

2011 Puget Sound Maritime Air Emissions Inventory



Air Emissions Update

The inventory was funded by the Puget Sound Maritime Air Forum, a voluntary association of private and public maritime organizations, ports, air agencies, environmental and public health advocacy groups, and other parties with operational or regulatory responsibilities related to the maritime industry.

The Forum is committed to accurately quantifying and voluntarily reducing air emissions associated with maritime related freight, vehicles and passengers in the Puget Sound airshed.



Members of the Puget Sound Maritime Air Forum

American Lung Association of the Mountain Pacific • BNSF Railway Company • United States Environmental Protection Agency
 Northwest Clean Air Agency • Northwest and Canada Cruise Ship Association • Pacific Merchant Shipping Association
 Port of Anacortes • Port of Everett • Port of Olympia • Port of Seattle • Port of Tacoma • Puget Sound Clean Air Agency
 Washington State Department of Ecology • Washington State Department of Transportation-Ferries • Western States Petroleum Association

► For more details: www.pugetsoundmaritimeairforum.org

Defined Pollutants

CO Carbon Monoxide, an EPA pollutant

CO₂e.. Carbon dioxide equivalents, a greenhouse gas

DPM .. Diesel Particulate Matter, a particulate component of combustion that is directly emitted from diesel engines.

NO_x ... Oxides of Nitrogen, an EPA pollutant

SO₂.... Sulfur Dioxide, an EPA pollutant

VOC ... Volatile Organic Compound, a very broad term used to describe the entire set of vapor-phase atmospheric organic chemicals

Emission Sources

OGV... Ocean-Going Vessel that can operate in the open oceanic waters - cargo and cruise ships, tankers

CHV ... Commercial harbor vessels, government (non-military) vessels

CHE ... Cargo-Handling Equipment: cranes, straddle carriers, yard trucks, forklifts

Trucks...On-road heavy duty trucks that move in and out of terminals

Locomotives.... Train operations

Ocean Going Vessel

Pollutant	CY 2005-2011	
	%	tons/yr
DPM	-16%	-131
SO ₂	-9%	-1,215
CO ₂ e	-9%	-74,751

Commercial Harbor Vessel

Pollutant	CY 2005-2011	
	%	tons/yr
DPM	+2%	+6
SO ₂	-99%	-375
CO ₂ e	+4%	+16,761

Locomotives

Pollutant	CY 2005-2011	
	%	tons/yr
DPM	-24%	-14
SO ₂	-94%	-158
CO ₂ e	-24%	-23,206

Cargo-Handling Equipment

Pollutant	CY 2005-2011	
	%	tons/yr
DPM	-40%	-22
SO ₂	-99%	-61
CO ₂ e	-19%	-15,306

Trucks

Pollutant	CY 2005-2011	
	%	tons/yr
DPM	-52%	-59
SO ₂	-96%	-83
CO ₂ e	-3%	-12,775

Summary of Puget Sound-wide Emission Changes 2005-2011

2011 Port of Seattle Air Emissions Update

► For more details: www.portseattle.org



Emission Changes
2005 - 2011



Pollutant	OGV Hotelling	OGV Transit	CHV	Locomotives	CHE	Trucks	Overall	Normalized*
CO	-8%	-21%	-14%	-15%	-74%	-16%	-38%	-43%
CO ₂ e	-10%	-11%	-16%	-13%	-9%	+8%	-5%	-14%
DPM	-34%	-21%	-27%	-14%	-39%	-53%	-27%	-34%
NO _x	-13%	-27%	-22%	-34%	-27%	-16%	-25%	-32%
SO ₂	-39%	-11%	-100%	-93%	-99%	-96%	-21%	-28%
VOC	-7%	-20%	-8%	-19%	-64%	+10%	-29%	-27%

The 2011 Puget Sound Maritime Air Emissions Inventory shows significant reductions in pollutant emissions from the Port of Seattle.

*per 10,000 tonnes of cargo

Airshed Reduction in tons/year diesel particulate matter (Port of Seattle)
2005 - 2011 per category

