

Introduction

This is the fifth 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 particulates (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 the province. 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 Table 1.



Figure 1. Georgia Strait Air Zone.

Table 1. Air zone management framework for ground-level ozone and PM_{2.5}. The CAAQS define the upper threshold, separating the “red” and “orange” management levels.

Management Level	O ₃ (ppb)		PM _{2.5} – Annual (µg/m ³)		PM _{2.5} - 24h (µg/m ³)	
	2015	2020	2015	2020	2015	2020
Red	Actions for Achieving Air Zone CAAQS					
Threshold (CAAQS)	63	62	10	8.8	28	27
Orange	Actions for Preventing CAAQS Exceedance					
Threshold	56		6.4		19	
Yellow	Actions for Preventing Air Quality Deterioration					
Threshold	50		4		10	
Green	Actions for Keeping Clean Areas Clean					

Ozone Levels

Ozone measurements in the Georgia Strait Air Zone are summarized in Figure 2. Concentrations ranged from 45 ppb in Nanaimo to 54 ppb in Whistler.¹ All sites achieved the national standard of 63 ppb.

Trends in annual ozone levels are shown in Figure 3.² Concentrations have remained below the national standard over the 10-year period. Courtenay, Duncan and Whistler each recorded its highest ozone concentrations of the 10-year period in 2017.

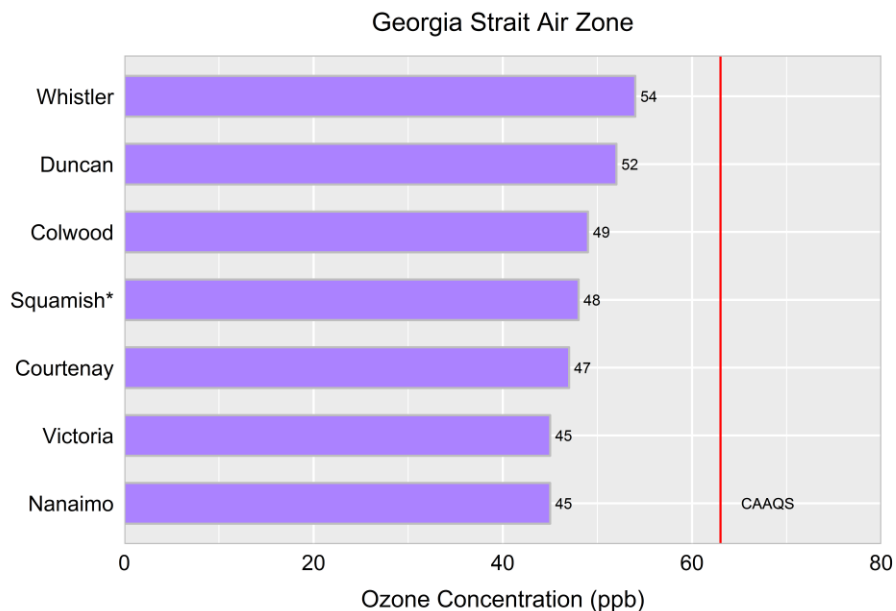


Figure 2. Ozone concentrations in the Georgia Strait Air Zone, based on annual 4th highest daily 8-hour maxima, averaged over 2015-2017. Red dashed line identifies the CAAQS of 63 ppb. Asterisk (*) indicates combined dataset from multiple sites in Squamish.

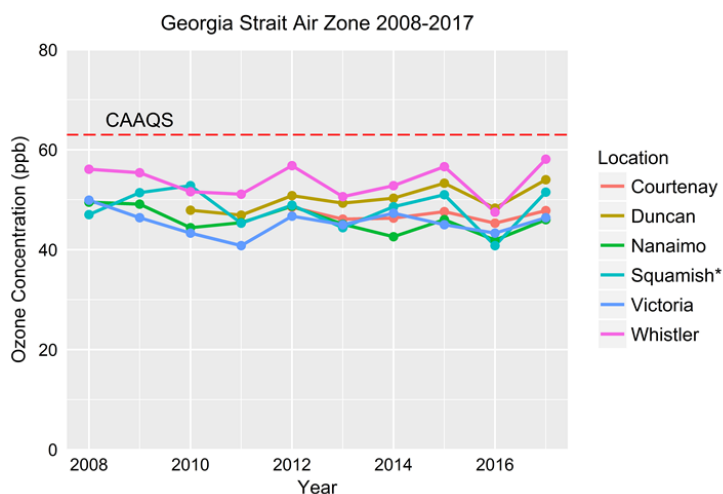


Figure 3. Annual trends in ozone concentrations (2008-2017), based on annual 4th highest daily 8-hour maxima for a single year. Red dashed line identifies CAAQS of 63 ppb. Asterisk (*) indicates combined dataset from multiple sites in Squamish.

¹ Concentrations based on 4th highest daily 8-hour maximum, averaged over three years (2015-2017).

² Concentrations based on 4th highest daily 8-hour maximum, averaged over a single year.

PM_{2.5} Levels

PM_{2.5} refers to inhalable particles up to 2.5 micrometres in diameter. PM_{2.5} measurements are summarized in Figure 4. A distinction is made between data collected using the new Federal Equivalent Method (FEM) technology and the older TEOM instruments that are being phased out. The FEMs are the preferred instrument as they provide a more complete measure of PM_{2.5} than the TEOMs.

Daily concentrations (upper plot) ranged from 17 to 41 µg/m³.³ The national standard of 28 µg/m³ was exceeded at five sites: Whistler, Langdale, Courtenay, Squamish and Port Alberni. Annual concentrations (lower plot) ranged from 3.1 to 8.8 µg/m³.⁴ All monitoring sites achieved the national standard of 10 µg/m³.

Trends in annual mean concentrations between 2008 and 2017 are shown in Figure 5 for a subset of these sites.⁵ A shift to higher reported concentrations is seen with the change from TEOM to FEM instruments from about 2010 onward. A marked increase in

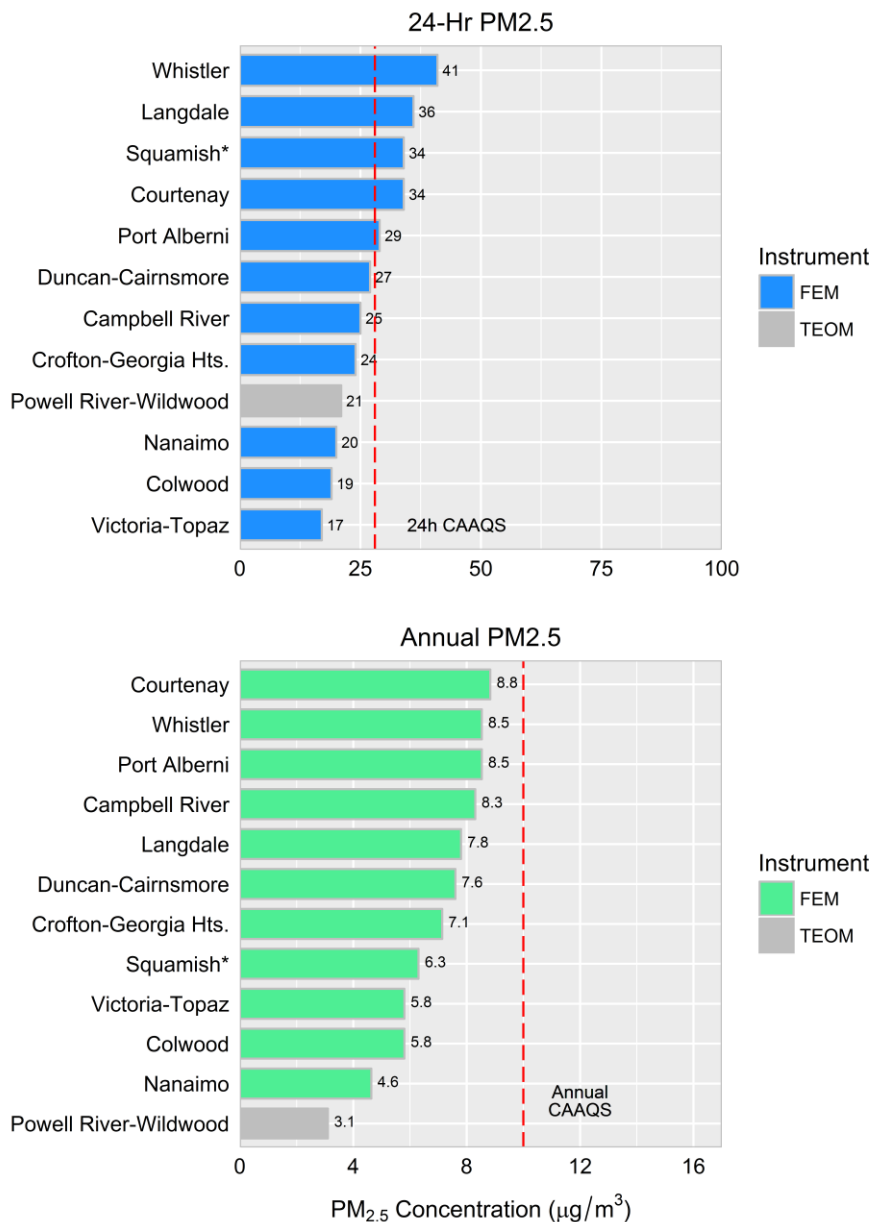


Figure 4. PM_{2.5} concentrations in the Georgia Strait Air Zone. Upper plot based on 24-hour concentration (annual 98th percentile, averaged over 2015-2017). Lower plot based on annual mean concentration (averaged over 2015-2017). Red dashed lines identify CAAQS of 28 µg/m³ (upper plot) and 10 µg/m³ (lower plot). Asterisk (*) indicates combined dataset from multiple sites in Squamish.

³ Concentrations based on annual 98th percentile of 24-hour values, averaged over three years (2015-2017).

⁴ Concentrations based on annual average of 24-hour values, averaged over three years (2015-2017).

⁵ Concentrations based on annual average of 24-hour values over single year.

annual PM_{2.5} levels in 2017 largely reflect the extensive wildfire activity and associated smoky conditions during the summer of 2017. See Appendix II for more information.

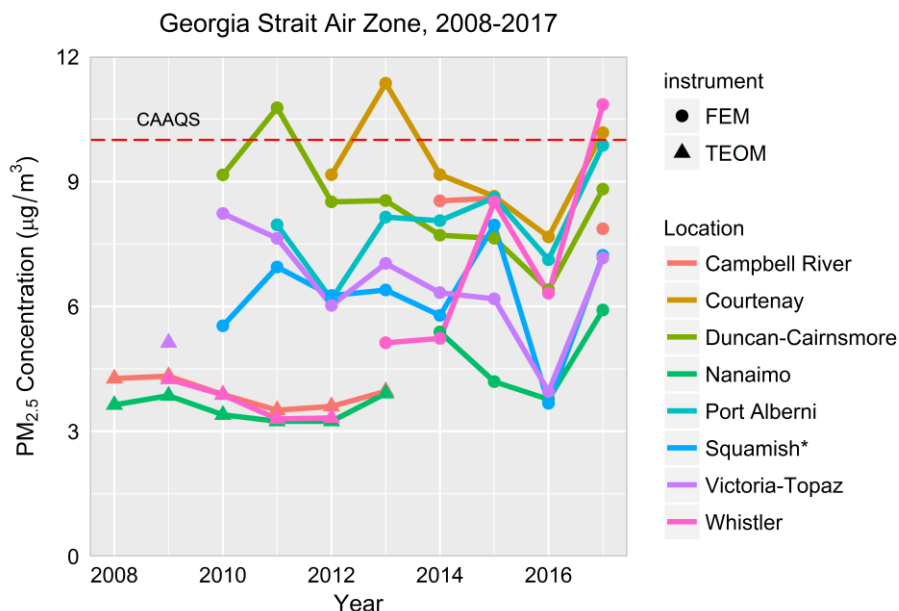


Figure 5. Trends in PM_{2.5} concentrations (2008-2017), based on annual mean concentrations from a single year. The CAAQS value of 10 µg/m³ is shown by the dashed line. PM_{2.5} measurements prior to 2011 are reported at 25°C and 1 atm. From 2011 onward, measurements are reported at local conditions. Asterisk (*) indicates combined dataset from multiple sites in Squamish.

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 (TF) and exceptional events (EE) such as wildfires, and preferentially based on those sites with three years of data. TF/EE influences are removed so that long-term management strategies are not developed on the basis of 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 2015 and 2017. During 2015, smoke from wildfires in the Pemberton area and on southern Vancouver Island contributed to periods of elevated PM_{2.5}. In 2017, extensive wildfire activity in the central and southern interior of the province led to periodically smoky conditions and the issuance of smoke-related bulletins that at times covered Whistler, the Sunshine Coast, Howe Sound, East Vancouver Island and the Gulf Islands.

Table 2 summarizes the as-measured concentrations for ground-level ozone and the management levels after any TF/EE influences have been removed. No TF/EE influences were identified for ozone. The ozone management level for the Georgia Strait Air Zone remains in the “yellow”, based on concentrations in Whistler and Duncan. This indicates that ozone-related actions should continue to focus on preventing further air quality deterioration.

Table 3 summarizes both as-measured PM_{2.5} concentrations and management levels once estimated wildfire influences have been removed (see Appendix I for more discussion of wildfire influences). The overall PM_{2.5} management level remains in the “red”, based on 24-hour PM_{2.5} concentrations in Courtenay. This means that PM_{2.5}-related actions should focus on meeting the standards in this community. Red management levels were also previously assigned to Port Alberni and Duncan, but both communities achieved the CAAQS in the latest report. To ensure that PM_{2.5} concentrations continue to stay below the CAAQS, a focus should remain on actions to avoid future CAAQS exceedances.

Table 2. Summary of ozone concentrations as measured and air zone management levels for the Georgia Strait Air Zone (based on 2015-2017 data). All concentrations in ppb. Asterisk (*) indicates combined dataset from multiple sites in Squamish.

Location	No. Valid Years	4 th Highest Daily 8-hour Maxima		Air Zone Management Level
		As Measured	TF/EE Influences Removed	
Colwood	3	49	49	Goal: Preventing Air Quality Deterioration
Courtenay	3	47	47	
Duncan-Cairnsmore	3	52	52	
Nanaimo	3	45	45	
Squamish*	3	48	48	
Victoria	3	45	45	
Whistler	3	54	54	

Actions to Protect Air Quality

The reduction of PM_{2.5} emissions remains a priority within the Georgia Strait Air Zone and particularly those individual communities that have been assigned a red management level since 2013 (i.e. Comox Valley Regional District including Courtenay; Cowichan Regional District including Duncan; and Port Alberni).

Several communities have taken advantage of the Provincial Wood Stove Exchange Program (WSEP) and its incentives for members of the public to replace old wood stoves with cleaner burning options, including heat pumps, gas or pellet stoves and cleaner burning wood stoves. Between 2015 and 2017,

Table 3. Summary of PM_{2.5} concentrations as measured and air zone management levels for the Georgia Strait Air Zone (based on 2015-2017 data). All concentrations in µg/m³. Asterisk (*) indicates combined dataset from multiple sites in Squamish.

Location	Monitor Type	No. Valid Years	Daily Mean (98 th Percentile)		Annual Mean		Air Zone Management Level
			As Measured	TF/EE Removed	As Measured	TF/EE Removed	
Campbell River	FEM	3	25	22	8.3	8.0	Goal: CAAQS Achievement
Colwood	FEM	3	19	17	5.8	5.6	
Courtenay	FEM	3	34	32	8.8	8.5	
Crofton-Georgia Hts.	FEM	3	24	18	7.1	6.7	
Duncan-Cairnsmore	FEM	3	27	25	7.6	7.4	
Duncan-Deykin Ave.	FEM	3	26	20	6.4	6.0	
Langdale	FEM	2	36	15	7.8	6.7	
Nanaimo	FEM	3	20	12	4.6	4.1	
Port Alberni	FEM	3	29	27	8.5	8.3	
Powell River-James Thomson School	TEOM	2	17	6	2.3	1.9	
Powell River-Wildwood	TEOM	2	21	7	3.1	2.4	
Squamish*	FEM	3	34	13	6.3	5.3	
Victoria-Topaz	FEM	3	17	17	5.8	5.7	
Whistler	FEM	3	41	18	8.5	6.9	

WSEP funding has been provided to: the Cowichan Valley Regional District⁶, Regional District of Nanaimo and the City of Nanaimo, the Alberni-Clayoquot Regional District (including Port Alberni),⁷ the Comox Valley Regional District and the Sunshine Coast Clean Air Society. The Regional Districts of Cowichan Valley, Comox Valley and Alberni-Clayoquot have also 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>.

Additional activities within individual communities to reduce PM_{2.5} emissions include the following:

⁶ <https://www.cvrd.bc.ca/3010/Apply-for-a-Woodstove-Rebate>

⁷ <https://www.acrd.bc.ca/cms/wpattachments/wplD239atID2875.pdf>

Comox Valley Regional District

- Convened an elected officials forum on air quality on April 4, 2017 to share information about air quality studies, initiatives and programs.⁸
- Approved a multi-year outreach program for air quality in June 2017 that includes the development and distribution of a brochure “Cleaner Air for Our Community” that identifies wood smoke “hot spots”, and an online home heating and air quality survey.

Port Alberni/Alberni Clayoquot Regional District

- Currently supporting the development of a draft bylaw to regulate wood burning stoves and appliances and will include a requirement for all wood-burning stoves and appliances to meet EPA standards by a specific date.
- Further investigating options available to Regional Districts for regulating open burning.

Cowichan Valley Regional District

- Completed public awareness and engagement roadmap that summarizes Regional Airshed Protection Strategy⁹
- Municipality of North Cowichan updated its open burning bylaw to effectively ban open burning within the more densely populated urban containment area.¹⁰
- Conducted public outreach using a low-cost (Purple Air) sensor network¹¹.

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).

⁸ Minutes of the forum, including links to the presented materials, can be found here:

<http://agendaminutes.comoxvalleyrd.ca/minutes/default.aspx?MeetingID=2379&PrinterVersion=0&DocumentTypeID=2&AgendaDeadline=3/30/2017%203%3A58%3A04%20PM>

⁹ <https://www.cvrld.bc.ca/DocumentCenter/View/89808/Airshed-Communications-Roadmap-in-Page-Order>

¹⁰ <https://www.northcowichan.ca/EN/main/departments/environmental-services/air-quality/Current-Open-Burning-Requirements.html>

¹¹ <https://www.cvrld.bc.ca/2187/Air-Quality-Map>.

Appendix I – Approach to Identify Wildfire-influenced Data

Summertime air quality in British Columbia is periodically influenced by wildfire smoke – from local fires as well as long-range transport from outside of the province. The wildfire season in B.C. typically occurs between May and September, when warm and dry conditions prevail.

A myriad of different pollutants are emitted from wildfires, including PM_{2.5} and gaseous pollutants such as nitrogen oxides and volatile organic compounds (VOCs) that can react in the atmosphere to form ground-level ozone and additional PM_{2.5}.

Given that smoke-affected areas may be extensive, and that smoke may linger for days before being fully dispersed from an airshed, the current analysis has focussed on those periods when wildfire smoke may have contributed to an exceedance of the CAAQS levels for PM_{2.5} or ozone. Criteria used to flag and evaluate wildfire-influenced data included the following:

- 24-hour PM_{2.5} concentrations exceeded the CAAQS level of 28 µg/m³ or 8-hour daily maximum ozone levels exceeded the CAAQS level of 63 ppb between May and September,
- Wildfires of interest were identified based on data from B.C. Wildfire Management Branch,
- Wildfire smoke advisories had been issued by the Ministry of Environment & Climate Change Strategy during the period of interest,
- NASA satellite images indicated smoke impacts over the region,
- Multiple monitoring sites in the area of concern exhibited similar air quality characteristics, suggesting a common source or contributing source, and
- Modelling studies identify enhanced pollutant concentrations due to wildfire smoke.

Wildfire-influenced data were then excluded from the calculation of air zone management levels. Excluded data are as summarized in Appendix II.

Appendix II – Wildfire-influenced Data in the Georgia Strait Air Zone (2015-2017)

Ozone and PM_{2.5} data from 2015-2017 for the Georgia Strait Air Zone were evaluated based on the criteria set out in Appendix I for TF/EE influences. Wildfire-influenced PM_{2.5} data are summarized in Figure II-1 and Tables II-1 and II-2. Supporting evidence included the following:

- There were large wildfires within the air zone in 2015 (e.g. Elaho, Boulder Creek and Cougar Creek fires near Pemberton) and smoke transported from numerous large fires burning in the interior of B.C. in 2017 (e.g. Elephant Hill fire near Ashcroft, and Hanceville and Plateau Complex fires in the Cariboo-Chilcotin area).
- At the time, the 2017 wildfire season was viewed as unprecedented in terms of the amount of land burned (more than 1.2 million hectares). This record during the 2018 wildfire season.
- A number of monitoring sites in the air zone observed elevated PM_{2.5} concentrations during the same or overlapping periods of time (see Figure II-1).
- Satellite images spanning the wildfire-influenced days clearly show large smoke plumes (viewed as grey plumes in the satellite images) extending from the mainland to Vancouver Island and beyond (see Figures II-2 and II-3).
- Wildfire-influenced days coincided with days that the Ministry of Environment & Climate Change Strategy had issued a smoke-related bulletin on 140 out of a possible 148 days (see Tables II-1 and II-2).
- For the remaining days, satellite images indicate the presence of smoke in the vicinity of affected monitoring areas.

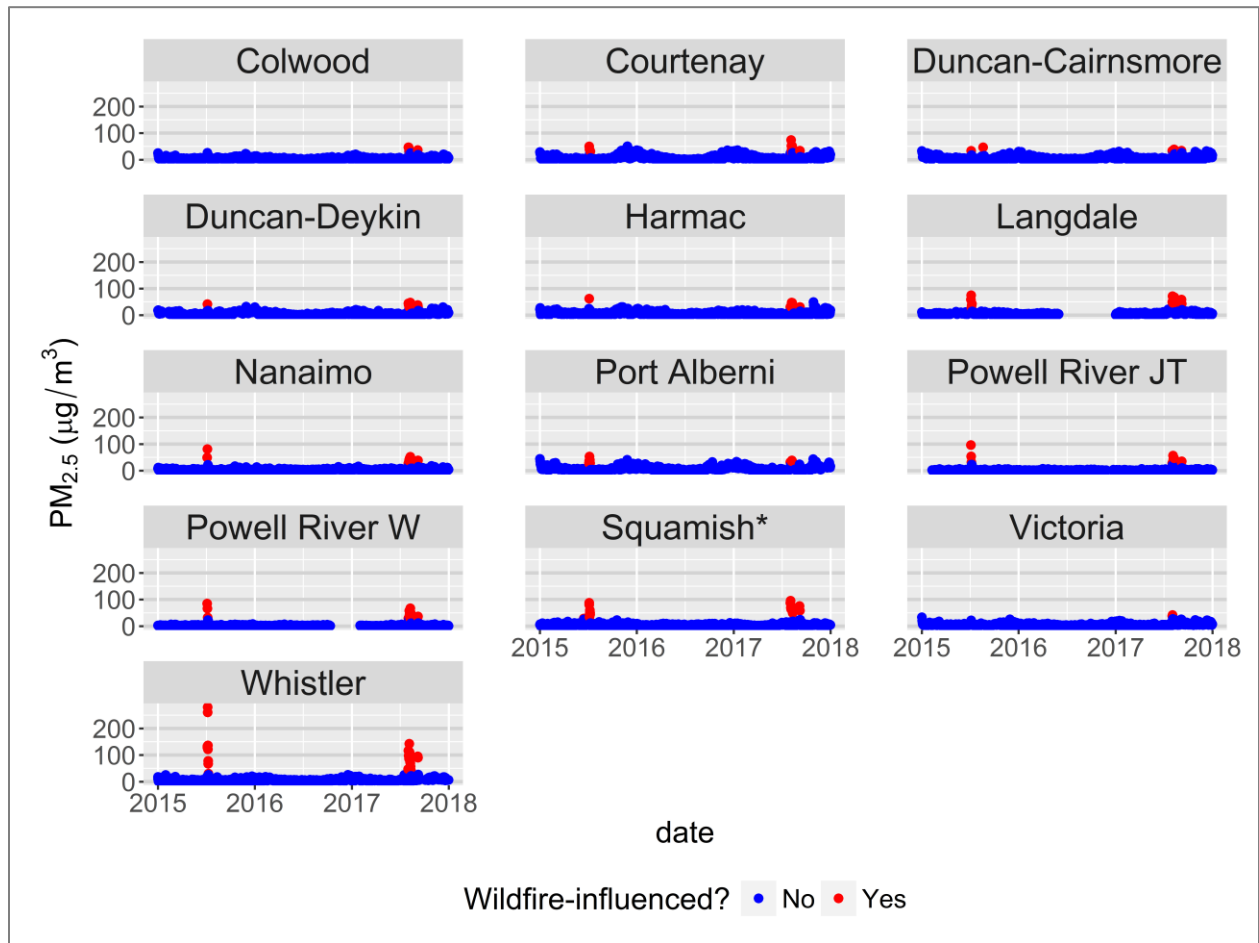


Figure II-1. Identification of wildfire-influenced PM_{2.5} data from 2015-2017. Asterisk (*) indicates combined dataset from multiple sites in Squamish. Red and blue symbols depict wildfire- and non-wildfire-influenced data identified based on procedures summarized in Appendix I. Wildfire-influenced days are listed in Table II-1.

Table II-1 Wildfire-influenced PM_{2.5} data from 2015.

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- Related Air Quality Advisory?
Squamish Gov't Bldg	2015-06-15	28.9	
Langdale Elementary	2015-07-05	58.7	Y
Nanaimo Labieux Road	2015-07-05	49.4	Y
Port Alberni Elementary	2015-07-05	28.3	Y
Powell River James Thomson School	2015-07-05	96.3	Y
Powell River Wildwood	2015-07-05	85	Y
Courtenay Elementary School	2015-07-06	50.3	Y
Crofton Georgia Hts	2015-07-06	46.5	Y
Duncan Cairnsmore	2015-07-06	33.8	Y
Duncan Deykin Avenue	2015-07-06	41.8	Y
Elk Falls Dogwood	2015-07-06	47.2	Y
Langdale Elementary	2015-07-06	75	Y
Nanaimo Labieux Road	2015-07-06	81.1	Y
Port Alberni Elementary	2015-07-06	37.2	Y
Powell River James Thomson School	2015-07-06	54	Y
Powell River Wildwood	2015-07-06	66.6	Y
Squamish Gov't Bldg	2015-07-06	88.2	Y
Whistler Meadow Park	2015-07-06	133.5	Y
Whistler Meadow Park	2015-07-06	127.9	Y
Courtenay Elementary School	2015-07-07	39.1	Y
Elk Falls Dogwood	2015-07-07	31	Y
Langdale Elementary	2015-07-07	28.5	Y
Port Alberni Elementary	2015-07-07	53.6	Y
Powell River James Thomson School	2015-07-07	32.1	Y
Powell River Wildwood	2015-07-07	32.8	Y
Squamish Gov't Bldg	2015-07-07	42.3	Y
Whistler Meadow Park	2015-07-07	260.4	Y
Whistler Meadow Park	2015-07-07	280.1	Y
Langdale Elementary	2015-07-08	37.3	Y
Port Alberni Elementary	2015-07-08	40.9	Y
Squamish Gov't Bldg	2015-07-08	59.9	Y
Whistler Meadow Park	2015-07-08	136.1	Y
Whistler Meadow Park	2015-07-08	121.8	Y

Table II-1 (continued)

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- related Air Quality Advisory?
Langdale Elementary	2015-07-09	43.4	Y
Port Alberni Elementary	2015-07-09	28.6	Y
Squamish Gov't Bldg	2015-07-09	50.5	Y
Whistler Meadow Park	2015-07-09	78.3	Y
Whistler Meadow Park	2015-07-09	67.4	Y
Courtenay Elementary School	2015-07-10	31.8	Y
Whistler Meadow Park	2015-07-10	30.3	Y
Crofton Georgia Hts	2015-08-20	36.7	Y
Duncan Cairnsmore	2015-08-20	46.8	Y

Table II-2 Wildfire-influenced PM_{2.5} data from 2017.

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- related Air Quality Advisory?
Whistler Meadow Park	2017-08-01	47.4	Y
Colwood City Hall	2017-08-02	46.8	N
Crofton Georgia Hts	2017-08-02	37.3	Y
Crofton Substation	2017-08-02	36.4	Y
Duncan Cairnsmore	2017-08-02	33.8	Y
Duncan Deykin Avenue	2017-08-02	44.9	Y
Gibsons Municipal Hall	2017-08-02	42.2	Y
Langdale Elementary	2017-08-02	49.5	Y
Nanaimo Labieux Road	2017-08-02	28.1	Y
Port Alberni Elementary	2017-08-02	32.5	N
Powell River James Thomson School	2017-08-02	28.5	Y
Powell River Wildwood	2017-08-02	29.7	Y
Squamish Elementary	2017-08-02	87.5	Y
Victoria Topaz	2017-08-02	38.5	N
Whistler Meadow Park	2017-08-02	116.6	Y
Colwood City Hall	2017-08-03	47	N
Duncan Cairnsmore	2017-08-03	32.3	Y
Duncan Deykin Avenue	2017-08-03	39	Y
Gibsons Municipal Hall	2017-08-03	52.4	Y
Langdale Elementary	2017-08-03	71.4	Y
Port Alberni Elementary	2017-08-03	28.5	N
Squamish Elementary	2017-08-03	95.7	Y
Victoria Topaz	2017-08-03	41.8	N
Whistler Meadow Park	2017-08-03	97.7	Y
Colwood City Hall	2017-08-04	31.5	N
Gibsons Municipal Hall	2017-08-04	28.8	Y
Langdale Elementary	2017-08-04	46.9	Y
Nanaimo Labieux Road	2017-08-04	37.6	Y
Squamish Elementary	2017-08-04	69.4	Y
Whistler Meadow Park	2017-08-04	86.2	Y
Courtenay Elementary School	2017-08-05	74.3	Y
Crofton Georgia Hts	2017-08-05	44.5	Y
Crofton Substation	2017-08-05	36.2	Y
Duncan Deykin Avenue	2017-08-05	31.1	Y
Elk Falls Dogwood	2017-08-05	60.5	Y
Gibsons Municipal Hall	2017-08-05	46.5	Y
Harmac Cedar Woobank	2017-08-05	31.7	Y
Langdale Elementary	2017-08-05	57.4	Y

Table II-2 (continued)

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- related Air Quality Advisory?
Nanaimo Labieux Road	2017-08-05	42.6	Y
Powell River James Thomson School	2017-08-05	56.6	Y
Powell River Wildwood	2017-08-05	58.4	Y
Squamish Elementary	2017-08-05	64.1	Y
Whistler Meadow Park	2017-08-05	142.8	Y
Courtenay Elementary School	2017-08-06	52.4	Y
Crofton Georgia Hts	2017-08-06	35.3	Y
Crofton Substation	2017-08-06	32.4	Y
Duncan Deykin Avenue	2017-08-06	33	Y
Elk Falls Dogwood	2017-08-06	40.2	Y
Gibsons Municipal Hall	2017-08-06	44.7	Y
Harmac Cedar Woobank	2017-08-06	33.9	Y
Langdale Elementary	2017-08-06	54	Y
Nanaimo Labieux Road	2017-08-06	46.2	Y
Powell River James Thomson School	2017-08-06	42	Y
Powell River Wildwood	2017-08-06	44.1	Y
Squamish Elementary	2017-08-06	72.3	Y
Whistler Meadow Park	2017-08-06	111.5	Y
Courtenay Elementary School	2017-08-07	37.8	Y
Crofton Georgia Hts	2017-08-07	45.1	Y
Crofton Substation	2017-08-07	48.5	Y
Duncan Cairnsmore	2017-08-07	34.3	Y
Duncan Deykin Avenue	2017-08-07	41.5	Y
Gibsons Municipal Hall	2017-08-07	49.7	Y
Harmac Cedar Woobank	2017-08-07	47.7	Y
Langdale Elementary	2017-08-07	57.6	Y
Nanaimo Labieux Road	2017-08-07	45.3	Y
Port Alberni Elementary	2017-08-07	35.6	Y
Powell River James Thomson School	2017-08-07	35.5	Y
Powell River Wildwood	2017-08-07	36.9	Y
Squamish Elementary	2017-08-07	69.5	Y
Whistler Meadow Park	2017-08-07	86.6	Y
Colwood City Hall	2017-08-08	28.7	Y
Courtenay Elementary School	2017-08-08	29.4	Y
Crofton Georgia Hts	2017-08-08	45.7	Y
Crofton Substation	2017-08-08	44.9	Y
Duncan Cairnsmore	2017-08-08	37	Y
Duncan Deykin Avenue	2017-08-08	45	Y
Elk Falls Dogwood	2017-08-08	28.7	Y

Table II-2 (continued)

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- related Air Quality Advisory?
Gibsons Municipal Hall	2017-08-08	46.7	Y
Harmac Cedar Woobank	2017-08-08	44	Y
Langdale Elementary	2017-08-08	62.6	Y
Nanaimo Labieux Road	2017-08-08	40	Y
Port Alberni Elementary	2017-08-08	38.6	Y
Powell River Wildwood	2017-08-08	31.5	Y
Squamish Elementary	2017-08-08	66.6	Y
Whistler Meadow Park	2017-08-08	73.9	Y
Colwood City Hall	2017-08-09	33.2	N
Courtenay Elementary School	2017-08-09	51.6	Y
Crofton Georgia Hts	2017-08-09	49.3	Y
Crofton Substation	2017-08-09	48.8	Y
Duncan Cairnsmore	2017-08-09	38.9	Y
Duncan Deykin Avenue	2017-08-09	47.5	Y
Elk Falls Dogwood	2017-08-09	35.9	Y
Gibsons Municipal Hall	2017-08-09	60.4	Y
Harmac Cedar Woobank	2017-08-09	47	Y
Langdale Elementary	2017-08-09	66.6	Y
Nanaimo Labieux Road	2017-08-09	52.6	Y
Port Alberni Elementary	2017-08-09	36.9	Y
Powell River James Thomson School	2017-08-09	47	Y
Powell River Wildwood	2017-08-09	67.5	Y
Squamish Elementary	2017-08-09	70.3	Y
Whistler Meadow Park	2017-08-09	69.9	Y
Courtenay Elementary School	2017-08-10	43.5	Y
Crofton Georgia Hts	2017-08-10	47	Y
Crofton Substation	2017-08-10	46.8	Y
Duncan Cairnsmore	2017-08-10	36.2	Y
Duncan Deykin Avenue	2017-08-10	45.2	Y
Gibsons Municipal Hall	2017-08-10	60.7	Y
Harmac Cedar Woobank	2017-08-10	42.3	Y
Langdale Elementary	2017-08-10	67.6	Y
Nanaimo Labieux Road	2017-08-10	46.3	Y
Powell River Wildwood	2017-08-10	51.7	Y
Squamish Elementary	2017-08-10	67	Y
Whistler Meadow Park	2017-08-10	57.3	Y
Crofton Georgia Hts	2017-08-11	31.7	Y
Crofton Substation	2017-08-11	34.6	Y
Duncan Deykin Avenue	2017-08-11	28.1	Y

Table II-2 (continued)

Location	Date	24-hr PM _{2.5} (µg/m ³)	Wildfire Smoke- related Air Quality Advisory?
Gibsons Municipal Hall	2017-08-11	31.5	Y
Harmac Cedar Woobank	2017-08-11	35.2	Y
Langdale Elementary	2017-08-11	46	Y
Nanaimo Labieux Road	2017-08-11	37.4	Y
Powell River Wildwood	2017-08-11	35.2	Y
Squamish Elementary	2017-08-11	49.7	Y
Whistler Meadow Park	2017-08-11	44.1	Y
Colwood City Hall	2017-09-06	36.5	Y
Crofton Georgia Hts	2017-09-06	39.5	Y
Crofton Substation	2017-09-06	32.7	Y
Duncan Cairnsmore	2017-09-06	34.2	Y
Duncan Deykin Avenue	2017-09-06	38.3	Y
Gibsons Municipal Hall	2017-09-06	39.6	Y
Langdale Elementary	2017-09-06	58.7	Y
Nanaimo Labieux Road	2017-09-06	35	Y
Powell River James Thomson School	2017-09-06	32.7	Y
Powell River Wildwood	2017-09-06	34.2	Y
Squamish Elementary	2017-09-06	75.6	Y
Whistler Meadow Park	2017-09-06	95.1	Y
Courtenay Elementary School	2017-09-07	34.3	Y
Crofton Georgia Hts	2017-09-07	34.6	Y
Crofton Substation	2017-09-07	30	Y
Duncan Deykin Avenue	2017-09-07	32.1	Y
Gibsons Municipal Hall	2017-09-07	38.9	Y
Harmac Cedar Woobank	2017-09-07	31.2	Y
Langdale Elementary	2017-09-07	43	Y
Nanaimo Labieux Road	2017-09-07	38.9	Y
Powell River James Thomson School	2017-09-07	35.2	Y
Powell River Wildwood	2017-09-07	36.7	Y
Squamish Elementary	2017-09-07	58.8	Y
Whistler Meadow Park	2017-09-07	90.3	Y

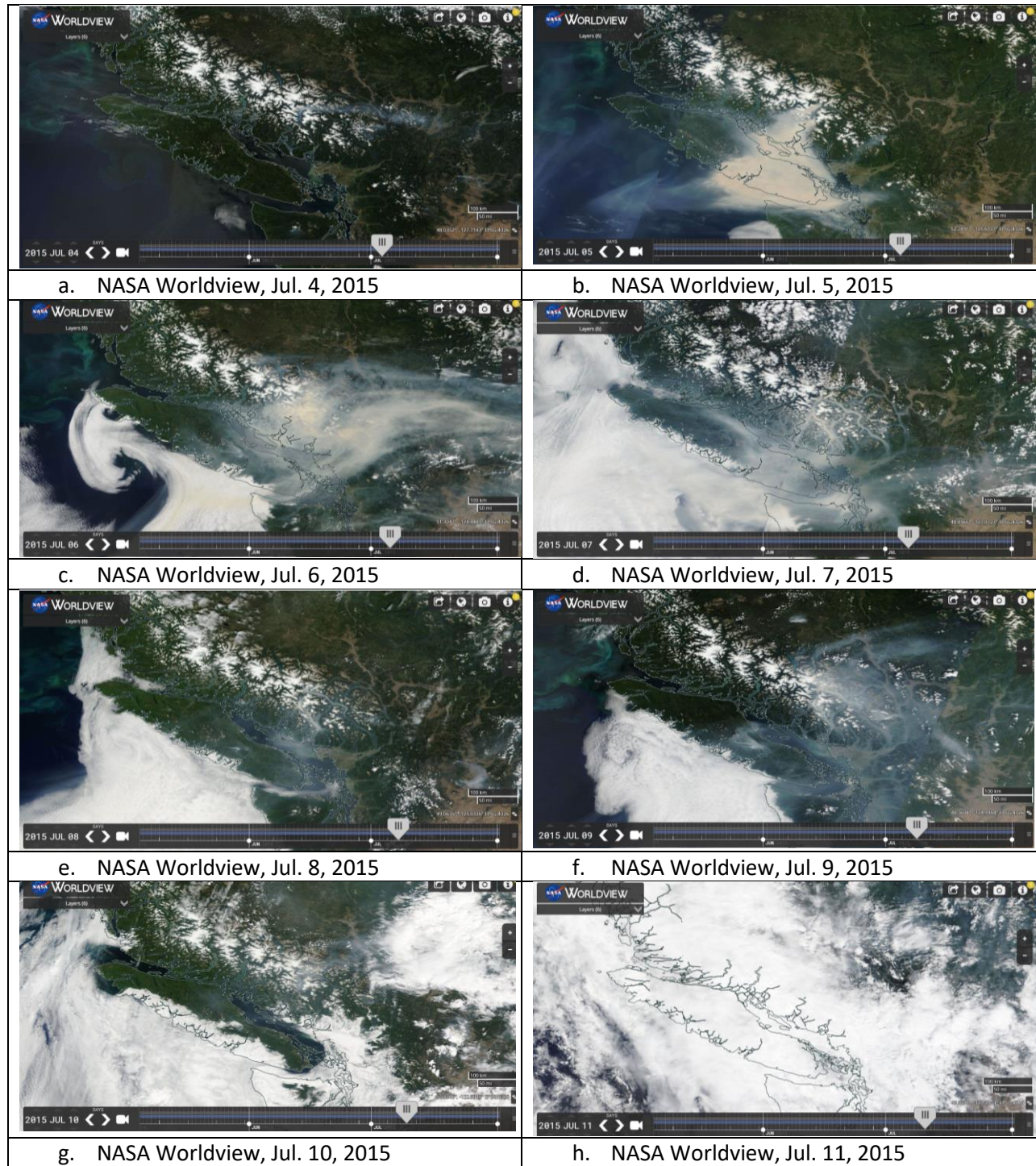


Figure II-2. Satellite images covering Jul. 4-11, 2015, showing wildfire smoke (grey plumes) over the southwest coast, including the Georgia Strait Air Zone. Source of images: NASA Worldview at: <https://worldview.earthdata.nasa.gov/>.

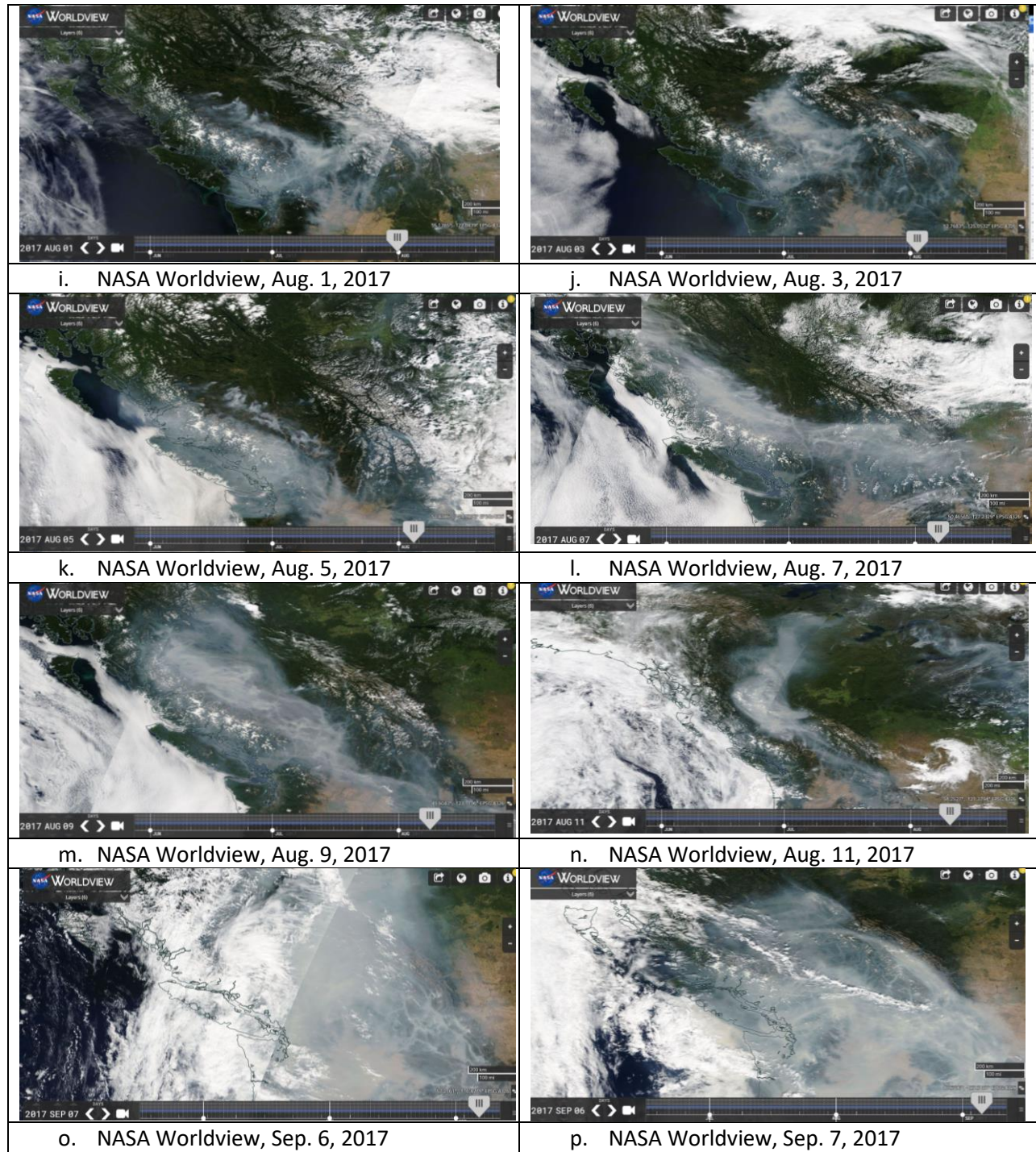


Figure II-3. Satellite images covering Aug. 1-11, 2017 and Sep. 6-7, 2017, showing wildfire smoke (grey plumes) over the southwest coast, including the Georgia Strait Air Zone. Source of images: NASA Worldview at: <https://worldview.earthdata.nasa.gov/>.