Executive Summary

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

Introduction

This is the seventh annual air quality report for the Southern Interior 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 (O_3) 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 Southern Interior 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.

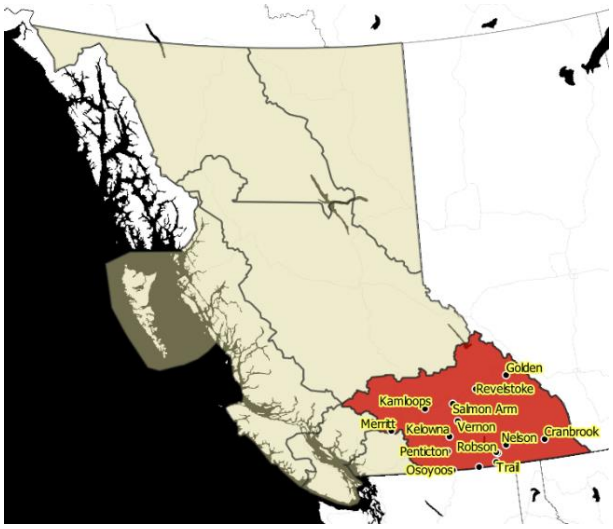


Figure 1. Southern Interior Air Zone.

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 ($\mu g/m^3$)	24-hour ($\mu g/m^3$)
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

Ozone measurements in the Southern Interior Air Zone are summarized in Figure 2. Concentrations based on the ozone 8-hour metric[1] ranged from 50 parts per billion (ppb) at Castlegar to 57 ppb at Kelowna. All sites were below the national standard of 63 ppb.

Ozone concentrations have remained below the level of the national standard throughout 2012 to 2019 (Figure 3). In 2012, impact from wildfires in Siberia led to higher ozone levels at Kelowna[2]. Since ozone metric is based on a trailing average over three consecutive years, the Siberian wildfire affects 2012-2014 data.

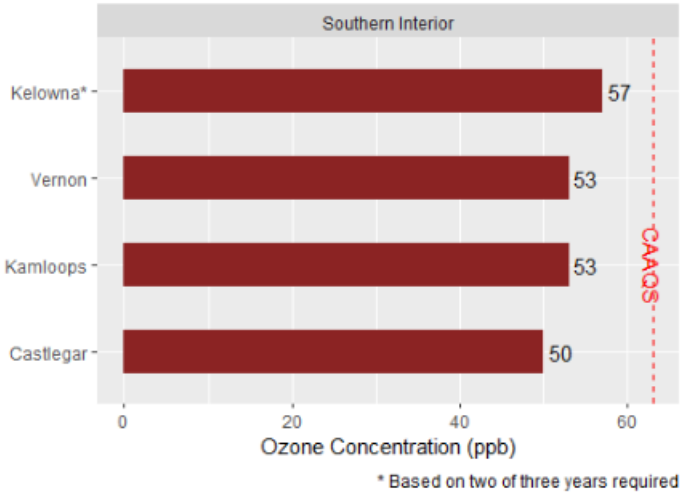


Figure 2. Ozone concentrations in the Southern Interior Air Zone, based on annual 4th highest daily 8-hour maxima, averaged over 2017-2019. Red dashed line identifies the CAAQS of 63 ppb.

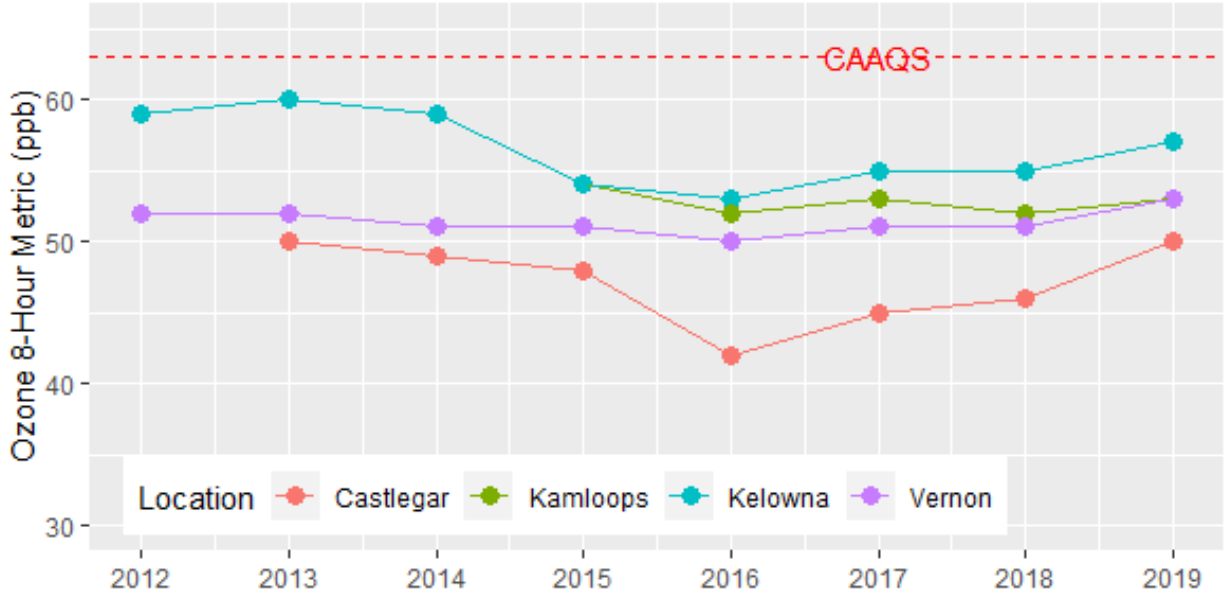


Figure 3. Trends in ozone concentrations (2012-2019), based on annual 4th highest daily 8-hour maximums over three consecutive years. Red dashed line identifies CAAQS of 63 ppb.

[1] Ozone 8-hour metric are based on the 4th highest daily 8-hour maximum, averaged over three years (2017-2019).
[2] Teakles, A.D., So, Rita, Ainslie, B. et al. (2017) Impacts of the July 2012 Siberian fire plume on air quality in the Pacific Northwest. Atmos. Chem. Phys. 17, pp. 2593-2611.

$PM_{2.5}$ 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).

$PM_{2.5}$ measurements are summarized in Figure 4. Concentrations based on the 24-hour metrics[3] (upper plot) ranged from 54 µg/m^3 at Grand Forks to 82 µg/m^3 at Lavington. All seven sites exceeded the national 24-hour standard of 28 µg/m^3. When adjusted for wildfire smoke following the methodology for transboundary flow/exceptional events (TF/EE) adjustment, $PM_{2.5}$ levels decrease and all sites achieve the standardConcentrations based on the annual metrics (lower plot) ranged from 10.8 µg/m^3 at Golden to 12.6 µg/m^3 at Lavington.[4] All sites exceeded the national standard of 10 µg/m^3 but achieves the standard following TF/EE adjustments.

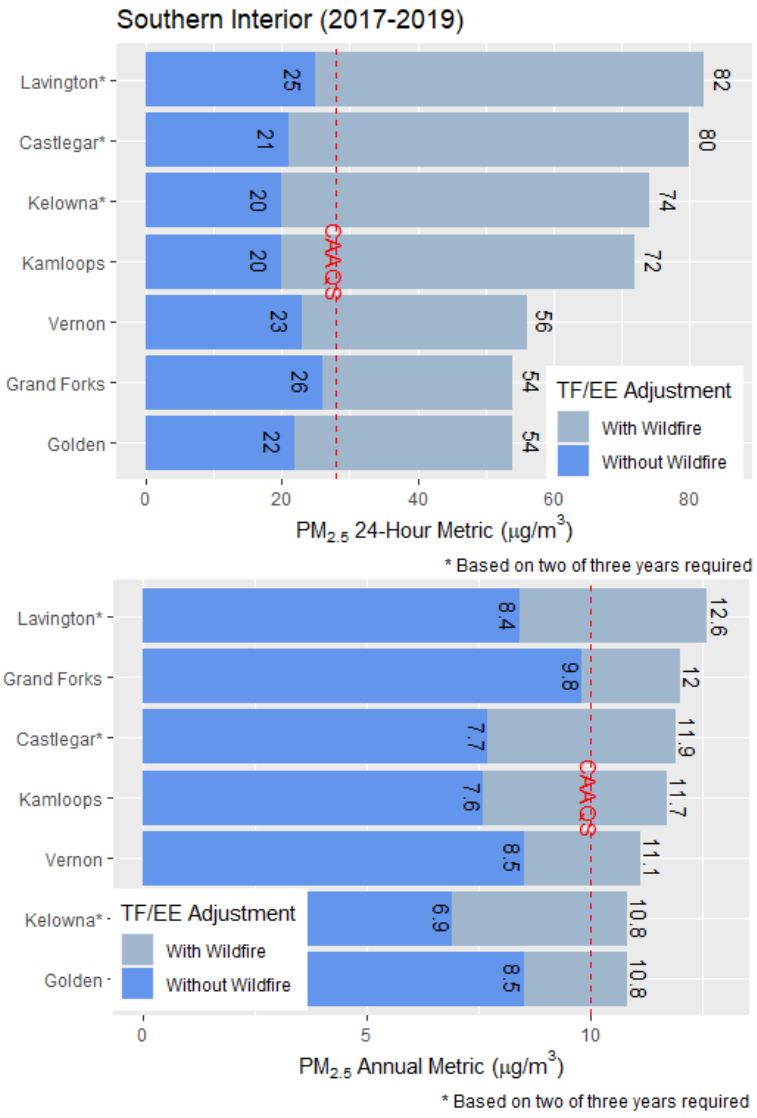


Figure 4. $PM_{2.5}$ concentrations in Southern Interior Air Zone. Upper plot based on 24-hour concentration (annual 98th percentile, averaged over 2017-2019). Lower plot based on annual mean concentration (averaged over 2017-2019). Red dashed lines identify CAAQS of 28 µg/m^3 (upper plot) and 10 µg/m^3 (lower plot).

Trends in annual $PM_{2.5}$ concentrations between 2012 and 2019 are shown in Figure 5 for a subset of Southern Interior Air Zone sites. Over the 8-year period, annual metrics without TF/EE adjustment recorded highest concentrations in 2017 to 2019, reflecting

[3] $PM_{2.5}$ 24-hour metrics are based on the annual 98th percentile of the 24-hour value, averaged over three years (2017-2019).
[4] $PM_{2.5}$ annual metrics are based on the annual average of 24-hour values, averaged over three years (2017-2019).

the magnitude of wildfires. The trends are relatively flat, with the exception of Grand Forks, when TF/EE adjustments are applied (bottom plot).

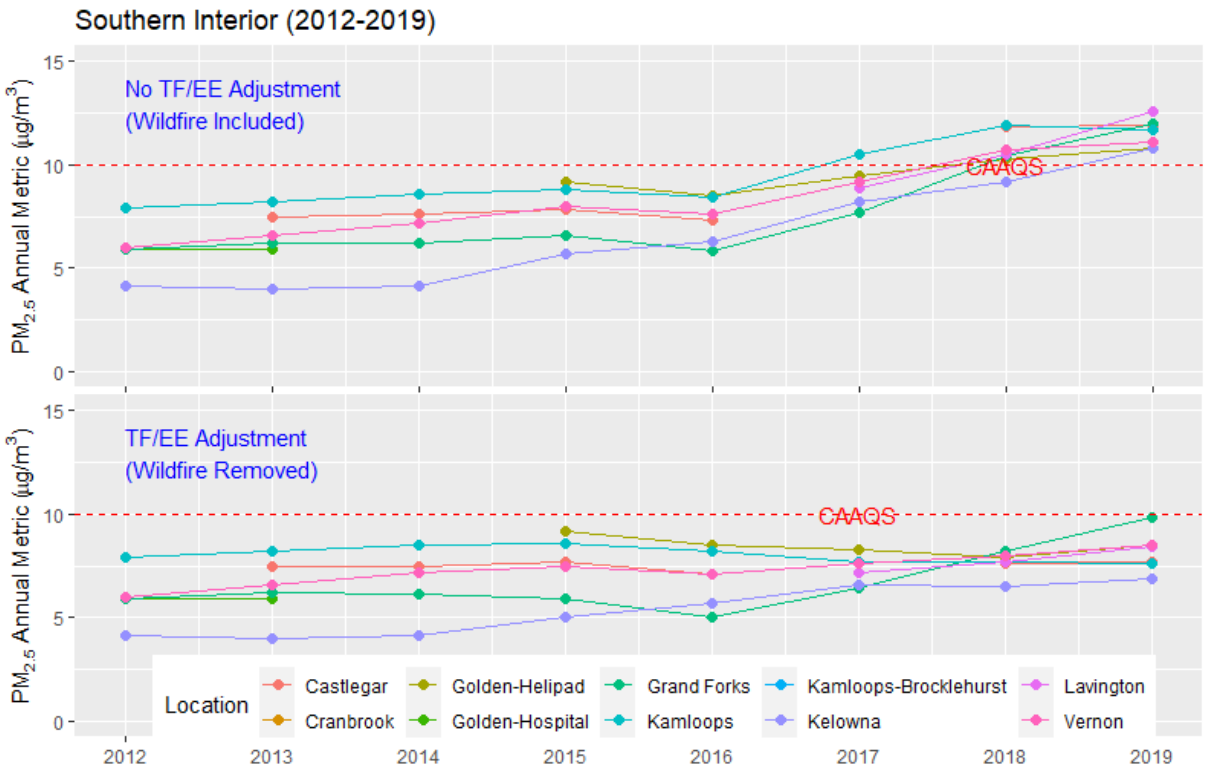


Figure 5. Trends in P $M_{2.5}$ concentrations (2012-2019), based on annual mean concentrations over three consecutive years. Upper plot shows trends without adjustments for wildfire influence. Lower plot is adjusted for wildfire events.

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. This is done so that long-term management strategies are not developed on the basis of events that are beyond local or provincial control.

In the Southern Interior Air Zone, wildfires are the primary contributor to TF/EE. The methodology for identifying wildfire-influenced data is provided in Appendix I and excluded data are summarized in Appendix II. The summers of 2017 and 2018 were characterized by hot, dry conditions and record-breaking number of hectares burned in B.C. These fires created smoky conditions and periods of degraded air quality in several communities across the air zone. the 2019 season was the second least active wildfire season since 2011.

Table 2 summarizes the as-measured concentrations for ground-level ozone and the management levels after consideration of TF/EE influences (none were identified). The Southern Interior Air Zone is assigned

a “orange” management level based on ozone concentrations in Kelowna. This indicates that ozone-related actions should focus on preventing further air quality deterioration.

Table 2. Summary of ozone metrics and air zone management levels for the Southern Interior Air Zone (based on 2017-2019 data).

Location	No. Valid Years	Ozone 8-Hour Metric (4^{th} Highest Daily 8-hour Maximums, ppb)		Air Zone Management Level for Ozone
		As Measured	TF/EE Influences Removed	
Castlegar	3	50	50	Goal: Preventing CAAQS Exceedance
Kamloops	3	53	53	
Kelowna	2	57	57	
Vernon	3	53	53	

Table 3 summarizes $PM_{2.5}$ concentrations as measured and with TF/EE influences removed for each monitoring site (see Appendix II for more information on excluded data). The impact of removing such data changed overall management levels for each site (i.e. the higher level based on 24-hour and annual metric values) from “red” to “orange” or “yellow”. As a result, the Southern Interior Air Zone is assigned an “orange” management level. This indicates that $PM_{2.5}$-related activities would be appropriate to prevent future CAAQS exceedances.

Table 3. Summary of $PM_{2.5}$ metrics and air zone management levels for the Southern Interior 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 for $PM_{2.5}$
		As Measured	TF/EE Adjusted	As Measured	TF/EE Adjusted	
Castlegar	2	80	21	11.9	7.7	Goal: Preventing CAAQS Exceedance
Golden	3	54	22	10.8	8.5	
Grand Forks	3	54	26	12	9.8	
Kamloops	3	72	20	11.7	7.6	
Kelowna	2	74	20	10.8	6.9	
Lavington	2	82	25	12.6	8.4	
Vernon	3	56	23	11.1	8.5	

Actions to Protect Air Quality

The reduction of $PM_{2.5}$ emissions continues to be a major air quality priority in many areas of B.C., including the Southern Interior Air Zone.

In 2016, the Province adopted a new Solid Fuel Burning Domestic Appliance Regulation that requires nearly all wood burning appliances sold in B.C. to be certified to meet particulate emissions standards set by the US Environmental Protection Agency (EPA) in 2015, or equivalent standards set by the Canadian Standards Association (CSA) in 2010. 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 low-emission appliances including new CSA-/EPA-certified clean-burning wood stoves. Between 2017 and 2019, wood stove change-out programs were carried out in the Regional Districts of Kootenay-Boundary, Central Kootenay and Central Okanagan as well as in Golden and District, City of Kamloops, Coldstream, Lavington and Lumby.

Strategies and actions to reduce $PM_{2.5}$ emissions have been documented in local airshed plans that have been developed for the Central Okanagan Regional District,[5] City of Kamloops,[6] the Boundary airshed,[7] and Merritt.[8] Golden is host to an active air quality committee.[9]

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).

[5] http://www.regionaldistrict.com/media/217275/RDCO_2015_Clean_Air_Strategy_Final_DRAFT_2015_02_03_final.pdf
[6] http://www.kamloops.ca/environment/pdfs/13-05-AirshedManagementPlan.pdf
[7] http://www.grandforks.ca/air/aqmplans/GrandForksAQMP-Oct22.pdf
[8] http://www.env.gov.bc.ca/epd/bcairquality/reports/pdfs/merritt_aqmp.pdf
[9] http://www.goldenairquality.ca/

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 is emitted from wildfires. These include $PM_{2.5}$ and gases such as nitrogen oxides and volatile organic compounds 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 ground-level ozone or $PM_{2.5}$. Criteria used to flag and evaluate wildfire-influenced data included the following:

- 24-hour $PM_{2.5}$ concentrations in excess of the CAAQS level of 28 $\mu g/m^3$ and/or 8-hour daily maximum ozone concentrations in excess of the CAAQS level of 63 ppb between May and September;
- Wildfires of interest identified based on data from the B.C. Wildfire Management Branch;
- Smoky Skies bulletins issued by the Ministry to notify the public of rapidly changing smoke conditions;
- NASA satellite images showing smoke impacts over the region; and
- Multiple monitoring sites in the area of concern showing elevated pollutant levels, suggesting a common source or contributing source.

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

Appendix II – Wildfire-influenced Data in the Southern Interior Air Zone (2017-2019)

Ozone and $PM_{2.5}$ data from 2017-2019 for the Southern Interior 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).
    - In contrast, 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 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, as shown in satellite images (see Figures II-1-3).
    - Smoke from wildfires in Washington State also affected air quality in the Southern Interior Air Zone (see Figure II-2(d)).
- Days flagged as wildfire-influenced (Table II-2) generally coincided with Smoky Skies Bulletins issued by the Ministry, and in a handful of cases, occurred the day before or after a bulletin was announced or ended.
- No bulletin was issued immediately before, during or after the period from Sept. 16-17, 2017 when elevated $PM_{2.5}$ levels were observed in Kamloops and Grand Forks. However, satellite images (e.g. Figure II-2(f)) indicated that there was still residual smoke over the region.

Table II-1. Examples of notable wildfires in the central and southern interior during 2018.[10]

Date Discovered	Size (ha)	Geographic Location	Description
2017-05-28	30	Fountain Valley Road	8 km east of Lillooet
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	3,278	Princeton	10 km northeast of Princeton
2017-07-07	3,607	Little Fort Complex-Thuya Lake	3 fires near Little Fort and Clearwater
~2017-07-07	545,151	Chilcotin Plateau	Complex of nearly 20 separate fires on Chilcotin Plateau

[10] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary

Table II-1 (continued)

Date Discovered	Size (ha)	Geographic Location	Description
~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
2017-07-23	12,453	Diamond Creek	Ashnola Valley; part of a larger fire in the U.S. that crossed over into B.C.
2017-07-27	3,117	Harrop Creek	4.5 km south of Harrop-Procter, east of Nelson
2017-07-29	12,000	White River	37 km northeast of Canal flats
2017-08-22	1,285	Linklater Creek	18 km southwest of Newgate; part of a larger fire in the U.S. that crossed over into B.C.
2017-08-24	465	Philpott Road	20 km east of Kelowna, near Joe Rich
2017-08-28	2,215	Lamb Creek	2.5 km northwest of Moyie and 18 km southwest of Cranbrook
2017-08-30	15,449	Kenow Mountain	Flathead Valley; burned into Alberta and Waterton Lake National Park
2017-09-02	2,224	Finlay Creek	7.5 km southwest of Peachland
2018-07-17	19,226	Placer Mount Complex-Snowy Mountain	Lightning-caused
2018-07-17	2,372	Placer Mountain Complex-Placer Mountain	37 km south of Princeton; lightning-caused
2018-07-17	1,370	Okanagan Complex-Goode's Creek	21 km south of Kelowna; lightning-caused
2018-07-17	1,790	Okanagan Complex-Mount Eneas	4 km south of Peachland; lightning-caused
2018-07-17	119	Okanagan Complex-Mount Conkle	6 km southwest of Summerland; lightning-caused
2018-07-18	2,363	Syringa Complex-Blacktail Mountain	8 km southeast of Silverton; lightning-caused
2018-07-29	703	Syringa Complex-McArthur Creek	13 km southeast of Salmo, lightning-caused
2018-07-31	1,370	Monashee Complex-Mabel Creek	6.5 km east of Mabel Lake; lightning-caused
2018-07-31	394	Monashee Complex-Sugar Mtn	4 km east of Sugar Lake; suspected lightning-caused

Table II-1 (continued)

Date Discovered	Size (ha)	Geographic Location	Description
2018-08-01	9,284	Syringa Complex-Meachen Creek	Located within Kianuko Provincial Park, 25.5 km southwest of St. Mary's Lake; lightning-caused
2018-08-02	3,015	Syringa Complex-Cross Creek	23 km northeast of Radium; lightning-caused
2018-08-07	6,798	Syringa Complex-Blazed Creek	20 km west of Creston; lightning-caused
2018-08-12	1,181	Syringa-Randal Creek	17 km southeast of Yahk, on Canada/U.S. border; lightning-caused
2018-08-09	642	Okanagan Complex-Gottfriedsen Mountain Creek	24 km west of West Kelowna, 8 km north of Hwy 97; lightning-caused
2018-08-11	2,227	Syringa Complex-Bulldog Mountain	5 km south of Renata; lightning-caused
2018-08-15	13,626	Placer Mountain Complex-Cool Creeek	20 km northeast from Eastgate; lightning-caused
2019-05-12	350,135	Chuckegg Creek wildfire HWF042 – High Level, Alberta	Lightning-caused; uncontrolled over 98 days due to extremely dry conditions

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

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Castlegar	2017-07-17	45.4
Castlegar	2017-07-18	39.2
Castlegar	2017-08-01	49.3
Castlegar	2017-08-02	45.1
Castlegar	2017-08-03	36.9
Castlegar	2017-08-04	30.5
Castlegar	2017-08-07	34.5
Castlegar	2017-08-08	50.4
Castlegar	2017-08-09	45.9
Castlegar	2017-08-10	46.4
Castlegar	2017-08-11	45.1
Castlegar	2017-08-12	38.6
Castlegar	2017-08-15	42
Castlegar	2017-08-29	35.1
Castlegar	2017-08-30	53.6
Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Castlegar	2017-08-31	29.3
Castlegar	2017-09-05	68.9
Castlegar	2017-09-06	73.4
Castlegar	2017-09-07	74.2
Castlegar	2017-09-08	98
Castlegar	2017-09-09	38.4
Castlegar	2018-08-08	35
Castlegar	2018-08-09	37.7
Castlegar	2018-08-10	42.1
Castlegar	2018-08-11	35.7
Castlegar	2018-08-12	96.1

Castlegar	2018-08-13	94.4
Castlegar	2018-08-14	71.6
Castlegar	2018-08-15	109
Castlegar	2018-08-16	114.5

Table II-2 (continued)

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Castlegar	2018-08-17	108.5
Castlegar	2018-08-18	265.2
Castlegar	2018-08-19	420.2
Castlegar	2018-08-20	177.5
Castlegar	2018-08-21	172.5
Castlegar	2018-08-22	217.3
Castlegar	2018-08-23	66.6
Castlegar	2018-08-24	143.1
Castlegar	2018-08-25	211.7
Castlegar	2018-08-26	139.2
Castlegar	2018-09-01	37.4
Castlegar	2018-09-02	88.6
Castlegar	2018-09-03	52.5
Castlegar	2018-09-04	66.5
Castlegar	2018-09-05	137.7
Castlegar	2018-09-06	130.8
Castlegar	2018-09-07	77.9
Castlegar	2018-09-11	35.7
Cranbrook	2018-08-23	93.3
Cranbrook	2018-08-24	86.6
Cranbrook	2018-09-02	30.2
Cranbrook	2019-05-31	36.0
Golden	2017-07-11	45.7
Golden	2017-07-12	43.2
Golden	2017-07-16	41.9
Golden	2017-07-17	50.5
Golden	2017-07-18	76.2
Golden	2017-07-19	79.6
Golden	2017-07-31	36.5
Golden	2017-08-01	34.2
Golden	2017-08-03	40.6
Golden	2017-08-07	52.2
Golden	2017-08-08	52.9
Golden	2017-08-09	41.6
Golden	2017-08-12	29
Golden	2017-08-13	29.4
Golden	2017-08-14	32.3
Golden	2017-08-15	62.9
Golden	2017-08-16	76.9

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Golden	2017-08-17	44.3
Golden	2017-08-21	42.9
Golden	2017-08-30	54.1
Golden	2017-08-31	48
Golden	2017-09-01	32.2
Golden	2017-09-05	78.5
Golden	2017-09-06	117.8
Golden	2017-09-07	100.2
Golden	2017-09-08	112.1
Golden	2017-09-09	41.9
Golden	2018-08-08	50.8
Golden	2018-08-09	65.4
Golden	2018-08-10	70.7
Golden	2018-08-11	77.4
Golden	2018-08-13	30.1
Golden	2018-08-14	36.9
Golden	2018-08-15	90.8
Golden	2018-08-16	73.1
Golden	2018-08-17	56.8
Golden	2018-08-18	159.7
Golden	2018-08-19	152.6
Golden	2018-08-20	42.9
Golden	2018-08-21	40.3
Golden	2018-08-22	59.5
Golden	2018-08-23	86.1
Golden	2018-08-24	76.4
Golden	2018-08-25	96.5
Golden	2018-08-26	60.6
Golden	2018-09-01	32.6
Golden	2018-09-02	41.2
Grand Forks	2017-07-11	35.6
Grand Forks	2017-07-17	45
Grand Forks	2017-07-18	37.2

Grand Forks	2017-08-01	60.6
Grand Forks	2017-08-02	54.4
Grand Forks	2017-08-03	28.8
Grand Forks	2017-08-04	33.8
Grand Forks	2017-08-06	35.5
Grand Forks	2018-09-06	29
Kamloops-Aberdeen	2017-07-08	63.9
Kamloops-Aberdeen	2017-07-10	157.9
Kamloops-Aberdeen	2017-07-11	127
Kamloops-Aberdeen	2017-07-16	51.5

Table II-2 (continued)

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Grand Forks	2017-08-07	51.1
Grand Forks	2017-08-08	50.9
Grand Forks	2017-08-09	38.2
Grand Forks	2017-08-10	55
Grand Forks	2017-08-11	42.5
Grand Forks	2017-08-12	28.1
Grand Forks	2017-08-15	34
Grand Forks	2017-08-22	72.2
Grand Forks	2017-08-23	44
Grand Forks	2017-08-29	30.9
Grand Forks	2017-08-30	38.6
Grand Forks	2017-09-16	28.8
Grand Forks	2018-07-31	29.9
Grand Forks	2018-08-07	37
Grand Forks	2018-08-08	35.6
Grand Forks	2018-08-09	37.3
Grand Forks	2018-08-10	34.3
Grand Forks	2018-08-11	87.6
Grand Forks	2018-08-12	95.8
Grand Forks	2018-08-13	92.7
Grand Forks	2018-08-14	57.8
Grand Forks	2018-08-15	81.9
Grand Forks	2018-08-16	75.2
Grand Forks	2018-08-17	80.5
Grand Forks	2018-08-18	200.3
Grand Forks	2018-08-19	409.8
Grand Forks	2018-08-20	92.4
Grand Forks	2018-08-21	86
Grand Forks	2018-08-22	73
Grand Forks	2018-08-23	100.9
Grand Forks	2018-08-24	102.6
Grand Forks	2018-08-25	113.2
Grand Forks	2018-08-26	35.5

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Kamloops-Aberdeen	2017-07-17	161.8
Kamloops-Aberdeen	2017-07-18	66.7
Kamloops-Aberdeen	2017-07-28	51.8
Kamloops-Aberdeen	2017-07-31	100.7
Kamloops-Aberdeen	2017-08-01	116.1
Kamloops-Aberdeen	2017-08-02	142.5
Kamloops-Aberdeen	2017-08-03	206.3
Kamloops-Aberdeen	2017-08-04	81.1
Kamloops-Aberdeen	2017-08-05	182.3
Kamloops-Aberdeen	2017-08-06	211.5
Kamloops-Aberdeen	2017-08-07	193.7
Kamloops-Aberdeen	2017-08-08	157.6
Kamloops-Aberdeen	2017-08-09	183.6
Kamloops-Aberdeen	2017-08-10	210
Kamloops-Aberdeen	2017-08-11	73.6
Kamloops-Aberdeen	2017-08-12	30.7
Kamloops-Aberdeen	2017-08-14	84
Kamloops-Aberdeen	2017-08-15	52.6
Kamloops-Aberdeen	2017-08-19	47.5
Kamloops-Aberdeen	2017-08-31	58.2
Kamloops-Aberdeen	2017-09-02	59.2
Kamloops-Aberdeen	2017-09-03	128.3
Kamloops-Aberdeen	2017-09-04	72.6
Kamloops-Aberdeen	2017-09-06	62.2
Kamloops-Aberdeen	2017-09-07	106.6
Kamloops-Aberdeen	2017-09-08	59.3
Kamloops-Aberdeen	2017-09-17	43.2
Kamloops-Fed. Bldg	2017-07-08	51.3
Kamloops-Fed. Bldg	2017-07-10	141.7
Kamloops-Fed. Bldg	2017-07-11	117.1
Kamloops-Fed. Bldg	2017-07-16	51.4
Kamloops-Fed. Bldg	2017-07-17	153.5
Kamloops-Fed. Bldg	2017-07-18	73.9

Kamloops-Fed. Bldg	2017-07-28	42.5
Kamloops-Fed. Bldg	2017-07-31	91
Kamloops-Fed. Bldg	2017-08-01	84.8
Kamloops-Fed. Bldg	2017-08-02	111.2
Kamloops-Fed. Bldg	2017-08-03	274.4

Kamloops-Fed. Bldg	2018-08-20	33.1
Kamloops-Fed. Bldg	2018-08-22	56
Kamloops-Fed. Bldg	2018-08-23	166.3
Kamloops-Fed. Bldg	2018-08-24	135.4
Kamloops-Fed. Bldg	2018-08-25	53.5

Table II-2 (continued)

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Kamloops-Fed. Bldg	2017-08-04	67.7
Kamloops-Fed. Bldg	2017-08-05	105.2
Kamloops-Fed. Bldg	2017-08-06	209.6
Kamloops-Fed. Bldg	2017-08-07	187.5
Kamloops-Fed. Bldg	2017-08-08	130.2
Kamloops-Fed. Bldg	2017-08-09	183.2
Kamloops-Fed. Bldg	2017-08-10	189.3
Kamloops-Fed. Bldg	2017-08-11	82
Kamloops-Fed. Bldg	2017-08-12	32.8
Kamloops-Fed. Bldg	2017-08-14	77.2
Kamloops-Fed. Bldg	2017-08-15	55.1
Kamloops-Fed. Bldg	2017-08-19	36
Kamloops-Fed. Bldg	2017-08-20	30
Kamloops-Fed. Bldg	2017-08-31	63.2
Kamloops-Fed. Bldg	2017-09-01	52.2
Kamloops-Fed. Bldg	2017-09-02	63.4
Kamloops-Fed. Bldg	2017-09-03	79.6
Kamloops-Fed. Bldg	2017-09-04	39.8
Kamloops-Fed. Bldg	2017-09-06	51.4
Kamloops-Fed. Bldg	2017-09-07	87.5
Kamloops-Fed. Bldg	2017-09-08	71.8
Kamloops-Fed. Bldg	2017-09-17	34
Kamloops-Fed. Bldg	2018-08-07	67.2
Kamloops-Fed. Bldg	2018-08-08	47.2
Kamloops-Fed. Bldg	2018-08-11	68.4
Kamloops-Fed. Bldg	2018-08-12	125.2
Kamloops-Fed. Bldg	2018-08-13	144.3
Kamloops-Fed. Bldg	2018-08-14	66.1
Kamloops-Fed. Bldg	2018-08-15	68.3
Kamloops-Fed. Bldg	2018-08-16	55.3
Kamloops-Fed. Bldg	2018-08-17	143.6
Kamloops-Fed. Bldg	2018-08-18	326.6
Kamloops-Fed. Bldg	2018-08-19	161

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Kelowna	2017-07-10	37
Kelowna	2017-07-11	76.3
Kelowna	2017-07-17	54.6
Kelowna	2017-07-18	83.6
Kelowna	2017-07-31	35.5
Kelowna	2017-08-01	65.1
Kelowna	2017-08-02	34.5
Kelowna	2017-08-03	30.7
Kelowna	2017-08-04	44.2
Kelowna	2017-08-07	68.2
Kelowna	2017-08-08	76.7
Kelowna	2017-08-09	62.6
Kelowna	2017-08-10	77.6
Kelowna	2017-08-11	65.2
Kelowna	2017-08-12	28.5
Kelowna	2017-08-15	65.6
Kelowna	2017-08-19	40.3
Kelowna	2017-08-25	37.7
Kelowna	2017-08-29	30.7
Kelowna	2017-08-30	28.2
Kelowna	2017-09-03	46.8
Kelowna	2017-09-07	73.1
Kelowna	2017-09-08	88
Kelowna	2018-07-19	48.6
Kelowna	2018-08-07	28.2
Kelowna	2018-08-08	47.8
Kelowna	2018-08-09	40
Kelowna	2018-08-10	49
Kelowna	2018-08-12	96.3
Kelowna	2018-08-13	127.8
Kelowna	2018-08-14	57.6
Kelowna	2018-08-15	81.9
Kelowna	2018-08-16	71.2

Kelowna	2018-08-17	122.1
Kelowna	2018-08-18	308.1
Kelowna	2018-08-19	299.2
Kelowna	2018-08-20	82.2
Kelowna	2018-08-21	51.5
Lavington	2018-08-09	51.4
Lavington	2018-08-10	64.8
Lavington	2018-08-11	64.8
Lavington	2018-08-12	107.3
Lavington	2018-08-13	124

Table II-2 (continued)

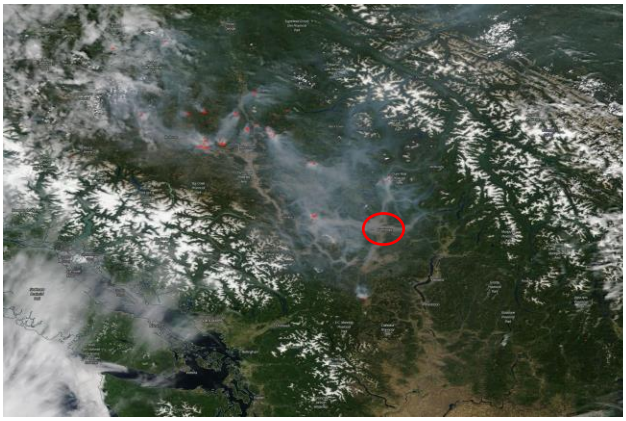
Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Kelowna	2018-08-22	61.9
Kelowna	2018-08-23	65.3
Kelowna	2018-08-24	118.9
Kelowna	2018-08-25	38.3
Lavington	2017-07-10	59.7
Lavington	2017-07-11	67.5
Lavington	2017-07-12	31.6
Lavington	2017-07-17	59.8
Lavington	2017-07-18	49.9
Lavington	2017-07-31	40.4
Lavington	2017-08-01	59.3
Lavington	2017-08-02	30.1
Lavington	2017-08-03	43.6
Lavington	2017-08-04	39
Lavington	2017-08-06	35.4
Lavington	2017-08-07	75.4
Lavington	2017-08-08	84.8
Lavington	2017-08-09	75
Lavington	2017-08-10	77.3
Lavington	2017-08-11	60.5
Lavington	2017-08-12	35
Lavington	2017-08-14	42.2
Lavington	2017-08-15	67.4
Lavington	2017-08-19	35
Lavington	2017-08-29	37.5
Lavington	2017-08-30	34
Lavington	2017-08-31	35.7
Lavington	2017-09-03	37.3
Lavington	2017-09-06	51.8
Lavington	2017-09-07	69.6
Lavington	2017-09-08	79
Lavington	2018-08-07	40.2
Lavington	2018-08-08	57

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Lavington	2018-08-14	72.9
Lavington	2018-08-15	96.2
Lavington	2018-08-16	63.3
Lavington	2018-08-17	119.3
Lavington	2018-08-18	257.9
Lavington	2018-08-19	292.3
Lavington	2018-08-20	100.1
Lavington	2018-08-21	62.1
Lavington	2018-08-22	92.2
Lavington	2018-08-23	86.6
Lavington	2018-08-24	146.9
Lavington	2018-08-25	88.7
Lavington	2018-09-07	37.6
Nelson	2017-08-02	44.2
Nelson	2017-08-03	52.1
Nelson	2017-08-04	48.3
Nelson	2017-08-05	38.6
Nelson	2017-08-12	55.7
Nelson	2017-08-15	46.1
Nelson	2017-08-06	34.6
Nelson	2017-08-07	39.9
Nelson	2017-08-08	63.1
Nelson	2017-08-09	50.9
Nelson	2017-08-10	56.5
Nelson	2017-08-11	68.3
Nelson	2017-08-27	30.4
Nelson	2017-08-28	42.6
Nelson	2017-08-29	60.9
Nelson	2017-08-30	65.1
Nelson	2017-08-31	28.6
Nelson	2017-09-02	29
Nelson	2017-09-04	69.6
Nelson	2017-09-05	158.9

Nelson	2017-09-06	148.2
Nelson	2017-09-07	129.7
Nelson	2017-09-08	131
Nelson	2017-09-09	47.6

Table II-2 (continued)

Location	Date	Daily $PM_{2.5}$ ($\mu g/m^3$)
Vernon	2017-07-10	60.7
Vernon	2017-07-11	82
Vernon	2017-07-16	28.3
Vernon	2017-07-17	64
Vernon	2017-07-18	53.4
Vernon	2017-07-31	42.6
Vernon	2017-08-01	61.1
Vernon	2017-08-03	45.2
Vernon	2017-08-04	38.6
Vernon	2017-08-06	32.6
Vernon	2017-08-07	72.2
Vernon	2017-08-08	71.5
Vernon	2017-08-09	68.8
Vernon	2017-08-10	70
Vernon	2017-08-11	60.3
Vernon	2017-08-12	34.5
Vernon	2017-08-14	38.8
Vernon	2017-08-15	71
Vernon	2017-08-19	36.2
Vernon	2017-08-29	31.9
Vernon	2017-08-30	30.5
Vernon	2017-08-31	36.5
Vernon	2017-09-03	43.9
Vernon	2017-09-06	45.8
Vernon	2017-09-07	62.1
Vernon	2017-09-08	74.6
Vernon	2018-08-07	36.4
Vernon	2018-08-08	52.3
Vernon	2018-08-09	39.3
Vernon	2018-08-10	43
Vernon	2018-08-11	48.6
Vernon	2018-08-12	111.3
Vernon	2018-08-13	117.8
Vernon	2018-08-14	59.1
Vernon	2018-08-15	77.5
Vernon	2018-08-16	58.1
Vernon	2018-08-17	139
Vernon	2018-08-18	284.6
Vernon	2018-08-19	264.6
Vernon	2018-08-20	80.3
Vernon	2018-08-21	46.9
Vernon	2018-08-22	68.8
Vernon	2018-08-23	86.7
Vernon	2018-08-24	138.7
Vernon	2018-08-25	76.5
Vernon	2018-09-07	29.8



a. July 8, 2017

b. July 11, 2017

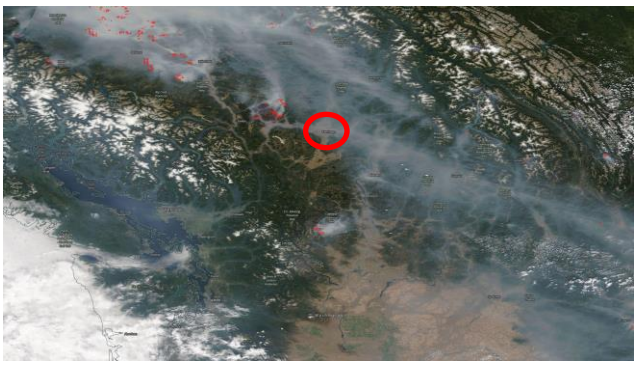
c. July 17, 2017

d. July 18, 2017

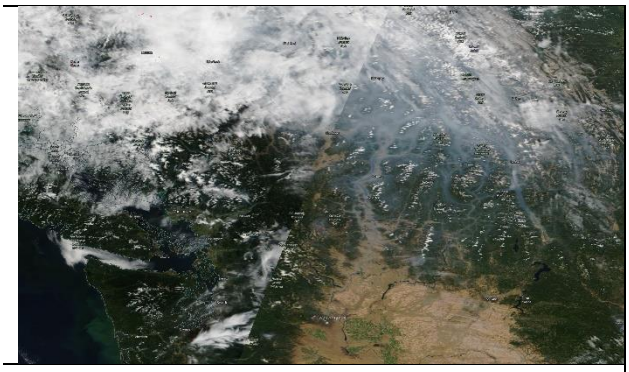
e. July 31, 2017

f. Aug. 6, 2017

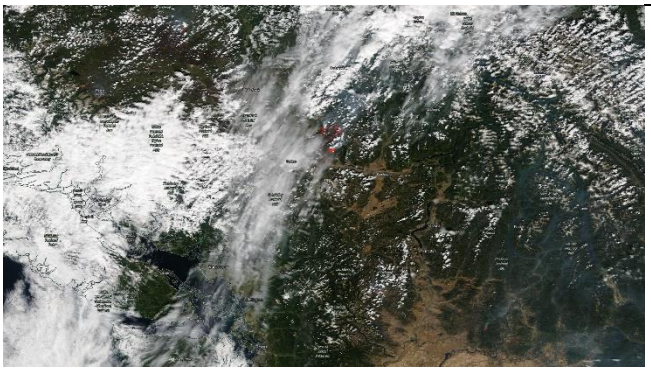
Figure II-1. Satellite images from Jul. 8 to Aug. 6, 2018, showing smoke (grey plumes) over the province, including the Southern Interior Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-1(a) identifies Kamloops on map. Source of images: NASA Worldview Snapshots at: https://worldview.earthdata.nasa.gov/.



a. Aug. 11, 2017

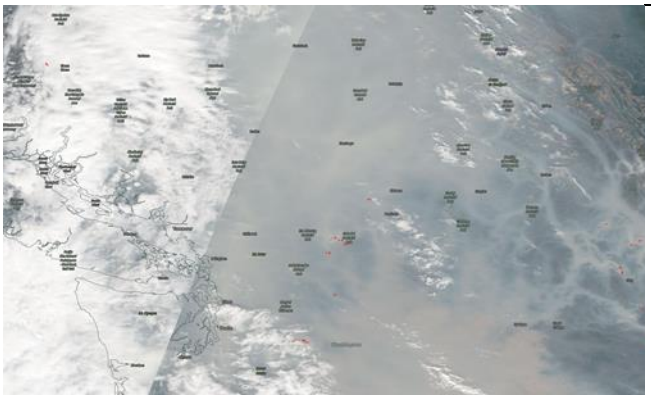


b. Aug. 15, 2017

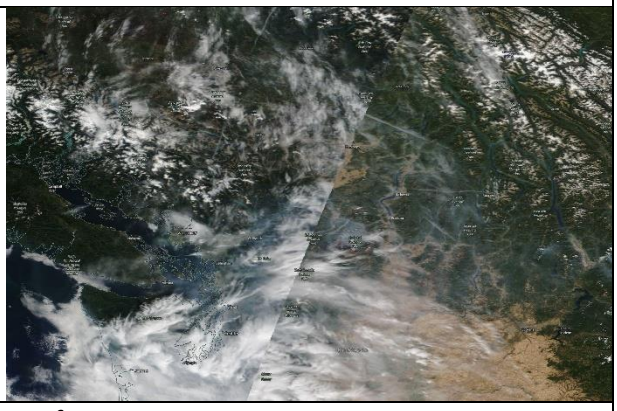


c. Aug. 23, 2017

d. Aug. 29, 2017



e. Sept. 7, 2017



f. Sept. 16, 2017

Figure II-2. Satellite images from Aug. 11 to Sept. 16, 2017, showing smoke (grey plumes) over the province, including the Southern Interior Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-2(a) identifies Kamloops on map. Source of images: NASA Worldview Snapshots at: https://worldview.earthdata.nasa.gov/.

a. Aug. 7, 2018

b. Aug. 10, 2018

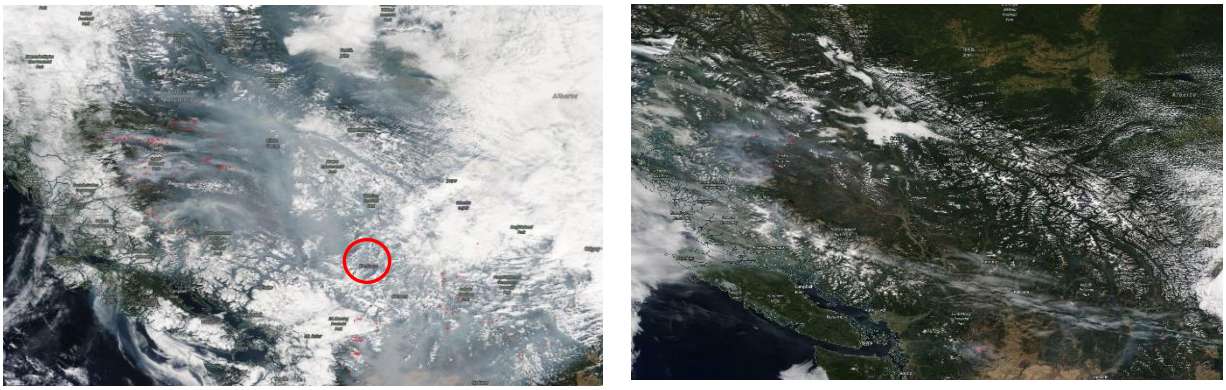
c. Aug. 14, 2018

d. Aug. 17, 2018

e. Aug. 20, 2018

f. Aug. 22, 2018

Figure II-3. Satellite images from Aug. 7-22, 2018, showing smoke (grey plumes) over the province, including the Southern Interior Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-3(a) identifies Kamloop on map. Source of images: NASA Worldview Snapshots at: https://worldview.earthdata.nasa.gov/.



a. Aug. 24, 2018 b. Sept. 4, 2018

Figure II-4. Satellite images from Aug. 24-Sept 4, 2018, showing smoke (grey plumes) over the province, including the Southern Interior Air Zone. Red dots indicate fires and thermal anomalies. Large red circle in Figure II-4(a) identifies Kamloops on map. Source of images: NASA Worldview Snapshots at: https://worldview.earthdata.nasa.gov/.

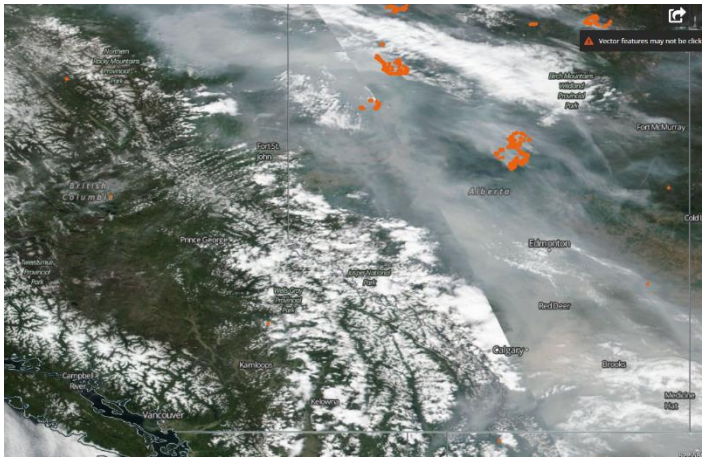


Figure II-5. Satellite images taken on May 25, 2019 showing wildfire smoke over parts of B.C. including the Southeastern part of the province. Small orange dots indicate thermal anomalies from wildfires in High Level, Alberta.