Oregon’s Ballast Water Program

PBWG
April 2017
Portland, OR
Oregon Ballast Water Program
(Regulations established 2001 - Program activities since 2008)

Operations:
Pre-Arrival Screening
Vessel Inspections & Enforcement

Outreach & Coordination:
with Industry, other Stakeholders and Regional Partners

Policy Analysis & Development:
Data Analysis
Scientific Collaboration, and Regulatory Solutions
### Regional Ballast Water Management Comparison*

<table>
<thead>
<tr>
<th>Region</th>
<th>Annual Arrivals</th>
<th>Annual BWD Volume</th>
<th>Percent Discharging</th>
<th>BWD per arrival</th>
<th>Port Environ. Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf of Alaska</td>
<td>785</td>
<td>9.7 M m³</td>
<td>44%</td>
<td>12,400 m³</td>
<td>Marine</td>
</tr>
<tr>
<td>Salish Sea (WA &amp; BC)</td>
<td>6489</td>
<td>22.1 M m³</td>
<td>28%</td>
<td>3,400 m³</td>
<td>Marine</td>
</tr>
<tr>
<td><strong>Columbia River (OR &amp; WA)</strong></td>
<td><strong>1541</strong></td>
<td><strong>12.9 M m³</strong></td>
<td><strong>61%</strong></td>
<td><strong>8,400 m³</strong></td>
<td>Freshwater</td>
</tr>
<tr>
<td><strong>Coos Bay</strong></td>
<td><strong>51</strong></td>
<td><strong>0.9 M m³</strong></td>
<td><strong>69%</strong></td>
<td><strong>13,900 m³</strong></td>
<td>Brackish</td>
</tr>
<tr>
<td>San Francisco Estuary</td>
<td>3495</td>
<td>7.5 M m³</td>
<td>18%</td>
<td>2,100 m³</td>
<td>Brackish</td>
</tr>
<tr>
<td>LA / Long Beach</td>
<td>4265</td>
<td>4.6 M m³</td>
<td>16%</td>
<td>1,100 m³</td>
<td>Marine</td>
</tr>
<tr>
<td>Hawaii</td>
<td>1026</td>
<td>0.7 M m³</td>
<td>15%</td>
<td>682 m³</td>
<td>Marine</td>
</tr>
</tbody>
</table>

(* - 2014 NBIC or most recent year available)
Oregon Qualifying Voyages (QV’s) by Last port of call (LPOC)

1592 QV’s in 2016 (101% of 10-yr-avg)
Slight decrease in proportion of CR vessel arrivals using OR facilities
Oregon Qualifying Voyages
by vessel type

09-14 Avg (1550 QV)

- Bulk Carriers: 60%
- Barges: 5%
- ATB/ITB: 3%
- Other: 2%
- Tanker: 5%
- General Cargo: 6%
- Vehicle (RO/RO): 12%
- Container: 8%

2016 (1592 QV)

- Bulk Carriers: 65%
- Barges: 7%
- ATB/ITB: 4%
- Other: 0%
- Tanker: 5%
- General Cargo: 5%
- Vehicle (RO/RO): 13%
- Container: 2%
13.9 M m³ BWD to OR waters in 2016
BWD Propogule Pressure ‘pulses’ in CR
(45 river mile stretch LGV-PDX)

Daily Average BWD = 33k m$^3$
(~650 Million zooplankton following BWE;
~330k zoops following BWT)

31% of days > 50k m$^3$
(1 Billion/500k zoops)

9 days/year > 100k m$^3$
(2 Billion/1 Million zoops)
Source of Ballast Water Discharged to OR
(pre-management)

13.9 Million m³ discharged to CR and OR waters in 2016

Oregon Ballast Water Management Program
Reported Ballast Management
of 13.9 Million m$^3$ discharged in 2016

~95% managed with ballast water exchange (BWE)
Reported Ballast Exchange
5% ‘non-compliant’ in 2016 (756k m$^3$)
20x increase in treated BWD volume in past 3 yrs.
Management Shift Underway

(BWE → BWT)

Oceanic Ballast Water Exchange (BWE)

Standards limiting the number of viable organisms per unit volume (BWT)

Oregon Ballast Water Management Program
~15% of reports submitted incomplete or with errors in 2016
Vessel Inspections

1. Outreach & Technical Service
2. Audit of Shipboard Records
3. Compliance Verification via Sampling of Ballast water salinity
4. Assist with Corrective Action
Target inspection rate:
- ≥ 12% arrivals
- ≥ 15% vessels
‘Exchange plus Treatment’ (BWE+BWT)

Elements of recently adopted rule (OAR 340-143-0050):

- Effective March 2017.
- Applies only to vessels discharging to low-salinity ports of Oregon (Columbia River, Coos Bay, and Yaquina Bay).
- Applies only to ballast tanks sourced with water salinity < 18 ppt.
- Exemptions included for:
  - BWT system configurations that cannot accommodate BWE with BWT.
  - Circumstances when voyage duration and BWT system configuration would not allow for adequate holding time between BWE and anticipated discharge.
  - Vessels that have invested in BWT systems that meet higher discharge standard.
- Rule set to be repealed December 2023.
‘Exchange plus Treatment’ (BWE+BWT)

Anticipated affect of adopted rule on Oregon vessel traffic:

- **Source of Low-Salinity Ballast**
  - China: 66%
  - Japan: 20%
  - California: 13%
  - Other: 2%

- <9% of vessel arrivals to state waters (~135 per year) may be subject to BWE + BWT rule proposal
‘Exchange plus Treatment’ (BWE+BWT)

Reported BWM for March 2017:

- BWE: 95.4%
- CW: 1.6%
- BWT: 1.7%
- BWE+BWT: 1.4%
Risk Assessment

Environmental Similarity
(source port to receiving ports)

R. P. Keller et al.

Figure 3 Environmental distance of global ports from the Greater Great Lakes Ecosystem. This index is based on salinity and temperature, with lower numbers indicating ports that are more similar. As examples of high-risk ports, the locations of South American ports invaded by the golden mussel, and ports along the Amur River, are indicated.
Risk Assessment

Environmental Distance/Similarity of Global Ports to Oregon

**Example FW Ports**

- PCR
  - Sacramento, CA
  - Stockton, CA
  - Kitimat, BC
- East Asia
  - Nantong, CHN
  - Taizhou, CHN
  - Zhangjiagang, CHN
  - Jiangyin, CHN
  - Yangzhou, CHN
  - Changshu, CHN
  - Taixing, CHN
  - Nanjing, CHN
  - Da Feng, CHN
  - Kagoshima, JPN
  - Tokyo, JPN
  - Chiba, JPN
  - Kawasaki, JPN
  - Masan, KOR
- Other
  - Rio Grande, BRZ

**Similarity to CR Freshwater Conditions**

- 17% Very High or High (22 of 126 ports)

**Example Estuarine Ports**

- PCR
  - Richmond, CA
  - Crockett/Pitt., CA
  - Fraser R., BC
- East Asia
  - Vanino, RUS
  - Bayuquan, CHN
  - Dalian, CHN
  - Taicang, CHN
  - Longyan, CHN
  - Shanghai, CHN
  - Rizhao, CHN
  - Qingdao, CHN
  - Hachinohe, JPN
  - Kushiro, JPN
  - Kobe, JPN
  - Matsunaga, JPN
  - Donghae, KOR
  - Incheon, KOR
  - Ulsan, KOR
- Other
  - Bilbao, ESP
  - Callao, Peru
  - Imbituba, BRZ
  - Kwinana, AUS
  - Tauranga, NZ

**Similarity to CR Estuarine Conditions**

- 72% Very High or High (91 of 126 ports)
Use Environmental Similarity Risk ‘Score’ & Ballast Volume/Age Risk ‘Score’ to prioritize candidate vessels for inspection.