



Puget Sound Georgia Basin Ecosystem Indicator Report

Executive Summary



Air Quality

Insufficient Progress ■

The Puget Sound Georgia Basin Ecosystem Indicators give a glimpse into the health of our ecosystem, which includes the interactions among seven million people, their health, local economies and a complex system of water, land, plants, animals and microorganisms. This indicator examines trends in air quality related to concentrations of fine particulate matter (PM_{2.5}) in Puget Sound (between 1999-2004) and the Georgia Basin (1996-2004). PM_{2.5} refers to small particles that are 2.5 micrometers or less in diameter, approximately 1/30 the width of a single human hair. Fine particulate matter affects both visibility and human health.

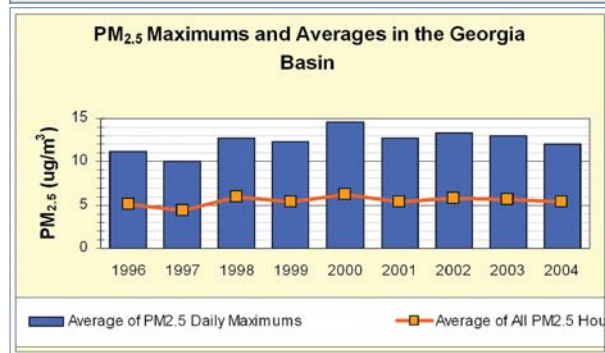
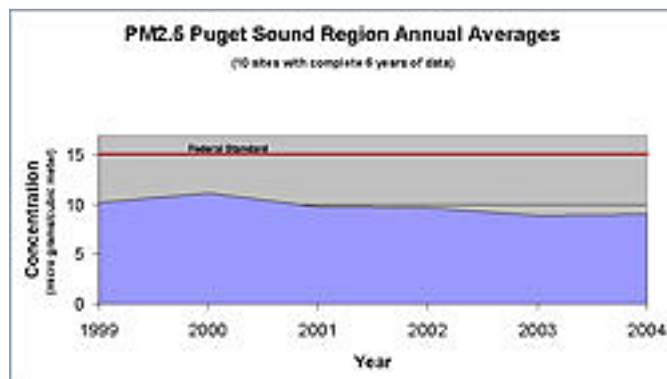
What Is Happening?

Levels of PM_{2.5} in Puget Sound have gradually decreased since the early 1990s but are forecasted to increase by about 20 percent between 1996 and 2018. In the Georgia Basin, concentrations remained relatively steady between 1996 and 2004 and are forecasted to increase 10 percent in the Lower Fraser Valley between 2000 and 2020. The Lower Fraser Valley is just north of Whatcom County and is BC's prime agricultural region.

Why Is It Happening?

Sources of PM_{2.5} include:

- **Diesel particulate:** The exhaust from diesel combustion results in the formation of PM_{2.5} which contains carbon particles and other gases that become visible as they cool. This contributes to haze and reduced visibility.
- **Vehicles and trucks:** In 2004, vehicles in the Greater Vancouver Regional District contributed 75 percent of the sulfur dioxide, nitrogen oxides, fine particulate matter and gaseous hydrocarbon emissions as well as other air pollutants. In the Puget Sound, about 57 percent of human-caused emissions are attributable to motor vehicles.
- **Indoor burning:** Wood stoves and fireplaces contribute significantly to PM_{2.5}.
- **Marine vessel and port diesel emissions** are of particular concern as commercial and recreational marine traffic increase throughout the Puget Sound and Georgia Basin.



How Does This Affect Me?

- **Health effects:** Adults breathe 11,000 liters of air every day and children breathe more air per pound of body weight. Diesel particulates contain cancer-causing agents in the form of polycyclic aromatic hydrocarbons (PAHs). Exposure to PM_{2.5} can lead to cardiovascular and respiratory effects such as asthma, bronchitis, emphysema, pneumonia, coronary artery disease, abnormal heart rhythms, congestive heart failure and increased risk of lung cancer. **Populations particularly at risk** are the elderly, people with pre-existing heart and

continued

How Does This Affect Me? *continued*

lung conditions, children and asthmatics. In BC, almost eight percent of the population has asthma, leading to 27,646 hospital stays each year. In Washington State, 11 percent of adults and 10 percent of children have asthma (BC Lung Association and WA Lung Association; PSGB Air Quality | References www.epa.gov/region10/psgb/indicators/air_quality/references.htm).

- **Economic effects:** These health effects are accompanied by associated medical and social costs such as lost work time, impaired enjoyment of life and sick children. A recent Lower Fraser Valley study estimated that a mere *one percent* improvement in general ambient air quality would lead to \$29 million in annual savings. Haze, to which PM_{2.5} is the greatest contributor, can also lead to loss of valuable tourism revenue. A 2000 study predicted losses of \$7.45 million for the Greater Vancouver Regional District and \$1.32 million for the Fraser Valley from just one poor visibility event.

What Are We Doing About It?

Public policies to reduce PM_{2.5} include a new EPA law that will decrease sulphur in non-road diesel fuel; diesel emission reduction partnerships like clean school bus initiatives; BC's AirCare and Scrap-It Program and Washington's emission check program; ferry system pilots, and wood stove and fireplace education programs.

What Can I Do?

Your Tool Box As A Citizen

- Burn only dry, seasoned wood at very high heat using certified stoves and inserts
- Use alternative sources of transportation. Bike to work!
- Use your car less often, carpool, or drive a fuel efficient car.
- Switch from diesel to biodiesel fuels. Learn more at Puget Sound Clean Cities Coalition | Biodiesel www.pugetsoundcleancities.org/FuelingBiodiesel.htm or BC Sustainable Energy Association | Biodiesel www.bcsea.org/sustainableenergy/biodiesel.asp.
- If you are sensitive to air quality, check on local conditions at AirNow www.airnow.gov in Washington and the Lower Fraser Valley Air Quality Monitoring Network in BC www.gvrd.bc.ca/aqi. Be smart and limit outdoor exercise when air quality conditions are poor.

Your Tool Box As A Business Owner

- Use ultra low sulphur diesel fuels or biodiesel blends.
- Choose shipping and receiving suppliers that belong to EPA's SmartWay Transport Partnership www.epa.gov/otaq/smartway.
- Support a commute-trip reduction program.

Learn more http://www.epa.gov/region10/psgb/indicators/air_quality/
Share what's important to you and your community
<http://www.epa.gov/region10/psgb/contact/>



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The Puget Sound Georgia Basin Ecosystem Indicators Report is a collaborative effort brought to you by Federal, State, Provincial and Local partners from the United States and Canada.