Noncompliant
Noncompliant Discharge Proportion

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion</th>
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<tbody>
<tr>
<td>2012b</td>
<td>10%</td>
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<tr>
<td>2013a</td>
<td>8%</td>
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<tr>
<td>2013b</td>
<td>12%</td>
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<tr>
<td>2014a</td>
<td>6%</td>
</tr>
<tr>
<td>2014b</td>
<td>6%</td>
</tr>
<tr>
<td>2015a</td>
<td>4%</td>
</tr>
<tr>
<td>2015b</td>
<td>4%</td>
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<tr>
<td>2016a</td>
<td>2%</td>
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Exchange in Wrong Location 2014-2015
Noncompliant Discharge Type

Total Volume Discharged (MT)

- Exchange Wrong Location
- No Exchange

<table>
<thead>
<tr>
<th>Year</th>
<th>Exchange Wrong Location</th>
<th>No Exchange</th>
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<tr>
<td>2014b</td>
<td>200000</td>
<td>100000</td>
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<tr>
<td>2015a</td>
<td>150000</td>
<td>50000</td>
</tr>
<tr>
<td>2015b</td>
<td>150000</td>
<td>50000</td>
</tr>
<tr>
<td>2016a</td>
<td>100000</td>
<td>25000</td>
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CSLC: Serving the Public Trust Since 1938
2014 Unexchanged Ballast Source
2015 Unexchanged Ballast Source
<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td>Total Arrivals</td>
<td>9,345</td>
<td>9,055</td>
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<tr>
<td>Discharged</td>
<td>1,510 (16%)</td>
<td>1,349 (15%)</td>
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<tr>
<td>Operational Violations</td>
<td>104</td>
<td>66</td>
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<tr>
<td>Field Inspections</td>
<td>28</td>
<td>20</td>
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<tr>
<td>GIS</td>
<td>76</td>
<td>46</td>
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<tr>
<td>Repeat Vessels</td>
<td>13</td>
<td>3</td>
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<tr>
<td>Fixed/Amended BWRF</td>
<td>18</td>
<td>17</td>
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</table>
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

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questions?

For more information:

www.slc.ca.gov

Christopher Brown, Senior Environmental Scientist

Chris.Brown@slc.ca.gov; 916-574-0236