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Air Quality in San Juan County

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- San Juan County Parks Superintendent
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Abstract

To gain a better understanding of air pollution levels in San Juan County, the Washington State Department of Ecology (Ecology) monitored air quality in Friday Harbor from January 29 - May 30, 2019. The monitored data showed good air quality for the duration of the study. Ecology compared the Friday Harbor monitor data with air pollution monitoring data from nearby sites in Anacortes, Oak Harbor, and Victoria B.C., Canada. The comparison shows similar air pollution levels and patterns at all four sites, indicating that the Anacortes, Oak Harbor, and Victoria sites are reasonably representative of air pollution in San Juan County.

Background

In January 2019, Ecology established a temporary monitoring site at the San Juan County Parks Superintendent offices in Friday Harbor, San Juan County. Ecology chose Friday Harbor for the monitoring study because it has the highest population and most pollution sources in San Juan County. As such, Friday Harbor is likely to represent the highest pollution levels in San Juan County.

Fine particulate matter (also called PM_{2.5}) was monitored from January 29, 2019 to May 30, 2019. PM_{2.5} is a pollutant of concern in Washington State due to its known adverse human health effects. PM_{2.5} exposure has been linked to increases in heart, circulatory, and lung problems that can result in hospitalizations and death. Common anthropogenic sources of PM_{2.5} include smoke from burning of wood for home heating as well as exhaust from motor vehicles. Excluding wildfires, levels of PM_{2.5} are often highest during the winter when the use of woodstoves and fireplaces is most frequent.

Air monitoring

The Friday Harbor monitoring site consisted of a small, climate-controlled trailer equipped with a PM_{2.5} monitor. The monitor ran continuously, reporting hourly concentrations to Ecology's website in near real-time for the duration of the study. The monitor was checked for accuracy every 14 days. Following the end of sampling, Ecology's air monitoring operator and quality assurance team reviewed the final dataset. Any erroneous data were identified and removed from the final dataset. Approximately six sampling days were missed due to a data logging issue. The overall study data completeness was 93%.

Ecology compared the Friday Harbor monitor data with PM_{2.5} concentrations measured by monitors in Anacortes (202 O Ave.) and Oak Harbor, both of which are operated by the Northwest Clean Air Agency (NWCAA), and Victoria B.C., Canada, operated by Environment Canada. Figure 1 shows the location of these four sites.

The Anacortes and Oak Harbor PM_{2.5} data were obtained from Ecology's public air monitoring website (<https://fortress.wa.gov/ecy/enviwa/>). The Oak Harbor monitor is not part of Ecology's state monitoring network but Ecology collects and displays the data on its public website. Victoria PM_{2.5} data were obtained from Environment Canada's website. Meteorological data from the nearby Friday Harbor airport were used to understand air movement and pollution patterns. The meteorological data were obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers of Environmental Information.

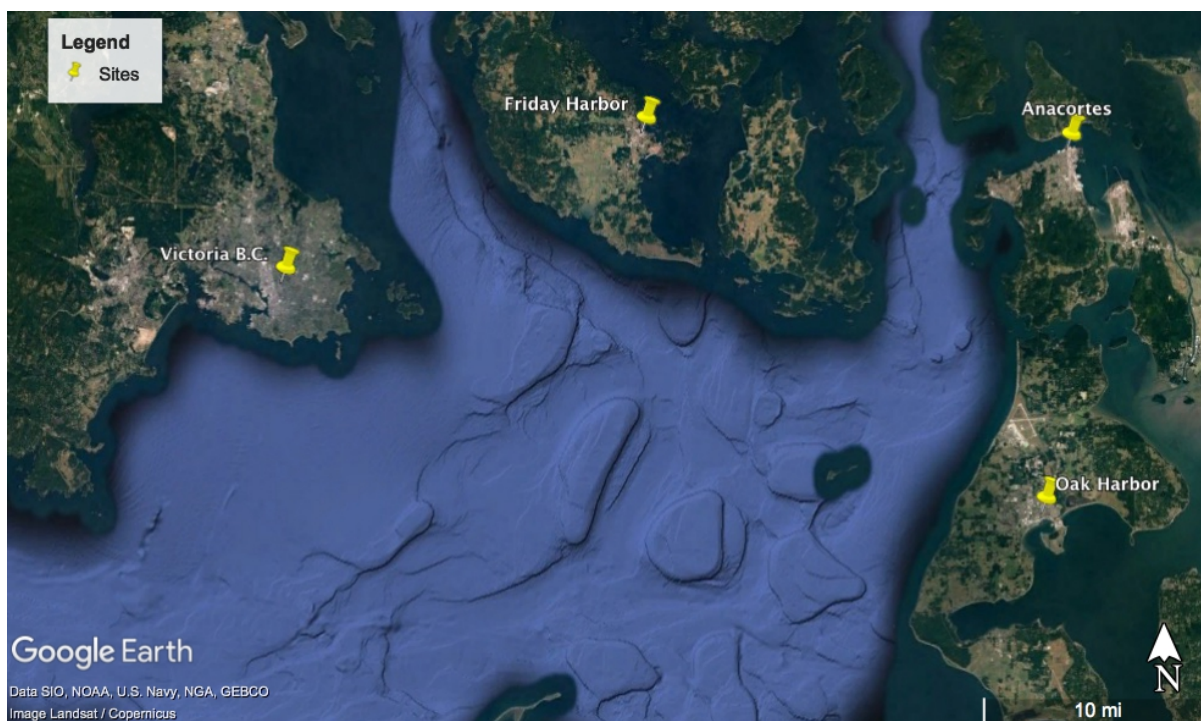


Figure 1 Locations of monitoring sites

Findings

Figure 2 shows the 24-hour average PM_{2.5} concentrations for the duration of the study. All days were in the “Good” category of the Washington Air Quality Advisory (WAQA). “Good” air quality is defined as a 24-hour PM_{2.5} average within the range of 0-12 µg/m³. Average PM_{2.5} concentrations at the Friday Harbor site were well below the National Ambient Air Quality Standards (NAAQS) for the duration of the study.

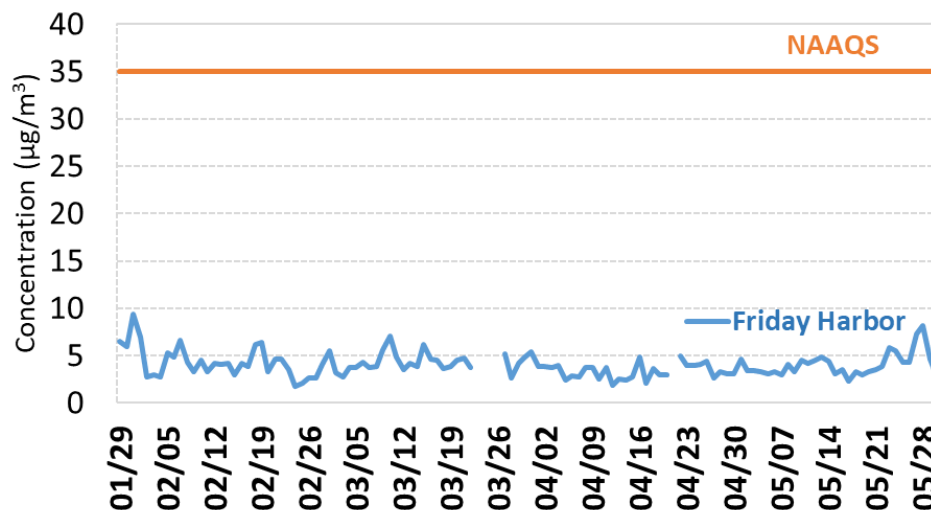


Figure 2 24-hour average PM_{2.5} Concentrations in Friday Harbor

Figure 3 shows that daily average $PM_{2.5}$ for the four sites remained well below the 24-hour $PM_{2.5}$ NAAQS and track each other reasonably well. This trend suggests that Anacortes, Oak Harbor, and Victoria B.C. are reasonably representative of air quality conditions in Friday Harbor. $PM_{2.5}$ concentrations in Victoria B.C. were up to 2 times higher than Friday Harbor, possibly due to the additional pollution sources associated with the Victoria's larger population.

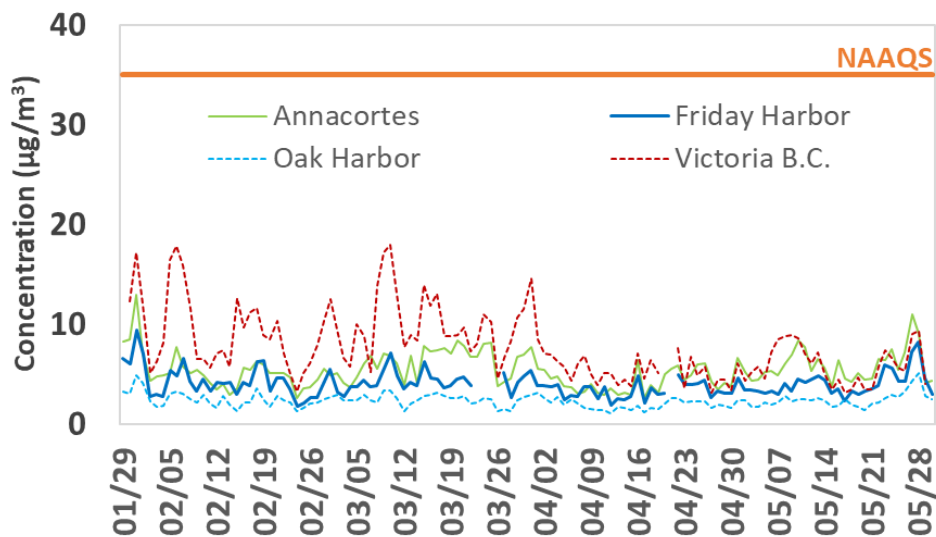


Figure 3 Comparison of 24-hour Average $PM_{2.5}$ Concentrations

Summary

- Air quality was good in Friday Harbor during the duration of the study.
- $PM_{2.5}$ monitors in Anacortes (202 O Ave.) and Oak Harbor provide a reasonable indication of air quality conditions in San Juan County.
- The $PM_{2.5}$ monitor in Victoria B.C. tracked pollution concentrations at Friday Harbor but was roughly 2 times higher on average.