Annual Air Quality Management Partnership Newsletter

The Annual Air Quality Management Partnerships Newsletter will focus on highlighting the recent success and accomplishments of organizations that contribute to Air Quality Management across Alberta. This issue will focus on updates provided by several Airsheds. There are ten Airsheds across the province that operate over 70 monitoring stations. These stations are in compliance with Provincial and Federal air monitoring standards and provide data that contribute to the Air Quality Health Index (AQHI).

Similar to the Clean Air Strategic Alliance (CASA), each Airshed is governed by a multi-stakeholder consensus-based board of directors. In addition to reporting and responding on regional air matters, the Airsheds participate in community and education initiatives across the province.

In this issue there are updates from:

- Peace River Area Monitoring Program
- Wood Buffalo Environmental Association
- Lakeland Industry & Community Association

First AQHI Station in Peace River Area
Submitted by the Alberta Airsheds Council

The Peace River Area Monitoring Program (PRAMP) Committee deployed a new Air Quality Health Index (AQHI) air monitoring station in the fall of 2019 on Woodland Cree First Nation land, near Cadotte Lake. With this station, the Peace River area will join the other 37 communities in Alberta with AQHI information readily available.

This first location for the new station was identified using a multi-stakeholder assessment process that considered community interests and concerns. Factors included: data gaps where there is little or no monitoring information; existing air quality issues from within or outside of PRAMP where there may be a need for more comprehensive data; requests from government agencies or industry members; and issues raised by the general public, groups, agencies and other organizations. The location of the station will be reviewed in 18-24 months.

PRAMP had been aware of the air quality concern in the Woodland Cree area for some time but it had not been able to address it due to the "fixed" nature of the existing regional air quality monitoring stations. The new AQHI station now allows

for monitoring in the area and AQHI reporting.

With the Woodland Cree First Nation, PRAMP held an open house in the community to share information about the new station and the AQHI. Local honey and beeswax products were popular giveaways at the event since it coincided with PRAMP's "honey tour". Go to prampairshed.ca for information about the new AQHI station and to view the video on how honey bees are impacted by poor air quality.

The WBEA Performs 15-year Review of TEEM Program
Submitted by the Alberta Airsheds Council

The Wood Buffalo Environmental Association's (WBEA) Terrestrial Environmental Effects Monitoring (TEEM) program was established over 20 years ago with the objective of detecting, characterizing, and quantifying the impact of oil sands related air emissions on terrestrial ecosystems. Stakeholders and scientists agreed the focus of the program would be to monitor jack pine forest stands that are sensitive to acid deposition to assess whether there are changes to biological, physical, and chemical indicators. In 2019, a review of fifteen years of data was completed, resulting in nine open access scientific publications. This review was an opportunity to reflect not only on the status of forest health in the region but to also determine how well the TEEM program was meeting its objectives.

Key findings indicate that deposition of oil sands related air emissions, while present in the region and further assessment is required, decline rapidly with distance from

emission sources. There was evidence to show that the addition of nitrogen and sulfur species to forest ecosystems, maybe resulting in a "fertilizer effect" on jack pine needles and understory plant communities due to the addition of nutrients to this nutrient-poor soil while little evidence showed acidification effects. Researchers also suspect that fugitive dust (i.e., dust particles that become airborne unintentionally from roads and mining), as it was deposited throughout the region, was acting as a neutralizing agent on the acidic emissions, compounding the fertilizer effect.

Overall the emissions are having an effect on the ecosystem, though not necessarily the effects that were expected when the program was conceived 20-years ago. It shows that understanding air emissions and deposition in the region is complex and that the WBEA's TEEM program is effectively positioned to help monitor the ongoing effects.

*For more open access publications on air quality, please click underline here.*

Lakeland Industry & Comunity Association (LICA) – Environmental Stewards
Air Quality Data Visualization
Submitted by the Alberta Airsheds Council

Colourful nucleotides interlock with one another as they form a mesmerizing twisting staircase, varying in brightness and intensity. We've all seen these fascinating images in science textbooks, on crime-scene dramas. It's DNA—the fundamental ingredient of life. Most of us are familiar with human DNA. But, how about the DNA of the air we breathe?

LICA "Air Quality DNA Data Visualization" was developed to help us understand air quality patterns in our region. Our approach presents large, multi-year environmental monitoring datasets that mimic the appearance of a DNA sequencing gel. It's a novel approach to presenting data.

Cold Lake
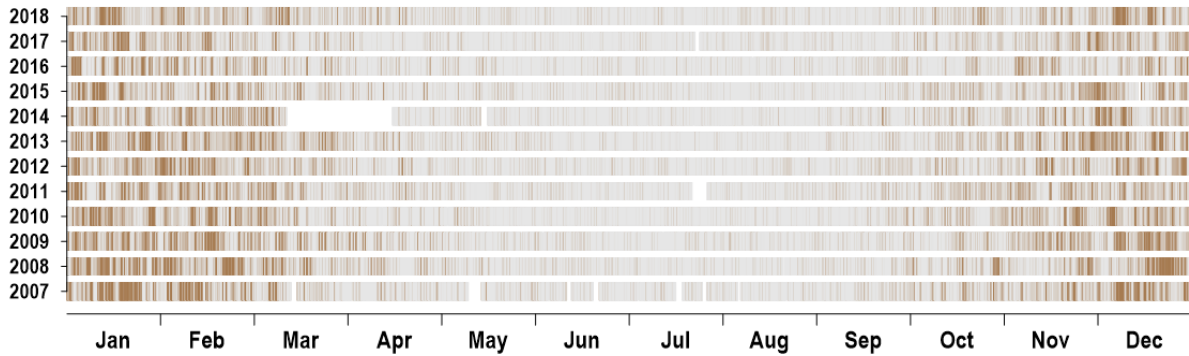
In the series of Air Quality DNA Data Visualizations below, 1-hour average nitrogen dioxide (NO_2) data are presented for Cold Lake, Red Deer, and Edmonton. In the visualization, darker shades of brown represent higher 1-hour concentrations of NO_2. Fuel combustion is a major source of NO_2; sources include vehicle exhaust, home heating, and industrial processes. In all three cities, we see higher concentrations in the wintertime when there is increased demand for home heating; colder temperatures also often lead to stagnant air masses which hinder the dispersion of pollutants. The visualization also points out how the NO_2 concentrations are different from city to city; as size and population of the urban center increases (more homes, more vehicles, more industries), the intensity and frequency of elevated concentrations of NO_2 also increase, both during the winter and throughout the year.
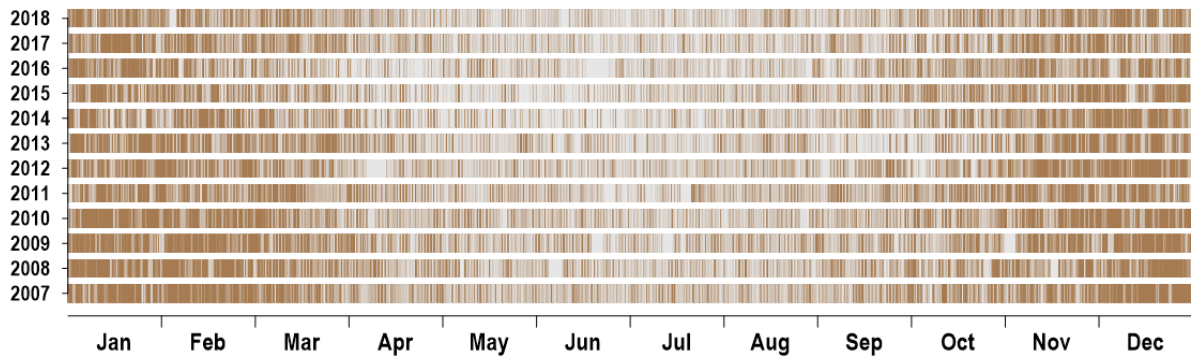
Red Deer
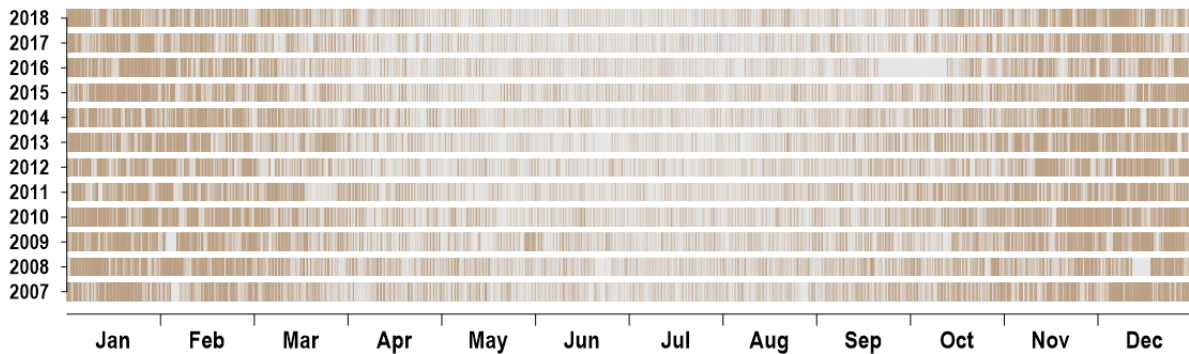
With environmental data, it's common to compare results against measured values and existing standards and objectives. While this comparison is important, there's also value in understanding year-over-year long-term seasonal patterns and trends. Our DNA visualization tool helps Albertans understand their province's air quality in

an approachable and engaging way.

Edmonton South

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