

# AEMERA Overview of Air Monitoring

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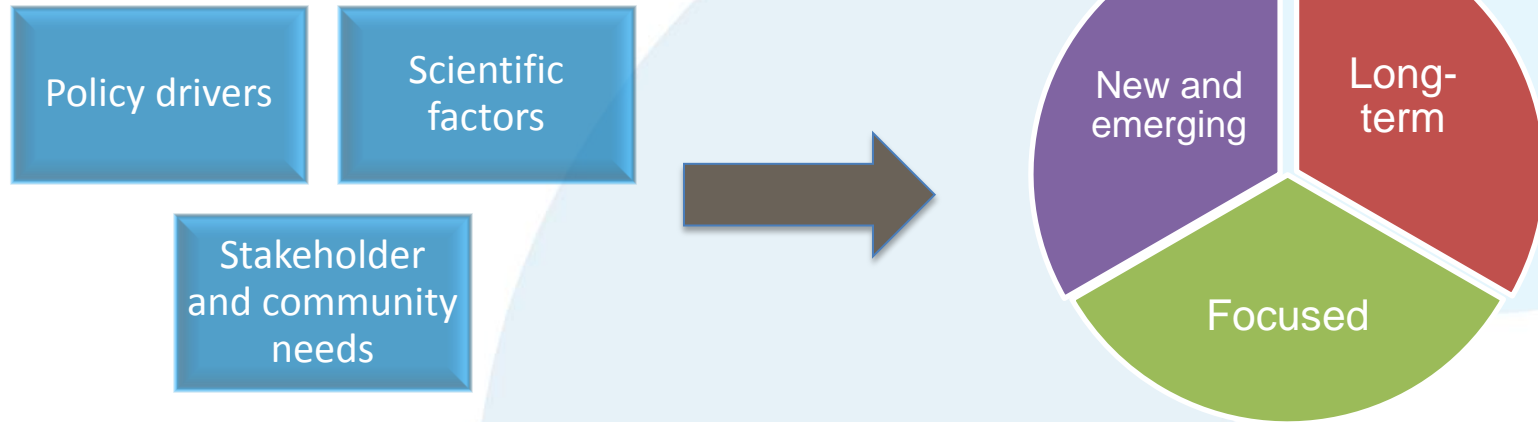


[aemera.org](http://aemera.org)

## Overview

- Oil sands monitoring – air component
- Province-wide air monitoring
- Citizen-based monitoring
- The Air Quality Health Index
- Working with partners

# Oil Sands Monitoring

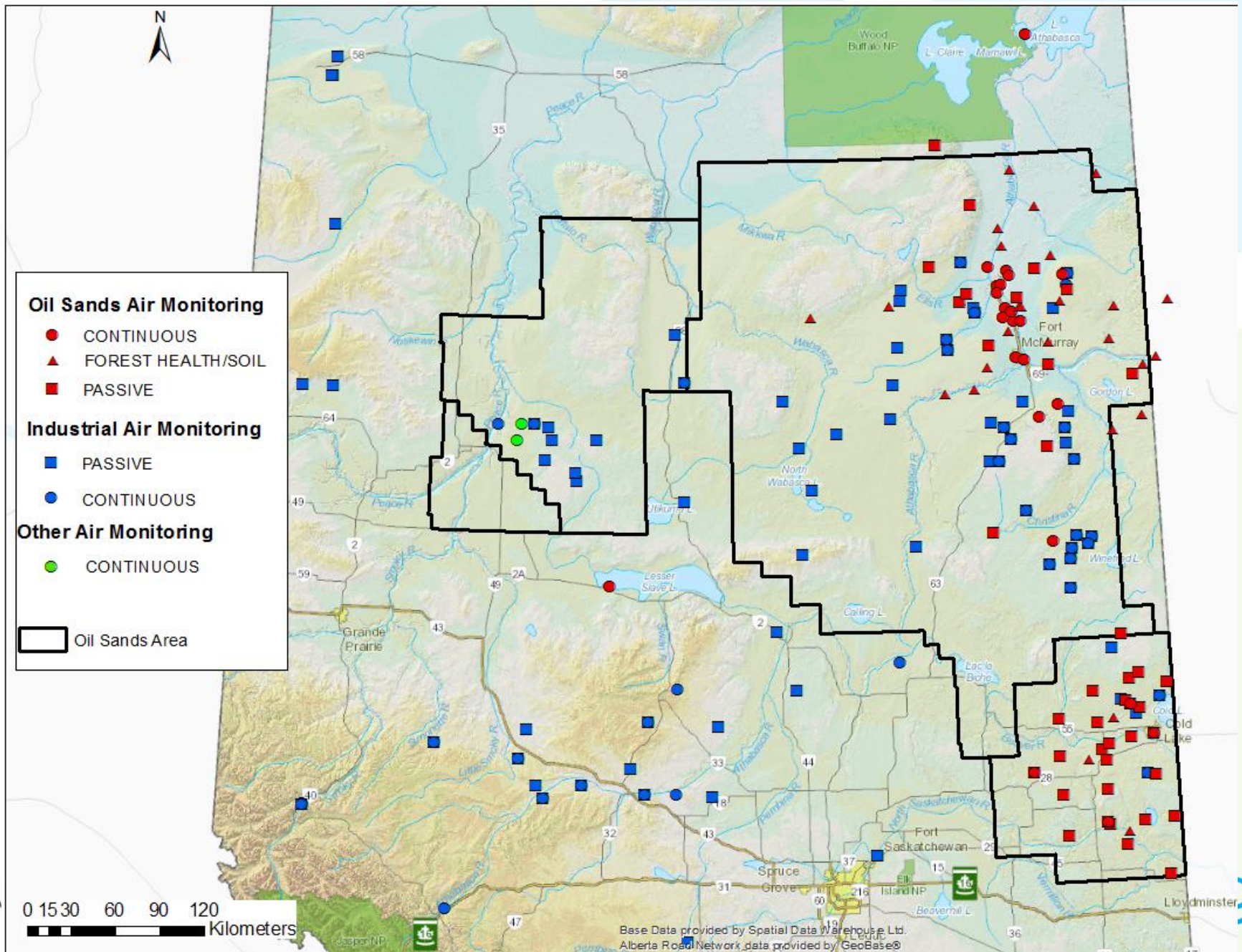


- **Long Term Monitoring**
  - Monitoring of status and trends to evaluate the state of the environment with regard to oil sands monitoring objectives
  - Periodic adaptation of long-term monitoring is required based on scientific review
- **Focused Studies**
  - Monitoring activities designed to answer a specific monitoring question
  - Informed by signals from long-term monitoring
- **New and Emerging Monitoring**
  - Application of monitoring technology proven elsewhere and applied to the oil sands region.
  - Can be used to address environmental/health issues in the oil sands region.

# 2015-16 Air Work Plan – Long-term Monitoring

- **Ambient Air Monitoring Network**
  - Wood Buffalo, Cold Lake and Peace regions
- **Passive Air Monitoring Network**
  - Wood Buffalo, Cold Lake and Peace regions
- **Additional long-term monitoring in the Wood Buffalo Region**
  - Forest Health Monitoring Program
  - Instrumented Meteorological Towers
  - Remote Ozone Monitoring
  - Passive PAH Monitoring Program
  - Enhanced Deposition Monitoring Program
- **Additional long-term monitoring in the Cold Lake Region**
  - Soil Acidification Monitoring Program

# Long-term Monitoring in the Oil Sands Region



# 2015-16 Air Work Plan – Focused and Emerging Monitoring

- Intensive monitoring in Fort McKay – Oski-Ôtin site
- Odour Monitoring Program in the Wood Buffalo Region
  - Uses innovative technologies (e.g. OP-FTIR and LiDAR systems)
- Beaver River Valley Air Quality/Visibility Monitoring Project
- Traditional Ecological Knowledge Berry Health Program
- Air Modeling to Integrate Data – Deposition Modeling
- Enhanced measurements of nitrogen and sulphur species at CAPMoN sites
- Enhanced measurement at existing sites (mercury and BTEX)
- Source characterization and satellite monitoring workshops

# Province-wide Air Monitoring

- Ambient monitoring
  - About 110 continuous air monitoring stations in the province
  - Most ambient air monitoring done by airsheds and industry
  - AQHI reported at 26 communities
- Ambient audit program
  - AEMERA conducts audits of ambient air stations operations by airsheds and industry
- Special air monitoring projects
  - obtain province-wide air quality data
  - explore potential sites for Alberta's permanent monitoring network
  - identify potential problem areas
  - respond to community air quality concerns
  - support emergency response



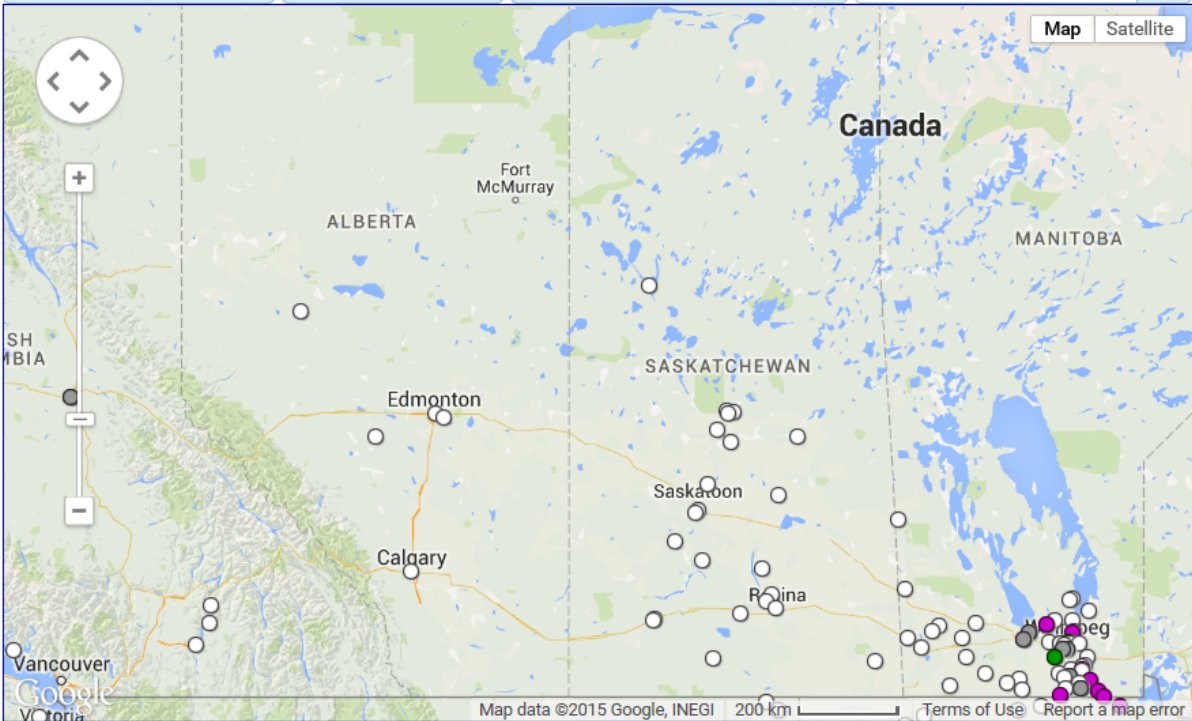
**AEMERA's Mobile Air Monitoring Laboratory (MAML)**

# Citizen-based Monitoring

- Requires little training and can be done by any responsible and capable person
- Provides good qualitative data at potentially more locations
- Can be uploaded to a public web site in real time
- Data is not good for reporting against legal standards or limits
- Some examples:
  - Community precipitation monitoring network (CoCoRaHS) (\$30)
  - Airbeam (\$200)
  - Village Green Project – U.S. EPA park benches with solar-powered air monitors (\$5000)







**CoCoRaHS**  
**CoCoRaHS**  
**Precipitation Map**

Date: 05/19/2015  
 Country: CAN  
 Province:  
 Units: US Units

- Zero
- Trace
- 0.01 - 0.13 in.
- 0.14 - 0.26 in.
- 0.27 - 0.65 in.
- 0.66 - 1.57 in.
- 1.58 - 2.36 in.
- 2.37 - 2.62 in.

Show US Active Fire Perimeters  
 Source: [GEOMAC](#). GEOMAC wildfire data layers courtesy of the [U.S. Geological Survey](#).

Obs Date	Obs Time	Station Number	Station Name	Precip (in.)	Snowfall (in.)	Snow Depth (in.)	Snow Depth SWE (in.)
2015-05-19	07:00 AM	CAN-AB-3	Sunset House 0.9 S	0.00	0.0	NA	NA
2015-05-19	07:30 AM	CAN-AB-10	Sherwood Park 5.5 SE - AEMERA	0.00	NA	NA	NA
2015-05-19	07:45 AM	CAN-AB-2	Edmonton 5.3 NE	0.00	0.0	NA	NA
2015-05-19	07:45 AM	CAN-AB-5	Calgary 2.7 N	0.00	NA	NA	NA
2015-05-19	08:00 AM	CAN-AB-8	Drayton Valley 0.6 WNW	0.00	0.0	NA	NA
2015-05-19	08:00 AM	CAN-BC-7	Lang Bay 0.6 E	0.00	0.0	NA	NA
2015-05-19	08:00 AM	CAN-BC-4	Westbank 4.6 NNE	0.00	0.0	0.0	0.00
2015-05-19	08:00 AM	CAN-BC-6	Cobble Hill 5.7 WSW	0.00	0.0	NA	NA
2015-05-19	07:00 AM	CAN-BC-9	Armstrong 8.8 NNW	0.00	0.0	NA	NA
2015-05-19	06:30 AM	CAN-BC-5	Coldstream 2.0 W	0.00	0.0	0.0	NA

Alberta:



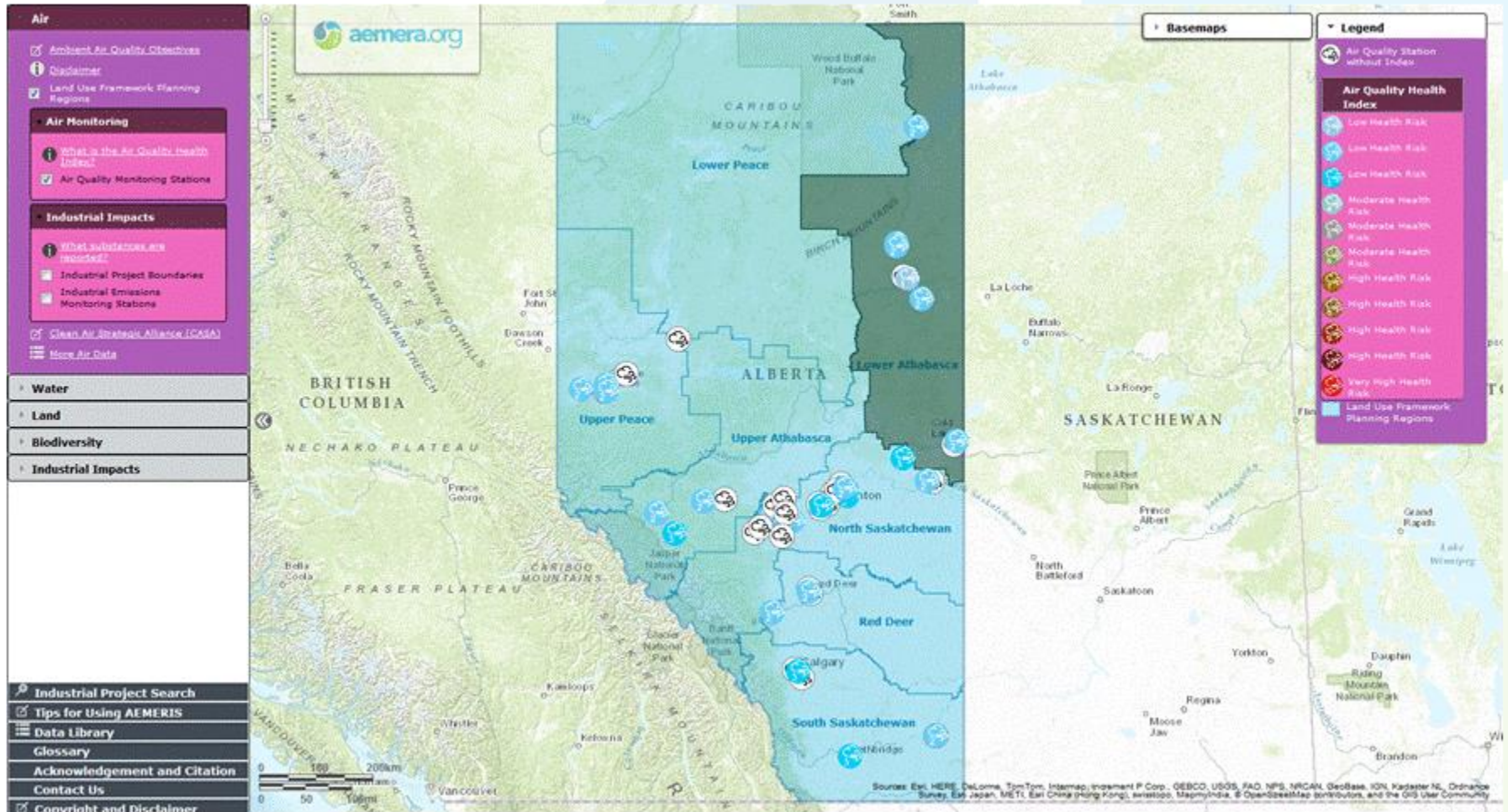
# Innovative Monitoring

- New monitoring technologies and new ways of visualizing environmental data

**AEMERA's Advanced Air LIDAR  
(Light Detection and Ranging)**



# Alberta Environmental Monitoring Evaluation and Reporting Information Service (AEMERIS)



# The Air Quality Health Index (AQHI)?

## AQHI



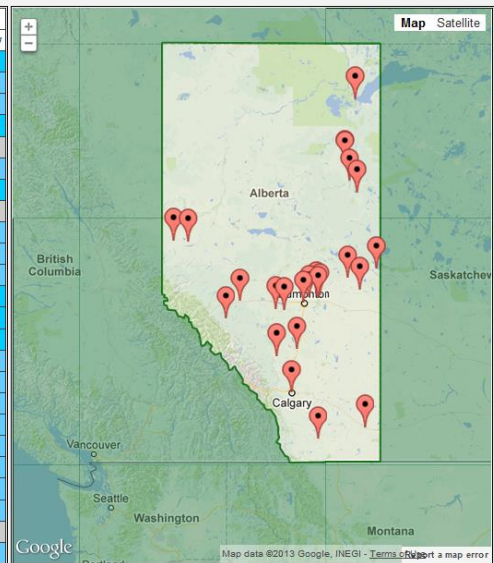
- Information tool to help Albertans
  - understand what air quality means to their health
  - manage exposure to air pollution
- Reports the risk to your health on a scale of 1 to 10
  - the higher the number, the higher the health risk
- Reported across Canada
- Uses 3-hour average concentrations of fine particulate matter (PM<sub>2.5</sub>), ozone and nitrogen dioxide
- Provides an air quality forecast for today, tonight and tomorrow

# Accessing the AQHI

## Alberta Environmental Monitoring Evaluation and Reporting Information Service (AEMERIS)

Health Risk	Low			Moderate			High			Very High
AQHI Scale	1	2	3	4	5	6	7	8	9	10

Community	AQHI	Maximum AQHI Forecast		
		Today	Tonight	Tomorrow
Anzac	2	3	3	3
Beaverlodge	2	2	2	2
Bruderheim	2	2	2	2
Calgary	2	4	3	3
Caroline	1	Area not forecasted		
Cold Lake	2	2	2	2
Edmonton	3	3	3	3
Edson	1	Area not forecasted		
Elk Island	2	2	2	2
Elk Point	2	2	2	2
Fort Chipewyan	2	2	2	2
Lackay	2	4	3	3
Rocky Mountain View	2	4	3	3
Murray	2	3	3	3
Wainwright	2	2	2	2
Wetaskiwin	2	2	2	2
Grande Prairie	2	2	2	2
Grain Processing County	2	2	2	2
High Prairie	3	3	2	2
High Level	2	2	2	2
Deer	2	3	3	2
Jana	2	2	2	2
Stettin	N/A	Area not forecasted		
Wainwright	2	2	2	2




Mobile app

## Working With Partners

- AEMERA understands the value local organizations, such as airsheds, have in environmental monitoring, evaluation and reporting.
- Working with monitoring organizations, AEMERA has begun to bring together data and information from a variety of sources to provide scientific evaluation and online environmental reporting.
  - Examples through AEMERIS
- AEMERA's monitoring, evaluation and reporting activities must meet the needs of a broad base of stakeholders.
- It is essential that AEMERA engage partners to ensure we are asking the right questions and providing relevant and timely answers.

# Questions?

 [aemera.org](http://aemera.org) and [aemeris.aemera.org](http://aemeris.aemera.org)

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