California’s Marine Invasive Species Program

Prevention First
September 13, 2006
Lynn Takata
Nonindigenous Species (NIS): Why The Concern?

Fisheries • Aquaculture • Ecology • Human Health • Municipalities • Agriculture • Recreation • Tourism

Zebra Mussel

- Clogs municipalities
- Smothers other organisms
- Infests approx 50% of U.S. waterways ~$1 billion/yr.

A U.S. Export: The Atlantic Comb Jelly

- Accounts for over 90% of biomass in the Black Sea
  - Consumes fish eggs, fish young & zooplankton
  - Wiped out fisheries: $350 million/18 years
Ballast Water and Nonindigenous Species

• Purpose: Vessel trim and stability
• One of the most important marine transport vectors
• Ballast water exchange is primary management tool
California’s Marine Invasive Species Program: Legislative Origins and Directives

**Ballast Water Management For Control of Nonindigenous Species Act (1999)**
- Management of ballast water originating from outside the EEZ
- Ballast water management reporting
- Vessel inspections
- Biological survey (CDFG)
- Treatment technology evaluation (SWRCB)
- Exotic Species Control Fund (BOE)

**Marine Invasive Species Act of 2003**
- All the above…plus
- Regulations & reporting coastal voyages
- Treatment technology performance standards
- Non-ballast water vessel vectors
Components of the Marine Invasive Species Program

**Program Management (4 Staff)**
- Policy development
- Stakeholder coordination (regulators, scientists, sister agencies, environmental organizations, etc…)
- Technical Advisory Group facilitation

**Data Management & Field Office Coordination (4 Staff)**
- Ballast water reporting forms
- Field office coordination
- Vessel & agent point of contact
  - Outreach

**Field Offices (6 FT Positions)**
- Vessel inspections
- Scientist facilitation
  - Outreach
Marine Invasive Species Program: Recent Activities

- Coastal regulations
- Performance standards
  - Vessel fouling
  - Research

Photo by: C. Simkanin
Ballast Water Management in the Pacific Coast Region

PRC§71204.6: Adopt regulations for ballast water management for vessels arriving from the Pacific Coast Region

Where?
• Cooks Inlet (AK) to ¾ down the Baja Peninsula

Why?
• Short voyages = better organism survival
• Prevent spread of established species
  ➢ 203 NIS in SF Bay that are not yet in Humboldt Bay
**Developing the Regulation**

- 2002 West Coast Oceanography Workshop (Scientists)
- 2003 West Coast Exchange Workshop (Multidisciplinary)
- 2004 CSLC Technical Advisory Group Meeting (Multidisciplinary)

**Article 4.6 - Effective March 2006**

- Ballast Water Exchange 50nm Offshore
- Shared Waters Provision
- Safety Provision
- Alternatives Through Petition
Performance Standards

PRC§71204.9: Recommend specific performance standards for the discharge of ballast water into waters of the state

Why?
Drawbacks to ballast water exchange
  • Variable efficiency (~50%-90%)
  • Time consuming
  • Safety
Need for a numerical “target”

  • Consult with State Water Resources Control Board (SWRCB) & Technical Advisory Group
  • Protect beneficial uses
  • Economic achievability
  • Best available technology
Performance Standards
Technical Advisory Group Meetings (2005)

March 7 ● April 27 ● June 22 ● July 13 ● August 8

**Major Considerations**
- Biological questions
- Efficacy of ballast water exchange
- Prototype technologies
- Economic Achievability
- Standards adopted/considered by others

**Major Findings and Challenges**
- What is “protective enough”? No concrete biological guidance.
- Long term goal should be “zero discharge”
- Should be significantly better than status quo.
- Standard should drive technologies.
## Performance Standards

<table>
<thead>
<tr>
<th>Organism Size (units)</th>
<th>Performance Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 50 μm (/m³)</td>
<td>No detectable living organisms</td>
</tr>
<tr>
<td>10 - 50 μm (/mL)</td>
<td>$10^{-2}$ organisms</td>
</tr>
</tbody>
</table>
| < 10 μm(/100 mL)      | $10^3$ for bacteria  
                          | $10^4$ for viruses  
                          | Public health protective limits |

**Final Discharge Standard:**

Zero detectable living organisms by **January 2020**

**Status:**

Report submitted to the Legislature in January 2006  
Senate Bill 497 (2006)
Non-Ballast NIS Vectors: Vessel Fouling

PRC§71210.5: Recommend actions to reduce release of NIS from non-ballast commercial vessel vectors (essentially vessel fouling)

Why?

North America: At least 36% of shipping introductions due to fouling (Fofonoff et al. 2003)


- Consult with SWRCB, U.S. Coast Guard & Technical Advisory Group
- Analyze risk for NIS release
- Report for State Legislature
Non-Ballast NIS Vectors: Vessel Fouling
Technical Advisory Group Meetings (2005)

May 11 • August 3 • October 13 • December 19

Major Considerations

• Vessel behavior
• Vessel maintenance practices
• Management strategies elsewhere

Major Findings and Challenges

• Limited scientific research
• Majority of fleet regularly maintained. Risk unknown.
• Case Studies: Exaggerated fouling factors = High risk
Non-Ballast NIS Vectors: Vessel Fouling

Major Recommendations

• Authorize/Broaden state program to develop and adopt regulations, especially for high risk situations

• Expand biological research – NIS & “fouling risk factors”

• Collect information on vessel behavior and maintenance

• Address fouling & NIS on vessels under 300 GRT

*Report submitted to the Legislature in April 2006*
Funded Technology Development and Research

**Matson Navigation**
*(next talk)*
Installation of treatment technology on the ITB *Moku Pahu*

**Smithsonian Environmental Research Center**
*(tune in around 9:35)*
Ballast water exchange verification

**Aquatic Bioinvasions Research and Policy Institute**
*(After the break)*
Wetted surface area analysis of vessels coming to west coast ports

**APL (Pending)**
Installation of treatment technology onboard the *APL Japan*
On the Horizon

Biennial Report 2007
Senate Bill 497
Fouling Legislation
More Research

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