

Background

A healthy environment, which includes good air quality, is important to British Columbians. Air quality impacts not just an individual's health and well-being, but also the natural environment, infrastructure, society, and the economy. The national Air Quality Management System (AQMS) was developed through the Canadian Council of Ministers of the Environment as a collaborative and comprehensive approach to managing air quality across Canada. Under the AQMS, jurisdictions are committed to report the status of air quality by regularly publishing air zone reports. These reports use measured concentrations to determine achievement of the Canadian Ambient Air Quality Standards (CAAQS) and assign management levels for major pollutants. Occasionally, there are non-local influences on air quality. This includes transboundary flows such as the long-range transport of pollutants from outside the province. There are also exceptional events such as wildfires. When wildfires occur, they can have a huge impact on air quality, as wildfires can be the largest source of fine particulate matter in B.C. and can also influence the concentration of ozone.

The AQMS allows the adjustment of air quality data to account for these transboundary flows and exceptional events (TFEE). The goal of TFEE adjustment is to use air zone reports and management levels to focus on local management actions addressing sources of air pollution that can be managed. In this document, TFEE influence on the 2021 air quality data are listed as applied in the "Air Zone Report (2019-2021)". Adjustment for previous years data can be found at the appendix of previous air zone reports (see gov.bc.ca/airzonereports).

Methodology

Identification of TFEE follows a Canadian Council of Ministers of the Environment guidance document¹ that applies a scientific approach to examine air quality data. This process involves a preliminary scan of data and assessment based on the following criteria:

- 24-hour PM_{2.5} concentrations exceeded the CAAQS of 27 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$), or 8-hour daily maximum ozone levels exceeded the CAAQS of 62 parts per billion (ppb)
- Wildfires of note were recorded by the BC Wildfire Service
- Smoky Skies Bulletin have been issued for the region by the Ministry of Environment and Climate Change Strategy during the period of interest
- Satellite images from NASA, ESA, and other space agencies indicate the presence of fire and smoke over the region
- Multiple monitoring sites in the area are showing similar air quality characteristics, suggesting a common source
- Modelling studies that indicate elevated pollution levels from outside the province, or from wildfires

Once data is assessed as influenced by TFEE, it is excluded from the calculation of air zone management levels. It is important to note that this data is not removed from the data set and that CAAQS values based on the complete set of valid measured data are calculated in addition to the management levels. Data that are excluded due to TFEE influence are listed in the tables that follow.

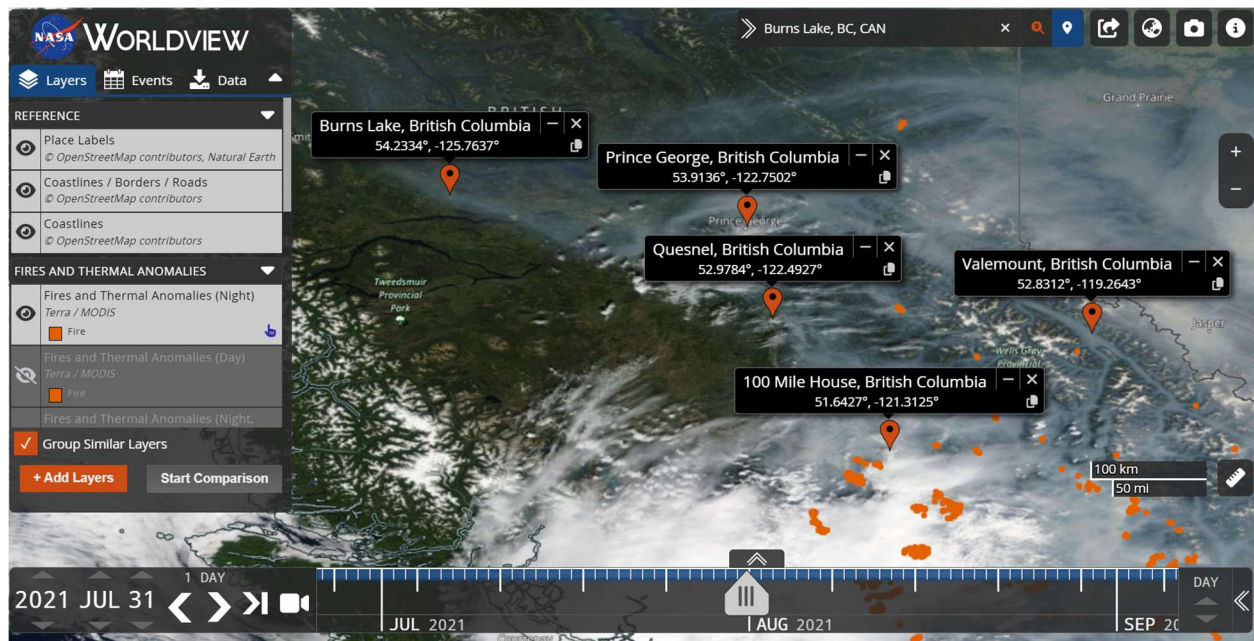
¹ Canadian Council of Ministers of the Environment, *Guidance Document on Transboundary Flows and Exceptional Events* (CCME, 2021), https://ccme.ca/en/res/guidancedocumentontransboundaryflowsandexceptionalevents_secured.pdf.

Fine Particulate Matter (PM_{2.5})

100 Mile Northeast Complex Fire

Wildfires are grouped into a complex when multiple fires are in such close proximity that they are managed by a single incident management team. The 100 Mile Northeast Complex is the combination of the following fires: South of Canim Lake (C41100), Succour Lake (C41191), Flat Lake (C41602), Young Lake (C41097), Churn Creek Protected Area (C21250).

Monitoring Stations Affected	Dates Impacted (in 2021)
Burns Lake Fire Centre	August 1
Hudson's Hope Dudley Drive	August 1,2
Kamloops Federal Building	August 12,18
Prince George Plaza 400	July 31; August 1, 2
Quesnel Kinchant St MAML	July 31; August 1, 2
Valemount	July 14, 15, 20, 31; August 1 to 5, 7, 14, 15
Vanderhoof Courthouse	July 31; August 1, 2
Williams Lake Columneetza School	July 30, 31; August 1, 2, 5



Arrow Lake Complex Fire

Complex is combination of Michaud Creek (N51765), Octopus Creek (N51800) wildfires.

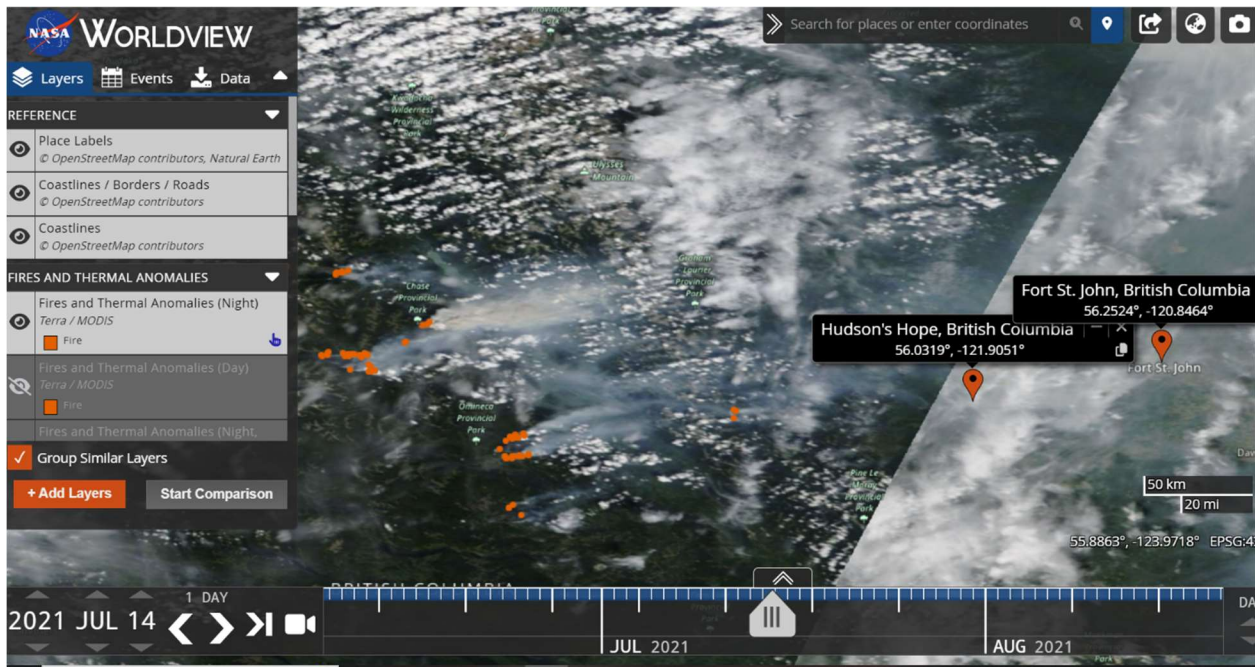
Monitoring Stations Affected	Dates Impacted (in 2021)
Castlegar Zinio Park	July 13, July 22 to August 6, August 15 to 17
Cranbrook Muriel Baxter	August 1 to 3
Grand Forks City Hall	July 22 to 27



Black Pine Fire (G61316) and Mount Porter (G61192)

Total fire size of 16, 835.6 hectares that started on June 30, 2021.

Monitoring Stations Affected	Dates Impacted (in 2021)
Fort St John Key Learning Centre	July 12 to 14
Hudsons Hope Dudley Drive	July 8, 9, 12, 13

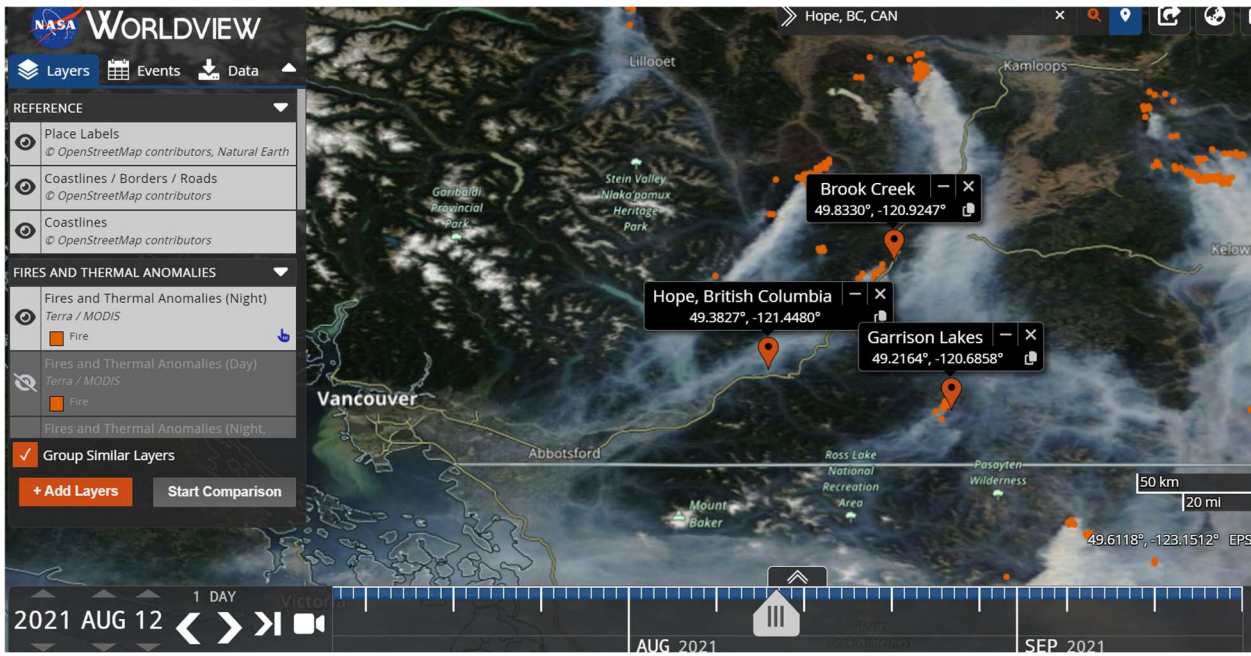
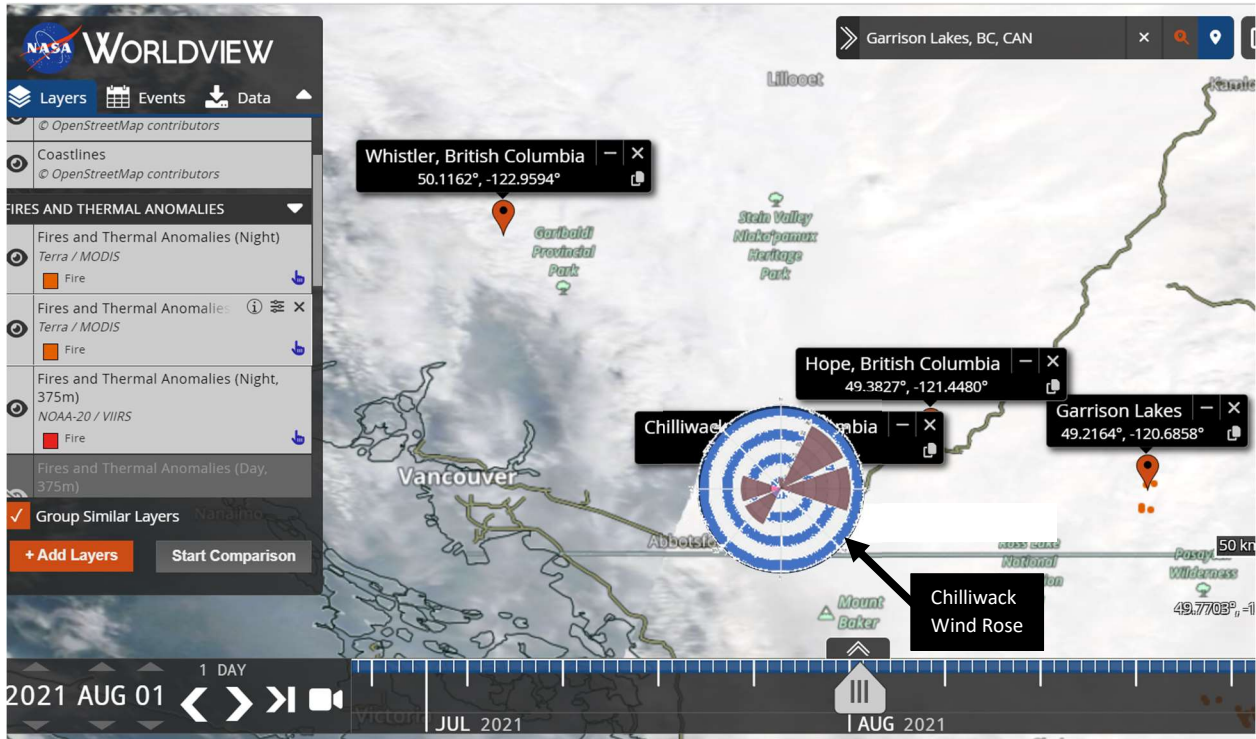


Cascades Complex

Complex results from the July Mountain (K61882), Brook Creek (K62615), Garrison Lake (K62088) wildfires.

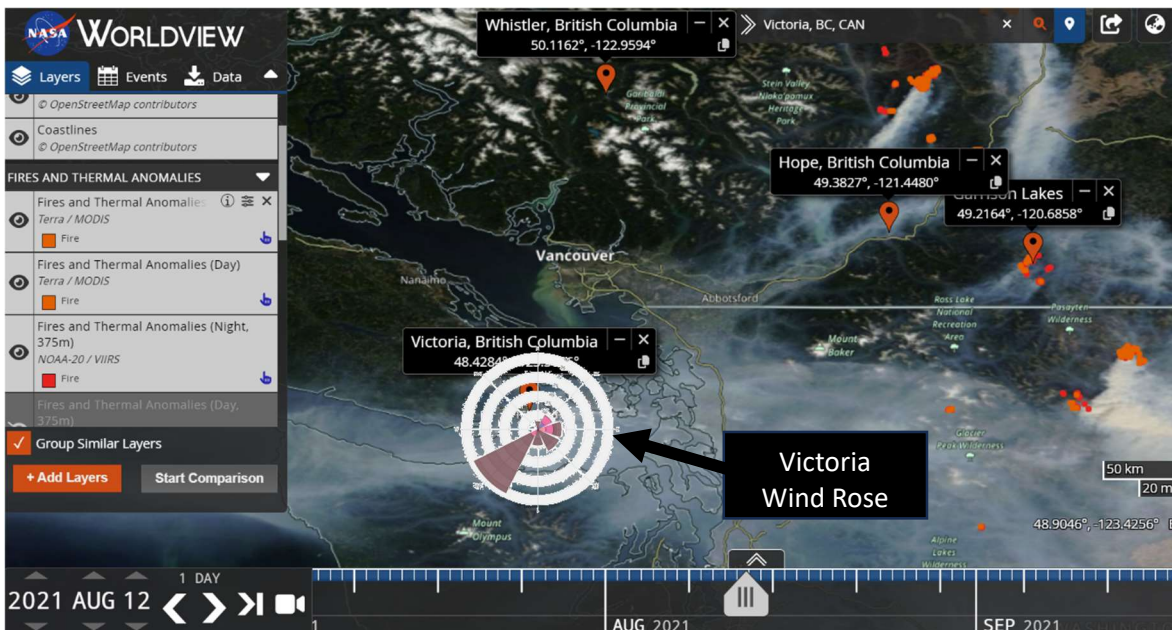
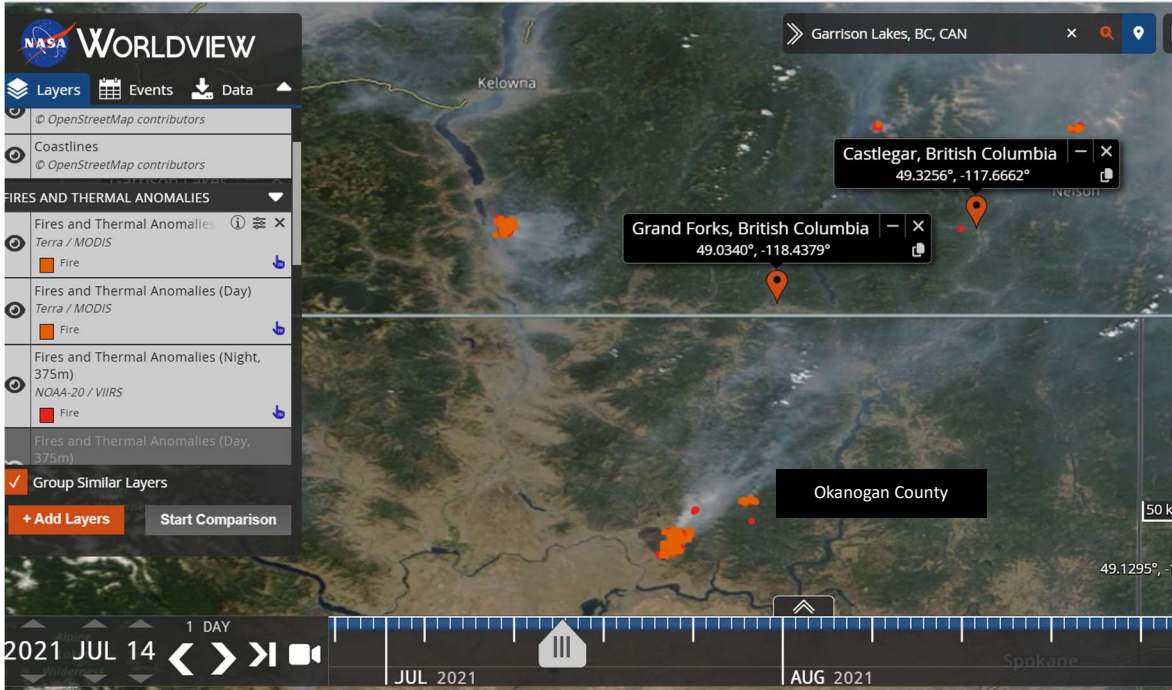
Monitoring Stations Affected	Dates Impacted (in 2021)
Abbotsford A Columbia Street	August 12 to 14
Abbotsford Central	August 12 to 14
Agassiz Municipal Hall	August 1, 12 to 14
Burnaby Kensington Park	August 13, 14
Burnaby South	August 13
Chilliwack Airport	August 1, 12 to 14
Colwood City Hall	August 13
Hope Airport	July 31 to August 2, August 12 to 14
Horseshoe Bay	August 13, 14
Langdale Elementary	August 13, 14
Langley Central	August 13
Mission School Works Yard	August 12 to 14
Nanaimo Labieux Road	August 14, 2021
New Westminster Sapperton Park	August 13, 14
North Delta	August 13
North Vancouver Mahon Park	August 13, 14
North Vancouver Second Narrows	August 13, 14
Pitt Meadows Meadowlands School	August 13, 14
Port Moody Rocky Point Park	August 13, 14
Powell River James Thomson School	August 14
Richmond South	August 13
Squamish Elementary	August 13, 14
Surrey East	August 13
Tsawwassen	August 13
Vancouver Clark Drive	August 13, 14
Vancouver International Airport #2	August 13
Victoria Topaz	August 13
Whistler Meadow Park	August 1, 13, 14

Cascades Complex...cont'd



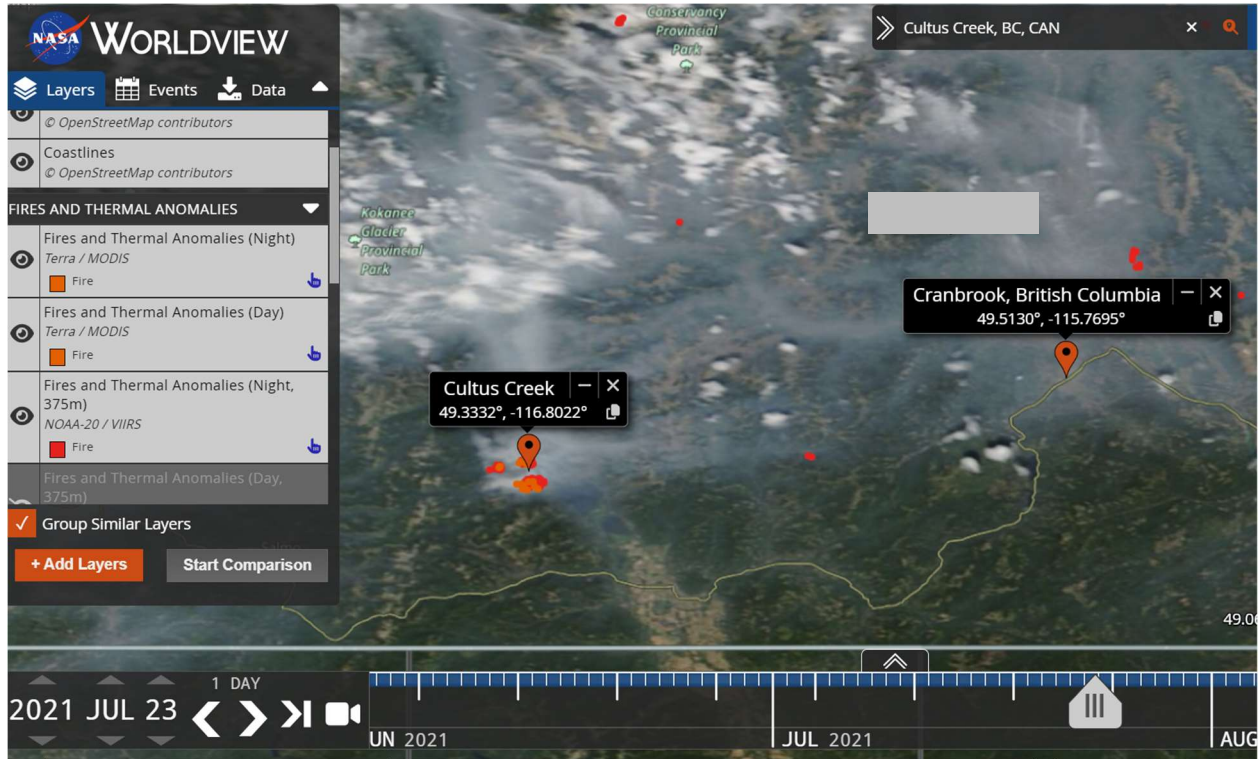
Chuweah Creek Fire (Okanogan County, Washington State)

Monitoring Stations Affected	Dates Impacted (in 2021)
Castlegar Zinio Park	July 14, 19; August 7,8
Grand Forks City Hall	July 14, 28 to 30; August 6,7
Victoria Topaz	August 12



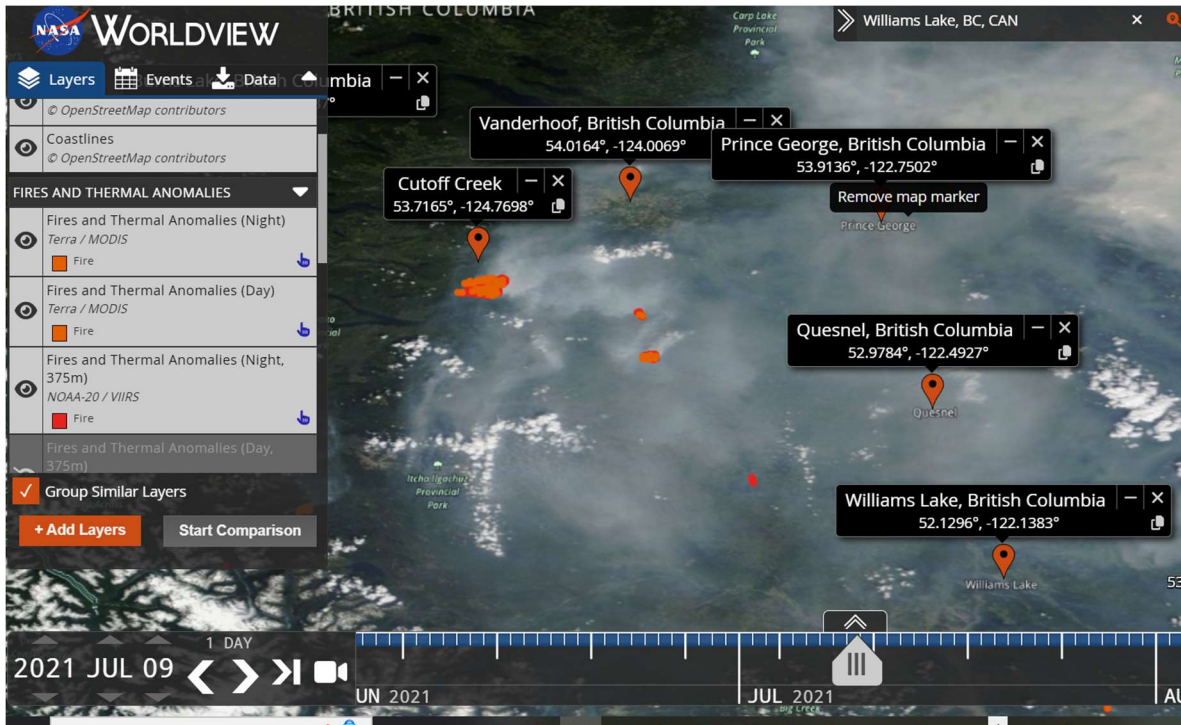
Cultus Creek (N71245)

Monitoring Stations Affected	Dates Impacted (in 2021)
Cranbrook Muriel Baxter	July 23 to 25, July 30,31



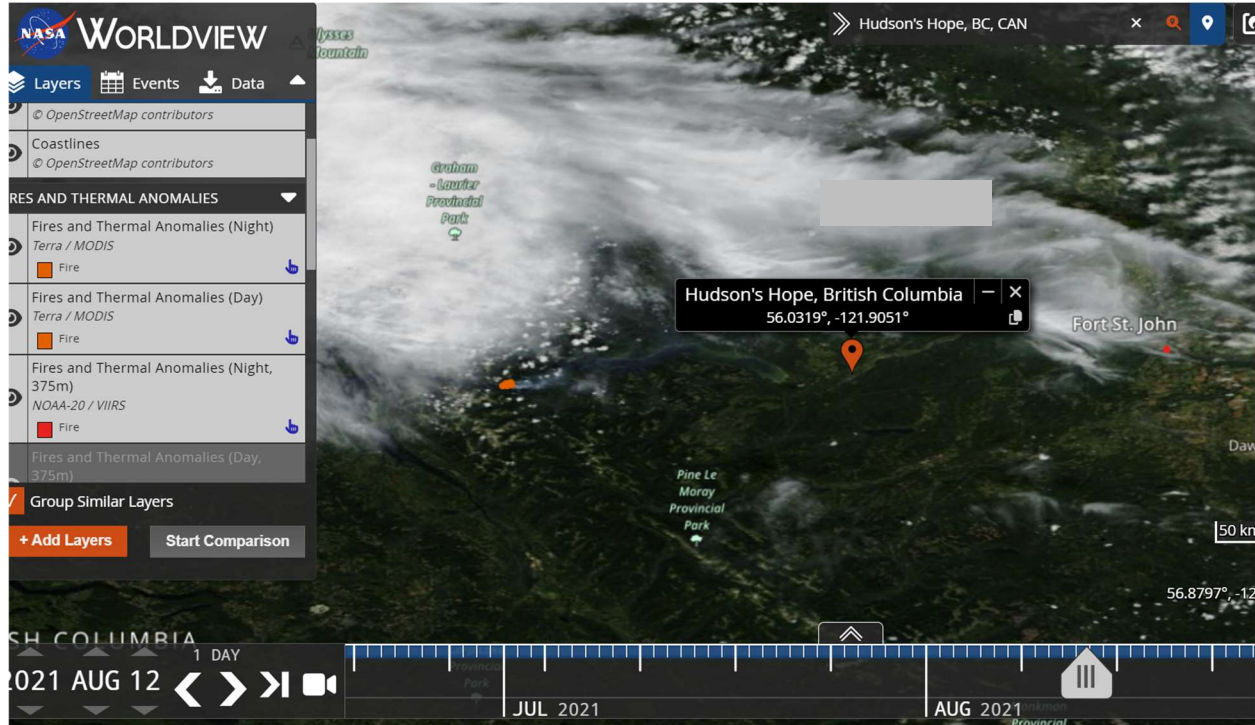
Cutoff Creek (4129)

Monitoring Stations Affected	Dates Impacted (in 2021)
Prince George Plaza 400	July 8, 9, 13, 14
Quesnel Kinchant St MAML	July 8, 9, 11 to 16
Vanderhoof Courthouse	July 6, 13
Williams Lake Columneetza School	July 12 to 17



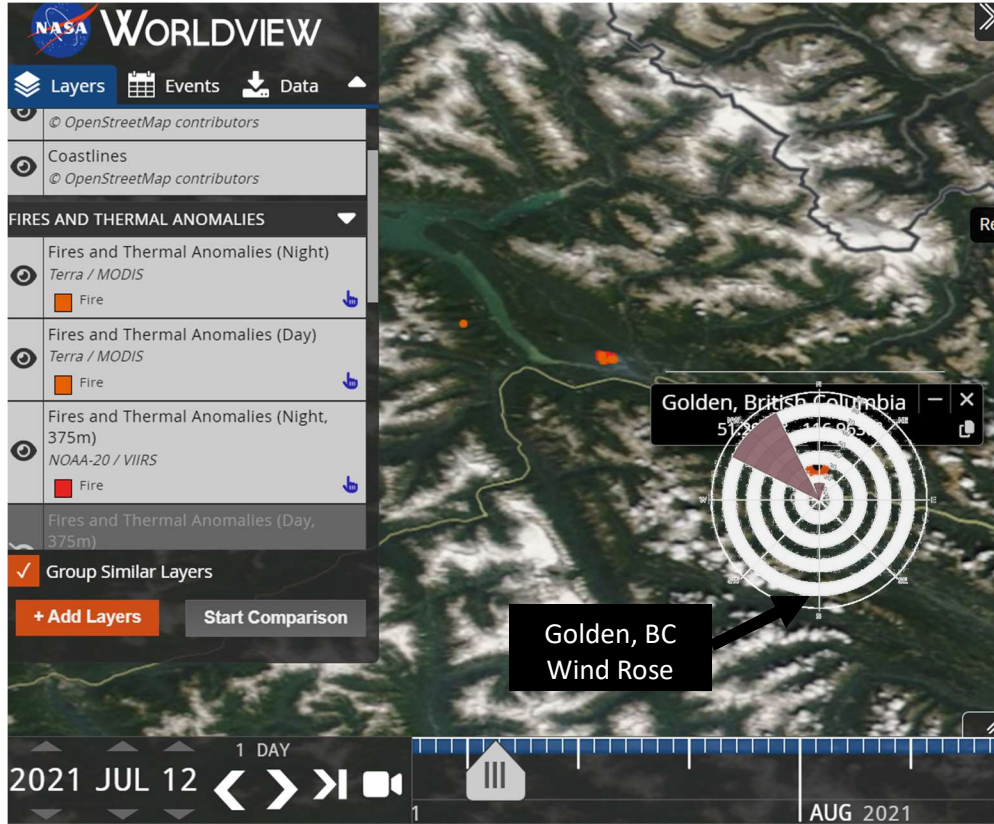
G61601

Monitoring Stations Affected	Dates Impacted (in 2021)
Hudsons Hope Dudley Drive	August 12



K41656

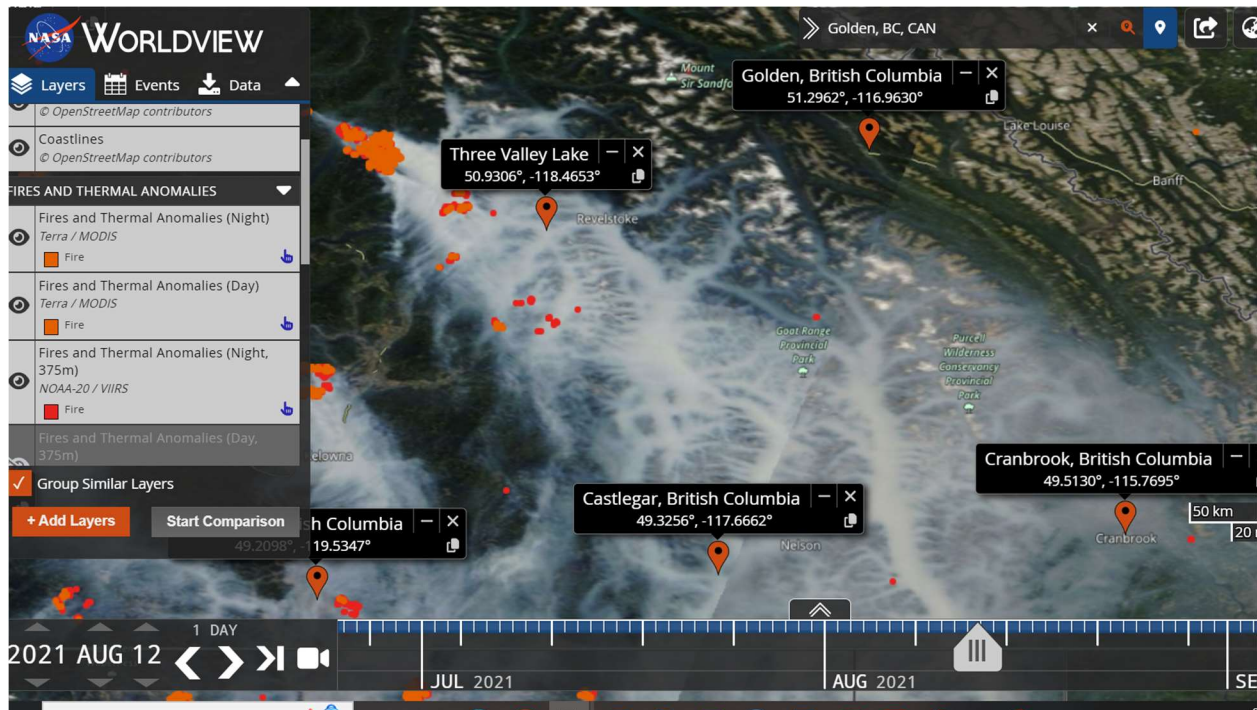
Monitoring Stations Affected	Dates Impacted (in 2021)
Golden Helipad	July 12



Shuswap Complex

Hunakwa Lake (K4167), Three Valley Lake (K41807), Two Mile Road (K42078), Bunting Road (K41561), Crazy Creek Gorge FSR (K41769), Momich Lake (K21658)

Monitoring Stations Affected	Dates Impacted (in 2021)
Castlegar Zinio Park	August 12 to 14
Cranbrook Muriel Baxter	August 12 to 16
Golden Helipad	July 14 to August 3



Sparks Lake Complex and Lytton Creek (K71086)

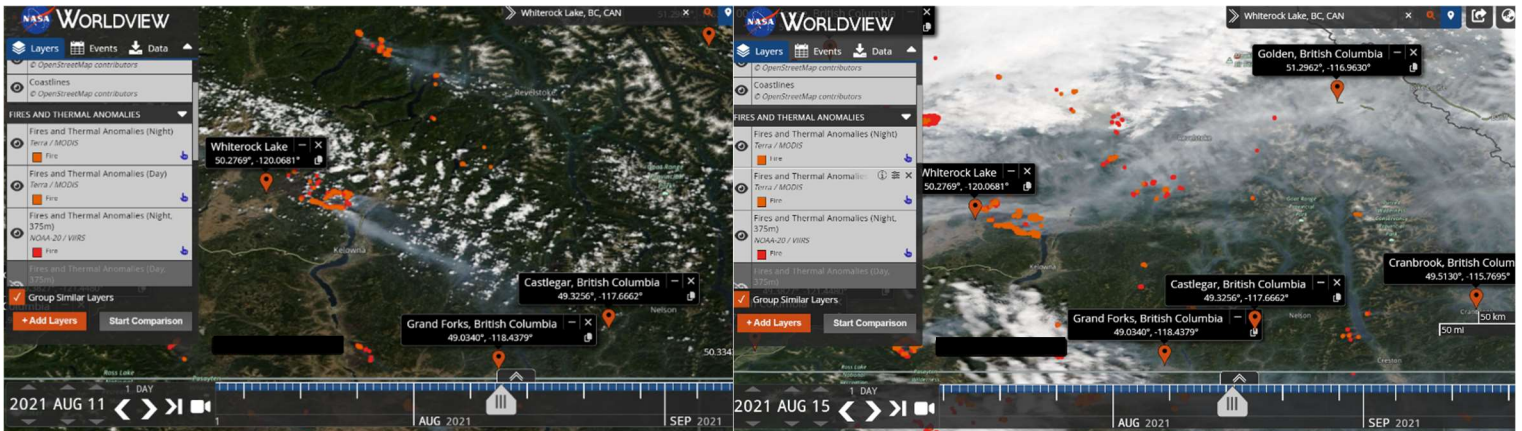
Sparks Lake (K21001), Embleton Mountain (K21644), Tremont Creek (K21849)

Monitoring Stations Affected	Dates Impacted (in 2021)
Kamloops Federal Building	July 1 to 5, 11 to 15, 19, July 22 to August 6, August 13 to 16
Kelowna KLO Road	July 12, 13, 19
Valemount	July 28, 30
Vernon Science Centre	July 11 to 15, 19, 23 to 25



White Rock Lake (K61884)

Monitoring Stations Affected	Dates Impacted (in 2021)
Castlegar Zinio Park	August 11
Golden Helipad	August 4 to 8, 14 to 16
Grand Forks City Hall	July 31, August 2, 3, 5, 11 to 15
Kelowna KLO Road	July 27 to August 5, 11 to 18, 21, 25
Penticton Industrial Place	August 11 to 18
Vernon Science Centre	July 26 to August 4, August 10, 12 to 16, 18, 24, 25

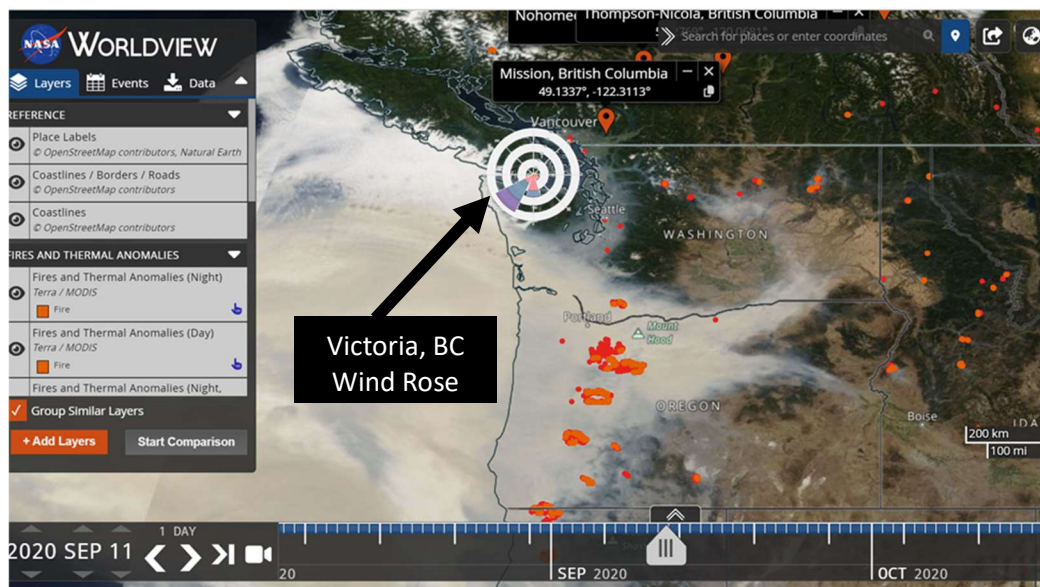


Ground-level Ozone (O₃)

There were no TFEI-influenced data adjustments for 2019 and 2021. The table below shows the adjustments that were made in 2020.

California, Oregon, and Washington Wildfires of 2020

Monitoring Stations Affected	Dates Impacted (in 2020)
Abbotsford A Columbia Street	September 11
Agassiz Municipal Hall	September 11
Burnaby Mountain	September 11
Chilliwack Airport	September 11
Hope Airport	September 11
Maple Ridge Golden Ears School	September 11
Mission School Works Yard	September 11
Squamish Elementary	September 11



References

1. Satellite images and fire detection are provided by NASA's Earth Science Data Systems Program, particularly using the Earth Observing System Data and Information System. <https://worldview.earthdata.nasa.gov/>. Accessed on May 2023.
2. B.C. wildfire information and data are provided by the BC Wildfire Service. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history>
3. U.S. wildfire information and data are provided by the interagency all-risk incident information management system, InciWeb. <https://inciweb.nwcg.gov/>
4. Process of evaluating data for transboundary flows and exceptional events are explained by this guidance document from the Canadian Council of Ministers of the Environment. https://ccme.ca/en/res/guidancedocumentontransboundaryflowsandexceptionalevents_secure_d.pdf