KITSAP PUBLIC HEALTH DISTRICT

2023 | KITSAP COMMUNITY HEALTH ASSESSMENT

ENVIRONMENTAL HEALTH

Environmental health focuses on the relationships between people and their environment. By maintaining a healthy natural environment and creating a healthy built environment — the human-made spaces in our communities such as parks and green spaces, transportation systems, safe sidewalks/bike lanes, and buildings — we improve public health outcomes.

TOPIC OVERVIEW

This chapter includes both indicators of our natural and our built environment that influence health. It also highlights a selection of recent environmental health data gathered for Kitsap County from publicly available, countywide reports published in the last five years (2019-2023).

While this chapter is not intended to be a comprehensive assessment of environmental health in Kitsap, with this information we hope to better understand where we are starting from as we focus more on the impact of environmental health on our community moving forward.

Note: *As this chapter draws from existing reports, data may not reflect our current environmental health landscape, and the time periods and data used to generate the information included below will vary.*

For more information about foodborne and waterborne diseases, as well as how climate change is impacting communicable disease vectors and local disease epidemiology, see the Communicable Disease chapter.

KEY FINDINGS

While the findings from this report provide evidence of disparities in Kitsap County across multiple indicators, the following were identified as the most significant and are not a complete list of all disparities:

A lapse in data

More recent data are needed in order to identify key environmental health priorities, we need timely data that reflects our current environmental health landscape and identifies the subpopulations that may be disproportionately impacted by and/or more vulnerable to environmental health risks, climate change impacts, built environment changes, and exposures to hazards.

Natural environment

- **Surface water** quality is good. Since 1995, there has been a net increase of more than 5,000 acres of shellfish beds approved for harvest in Kitsap County. No public health advisories were issued for Kitsap streams in 2023.
- **Per- and polyfluoroalkyl substances** (or PFAS) groundwater contamination affects very few public drinking water systems in Kitsap: There was only one system requiring corrective action and one system exceeding the state action level, all other systems had no detection or detection below the state action level.

- **Climate change impacts —** In a 2020 report commissioned by Kitsap County, increases in heat-related illnesses and increases in acute injuries from extreme weather events are expected to have a high magnitude of impact in Kitsap moving forward.

- **Increases in total greenhouse gas emissions —** From 2015 to 2019, Kitsap County increased overall emissions by 16%. Emission increases were primarily driven by tree loss, fossil fuel-based electricity, and population growth.
- **Air quality** — Air quality in 2021 was excellent at the one station monitored by the Puget Sound Clean Air Agency located at 3250 Spruce Ave, Bremerton. More stations may be helpful to monitor differences in air quality throughout the county.

Built environment

- **Community members' transit priorities** include 30-minute services, new transit routes, and high-capacity transit (2022): In a 2022 Kitsap Transit survey, respondents ranked their top preferred transit service investments as: 30-minute service on most routes (60%), new ferry route(s) (52%), new bus routes (49%), and high-capacity transit (49%).
- Two-thirds of the Kitsap workforce reported **driving alone to work**, similar to Washington state (2017-2021).
- Puget Sound Regional Council designated 6 communities in Kitsap as **High Transit Communities** (2020). These communities are expected to accommodate regional employment and population growth in the coming years and include Bainbridge Island, Kingston, Port Orchard, Port Orchard Urban Growth Area (UGA), Poulsbo, and Poulsbo UGA.
- The percentage of Kitsap youth who **walked or biked to school** was lower than Washington overall (2018). In 2018, 31% of 8th graders in Kitsap reported walking or biking to school one or more days a week on average, which was lower than the percentage of Washington 8th graders overall (38%).

KEY SOURCES

Kitsap Water Quality Report	Kitsap Public Health District	2022
Washington Tracking Network	Washington State Department of Health	*
Climate Change Resiliency Assessment	Kitsap County	2020
Air Quality Data Summary for 2021	Puget Sound Clean Air Agency	2022
Long-Range Transit Plan 2022–2042	Kitsap Transit	2022
VISION 2050: A Plan for the Central Puget Sound Region	Puget Sound Regional Council	2020
Communitywide Geographic Greenhouse Gas Emissions	Kitsap County	2022
Community Health Assessment	Kitsap Public Health District	2019
County Health Rankings & Roadmaps	University of Wisconsin Population Health Institute	**

**Source is not a published report, website accessed Nov. 19, 2023.*

*** Source has many indicators with different dates (see page 10).*

INDICATORS

Kitsap Water Quality Report

The Kitsap Water Quality Report is published yearly by the Kitsap Public Health District to provide the community with an overview of surface water health in Kitsap County. It includes sampling results for dozens of Kitsap streams and other indicators of surface water health.

Surface water quality monitoring — The Health District Pollution Identification and Correction (PIC) program employees sample shorelines, streams and swimming beaches across the county for *E. coli* bacteria, an indicator of fecal pollution caused by human or animal waste. Fecal pollution can carry viruses, bacteria and parasites that make people sick. In the 2022 water year (Oct. 1, 2021 – Sept. 30, 2022), 3,559 fresh and saltwater samples were collected.

Fecal pollution can come from many sources, including failing septic systems, leaking sewage pipes, and wildlife and pet waste. While the PIC team works with the community to try to correct pollution as soon as possible, improvements can take weeks, months and sometimes years to complete.

One indicator of improvements in pollution in surface waters is the number of acres of shellfish beds open for harvest. Since 1995, there has been a net increase of more than 5,000 acres of shellfish beds approved for harvest in Kitsap County. (Figure 1)

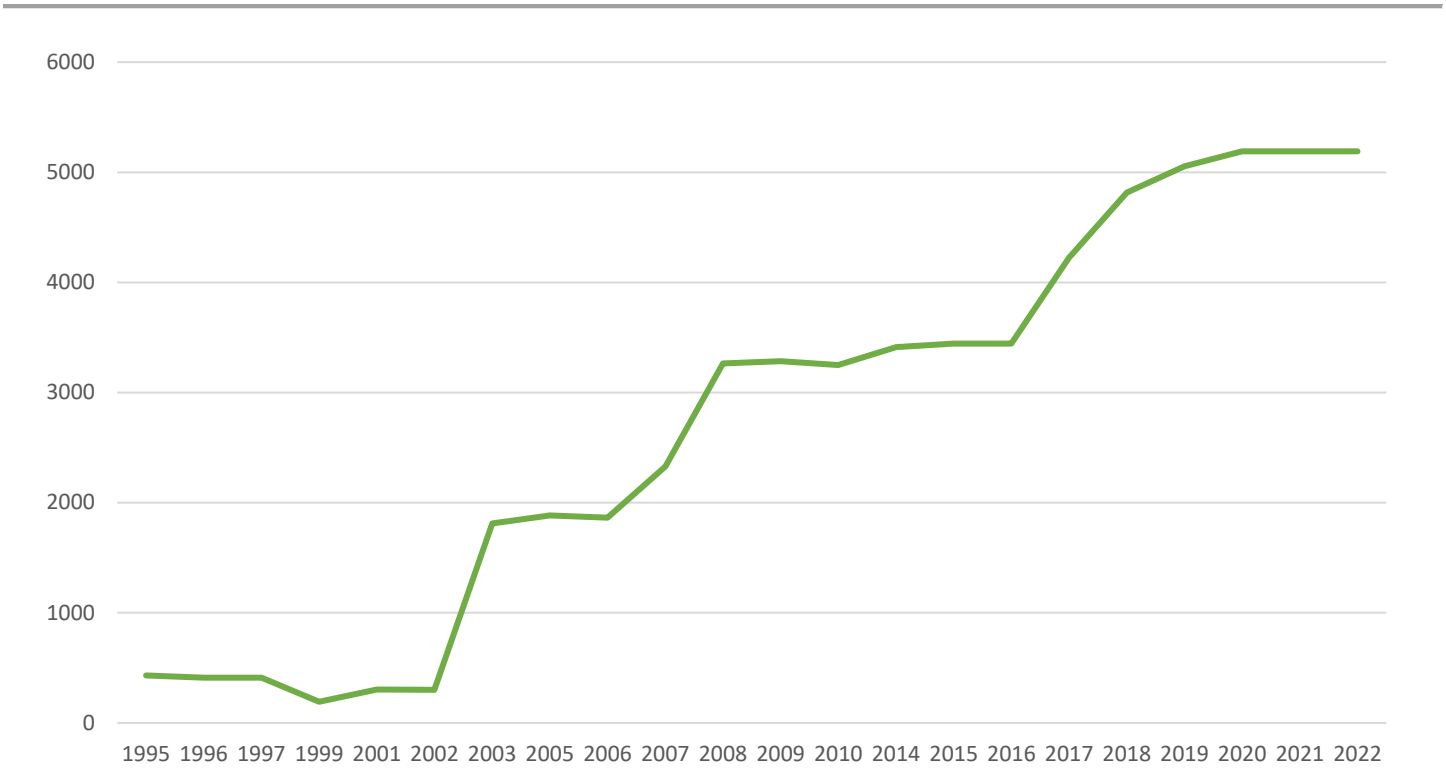

Figure 1. *Cumulative acres of shellfish beds approved since 1995*

Data source: *Washington State Department of Health Shellfish Program*

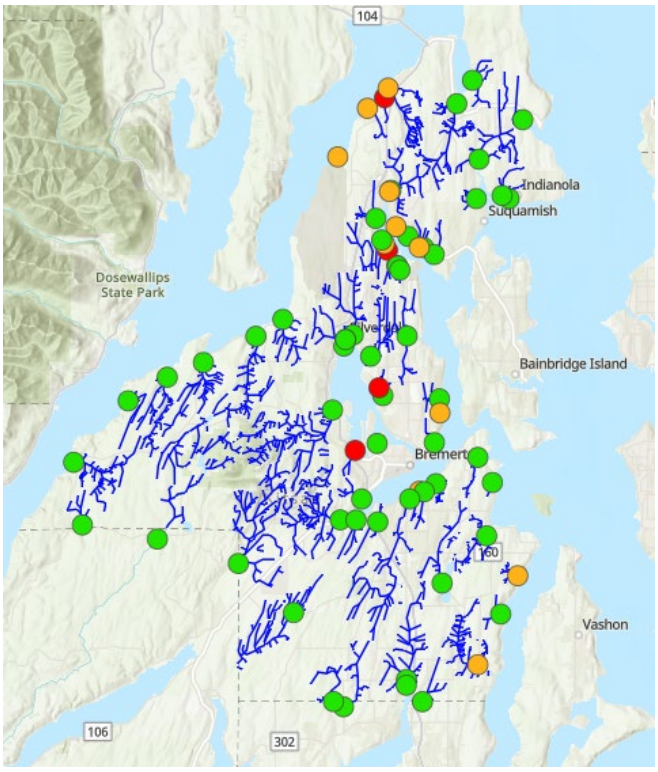

Figure 2. *Sampling results for water year 2022 for streams monitored by Kitsap Public Health District. Green dots represent monitoring stations reporting low bacteria, yellow stations reported periodic high bacteria, red stations reported consistent high bacteria.*

Data source: *Kitsap Water Quality Report, Kitsap Public Health District, 2022*

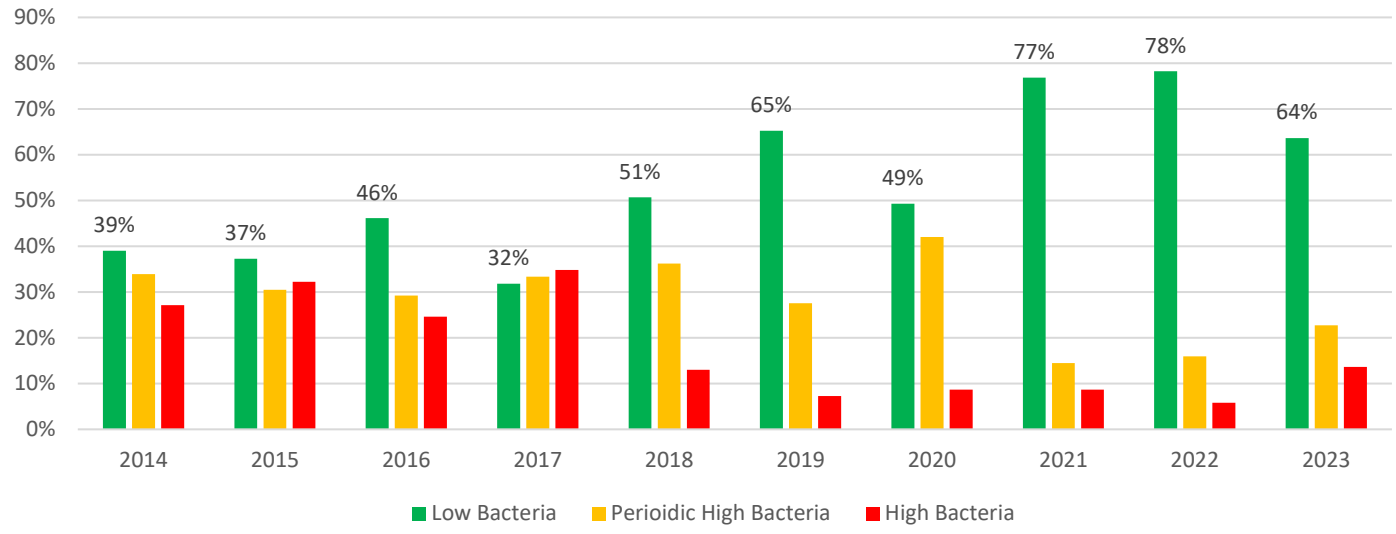

Figure 3: *Water sampling results for streams monitored by Kitsap Public Health District*

Data source: *Kitsap Public Health District Water Pollution Identification and Correction Program*

The PIC program also monitors about 70 streams for *E. coli* bacteria (Figure 2). The state Department of Ecology establishes standards for surface water quality. The freshwater standard is applied to "primary contact" water bodies, where people are likely to become submerged or ingest water through recreational activities such as wading and swimming. The City of Bainbridge Island performs its own water quality monitoring, and those data points are not presented in this report.

Sixty-four percent of monitored streams in Kitsap County met water quality (bacteria) standards during the 2023 water year, down slightly from the prior two water years. (Figure 3)

Public health advisories are issued for streams that have consistent problems with high bacteria levels. Advisories are posted to protect the health of people who might encounter stream water, especially children. A new advisory threshold was adopted in 2022 to incorporate changes to the state water standard to improve our monitoring of risk to human health. Based on water quality results the year prior, there were no public health advisories in effect for the 2023 water year (Oct. 1, 2022 to Sept. 30, 2023). The number of stream advisories has declined since 2007. (Figure 4)

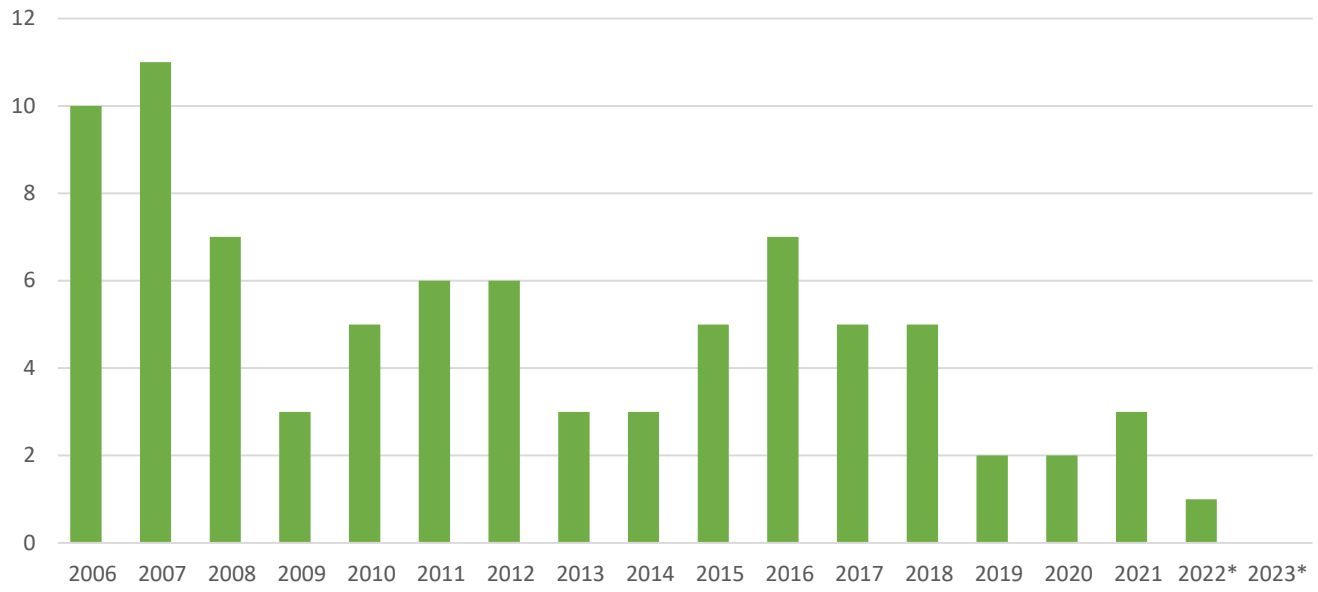

Figure 4: *Stream advisories issued by Kitsap Public Health since 2006*

Data source: *Kitsap Water Quality Report, Kitsap Public Health District, 2022*

****Note:*** *A new advisory threshold was adopted in 2021.*

The Health District freshwater swimming beach monitoring program samples at 17 lakes across Kitsap County during summer months to help keep swimmers healthy. Health advisories are issued when water samples show high levels of E. coli bacteria or when potentially toxic cyanobacteria (blue-green algae) blooms are present. Three lakes had advisories issued in the calendar year 2022 with a total of 162 health advisory days. Island Lake had three advisories, Long Lake had one advisory, and Kitsap Lake had two advisories.

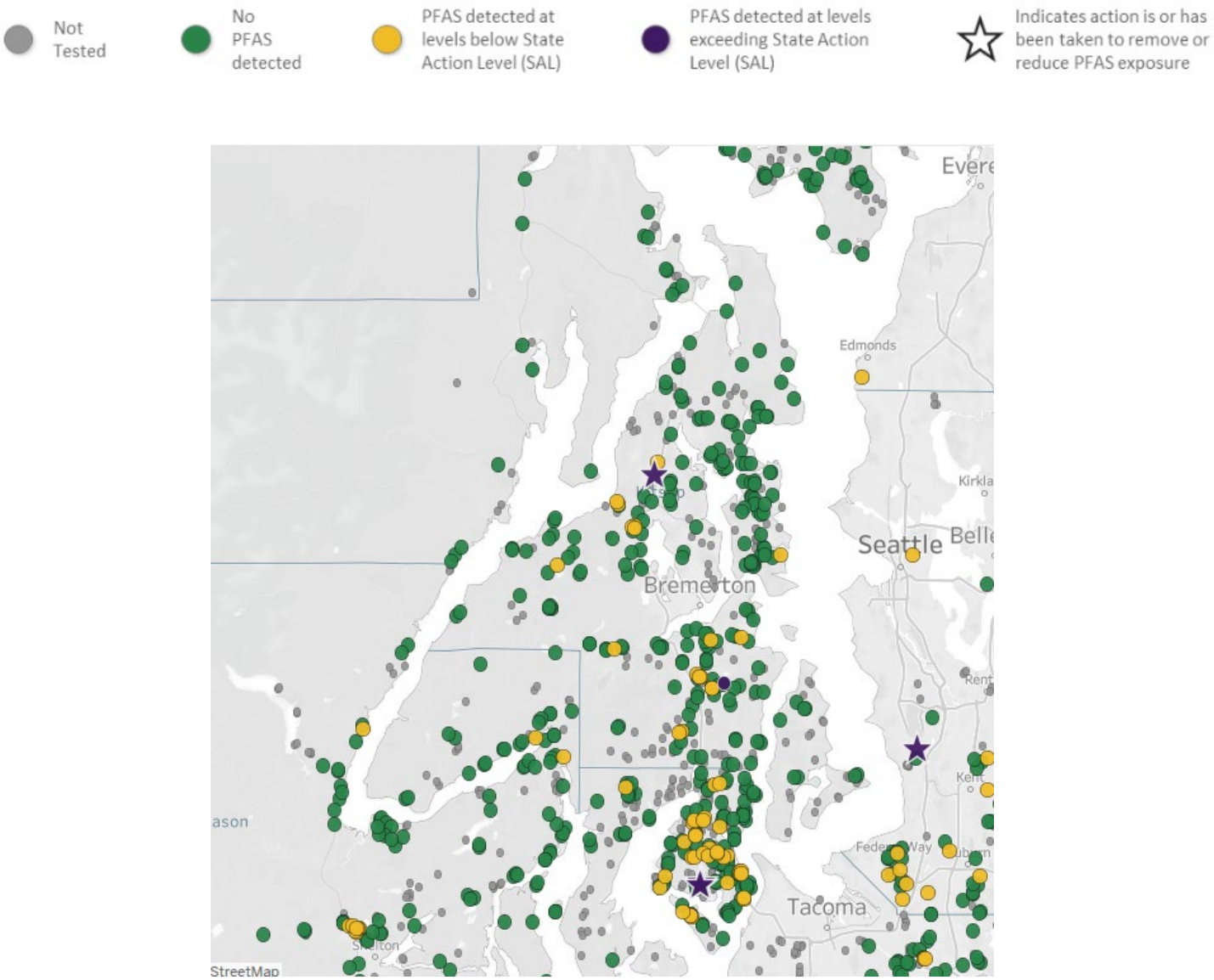

Figure 5. Drinking water PFAS testing results

Data source: Washington Tracking Network, Washington State Department of Health

Polyfluoroalkyl substances (PFAS) in drinking water

The Washington State Board of Health adopted a new rule in 2021 that requires over 2,400 public drinking water systems (Group A) to test for a large family of chemicals called per- and polyfluoroalkyl substances (PFAS). PFAS stay in the environment for a very long time and could harm human health when they build up in our bodies over time. Historical use of firefighting foam is a common source of PFAS in drinking water.

The federal government has not finalized safety standards for PFAS in drinking water, but Washington state created rules to inform communities about PFAS in drinking water when it is found. A PFAS detection at a single source doesn't necessarily mean that results occur throughout the water system or at nearby homes.

Across Washington state, 2% of water systems have found PFAS above the state action level. Figure 5 shows Group A water system PFAS test results since October 2021. Of Kitsap County water system tests for PFAS, one system had PFAS detected and corrective action has been taken (star); one system had results at or exceeding the state action level (purple); 14 additional systems had PFAS detected but lower than the state action level (yellow dots); and all other systems had no PFAS detected (green dots).

Kitsap County Climate Change Resiliency Assessment

In 2020, Kitsap County, the City of Bremerton, and the City of Port Orchard commissioned Cascadia Consulting Group, with Greene Economics and Herrera Environmental, to prepare a Climate Change Resiliency Assessment to review and summarize climate change drivers, impacts, and risks for Kitsap County. This assessment studies the area's natural environment. (Figure 6)

Public Health-Related Climate Change Key Findings	Reported "Magnitude of Impact"
Increase in heat-related illnesses	High
Increase in respiratory illnesses	High
Increase in acute injuries from extreme weather events	Low-Medium
Increase in vector-borne diseases	Medium

Figure 6. *Public health-related climate change impacts and magnitude*

Data source: *Kitsap County Climate Change Resiliency Assessment*

Note: *The magnitude of climate impact is defined qualitatively based on its relative change from historical or current baseline conditions.*

Puget Sound Clean Air Agency Air Quality Data Summary reports

The purpose of the Puget Sound Clean Air Agency's Air Quality Data Summary reports is to summarize air quality data from their core monitoring network every year.

The Agency's jurisdiction includes King, Kitsap, Pierce, and Snohomish Counties. Monitoring stations are in a variety of geographic locations in the Puget Sound region. Note that in Kitsap County, there is only one official air quality monitoring station, located at 3250 Spruce Ave. in Bremerton.

The summary studies the area's natural environment. (Figure 7)

% of year with an Air Quality Index (AQI) rating of "good"	98.4%
Highest AQI (on a scale of 0 to 500)	113

Figure 7. Air quality monitoring summary for Kitsap County, 2021

Data source: Puget Sound Clean Air Agency, Air Quality Data Summary for 2021

Kitsap Transit Long Range Transit Plan 2022-2042

The purpose of Kitsap Transit's Long-Range Transit Plan, updated every five to 10 years, is to provide a roadmap for service and capital investments over the next 20 years. The last plan was adopted by the Kitsap Transit Board of Commissioners in 2016. The transit plan supports regional plans and state policies, including the Puget Sound Regional Council's Vision 2050 Transportation Plan, Washington State Commute Trip Reduction, and the Washington State Growth Management Act.

The plan studies the area's built environment. (Figure 8)

Preferred transit investments among Kitsap Transit survey respondents	% of respondents
30-minute service on most routes	60%
New ferry routes	52%
New bus routes	49%
High-capacity transit	49%
Bremerton-Tacoma express route	34%
More on-demand service	31%
Circulator service	28%

Figure 8. Kitsap Transit survey responses, 2022

Data source: Kitsap Transit, Long-Range Transit Plan 2022–2042

Notes: Respondents were asked to select their top 3 choices. Every Kitsap County household was sent a postcard and invited to take the Kitsap Transit survey.

Puget Sound Regional Council's VISION 2050

The purpose of Puget Sound Regional Council's VISION 2050: A Plan for the Central Puget Sound Region, a long-range plan, is to fulfill requirements under Washington's Growth Management Act to develop multicounty planning policies. The policies also serve as the region's guidelines and principles required under RCW 47.80. The plan is grounded in the

public's commitment to environmental sustainability, social equity, and efficient growth management that maximizes economic strength and mobility. The plan looks ahead to the year 2050, recognizing the significant growth the region expects.

VISION 2050 studies the area's built environment. (Figure 9)

	Key finding
VISION 2050's Regional Growth Strategy calls for the 34 High Capacity Transit Communities (cities and unincorporated areas that are connected to the regional high-capacity transit system) in Washington to accommodate 24% of the region's population growth and 13% of its employment growth by the year 2050.	High Capacity Transit Communities in Kitsap: • Bainbridge Island • Kingston • Port Orchard • Port Orchard Urban Growth Area • Poulsbo • Poulsbo Urban Growth Area

Figure 9. *Kitsap High Capacity Transit Communities identified in the Vision 2050 Regional Growth Strategy*

Data source: *Puget Sound Regional Council's VISION 2050: A Plan for the Central Puget Sound Region, 2020*

Kitsap County's Communitywide Geographic Greenhouse Gas emissions inventory

The purpose of the 2019 Kitsap County Geographic Greenhouse Gas (GHG) emissions inventory was to meet the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions and the Global Protocol for Community Scale Greenhouse Gas Emission Inventories.

Inventory data was gathered for the 2019 calendar year and accounts for emissions from the activities of Kitsap County residents, businesses, employees, and visitors undertaken within or originating from within the county limits. A geographic emissions inventory does not account for upstream emissions from goods and services consumed within the community, such as food or furniture.

Emissions are reported in metric tons of carbon dioxide equivalent (MTCO2e), a metric used to measure and compare emissions of a variety of greenhouse gases.

The GHG emissions inventory studies the area's natural and built environments. (Figure 10)

	Change in Kitsap emissions from 2015-2019
Total change in greenhouse gas emissions	+16% (+0.4 million $MTCO_{2e}$)
Change in emissions due to land use (including tree loss)	+181k $MTCO_{2e}$
Change in emissions due to fossil fuels-based electricity	+131 $MTCO_{2e}$
Change in emissions due to population growth	+110 $MTCO_{2e}$
Change in emissions due to colder winters	+35 $MTCO_{2e}$
Change in emissions due to improved vehicle efficiency	-99 $MTCO_{2e}$
Change in emissions due to decreased residential energy use (per home)	-32 $MTCO_{2e}$
Change in emissions due to decreased commercial energy use (per job)	-20 $MTCO_{2e}$
Change in emissions due to decreased waste generation (per person)	-13 $MTCO_{2e}$

Figure 10. *Change in Kitsap greenhouse gas emissions*

Data source: *Kitsap County, Communitywide Geographic Greenhouse Gas Emissions, 2019*

Note: *Metric tons of carbon dioxide equivalent ($MTCO_{2e}$) is a metric used to measure and compare emissions of a variety of greenhouse gases.*

University of Wisconsin County Health Rankings & Roadmaps

The purpose of the County Health Rankings & Roadmaps, a program of the University of Wisconsin's Public Health Institute, is to provide data, evidence, guidance, and examples to build awareness of the multiple factors that influence health and support leaders in growing community power to improve health equity.

The program studies each county's built environment. (Figure 11)

	Kitsap	Washington	Years
Percentage of households with at least 1 of 4 housing problems: overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities	14%	17%	2015-19
Percentage of the workforce that drives alone to work	66%	68%	2017-21
Among workers who commute in their car alone, the percentage that commute more than 30 minutes	33%	37%	2017-21

Figure 11. *Built environment indicators from the 2023 County Health Rankings & Roadmaps*

Data source: *County Health Rankings & Roadmaps*

Kitsap Public Health District's 2019 Community Health Assessment

The last Kitsap Community Health Assessment conducted in 2019 included several indicators of the area's built environment.

The following indicators provide information about our built environment. (Figure 12)

	Estimate	Compared to Washington	Year
Density of supermarket and grocery stores	18 per 100,000 residents	Same	2016
Density of fast food and convenience stores	65 per 100,000 residents	Same	2016
8th graders walk/bike to school	31%	Lower	2018

Figure 12. Built environment indicators from the 2019 Kitsap Community Health Assessment

Data source: Kitsap Public Health District's Community Health Assessment, 2019

DATA SOURCES

- Kitsap Public Health District Water Pollution Identification and Correction Program, Kitsap Water Quality Report 2022, https://kitsappublichealth.org/environment/water_reports.php

- Washington State Department of Health, Washington Tracking Network, PFAS Testing Results Dashboard, 2023, https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/pfas/dashboard

- Puget Sound Regional Council, VISION 2050: A Plan for the Central Puget Sound Region, 2020, https://www.psrc.org/media/5098

- Kitsap County, Climate Change Resiliency Assessment, accessed at https://www.kitsapgov.com/dcd/Kitsap_climate_assessment/KitsapCountyClimateAssessment_June2020%20-%202%20Full%20Assessment%20LowRes.pdf

- Puget Sound Clean Air Agency, Air Quality Data Summary for 2021, accessed at https://pscleanair.gov/DocumentCenter/View/4828/Air-Quality-Data-Summary-2021-PDF?bidId=

- Kitsap Transit, Long-Range Transit Plan 2022–2042, accessed at https://www.kitsaptransit.com/uploads/pdf/planning/lrtpreport_6dec2022.pdf

- Kitsap County, Communitywide Geographic Greenhouse Gas Emissions, 2019, accessed at https://www.kitsapgov.com/dcd/Kitsap_climate_assessment/Kitsap%20County%20GHG%20Final%20Report.pdf

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- Kitsap Public Health District, Community Health Assessment 2019, accessed at http://nebula.wsimg.com/c287fe1a08fbda3f63c101159e0f83b7?AccessKeyId=2E4FDF62153933E23772&disposition=0&alloworigin=1