



Environment
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Environment Canada's **MOBILE WEATHER STATION**

A decision-making support tool for
ENVIRONMENTAL EMERGENCIES



Canada

In an environmental emergency, it is essential that the current conditions at an intervention site be added to regular weather data. To achieve this, the Meteorological Service of Canada (MSC) – Quebec Region uses a mobile weather station (MWS) that can collect data onsite to complement the data gathered by the monitoring network. The MWS allows meteorologists to have real-time information on the weather at a specific location and to prepare forecasts that are perfectly adapted to the site.

When a request comes in from a public safety, emergency or environmental protection organization, the MWS can be deployed quickly to the site of a fire, chemical or hazardous substance leak, oil spill or train derailment where hazardous products have spilled. If necessary, the MWS can also be set up at a site to provide additional information for observing or forecasting severe weather phenomena.

Equipped with surface weather and aerology instruments, the MWS records better observations, resulting in weather forecasts that are more useful for the evaluation of affected or at-risk zones.



Environmental emergencies

In an environmental emergency, the weather station can be deployed within a few hours, depending on the location of the event. Once onsite, initial data can be sent within an hour. The data gathered can be used to predict the trajectory of products released into the atmosphere, or the direction and dispersal of a plume that is threatening a populated area, all essential information for decision making to protect people and the environment: mass evacuations or confinement of populations, spill containment, wildlife protection, and so on. This service also enables other partners to optimize the management of their personnel deployment and equipment use.

Support in communicating risk

During severe weather or weather conditions that are particularly threatening or are worsening in a given region, the MWS can also be deployed to better evaluate the elements and, consequently, the risks and impacts. When they are better informed of the consequences, local authorities and residents are in a stronger position to take the appropriate measures to ensure their safety. In 2011, the MWS was deployed during the flooding in Montérégie in order to gather data on winds whose impact on the waves of the Richelieu was a determining factor. It was also used during tropical storm Irene.

Research tool

Although priority is given to environmental emergencies and major weather events, the MWS can also be used to research weather phenomena, such as high wind corridors, climate studies or data collection on a territory, as a complement to other instruments already in use. The MWS can also contribute to various projects being conducted by partners.



Cutting-edge instruments

The MWS has a telescopic tower with devices that record wind direction and speed, temperature, humidity, dew point and atmospheric pressure. It also has the necessary equipment to conduct atmospheric radiosonde observation using an aerological balloon and a radiosonde. All surface data and aerological parameters gathered and collected onsite are then transmitted to the MSC network.

Using this information, forecasters can provide a complete picture of the winds and their behaviour at all levels, as well as a vertical profile of temperatures that change with altitude, possibly impacting the behaviour of a product travelling through the air. The data collected can indicate if there is a thermal inversion or atmospheric instability and can determine the height of the mix, which is essential information in adapting forecasts to the atmospheric particularities of the emergency site.



Surface instruments

Tools include an automatic telescopic weather tower equipped with recording devices, with

- an anemometer for wind direction and speed, at an elevation of 10 m;
- a sensor for temperature, humidity and dew point; and
- a barometer for atmospheric pressure.

All parameters, recorded in accordance with international standards, are sent automatically every hour to the MSC network via satellite.

Aerological instruments

Other equipment allows for complete atmospheric radiosonde observation up to approximately 30 km (or 10 hPa) with

- a portable console for receiving and processing data;
- a microcomputer for analyzing and coding the data;
- a balloon-filling shelter; and
- an antenna for receiving radiosonde signals.

Like the surface data, all aerological parameters are transmitted to the MSC.

INFORMATION

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