

Executive Summary

For the 2017-2019 reporting period, the Georgia Strait Air Zone is assigned an orange management level for fine particulate matter and yellow management level for ozone.

Introduction

This is the seventh annual air quality report for the Georgia Strait Air Zone. Annual air zone reporting is a commitment under the national Air Quality Management System (AQMS). This report describes achievement of the Canadian Ambient Air Quality Standards (CAAQS) for ground-level ozone (O₃) and fine particulate matter (PM_{2.5}), the associated management levels and recent actions to improve air quality. A province-wide summary can be found at: <http://www.env.gov.bc.ca/soe/indicators/air/>.

Background

The AQMS is the national approach to managing air quality in Canada. Under the AQMS, the CAAQS are developed to drive action to protect human health and the environment. Air zones are areas that exhibit similar air quality characteristics, issues and trends, and that form the basis for monitoring, reporting and taking action on air quality. The Georgia Strait Air Zone (see Figure 1) is one of seven broad air zones across B.C. Under the AQMS, progressively more rigorous actions are expected as air quality approaches or exceeds the CAAQS. The level of action is guided by the Air Zone Management Framework outlined in the AQMS management levels and objectives in Table 1.

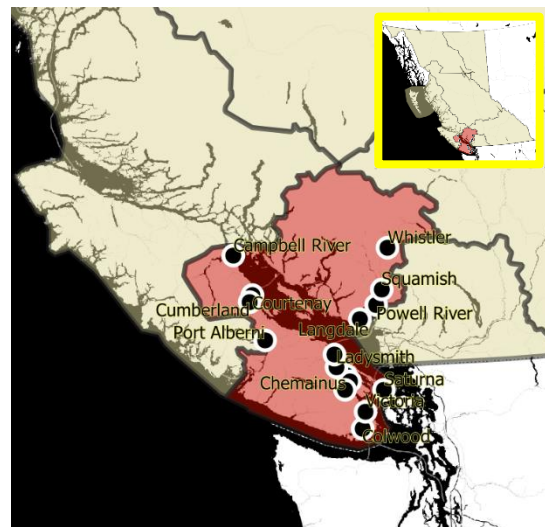


Figure 1. Georgia Strait Air Zone.

Table 1. AQMS management levels and objectives for PM_{2.5} and ozone based on 2015 CAAQS.

Management Level	Objectives	Ozone	PM _{2.5}	
		8-hour (ppb)	Annual (µg/m ³)	24-hour (µg/m ³)
Red	Achieve CAAQS	>63	>10.0	>28
Orange	Prevent CAAQS Exceedance	>56 and ≤63	>6.4 and ≤10.0	>19 and ≤28
Yellow	Prevent Air Quality Deterioration	>50 and ≤56	>4.0 and ≤6.4	>10 and ≤19
Green	Keep Clean Areas Clean	≤50	≤4.0	≤10

Ozone Levels

Ground-level ozone is a colourless and irritating gaseous pollutant. It forms just above the earth’s surface through chemical reactions between “ozone precursor” emissions. Unlike naturally occurring ozone in the ozone layer, ground-level ozone can be harmful to people, animals, and plants.

Figure 2 is the 2017-2019 summary of ozone levels in the Georgia Strait Air Zone. Concentrations ranged from 46 parts per billion (ppb) in Nanaimo to 53 ppb in Whistler.¹ Thus, all seven sites achieved the national standard of 63 ppb.

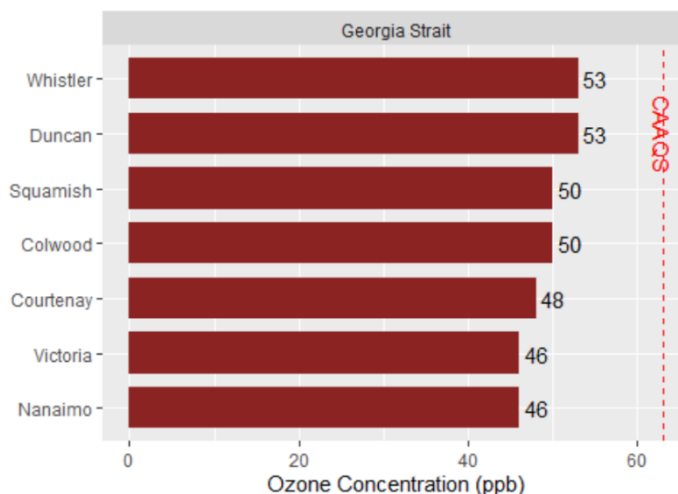


Figure 2. Ozone concentrations in the Georgia Strait Air Zone, based on annual 4th highest daily 8-hour maximums, averaged over 2017-2019. Red dashed line identifies the 2015 CAAQS of 63 ppb.

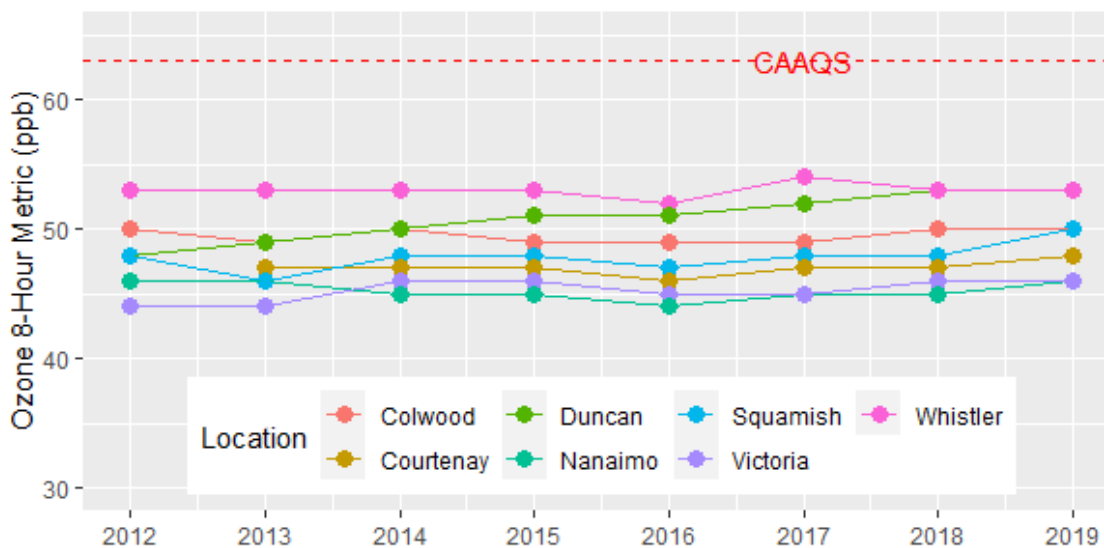


Figure 3. Annual trends in ozone concentration (2012-2019), based on annual 4th highest daily 8-hour maximums over three consecutive years. Red dashed line identifies the 2015 CAAQS of 63 ppb.

¹ Ozone 8-hour metric are based on the 4th highest daily 8-hour maximum, averaged over three years (2017-2019).

PM_{2.5} Levels

PM_{2.5} or fine particulate matter refers to inhalable particles that are smaller than 2.5 microns (µm) in diameter. All PM_{2.5} measurements in this reporting period are based on instruments certified under the US-EPA Federal Equivalent Method (FEM).

Daily concentrations (upper plot) based on the 24-hour metric² ranged from 20 to 55 µg/m³. The national 24-hour standard of 28 µg/m³ was exceeded at four sites: Whistler, Langdale, Squamish and Courtenay. When adjusted for wildfire smoke following the methodology for transboundary flow/exceptional events (TF/EE) adjustment, PM_{2.5} levels at all sites decreased below the 24-hour standard.

Concentrations (lower plot) based on the annual metric³ ranged from 3.1 to 9.7 µg/m³. All monitoring sites meet the national annual standard of 10 µg/m³ even before adjustments for wildfire smoke events.

Trends in annual mean concentrations between 2012 and 2019 are shown for a subset of sites in Figure 5. Over the 8-year period, concentrations in 2017 to 2019 at Whistler, Squamish, Victoria and Nanaimo reflect extensive wildfire activity and associated smoky conditions. When adjusted for wildfire influence, annual trends have remained mostly flat since 2016.

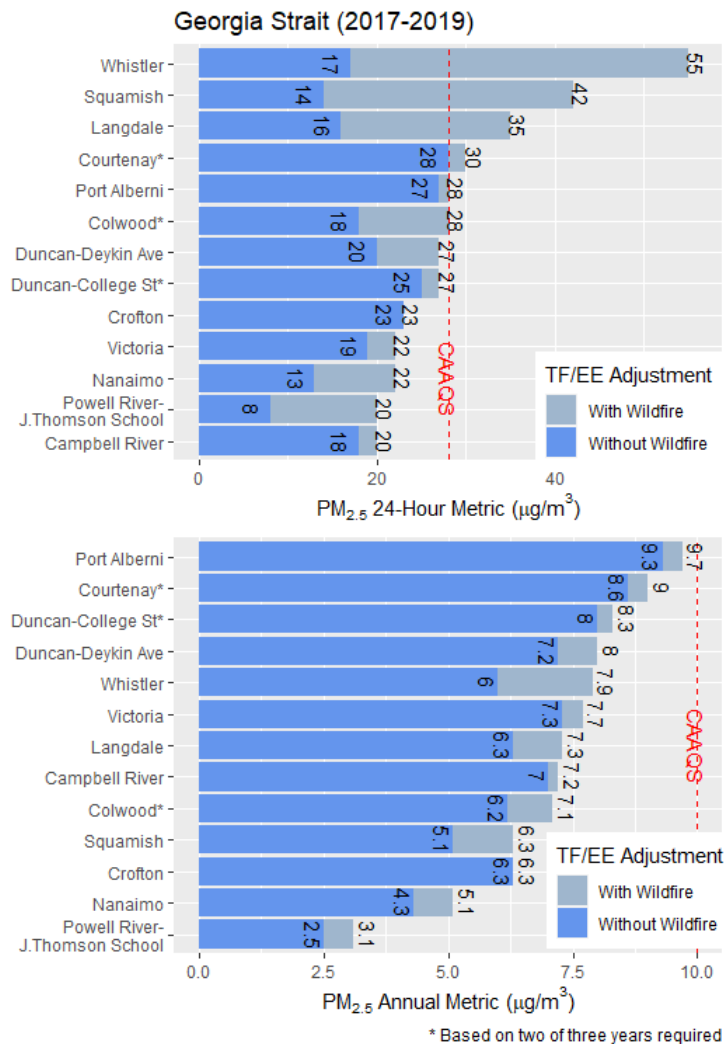


Figure 4. PM_{2.5} concentrations in the Georgia Strait Air Zone. Upper plot based on 24-hour metric (annual 98th percentile, averaged over 2017-2019). Lower plot based on annual metric (averaged over 2017-2019). Red dashed lines identify 2015 CAAQS of 28 µg/m³ (upper plot) and 10 µg/m³ (lower plot).

² PM_{2.5} 24-hour metric are based on the annual 98th percentile of the 24-hour value, averaged over three years (2017-2019).

³ PM_{2.5} annual metric are based on annual average of 24-hour values, averaged over three years (2017-2019).

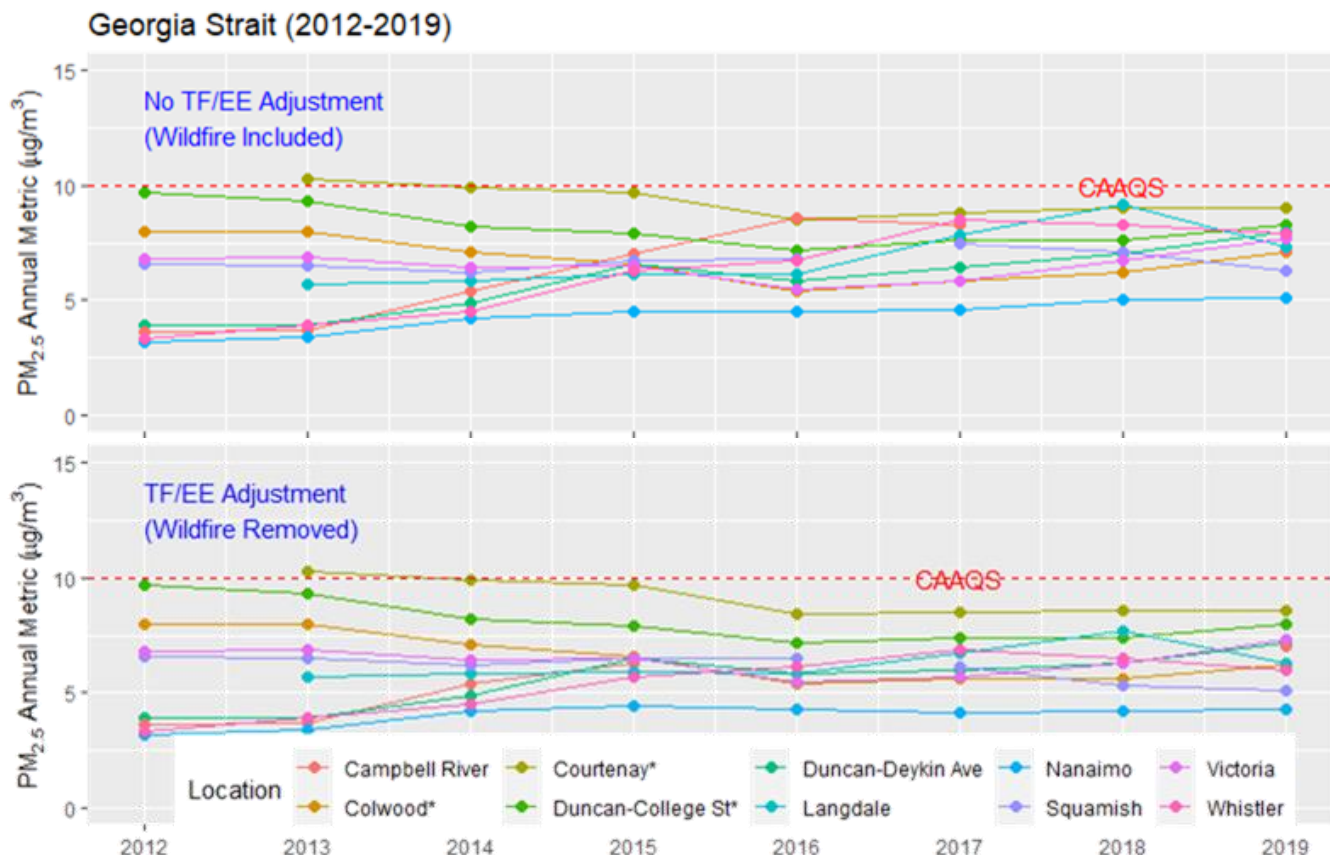


Figure 5. Trends in PM_{2.5} annual metrics (2012-2019) based on the annual average over three consecutive years. Upper plot shows trends without adjustments for wildfire influence. Lower plot shows trends adjusted for wildfire events.

Air Zone Management Levels

Air zone management levels are assigned on the basis of the highest concentrations within an air zone, excluding contributions from transboundary flows and exceptional events (TF/EE) such as wildfires, and preferentially based on sites with three years of data. TF/EE influences are removed so that long-term management strategies are not developed based on events that are beyond local or provincial control.

In the Georgia Strait Air Zone, wildfires are the primary contributor to TF/EE. The methodology for identifying wildfire-influenced data is provided in Appendix I. Excluded data are identified in Appendix II. Wildfire influences were particularly noted for the summers of 2017 and 2018, when there was extensive wildfire activity in the central and southern interior of the province that led to periodically smoky conditions and the issuance of smoke-related bulletins that at times, covered the entire Georgia Strait Air Zone.

Table 2 summarizes the ozone 8-hour metrics as measured and the management levels after removing TF/EE influences. No TF/EE influences on ozone were identified. Consequently, the Central Interior Air Zone is assigned a “yellow” management level based on concentrations at Whistler. This indicates that

any ozone-related actions should focus on preventing further air quality deterioration. This indicates that ozone-related actions should continue to focus on preventing further air quality deterioration.

Table 2. Summary of ozone metrics and air zone management levels for the Georgia Strait Air Zone (based on 2017-2019 data). All concentrations in ppb.

Location	No. Valid Years	Ozone 8-Hour Metric (4 th Highest Daily 8-hour Maximums, ppb)		Air Zone Management Level
		As Measured	TF/EE Adjustment	
Colwood	3	50	50	Goal: Prevent Air Quality Deterioration
Courtenay	3	48	48	
Duncan	3	53	53	
Nanaimo	3	46	46	
Squamish	3	50	50	
Victoria	3	46	46	
Whistler	3	53	53	

Table 3. Summary of PM_{2.5} metrics and air zone management levels for the Georgia Strait Air Zone (based on 2017-2019 data).

Location	No. Valid Years	PM _{2.5} 24-Hour Metric (98 th Percentile, µg/m ³)		PM _{2.5} Annual Metric (Annual Average, µg/m ³)		Air Zone Management Level
		As Measured	TF/EE Adjustment	As Measured	TF/EE Adjustment	
Campbell River	3	20	18	7.2	7.0	Goal: Prevent CAAQS Exceedance
Colwood	2	28	18	7.1	6.2	
Courtenay	2	30	28	9.0	8.6	
Crofton	3	23	23	5.1	4.3	
Duncan	2	27	25	8.3	8.0	
Duncan-Deykin Ave.	3	27	20	8.0	7.2	
Langdale	3	35	16	7.3	6.3	
Nanaimo	3	22	13	5.1	4.3	
Port Alberni	3	28	27	9.7	9.3	
Powell River-James Thomson School	3	20	8	3.1	2.5	
Squamish	3	42	14	6.3	5.1	
Victoria	3	22	19	7.7	7.3	
Whistler	3	55	17	7.9	6.0	

Table 3 summarizes PM_{2.5} concentrations as measured using the 24-hour and annual metrics, and with TF/EE adjustments for each monitoring site. The PM_{2.5} management level at Georgia Strait Air Zone improved from “red” in previous reports to “orange” based on the 24-hour metric of Courtenay and annual metric of Port Alberni. Red management levels were previously assigned to Duncan, Port Alberni, and Courtenay but all three communities achieved CAAQS in this reporting period. To ensure that PM_{2.5}

concentrations continue to stay below the CAAQS, a focus should remain on actions to prevent CAAQS exceedances.

Actions to Protect Air Quality

The reduction of PM_{2.5} emissions is a priority across the province including the Georgia Strait Air Zone. In 2016, the Province adopted a new Solid Fuel Burning Domestic Appliance Regulation. This piece of legislation requires that most wood burning appliances sold in B.C. are certified to the 2015 U.S. Environmental Protection Agency (EPA) particulate emission standards, or equivalent 2010 Canadian Standards Association (CSA) (has this not now changed to the more stringent USEPA 2020 standard?). The regulation also specifies the types of fuels that can be burnt and has provisions around the sale and installation of outdoor wood boilers. For more information on the regulation, see: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/air/air-pollution/smoke-burning/regulations/solid-fuel-burning-domestic-appliance-regulation>.

The Provincial Wood Stove Exchange Program encourages residents to change out their older, smoky wood stoves for lower-emission appliances including new CSA-/EPA-certified wood stoves, natural gas or pellet stoves and electric heat pumps. Between 2017 and 2019, wood stove change-out programs were supported in the Cowichan Valley Regional District⁴, Regional District of Nanaimo and the City of Nanaimo, the Alberni-Clayoquot Regional District (including Port Alberni),⁵ the Comox Valley Regional District, the Sunshine Coast Clean Air Society and qathet ??? Regional District. The Regional Districts of Cowichan Valley, Comox Valley and Alberni-Clayoquot provided enhanced incentives to further encourage the transition away from wood stoves to natural gas or pellet stoves and electric heat pumps. For more information on the Provincial Wood Stove Exchange Program, see: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/air/air-pollution/smoke-burning/exchange>.

Individual communities have taken various actions to reduce PM_{2.5} emissions and improve air quality. For additional information, please see the following webpages:

- Comox Valley Regional District: <https://www.comoxvalleyrd.ca/services/environment/air-quality>
- Cowichan Valley Regional District: <https://www.cvrld.bc.ca/2115/Air>
- Cumberland: <https://cumberland.ca/air-quality/>
- Port Alberni and the Alberni-Clayoquot Regional District: <https://www.acrd.bc.ca/agc-of-port-alberni>

A description of other activities underway in B.C. air zones can be found in the “Air Zone Management Response for British Columbia” (see: www.gov.bc.ca/bcairquality).

⁴ <https://www.cvrld.bc.ca/3010/Apply-for-a-Woodstove-Rebate>

⁵ <https://www.acrd.bc.ca/cms/wpattachments/wplD239atID2875.pdf>

Appendix I – Approach to Identify Wildfire-influenced Data

Ozone and PM_{2.5} data from 2017-2019 for the Georgia Strait Air Zone were evaluated based on the criteria set out in Appendix I for TF/EE influences. Various pieces of evidence were used to support identification of wildfire-influenced periods. These included the following:

- Wildfires of note – either due to size or proximity to populated areas – are tracked by the BC Wildfire Service (see: <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>).
 - 2017 (1.22 million hectares) and 2018 (1.35 million hectares ha) were record-breaking years in terms of area of land burned.
 - Several large fires burned in the south-central interior of B.C. in the summers of 2017 and 2018 (see Table II-1 for example). The smoke impacts due to these fires was at times widespread and affected air quality in B.C. and beyond.
- Days flagged as wildfire-influenced (Table II-2) coincided with Smoky Skies Bulletins issued by the Ministry or were in between periods of Smoky Skies Bulletins.
- Satellite images during this period (see Figures II-1 and II-2) provide additional information on the number of wildfires and spatial extent of wildfire smoke within and near the Georgia Strait Air Zone.

Table II-1. Examples of notable wildfires in the south-central interior during 2017 and 2018.⁶

Date Discovered	Size (ha)	Geographic Location	Description
2017-07-06	191,865	Elephant Hill	Large area spanning near Ashcroft to near B.C. Highway 24 at north end
2017-07-06	5,700	Gustafsen fire	Just west of 100 Mile House
2017-07-07	545,151	Chilcotin Plateau	Complex of nearly 20 separate fires on Chilcotin Plateau
2017-07-07	241,160	Hanceville Complex	Complex of fires around Hanceville, Riske Creek, Alexis Creek and surrounding areas
2017-07-07	31,181	Central Cariboo Complex	Complex of fires around Williams Lake, Soda Creek and surrounding areas
2017-07-07	33,018	West Chilcotin Complex	Complex of fires that included the 7,368 ha Precipice fire 52 km east of Bella Coola
2018-07-31	79,394	Tweedsmuir Complex – Ramsey Creek	Tweedsmuir Provincial Park; lightning-caused

Table II-1 (continued)

⁶ <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>

Date Discovered	Size (ha)	Geographic Location	Description
2018-08-01	44,817	Tweedsmuir Complex - Dean River	Tweedsmuir Provincial Park; lightning-caused
2018-08-03	60,631	Tweedsmuir Complex – Pondosy Bay	Tweedsmuir Provincial Park; lightning-caused

Table II-2 – Wildfire-influenced PM_{2.5} data from 2017-2019. All dates shown coincided with a Smoky Skies Bulletin for the area of interest, with exception of those highlighted in red.

Location	Date	Daily PM _{2.5} (µg/m ³)
Campbell River	2017-08-05	60.5
Campbell River	2017-08-06	40.2
Campbell River	2017-08-08	28.8
Campbell River	2017-08-09	35.9
Campbell River	2018-08-13	42.4
Campbell River	2018-08-19	35.9
Campbell River	2018-08-20	108.9
Campbell River	2018-08-21	146.9
Campbell River	2018-08-22	101.4
Colwood	2017-08-02	46.8
Colwood	2017-08-03	47
Colwood	2017-08-04	31.5
Colwood	2017-08-08	28.7
Colwood	2017-08-09	33.2
Colwood	2017-09-06	36.5
Colwood	2018-08-14	54.8
Colwood	2018-08-15	45.1
Colwood	2018-08-16	32.3
Colwood	2018-08-20	91.9

		(µg/m ³)
Colwood	2018-08-21	106.7
Colwood	2018-08-22	113.1
Colwood	2018-08-23	35
Colwood	2018-08-24	31.8
Courtenay	2017-08-05	74.3
Courtenay	2017-08-06	52.4
Courtenay	2017-08-07	37.8
Courtenay	2017-08-08	29.4
Courtenay	2017-08-09	51.6
Courtenay	2017-08-10	43.5
Courtenay	2017-09-07	34.3
Courtenay	2018-08-13	41.9
Courtenay	2018-08-14	30.1
Courtenay	2018-08-20	104.5
Courtenay	2018-08-21	116.8
Courtenay	2018-08-22	90.3
Crofton-Georgia Hts	2017-08-02	37.3
Crofton-Georgia Hts	2017-08-05	44.5
Crofton-Georgia Hts	2017-08-06	35.3

Table II-2 (continued)

Location	Date	Daily PM _{2.5}
----------	------	-------------------------

Georgia Strait Air Zone Report (2017-2019)

Location	Date	Daily PM _{2.5} (µg/m ³)
Crofton-Georgia Hts	2017-08-07	45.1
Crofton-Georgia Hts	2017-08-08	45.7
Crofton-Georgia Hts	2017-08-09	49.3
Crofton-Georgia Hts	2017-08-10	47
Crofton-Georgia Hts	2017-08-11	31.7
Crofton-Georgia Hts	2017-09-06	39.5
Crofton-Georgia Hts	2017-09-07	34.6
Crofton-Georgia Hts	2018-08-08	29.3
Crofton-Georgia Hts	2018-08-13	34.5
Crofton-Georgia Hts	2018-08-14	47.3
Crofton-Georgia Hts	2018-08-19	30.6
Crofton-Georgia Hts	2018-08-20	136.2
Crofton-Georgia Hts	2018-08-21	100.4
Crofton-Georgia Hts	2018-08-22	143.5
Crofton-Georgia Hts	2018-08-23	47
Duncan-Cairnsmore	2017-08-02	33.8
Duncan-Cairnsmore	2017-08-03	32.3
Duncan-Cairnsmore	2017-08-07	34.3
Duncan-Cairnsmore	2017-08-08	37
Duncan-Cairnsmore	2017-08-09	38.9
Duncan-Cairnsmore	2017-08-10	36.2
Duncan-Cairnsmore	2017-09-06	34.2
Duncan-College St	2018-08-14	40.2
Duncan-College St	2018-08-20	86.3
Duncan-College St	2018-08-21	82.4
Duncan-College St	2018-08-22	103.2
Duncan-College St	2018-08-23	37.8
Duncan-Deykin Ave	2017-08-02	44.9
Duncan-Deykin Ave	2017-08-03	39
Duncan-Deykin Ave	2017-08-05	31.1
Duncan-Deykin Ave	2017-08-06	33
Duncan-Deykin Ave	2017-08-07	41.5
Duncan-Deykin Ave	2017-08-08	45
Duncan-Deykin Ave	2017-08-09	47.5
Duncan-Deykin Ave	2017-08-10	45.2
Duncan-Deykin Ave	2017-08-11	28.1
Duncan-Deykin Ave	2017-09-06	38.3

Location	Date	Daily PM _{2.5} (µg/m ³)
Duncan-Deykin Ave	2017-09-07	32.1
Duncan-Deykin Ave	2018-08-13	32.5
Duncan-Deykin Ave	2018-08-14	47
Duncan-Deykin Ave	2018-08-20	107.7
Duncan-Deykin Ave	2018-08-21	90
Duncan-Deykin Ave	2018-08-22	117
Duncan-Deykin Ave	2018-08-23	44.8
Gibsons	2017-08-02	42.2
Gibsons	2017-08-03	52.4
Gibsons	2017-08-04	28.9
Gibsons	2017-08-05	46.5
Gibsons	2017-08-06	44.7
Gibsons	2017-08-07	49.7
Gibsons	2017-08-08	46.7
Gibsons	2017-08-09	60.4
Gibsons	2017-08-10	60.7
Gibsons	2017-08-11	31.5
Gibsons	2017-09-06	39.6
Gibsons	2017-09-07	38.9
Gibsons	2018-08-13	32
Gibsons	2018-08-14	57.4
Gibsons	2018-08-15	45.7
Gibsons	2018-08-16	33.2
Gibsons	2018-08-20	72.9
Gibsons	2018-08-21	54.8
Gibsons	2018-08-22	103.9
Gibsons	2018-08-23	50.2
Langdale	2017-08-02	49.5
Langdale	2017-08-03	71.4
Langdale	2017-08-04	46.9
Langdale	2017-08-05	57.4
Langdale	2017-08-06	54
Langdale	2017-08-07	57.6
Langdale	2017-08-08	62.6
Langdale	2017-08-09	66.6
Langdale	2017-08-10	67.6
Langdale	2017-08-11	46

Table II-2 (continued)

Georgia Strait Air Zone Report (2017-2019)

Location	Date	Daily PM _{2.5} (µg/m ³)
Langdale	2017-09-06	58.7
Langdale	2017-09-07	43
Langdale	2018-08-13	41
Langdale	2018-08-14	67.1
Langdale	2018-08-15	55.3
Langdale	2018-08-16	38.7
Langdale	2018-08-19	33.3
Langdale	2018-08-20	83.9
Langdale	2018-08-21	58.8
Langdale	2018-08-22	91.6
Langdale	2018-08-23	61.3
Nanaimo	2017-08-02	28.1
Nanaimo	2017-08-04	37.6
Nanaimo	2017-08-05	42.6
Nanaimo	2017-08-06	46.2
Nanaimo	2017-08-07	45.3
Nanaimo	2017-08-08	40
Nanaimo	2017-08-09	52.6
Nanaimo	2017-08-10	46.3
Nanaimo	2017-08-11	37.4
Nanaimo	2017-09-06	35
Nanaimo	2017-09-07	38.9
Nanaimo	2018-08-13	36.3
Nanaimo	2018-08-19	47.5
Nanaimo	2018-08-20	145.1
Nanaimo	2018-08-21	125.2
Nanaimo	2018-08-22	160.5
Port Alberni	2017-08-02	32.5
Port Alberni	2017-08-03	28.5
Port Alberni	2017-08-07	35.6
Port Alberni	2017-08-08	38.6
Port Alberni	2017-08-09	36.9
Port Alberni	2018-08-14	48.7
Port Alberni	2018-08-15	34.3
Port Alberni	2018-08-20	79.2
Port Alberni	2018-08-21	83.6
Port Alberni	2018-08-22	73.7

Location	Date	Daily PM _{2.5} (µg/m ³)
Powell River-James Thomson	2017-08-02	28.5
Powell River-James Thomson	2017-08-05	56.5
Powell River-James Thomson	2017-08-06	42
Powell River-James Thomson	2017-08-07	35.5
Powell River-James Thomson	2017-09-06	32.7
Powell River-James Thomson	2017-09-07	35.2
Powell River-James Thomson	2018-08-13	37.5
Powell River-James Thomson	2018-08-14	36.2
Powell River-James Thomson	2018-08-19	43.3
Powell River-James Thomson	2018-08-20	100.5
Powell River-James Thomson	2018-08-21	84.6
Powell River-James Thomson	2018-08-22	102.5
Powell River-Wildwood	2017-08-02	29.7
Powell River-Wildwood	2017-08-05	58.4
Powell River-Wildwood	2017-08-06	44.1
Powell River-Wildwood	2017-08-07	36.9
Powell River-Wildwood	2017-08-08	31.5
Powell River-Wildwood	2017-08-09	67.5
Powell River-Wildwood	2017-08-10	51.7
Powell River-Wildwood	2017-08-11	35.2
Powell River-Wildwood	2017-09-06	34.2

Table II-2 (continued)

Georgia Strait Air Zone Report (2017-2019)

Location	Date	Daily PM _{2.5} (µg/m ³)
Powell River-Wildwood	2017-09-07	36.7
Squamish	2017-08-02	87.5
Squamish	2017-08-03	95.7
Squamish	2017-08-04	69.4
Squamish	2017-08-05	64.1
Squamish	2017-08-06	72.3
Squamish	2017-08-07	69.5
Squamish	2017-08-08	66.6
Squamish	2017-08-09	70.3
Squamish	2017-08-10	67
Squamish	2017-08-11	49.7
Squamish	2017-09-06	75.6
Squamish	2017-09-07	58.8
Squamish	2018-08-13	48.6
Squamish	2018-08-14	73.8
Squamish	2018-08-15	57.3
Squamish	2018-08-16	36.3
Squamish	2018-08-19	44.7
Squamish	2018-08-20	94.4
Squamish	2018-08-21	50.5
Squamish	2018-08-22	75.5
Squamish	2018-08-23	68.8
Victoria-Topaz	2017-08-02	38.5
Victoria-Topaz	2017-08-03	41.8
Victoria-Topaz	2018-08-14	48.1
Victoria-Topaz	2018-08-15	45.6

Location	Date	Daily PM _{2.5} (µg/m ³)
Victoria-Topaz	2018-08-20	78
Victoria-Topaz	2018-08-21	106.9
Victoria-Topaz	2018-08-22	110
Victoria-Topaz	2018-08-23	30
Victoria-Topaz	2018-08-24	33.5
Whistler	2017-08-01	47.4
Whistler	2017-08-02	116.6
Whistler	2017-08-03	97.7
Whistler	2017-08-04	86.2
Whistler	2017-08-05	142.8
Whistler	2017-08-06	111.5
Whistler	2017-08-07	86.6
Whistler	2017-08-08	73.9
Whistler	2017-08-09	69.9
Whistler	2017-08-10	57.3
Whistler	2017-08-11	44.1
Whistler	2017-09-06	95.1
Whistler	2017-09-07	90.3
Whistler	2018-08-12	29.2
Whistler	2018-08-13	67.6
Whistler	2018-08-14	76.6
Whistler	2018-08-15	49.4
Whistler	2018-08-16	31
Whistler	2018-08-18	104
Whistler	2018-08-19	233.5
Whistler	2018-08-20	75.2
Whistler	2018-08-21	35.8
Whistler	2018-08-22	63.5
Whistler	2018-08-23	85.1

Georgia Strait Air Zone Report (2017-2019)



a. Jul. 31, 2017



b. Aug. 1, 2017



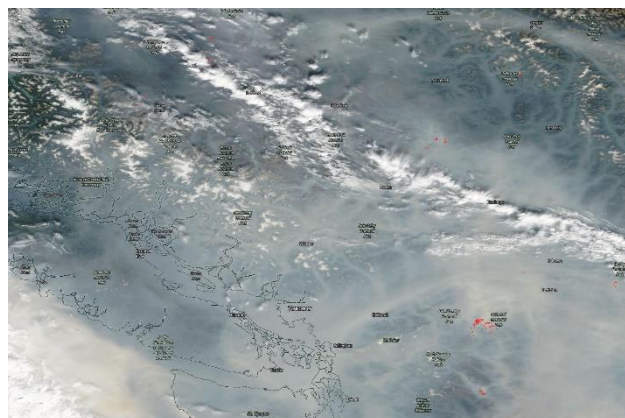
c. Aug. 4, 2017



d. Aug. 7, 2017



e. Aug. 10, 2018



f. Sept. 6, 2017

Figure II-1. Satellite images on Jul. 31, Aug. 1, 4, 7, 10 and Sept. 6, 2017, showing smoke (grey plumes) over the Georgia Strait Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-1(a) identifies Nanaimo on map. Source of images: NASA Worldview Snapshots at: <https://worldview.earthdata.nasa.gov/>.

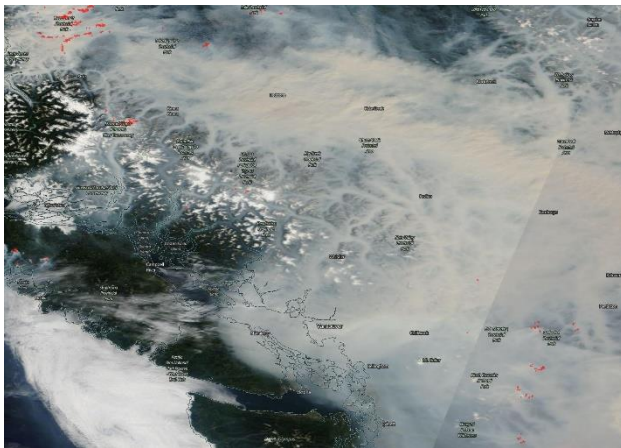
Georgia Strait Air Zone Report (2017-2019)



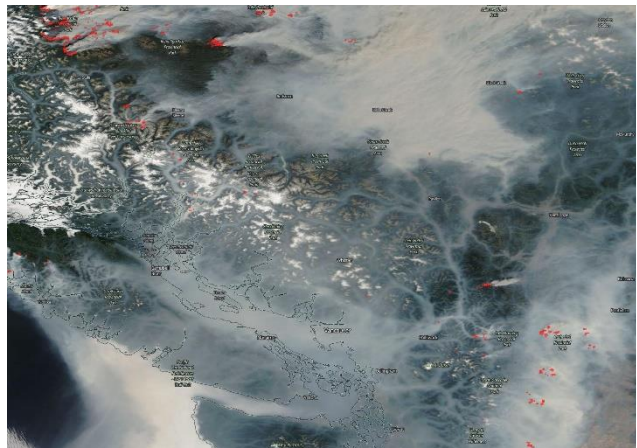
g. Aug. 13, 2018



h. Aug. 14, 2018



i. Aug. 18, 2018



j. Aug. 22, 2018

Figure II-2. Satellite images on Aug. 13, 14, 18 and 22, 2018, showing smoke (grey plumes) over the Georgia Strait Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-1(a) identifies Nanaimo on map. Source of images: NASA Worldview Snapshots at: <https://worldview.earthdata.nasa.gov/>.