Critical Issues and Initiatives for Pacific Northwest Ports

- Puget Sound Maritime Air Emissions Inventory
- Northwest Ports Clean Air Strategy

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Objectives

- Demonstrate environmental stewardship
- Ensure sustainable industry growth (attainment, diesel exhaust, climate change)
- Maintain competitiveness
- Maximize voluntary approaches
- Reduce risk ahead of regulation
- Reduce costs by preventing problems
- Develop and maintain partnerships
Puget Sound Maritime Air Emissions Inventory Discussion

• Objectives
• Considerations
• Project Overview
• Key Findings

Project Objectives

• To provide a baseline inventory of maritime-related air emissions.
• To provide a planning tool to help protect ambient air quality and reduce public health risks from exposure to maritime emissions.
Public Health Risks from Toxic Air Pollution

Greatest Air Toxics Contributors to Potential Cancer Risk


Project Coordination

• Commissioned by Puget Sound Maritime Air Forum
• Port of Seattle provided project management
• Prepared by Starcrest Consulting Group, LLC
Puget Sound Maritime Air Forum

A voluntary association of private and public organizations. Steering Committee members include:

- American Lung Association of Washington
- BNSF Railway
- Northwest Clean Air Agency
- NorthWest CruiseShip Association
- Olympic Region Clean Air Agency
- Pacific Merchant Shipping Association
- Port of Everett
- Port of Seattle
- Port of Tacoma
- Puget Sound Clean Air Agency
- U.S. Environmental Protection Agency
- Washington Department of Ecology
- Washington Department of Transportation
- Washington State Ferries
- Western States Petroleum Association

Project Overview - Pollutants

- Major Air Pollutants:
  - Fine Particulate Matter, \( \text{PM}_{2.5} \)
  - Diesel Particulate Matter (DPM)
  - Sulfur Oxides (\( \text{SO}_x \))
  - Nitrogen Oxides (\( \text{NO}_x \))
  - Carbon Monoxide (CO)
  - Volatile Organic Compounds (VOC’s)

- Greenhouse gases
  - Carbon dioxide (\( \text{CO}_2 \))
  - Methane (\( \text{CH}_4 \))
  - Nitrous oxide (\( \text{N}_2\text{O} \))
Source Categories Inventoried

- **Ocean-going vessels:** 7,000+ vessel moves including inbound, outbound, shifts, and at dock inventoried: Container ships, oceangoing tug boats, refrigerated vessels, roll-on roll-off ships, passenger cruise vessels, auto carriers, general cargo ships, bulk liquid tankers, etc.

- **Harbor vessels:** Almost 700 commercial fishing vessels, ocean tugs, harbor tugs, excursion vessels, government boats, ferries, tank barges, and almost 25,000 recreational vessels

- **Cargo handling equipment:** 1,145 cranes, straddle carriers, yard tractors, top and side handlers, forklifts,

- **Rail:** Line haul locomotives, yard locomotives, and cargo handling equipment and heavy-duty vehicles used within rail yards to support more than 7,000 trains

- **On-road heavy-duty vehicles:** More than 2,000,000 heavy-duty vehicle trips to move cargo to and from terminals, passenger buses for cruises

- **Fleet vehicles:** More than 91,000 passenger cars & trucks, auto imports

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**Technical Approach**

- **Activity-based inventory approach**
  - Activities x Emission Factors = Emissions

- **Recommendations by Technical Work Group**

- **Approved by Steering Committee**

- **Methodology same as for other major seaport emissions inventories**
**Geographic Extent**

- U.S. portion of the Puget Sound / Georgia Basin Airshed
- Spans ~140 miles south-to-north; 160 miles west-to-east
- Close coordination with similar inventory for Georgia Basin

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**Puget Sound Clean Air Agency**

Salmon-Colored Area on Map

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Figure 2.27: Regional Clean Air Agencies of Washington
### Emissions Summary of Maritime Sources by County for Entire Study Area

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<thead>
<tr>
<th>County</th>
<th>Emissions by County, tpy</th>
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Table 2.3: Puget Sound 2005 Maritime Emissions by County, tpy

### Total Emissions Summary
Non-Maritime and Maritime Sources in Puget Sound Clean Air Agency Jurisdiction

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Table 2.12: Comparison of 2005 Maritime and Non-Maritime Emissions for the Puget Sound Clean Air Agency Region, tpy
Diesel Particulate Matter
From Non-Maritime and Maritime Sources
in Puget Sound Clean Air Agency Jurisdiction

Figure 2.51: Comparison of 2005 Maritime and Non-Maritime DPM Emissions for the Puget Sound Clean Air Agency Region, tpy

Port of Seattle
Diesel Particulate Matter (DPM)

Figure 2.60: Port of Seattle 2005 Maritime DPM Emissions by Source Category, tpy
Port of Tacoma
Diesel Particulate Matter (DPM)

Figure 2.70: Port of Tacoma 2005 Maritime DPM Emissions by Source Category, tpy

Greenhouse Gases
Sources in Puget Sound Clean Air Agency Jurisdiction

97.6%
Non-Maritime Sources

2.1%
Other Regional Maritime Sources

2.4%
Port of Tacoma Related Sources

0.3%
Cargo Handling Equipment 37%

Rail: On-terminal 14%
Vessel Hotelling 26%
Objective:
Create a voluntary, joint strategy to reduce port-related air emissions that affect air quality and climate change in the Puget Sound/Georgia Basin Airshed.

Partners
- Partners
  - Port of Tacoma
  - Port of Seattle
  - Vancouver Port Authority (B.C.)
- Collaborators
  - Environment Canada
  - Puget Sound Clean Air Agency
  - U.S. Environmental Protection Agency
Geographical Scope

- Clear, measurable performance goals
- Encourage ongoing innovation instead of mandated solutions

Approach

- Clear, measurable performance goals
- Encourage ongoing innovation instead of mandated solutions
- Short Term (2010) and Long Term (2015) targets
Draft Performance Standards
Ocean-Going Vessels

- By 2010 - Reduce emissions of particulate matter at berth by 70%, equivalent to using low sulfur distillate fuels in auxiliary engines
- By 2015 - Compliance with performance standards adopted by the IMO

Draft Performance Standards
Cargo-Handling Equipment

- 30% PM reduction, equivalent to using ULSD or biodiesel blend, together with the fleet-wide equivalent of Tier 2 and 3 engines
- Fleet-wide equivalent of Tier 4 engines
Draft Performance Standards
Rail

- Work with the railroads
- Develop performance goal by 2008
- Support U.S. EPA Locomotive and Marine Diesel Engine Rule

Draft Performance Standards
Trucks

- Develop a performance standard
- Begin a dialogue with other West Coast ports and the trucking industry to develop a coast-wide model for reducing port related truck emissions
Draft Performance Standards
Harbor Craft

• Air agencies taking lead for this category
• Focus: -engine retrofits
    -use of cleaner fuels

Next Steps

• Consultation and outreach with industry stakeholders and the public
• Board/Commission approval late 2007