

## Was it a storm or a “landicane”?

Is it possible to have a hurricane in our part of the world? If you ask a meteorologist the answer will be “NO” because hurricanes are creatures of tropical ocean waters. They derive energy from warm water of 27° C or higher and can persist for more than a week. Severe winds associated with hurricanes quickly dissipate on reaching land or cooler water.

A storm in late October 2010 blurred the rules between hurricanes and “extra-tropical” storms. A massive low pressure system stretched from Texas to Saskatchewan to the American Midwest to eastern Quebec. People who glanced at their barometers on October 26, 2010 in the afternoon may have been concerned. The needle was threatening to go beyond “Stormy”. The storm did deliver damaging winds, power failures, some record snowfalls, heavy rains and about 20 tornadoes, mainly in the United States. The storm was huge and covered millions of square kilometres, noted Peter Kimbell, emergency preparedness meteorologist for Environment Canada.

Record snowfalls in Saskatchewan and northern states were part of this complex storm. Duluth established two new daily snow records but only traces of snow were seen around Thunder Bay and more easterly places in Ontario.

Exceptionally low air pressure was associated with this storm. All-time records were set in Manitoba, Minnesota, Wisconsin, Ontario and Illinois locations. The official Minnesota record of 955 millibars (mb) also established a new record for the lowest barometric pressure ever recorded in the continental United States, except with hurricanes and nor'easters on the Atlantic seaboard. Record pressures of 954 mb were recorded in Fort Frances, Duluth 961 mb, Winnipeg 967 mb, 963 mb in Thunder Bay and at many other locations.

Generally, the lower the pressure the stronger the storm. A pressure of 965/964 mb is the threshold between Category 2 and 3 hurricanes, although extreme low pressure over land does not result in winds as potent as experienced in hurricanes. Nevertheless, October 25 to 27 were great days NOT to be on Lake Superior. The Rock of Ages Lighthouse near Isle Royale, reported sustained winds 109 km/h, with gusts to 125 km/h. Waves at the Slate Island buoy (south of Terrace Bay) were cresting around 8 metres for several hours.

Commercial shipping had reasonable forecasts prior to the high winds and took shelter in Whitefish Bay, Thunder Bay and other safe locations.

The extreme weather was related to a so-called “weather bomb”, a term for a rapidly intensifying storm system. They tend to occur more frequently along the Eastern Seaboard of the United States and into the Atlantic provinces but can occur over mid-continent. The event was initiated by a sharp temperature contrast between record heat in the southern US and seasonal conditions to the north.

### Looking at historical records

The pressures noted above replaced records set on November 11, 1998 throughout the Northwest Region and Minnesota. The deadly storm of November 10, 1975 that sank the Edmund Fitzgerald, killing all 29 sailors aboard, was weaker than the 1998 or 2010 storms.

The remarkable low pressure recorded at Fort Frances did not set a new record for Ontario. This dubious honour belongs to Chatham in southwestern Ontario and set during a notable blizzard in January 1978.

The media reported local events associated with this storm – strong winds and power failures – but rarely discussed the bigger picture. Hard to believe, but pressure numbers are not so exciting for most. For people in the weather biz, noting new records of 2 to 7 millibars lower than anything seen in a century of data is startling. It stimulates discussion about whether we are seeing a trend to more intense storms in the fall and winter seasons.



[The photograph by Chris Walton of storm clouds was taken from Pebble Beach near Marathon and depicts the calm before the storm as the “eye” of the storm arrived.]

This particular storm system strengthened rapidly between the afternoon of October 25 and the afternoon of October 26. Rain and gusty winds were the main result in Manitoba and northern Ontario with daily records established in many locations including Thunder Bay with 50 mm of rain on October 26. The rain was accompanied by strong wind gusts which caused some local power failures.

The winds were the main impact felt in other parts of the province during the course of this event, with the strongest wind gusts occurring along the north shore of Lake Superior at Pukaskwa on the morning of October 27 (106 kilometres per hour) and in Greater Sudbury on the afternoon of the October 27 (100 kilometres per hour). The cities of Wawa, Sault Ste. Marie and Gore Bay on Manitoulin Island also registered strong wind gusts in excess of 90 kilometres per hour on October 27. While the wind intensity dropped off on October 28, this weather system continued to cause gusts from 50 to 60 kilometres per hour and produce showers over a good portion of the province.

Winds associated with the storm pushed Ontario wind-power generation to a record level. Output on Tuesday equaled generation of two nuclear reactor units at Pickering generating station.

Eyeing the “eye”

As timing would have it, I had a scheduled airline flight that went over Lake Superior on October 26, 2010 in the afternoon. As luck would have it, a window seat enhanced the experience of flying through the “eye” of one section of the storm. It was not a perfect textbook picture but blue sky and walls of cloud were visible. The pilots must have had the best view.

Sometimes, weather and events intertwine. I was flying to Sudbury via Toronto to attend a conference about how municipalities can (perhaps a better word is “must” adapt to more severe weather in the future. The two-day gathering was organized by the Ontario Centre for Climate Impacts and Adaptation resources. It brought scientists, policy makers and community organizations together.

We were inside of course and sheltered from the elements. Wind gusts of 100 km/h brought down some power-lines. About 50,000 customers were without power at the height of the storm.

The winds had impacts as the system moved east. Strong wind gusts occurred along the north shore of Lake Superior. In Marathon and Pukaskwa, winds of 106 kilometres per hour were recorded.

Many other communities registered strong winds. Sudbury had power failures that caused inconvenience for 50,000 households.