

The Dangerous Results of Climate Change Come More Powerfully to Southern Ontario

1.0 A Very Recent Event: On May 21, 2022, southern Ontario was struck by a weather system, identified by meteorologists as a “**Derecho**”. This is defined as follows:

“A widespread, long-lived, straight-line wind storm that is associated with a fast-moving group of severe thunderstorms known as a “mesoscale convective system”.

Derechos can cause hurricanic or tornadic-force winds, actual tornadoes, heavy rains, and flash floods.

They move about as fast as some *tornados*, but instead of spiraling like a tornado or hurricane, the winds of a *Derecho* move in straight lines. That's where the storm gets its name; the word “**derecho**” in Spanish means “*straight ahead*”.

2.0: Damage in Southern Ontario: The May 21, 2022 Canadian Derecho was a high-impact event that affected the Windsor to Quebec City- Corridor, Canada's most densely populated region, with 15.6 million people (41% of Canada's population).. Described by meteorologists as an historic *Derecho* and one of the most impactful thunderstorms in Canadian history, with winds up to 190 km/h (120 mph) as well as several tornadoes, it caused widespread and extensive damage along a path that extended for 1,000 kilometres (620 mi).

Three cities across southern Ontario declared a state of emergency. At least eleven people were killed, mostly by falling trees. Power outages affected an estimated 1.1 million customers, and thousands were still without power a week after the storm. Hydro Ottawa described the damage dealt to its power distribution system as more severe than the 1998 ice storm.

According to an estimate published on June 15 by the firm Catastrophe Indices and Quantification (CatIQ), the insured damage would amount to C\$875 million, that is, C\$720 million in Ontario and C\$155 million in Quebec. This Derecho ranks as the sixth costliest weather event in Canadian history in terms of insurance claims.

3.0 Some Other Recent Major Weather Events in Canada: Here is a list of Canada's top 10 Weather Events in 2020, in ascending order of impact.

10. August long-weekend storms: East and West
9. Fall in Canada – winter in the West and summer in the East
8. Frigid spring helps Canadians self-isolate
7. The year's most powerful tornado
6. Record hurricane season and Canada wasn't spared
5. St. John's “snowmageddon”
4. Endless hot summer in the East
3. Fort McMurray's flood of a century
2. BC's September skies: all smoke, no fires
1. Calgary's billion-dollar hailer

(Link to more details about each storm): <https://www.canada.ca/en/environment-climate-change/services/top-ten-weather-stories/2020.html#toc4>

Here is a list of Canada's top 10 Weather Events in 2021.

1. Record heat under the dome
2. British Columbia's flood of floods
3. Canada dry coast to coast
4. Wildfire season – early, active and unrelenting
5. Canada rides out four heat waves
6. Year of the EF2 tornado
7. Dreaded Arctic blast freezes Canada in February
8. Another hailer-flooder in Calgary
9. Hurricane Larry belonged to Newfoundland
10. January prairie clipper

(Link to more details about each storm): <https://www.google.com/search?client=firefox-b-d&q=Canada%27s+top+weather+events+in+2021>

A brief scan of these weather events suggests that, while some of these caused major damage, the ones that did were almost entirely in other provinces. The major exception was Barrie Ontario, where an EF2 (Enhanced Fujita Scale 2) tornado hit Barrie with little warning – there was no prior rain and the sky was without lightning and thunder – on July 15th, 2021. This tornado, with maximum winds of 210 km/h along a damage track of 12.5 km long and 510 m wide, caused damage to more than 150 homes. Otherwise, none of these caused any significant damage in the southern Ontario region, and especially not in the greater Toronto Area (GTA).

But the one that struck on May 21, 2022, was a big exception. The other difference was this weather system, characterized as a “Derecho” was something, in terms of strength and damage caused, that we haven't seen in southern Ontario, at least not for a long time.

4.0: A Storm in my History: For many years, I have taken some comfort in this thought, that the effects of Climate Change are being felt elsewhere in Canada, but not so much here in the GTA. The one that I remember most clearly, and for which I saw the damage personally was Hurricane Hazel, which occurred on October 15, 1954, and delivered 129 mm (5 inches) of rain that fell on ground already soaked earlier by some significant rainfall. While flooding occurred in all the rivers and creeks that flow south through the GTA into Lake Ontario, the most serious flooding was in the Humber River south from Rexdale, where several homes were washed away completely and 38 people were drowned. It should be noted that these homes had mostly been built on islands in the river, and were thus very prone to flood damage.

I saw the effect in the Don Valley because it was close to where I lived. I was down in this Valley two days after that storm went through, and I saw the high water mark on the trees that I estimated was 10 to 12 ft. above grade – note that the Don Valley is approximately 500 meters wide just south of the Prince Edward Viaduct where I viewed this. I discussed this with TRCA (Toronto and Region Conservation Authority), and they told me that their models estimated that it might have been as high as 16 ft. I recently acquired a copy of a book entitled “Remembering the Don” by Charles Sauriol that estimated that the depth of the flood reached 18 ft. Meteorologists term this a “100 Year Event”, estimated to occur only once in 100 years.

5.0 Projections of the Effects of Climate Change: Meteorologists and other scientific experts have been predicting for over 50 years that Climate Change, caused primarily by the burning of fossil fuels and the carbon

dioxide and carbon monoxide gases that this produces, and their effects on our upper atmosphere, would result in increasing climate effects, and the danger this would have on our world and our lifestyle.

For a careful explanation of this effect, try this link: <https://news.climate.columbia.edu/2021/02/25/carbon-dioxide-cause-global-warming/>

6.0 The Actions We Should Consider Taking: There is a wide variety of sources for advice and guidance on ways to take action against your own carbon emissions, but this has a longer term effect.

We do have a Canadian Resource for advice and guidance on steps that can be taken to protect our own property from major weather events. .

The **Intact Centre on Climate Adaptation (Intact Centre)** is an applied research centre with a national focus, located within the Faculty of Environment at the University of Waterloo, that is funded by Intact Financial Corporation, the owner of Intact Insurance. The Intact Centre works with homeowners, communities, governments and businesses to identify, and reduce, the impacts of extreme weather and climate change. To this end, the centre is an incubator of new adaptation ideas, conducting research, knowledge mobilization and promoting initiatives aimed at de-risking the negative impacts of a changing climate and extreme weather, such as flooding.

They offer three key Programs:

1. **The Home Flood Protection Program** helps homeowners reduce the risk of basement flooding and minimize damage if flooding occurs. The Program features an on-site flood risk evaluation service, known as the Home Flood Protection Assessment. In roughly one hour, a trained assessor works with the homeowner to complete a 50-point visual assessment of potential sources of water entry into the home. A concise, easy to read report identifies top ranked actions to reduce flood-risk.
2. **The Home Flood Risk Assessment Training Course** empowers students to help homeowners identify sources of basement flooding, and identify opportunities to reduce those risks through what are often simple and cost effective solutions. Students also receive flood-risk assessment software that will enable them to produce customized home flood assessment reports.
3. **The Infrastructure Adaptation Program** helps communities across Canada reduce the risk of flooding through development of national standard(s) for new and existing flood-resilient residential communities and establishing the business case for natural infrastructure (e.g. wetlands) preservation.
4. **The Corporate-Specific Adaptation Program (CSAP)** focuses on engaging business sectors (e.g., commercial real estate, electricity, telecommunications, etc.) to identify climate change and extreme weather risks, and to subsequently establish practical and cost-effective means to limit those risks. For each of the topics, there are Reports and other Resources available on their website: here's the link: <https://www.intactcentreclimateadaptation.ca/recent-reports/>

7.0 The Future Does Not Look Bright: Climate Change has been with us since the World started using fossil fuels for improving comfort in our homes and businesses, more rapid and comfortable transportation, more effective and productive manufacturing, and a host of other less significant reasons. The steps we should, must be taking are well defined. We just have to take them.

(Article prepared by H. R. (Bob) Bach P.Eng., Resident of Markland Wood Since 1979)