

## Canada's Top Ten Weather Stories for 2015

For the second consecutive year, Canada's top weather story is a long, cold, snowy winter in the East. For the Maritimes, it was a Snowpocalypse, with myriad storms that included a Super Bowl/Groundhog Day double-header, a Valentine weekend White Juan-a-be, and blasts on the Ides of March and St. Patrick's Day. In the far west, it verged on a year without winter and was the warmest year ever, with dwindling water levels in rivers and reservoirs, a costly drought, and wildfires that burned hot and fast. As a whole, however, Canadians were left largely unscathed from what still amounted to a good dose of extreme weather. There were weather bombs, nor'easters, a growing super El Niño, deluges and expensive hailers. And while property damage from weather cost insurers and governments millions and the economy billions, this year we were spared devastating hurricanes, had fewer tornadoes and experienced less weather-related personal injuries and fatalities.

From West to East:

- May and June in British Columbia came close to being the two driest months on record, which brought the forest fire season to a one month earlier than normal start. In total, firefighting costs hit close to \$300 million – twice the 10-year average – and thick and pungent smoke left thousands of residents gasping through surgical masks. Spring mountain snowpack was less than half of normal, leaving skiers and snowboarders to try hiking and biking for their outdoor fix. And some rivers ran at their lowest recorded flows since measurements began 80 to 100 years ago. Just when residents got used to too little weather and water, bashing winds from an August storm caught everyone off guard, leaving 710,000 hydro customers without power – the largest single outage in BC Hydro's history.
- Prairie farmers faced challenging weather this year with killing frosts in May, spring and early summer dryness, and too many hailstones. Manitoba was hardest hit for crop losses due to hail; three times last year's total. In Saskatchewan, uncontrollable fires prompted the displacement of more than 13,000 people – the largest evacuation in the province's history. Once again, nature didn't leave Calgary alone. Over a two-day bout of severe weather in July, storms in that city and across central and southern Alberta and Saskatchewan inflicted \$250 million in damages (not including crop losses). Some rescue rains helped out, but the harvest was delayed and yields were disappointing compared to recent years.
- In Ontario and Quebec, February became "Fridguary" with temperatures seven to nine degrees below normal. Toronto was colder than Edmonton in February and it was the city's coldest month ever with records dating back to 1840. Montreal didn't reach melting temperatures for 43 days and Ottawa's record number of days below -20°C allowed the Rideau Canal Skateway to stay open for an unprecedented 59 consecutive days. The prolonged and severe cold, combined with a scanty snow cover, caused an epidemic of frozen water pipes across the two provinces. After the deepfreeze, their early growing season was a marvel of contrasts with the southern regions experiencing their driest then wettest periods ever.
- In the Maritimes, residents will tell you winter was too long and tough. It grabbed hold in January and wouldn't let go until May. They proved their mettle as a winter people by beating back brutal cold, especially in February, and shovelling and plowing through record snowfalls. January, February and March were the coldest in 68 years. As for the white stuff, Moncton and Charlottetown – two of Canada's snowiest cities – established all-time records with amounts breaking the 5 m snow mark.

Other weather surprises included remnants of Pacific tropical storms that had a much greater impact on Canada than their Atlantic counterparts. Tropical storms Kilo, Oho and Patricia from the Pacific packed enough energy and leftover moisture to inflict some serious damage and widespread disruption in British Columbia and from Ontario through Newfoundland and Labrador.

At the top of the world, Arctic sea ice continued to disappear, reaching its fourth lowest minimum on record and ending a temporary rebound that highlighted conditions in 2014. Both the Northwest Passage and the Northern Sea Route opened up again simultaneously, a previously rare, but now more frequent occurrence.

Globally, it was another warm year – the 38th in a row. Even more spectacular, it was the warmest year in 135 years, surpassing 2014. Indeed, the National Oceanic and Atmospheric Administration, along with other government agencies, declared 2015 the warmest year on record in early November with two months still left to go.

It was also another warm year in Canada – the 19th in a row and the 11th warmest in 68 years of records. British Columbia had its warmest winter, spring and year ever, especially along the coast, which was 0.7°C warmer than the previous warmest year in 1992. The Prairies and the Mackenzie Region recorded their fourth and fifth warmest years, respectively. Yet, not all regions were warmer than normal between December 2014 and November 2015. From the Great Lakes to Newfoundland and Labrador, a cold winter and spring and a lukewarm summer made for a cooler than normal year by -0.1°C. It was one of very few regions in the world that registered a negative temperature anomaly in 2015.

The following top Canadian weather stories for 2015 are ranked from one to ten based on factors that include the impact they had on Canada and Canadians, the extent of the area affected, economic effects and longevity as a top news story:

## **Top Ten Canadian Weather Stories for 2015**

1. Record Cold Winter in the East
2. Forests Blazing in the West
3. Dry to Almost Disastrous in the West
4. Maritime Snowmagedon
5. Record Hot Dry Summer across British Columbia
6. The Prairie's Stormy Summer
7. Super Bowl/Groundhog Day Storm
8. British Columbia's Big August Blow
9. Maritime's Valentine Storm ... A White Juan-a-be
10. January in July for St. John's

## **Runner-up Stories**

1. A "Hurricane" with Snow
2. A No-Snow Winter in British Columbia
3. Ides of March Storm
4. Flooding in New Brunswick
5. Ontario and Quebec ... Dry then Wet
6. Ice – the Thick and Thin of It
7. Eastern Nunavut's Miserable July
8. Triple Storms Ruin British Columbia's Thanksgiving Weekend
9. Hurricanes – Quiet in the Atlantic, Active in the Pacific
10. Super El Niño Postpones Winter

### **1. Record Cold Winter in the East**

At the end of February 2015, the United Nations World Meteorological Organization announced that the world had just experienced its warmest winter on record covering 135 years of observations. While residents of British Columbia agreed, those in the East found it hard to believe. Seldom had Canadians seen such a winter of marked weather contrasts from coast to coast. In 68 years of national records, February 2015 was the warmest on record along the Pacific coast and the coldest in Ontario, Quebec and parts of Atlantic Canada. A persistent high-pressure ridge sitting over the West coast was primarily responsible for the opposing temperatures. On the west side of the ridge, December through to the end of February brought the Pacific coast its warmest winter on record with temperatures reaching +3.1°C above normal. On the east side, the cold air piled up and the jet stream – nature's weather delivery system – funnelled frigid air down from the Northwest Territories. It was a weather "pipeline" of

bitterly cold Arctic air that travelled all the way down to Florida. With the previous winter also in the top ten coldest, Canadians in the east shivered through the second coldest back-to-back winters on record.

Cruelly, December 2014 was much milder and greener than normal for the vast majority of Easterners, bringing hope that winter would almost certainly be shorter than the year before. Who could have predicted that “Fridguary” 2015 would be the coldest in 115 years in some parts of the East? Incredibly, February’s average temperature was seven to nine degrees colder than normal with not a single melting day in most cities. The month even set a record for the number of cold records broken, including at least 20 cities in Ontario and 12 in Quebec.

More cold weather highlights:

- At Toronto Pearson International Airport, there wasn’t a single melting temperature through February. In the city’s downtown, it was the only month since 1840 without an above-freezing temperature. The absence of any melting went on for 37 consecutive days – from January 25 to March 2. Whether at the airport or downtown, Toronto has never experienced a colder month. The average temperature of  $-12.6^{\circ}\text{C}$  was more than eight degrees colder than normal. Nine days in the month fell below  $-20^{\circ}\text{C}$  compared to a normal of one day. In the end, February was colder in Toronto than Edmonton and came under an extreme cold warning for 13 days that month and 23 days all winter.
- In Ottawa, the average February temperature was  $-16.2^{\circ}\text{C}$  ( $8.1^{\circ}\text{C}$  below normal) with 20 days dipping below  $-20^{\circ}\text{C}$  compared to its typical four-day average. And while the city’s Rideau Canal Skateway was open for a record 59 consecutive days, with ice reaching almost a metre thick, the bitter cold and frostbite warnings discouraged many from lacing up.
- At Kitchener-Waterloo, February averaged a shocking  $-14.8^{\circ}\text{C}$  – the coldest of any month at any time with records dating back to 1880. Over two-thirds of the days had raw temperatures below  $-20^{\circ}\text{C}$ . The minimum temperature on February 16 was a frigid  $-34.1^{\circ}\text{C}$  – one of the coldest days ever in southern Ontario in the past 75 years. In the heart of winter, 43 consecutive days stayed below freezing – a new record.
- In Quebec, raw days below  $-20^{\circ}\text{C}$  exceeded twice the norm. At Montréal Pierre Trudeau International Airport, February’s average temperature was  $-15.2^{\circ}\text{C}$  eclipsing the previous record of  $-14.1^{\circ}\text{C}$  in 1943 and 1979. Montrealers didn’t experience a melting temperature for 43 consecutive days between January 20 and March 3. In Québec City, it was the coldest February since 1889 when its observing program began. Other parts of the province fared even worse. On several days, temperatures were brutal and wind chills unbearable, such as the  $-50$  experienced on February 15 at Matagami.
- In Atlantic Canada, most of the talk was about the record snowfall, but it was cold too! January, February and March 2015 were the coldest in 68 years. Individual cities also broke longstanding records for cold. At Goose Bay, NL the temperature in February averaged  $-22.0^{\circ}\text{C}$  – the coldest on record with every day in the month below  $-20^{\circ}\text{C}$ . Moncton also set records: the coldest February with an average temperature of  $-13.6^{\circ}\text{C}$ ; the most number of days below  $-20^{\circ}\text{C}$  (12 in total); and the coldest January to April inclusive. On Cape Breton Island, Sydney tied for the coldest January to April in over 75 years. And, for the same period, Halifax’s average temperature was  $-4.9^{\circ}\text{C}$ . The coldest January to April up until then was  $-4.8^{\circ}\text{C}$  in 1923.

The bone-chilling, teeth-chattering weather and lasting snow had a host of negative impacts. Tragically, several Canadians lost their lives to the extreme cold. One – a toddler in Toronto clad only in a diaper, a thin T-shirt and a pair of boots – froze to death on February 19 when temperatures dipped to  $-22^{\circ}\text{C}$  with a wind chill of  $-30$ . For the homeless, the bitter cold made a hard life harder. Hospitals were pushed to handle more cases of frostbite and hypothermia. And the winter’s duration and difficulty led to increased reports of depression and anxiety.

Water mains were also pushed to the brink as old pipes buried in shifting ground cracked across the East from the enduring deep cold. For plumbers, things couldn’t have been busier as they scrambled to thaw frozen hydrants, ruptured pipes and broken sprinkler systems. In Hamilton, the city had to service 1,200 calls for burst water pipes and frozen toilets compared to its usual 50 calls in an average winter. Some residents went without water for two weeks. In Kingston, it was the worst rash of frozen pipes in 20 years. In Owen Sound, costs associated with frozen pipes and burst water mains topped \$1 million. Across the East, concerts, bingos, hockey games and other events

were postponed then cancelled. Prompted by the cold alert, many school boards often kept students indoors during recess and lunch or cancelled school outright. At times, the intense cold created transportation nightmares with extreme cold freezing switches and impeding doors. Millions of Canadians struggled to stay warm as residents cranked up the thermostat to beat back the cold, creating a demand for energy that soared to a third more than normal. On the positive side, crime was lower as the bitter cold and string of winter storms kept many people storm-stayed or close to home, city workers faced a smaller crop of potholes and travel agents enjoyed record bookings to warm-weather destinations.

## **2. Forests Blazing in the West**

The wildfire season in Canada began early, ended late and was extremely active, especially in the West. The Canadian Interagency Forest Fire Centre in Winnipeg reported that the 2015 national wildland fire season was above average for both number of fires and hectares burned. As of September 27, the north and west from British Columbia, the Northwest Territories and the Prairies recorded 6,765 fires and an unprecedented four million hectares of consumed woodland – about four times the 15-year average and three times the 25-year average.

### **Prairies**

Regional weather records have been kept since the late 1940s and never in that time has the Prairies seen a milder and drier winter/spring. Ensuing conditions led to an early forest fire threat across Alberta and Saskatchewan, prompting both governments to issue province-wide fire bans. As early as the second week of March, wildfires began ravaging northern Saskatchewan. Residents from several communities near La Ronge and La Loche began evacuating to centres in the south. Hot temperatures and dry thunderstorms in May and June meant fire conditions became even more volatile with more than 13,000 people evacuated in what was the largest evacuation in Saskatchewan's history. For the first time in some four decades, the Canadian military (1,400 strong) was on the ground battling forest fires and helping with mass evacuations affecting 50 communities. In all, 1.8 million hectares burned in Saskatchewan – more than two and one-half times the area lost in any other jurisdiction, six times the provincial average and one-third the area of Nova Scotia.

In Alberta, wildfires burned hot and fast in June when half the province came under a fire advisory. Evacuations included 2,000 people from Wabasca and the Bigstone Creek First Nations, 1,700 workers from near Cold Lake when fires threatened three oilsands sites and facilities, and 1,000 tourists and outdoor enthusiasts from the Maligne Valley near Jasper due to encroaching flames and choking smoke.

While Manitoba was largely spared record fires, it endured several days of hazy, yellow skies and poor air quality. The plume of smoke from the northwest was visible by satellites and was so thick at times that officials claimed it actually helped to control fires by blocking direct sunlight, which in turn lowered temperatures and boosted humidity. Crews from Quebec, Ontario, all Atlantic provinces, South Dakota, Mexico, Australia and New Zealand, along with First Nation volunteers and evacuees, stepped up to help western provincial crews.

### **British Columbia**

Tinder-dry forests combined with an unusual amount of dry lightning and strong winds resulted in aggravated fire behaviour throughout British Columbia in 2015. In addition, a build-up of dried trees killed by mountain pine beetles in recent years dramatically increased the fire risk. May and June were the driest two months on record at some sites, causing many rivers to flow at their lowest recorded levels since measurements began 80 to 100 years ago. Even the moist rainforests dried enough to be torched.

Early in the fire season, firefighters struggled to contain out-of-control blazes at Little Bobtail Lake, southwest of Prince George, Puntzi Lake near Williams Lake and near Lytton. In late June, provincial officials banned campfires at most parks and several municipalities in the Lower Mainland issued an extreme fire rating, which prompted the banning of campfires and barbecues in local parks. The forest fire season peaked a month earlier than usual in early July with much of the province blanketed by a thick, orange and pungent haze. Ash was falling like snowflakes, covering vehicles and leading to increased respiratory distress calls. At times, residents and tourists in the Lower Mainland could feel the heat and see, smell and taste the burning wood. Air quality advisories were often in effect

for Victoria, Greater Vancouver and the Fraser Valley. At mountain resorts, tourists preferred indoor activities in an effort to limit smoke intake.

After a short respite from late July to mid-August, firestorms resumed on two fronts – near Oliver and at Rock Creek – with both communities declaring local states of emergency. Fires near Oliver came within metres of scorching an elementary school and winery, while a massive uncontrollable wildfire in Rock Creek destroyed 30 homes and forced hundreds of people to flee. Heaps of burnt rubble, scorched earth, burnt-out vehicles and charred trees blackened the landscape. In late August, wildfires in Washington State – the worst on record – crept across the border, threatening Canadian wilderness and filling the air from British Columbia to Saskatchewan with overpowering clouds of smoke. Conditions were so bad that the fleet of helicopters fighting the wildfires had to be grounded. In the final week of August, late summer vacationers cancelled holidays or shortened stays, while hundreds fled campgrounds leaving their belongings behind to escape fast-moving flames.

All told, British Columbia reported more than 1,800 wildfires that burned an estimated 300,000 hectares and cost more than \$287 million to fight. The 20-year average number of fires is about 1,050 with an average 43,280 ha burned. This year's totals were not surprising given that conditions included extreme heat near 40°C, widespread dryness, large amounts of dry lightning and gusty shifting winds.

### **Northwest Territories**

Early in the year signs pointed to a challenging forest fire season in the Northwest Territories, which was difficult news given last year's record wildfire season. Fire bans went into effect a month earlier than usual (around mid-May), and by summer's first day 20 per cent more fires than average were reported across the territory. In Yellowknife, total precipitation from April to June inclusive was 23 mm (normal is 59 mm); not the driest on record but less than in 2014. Further, temperatures averaged two degrees warmer than normal. On Canada Day, residents woke up to a strong smell of smoke. Fires and restrictive visibility closed the only highway south out of the city, stranding many motorists and preventing delivery trucks from getting through. Going into July, moisture levels were closer to those normally seen at the end of August. By mid-July 2015, rainfall totalled 25 mm with seven wet days and one day above 25°C. By contrast, July 2014 had 5 mm on three wet days by mid-month and 12 days above 25°C. With more rain, more wet days and noticeably cooler temperatures that month, the weather stalled some of 2015's bigger fires. In summer, the Mackenzie District recorded 23 per cent more rain than normal making it the eighth wettest in 68 years. In the end, only one-fifth as much land burned compared to last year with 150 fewer fires. Further, aggressive action taken by forestry officials – who were determined not to see a repeat of the previous record year – helped to keep fires at bay. And, with so much land burned in 2014, there was less fuel available for fire consumption this year. Nevertheless, it was still the second costliest fire season on record.

### **3. Dry to Almost Disastrous in the West**

For much of 2015, the western half of North America was locked into a continent-wide ridge of high pressure stretching from the Mexican border to the Arctic Circle. Further, an immense super-heated swath of deep and wide water in the Pacific Ocean was strengthening. Surface waters in the northeast Pacific were the highest scientists had recorded since record-keeping began in 1948. Together, the atmospheric ridge and the Pacific blob kept much of the West in a southwesterly flow and helped block water-bearing clouds from forming and coming ashore.

Spring's mountain snowpack was also less than half of normal levels and had started to melt about four to six weeks earlier than usual. Together, winter and spring in Western Canada was the driest in almost 70 years of record-keeping. Consequently, by June 1, river discharge was running at levels not usually seen until August. The shrinking snowpack, retreating glaciers and measly amounts of rain pointed to looming problems for western agriculture.

Prairie growers were buoyed by the early jump on spring planting, although farmers in western Saskatchewan and Alberta were concerned by the dryness. Seeding was well ahead of normal with sprouts emerging by mid-May. On May 17, a harsh, hard frost quelled enthusiasm. Record low temperatures dipped to -4.5°C in North Battleford, -5.9°C in Swift Current and -5.7°C in Saskatoon. The widespread frost and freezing temperatures killed up to 70 per cent of recently planted canola. In some cases, replanting was not possible because seeds were unavailable.

During the crucial May to mid-July period, when crops are normally growing feverishly, rains only sprinkled across the bone-dry Prairies. About 60 per cent of the agricultural landscape was in serious moisture stress to the last week of July. Saskatoon experienced its driest May on record with just 0.4 mm of rain. Even worse, the city had its driest March-to-June stretch on record. Total precipitation was 40.2 mm – about one-quarter of the normal total of 147 mm. The previous driest stretch was 61.9 mm in 1937 with records dating back to 1892. Exacerbating the dryness, Saskatoon had almost double the average days at or above 30°C from May through July with 11 in total. In the heart of wheat country, Swift Current's total May-to-July total rainfall was 38 mm compared to a normal of 165 mm. Previous driest was 50 mm in 1973 and at an older station dating back to 1885 the record was 52 mm in 1919. Ironically, what saved Saskatchewan agriculture to some degree was the residual subsoil moisture from the previous spring. For example, rainfall in Regina amounted to 43 mm in spring 2015 compared to the previous year when 307 mm soaked the city. Within 10 months, parts of Saskatchewan went from the wettest to driest conditions in history.

Alberta, however, was not so lucky. Farmers across almost two-thirds of Alberta had to cope with some of the driest conditions in five decades, and 17 of the province's agricultural districts declared states of agricultural disaster before summer was half over. Crop production in drought-declared Alberta counties was down by 70 per cent. Spring canola seed and other moisture-sensitive crops didn't germinate at all. Near Leduc, it was the worst drought in a half-century. To mid-July, precipitation for the growing season was 50 mm compared to a typical 250 mm. While Alberta saw rain in mid- to late-August, it came too late for most farmers. Early on, pastures and forage crops in cattle country were in worse shape than grain fields. Growers were getting 200 bales of hay from a field last year but only 20 this year. Crops were short, thin and ragged; fields were brown and dry. High populations of grasshoppers and other pests arrived earlier than normal and ate anything green. In town, sales of fertilizers, pesticides and farm implements were poor. Early estimates in the midst of the drought put multi-peril crop losses at close to \$1 billion. Fortunately, rescue rains in late summer helped alleviate dryness and losses were not nearly as high as the \$1 billion predicted. The Prairie crops and grasslands improved significantly through the mid- to late-summer period. Yet parts of Alberta and British Columbia struggled through prolonged dry conditions and had a disappointing harvest with poorer quality and much less production than recent years. Manitoba fared much better because rainfall was ample and timely. In the end, western producers found yields respectable and certainly a lot better than first expected, with the 2015 crop turning out to be near-average in both quality and quantity. Ever optimistic, farmers were happy to have at least seeded a crop that was worth harvesting.

#### **4. Maritime Snowmageddon**

Winter was slow to begin in the Maritimes. New Brunswick and Prince Edward Island had snow in November but by Christmas nary a speck lay on the ground. Christmas Day was soggy and foggy in Atlantic Canada; both record warm and record wet. By the last day of December, Halifax had recorded its least amount of snow ever – a paltry 7 cm versus a normal 62 cm. Instead, Halifax International Airport received its greatest rainfall on record in November and December – a two-month total of 482 mm – besting the previous record by 64 mm. Things changed in early January, though, as winter let loose. Snow came from several storms, often just a few days apart. By the end of January, Maritimers were simply fed up with countless nor'easters, weather bombs and humongous snowfalls. But the worst was yet to come! Atlantic Canada was continually battered through February and March with storm after storm, leaving behind snow amounts not seen in decades. There were at least seven “big storms” when a typical season featured two or three. Residents couldn't wait until spring, but even when it arrived winter just kept coming.

Among the more spectacular snowfall records:

- Halifax International Airport recorded a total snow accumulation from New Year's Day to May 23 of 371 cm (normal is 59 cm). The previous snowiest January-to-April period at any Halifax station, with records dating back to 1871, was 330 cm in 1972. Further, snow on the ground in Halifax on the last official day of winter was 93 cm. The previous record was 51 cm in 1967.
- Saint John shovelled out more than double its normal snowfall – 495 cm (normal is 240 cm) – making it the snowiest winter on record, with records dating back to 1871. Among the other records set at Saint John were: all-time snowiest month (February); greatest snow depth (218 cm); greatest number of 30+ cm snowfalls (5 versus a previous high of 2); and the greatest depth of snow on any spring day (169 cm).

- Moncton, one of Canada's snowiest cities, broke the five-metre level at 507 cm (normal is 325 cm). Over the course of 10 days at the end of January and beginning of February, Moncton faced four major storms that collectively dumped one and a half metres of snow. Taken together, January and February had 322 cm – the snowiest ever. Further, in 75 years there has never been a snowier four months from January 1 to April 30 with 440 cm falling.
- Charlottetown had the distinction of being the snowiest city in Canada this winter. A late April snowstorm brought a new record for the most snow in one winter – 551 cm – nearly twice the normal amount and 12 cm more than the previous record in 1971-72. February had a whopping 223 cm compared to a normal of 58 cm, including a humongous 87 cm dump from a two-day blizzard that started February 15. The previous monthly record was nearly 70 cm less. On the last full day of winter, Charlottetown had 159 cm of snow on the ground – the most ever for so late in the year.

Crews worked continuously, hauling away snow from streets, clearing bus stops and pushing back snowbanks to widen intersections. Travel delays were frequent and long. Heavy snow took a toll on municipal and provincial snow removal budgets. Scanty rain and twice the number of cold days kept nature and salt from melting anything. First responders took longer to arrive at scenes of emergency. At times, social service volunteers were unable to deliver hot meals and groceries or drive patients to appointments. The huge amount of snow brought risks of roof collapse and carbon monoxide poisoning. More weather-weary Maritimers looked to get away with bookings to sun destinations – double the previous year – while retailers, restaurants and take-out delivery venues took a hit. Any profits to be had were made by those selling roof rakes, shovels and snowblowers until inventories sold out. School closings or “snow days” numbered as many as 13 in some districts of New Brunswick. Deep snow was also a hardship on birds and other wildlife. Flocks of migratory birds returning from the south arrived to find snow hiding their food sources. One expert claimed he had never seen such starvation among wildlife. On a more positive note, snowmobilers and snow enthusiasts couldn't remember better conditions thanks to weekly dumps of “white gold”. You know it's a lot of snow when ski hills close! In New Brunswick and Prince Edward Island, it was possible to snowmobile the entire circumference of the province.

## **5. Record Hot Dry Summer across British Columbia**

Persistently warm Pacific waters and a large stationary upper ridge of high pressure off the west coast of North America delivered record-breaking warmth and sunny skies over British Columbia for much of 2015. Temperatures across the Pacific coast and southern interior of British Columbia ranked among the top three warmest winters, springs and summers in 68 years of weather recordings. The stalled high also kept the region shielded from any rains. In British Columbia, the warmest January to July on record meant planting was early and so was the harvest. Nurseries reported an exceptional year of early sales – one of the best in 30 years. Some u-pick farms opened at least three weeks ahead of schedule. The prolonged intensity of the spring and summer heat and the lack of rain concentrated the growing season. At one point, harvesting of strawberries, raspberries and blueberries overlapped. Berry farmers had to leave crops unpicked because a berry glut outstripped worker help and processing capacity. Corn also matured faster than expected. Even pumpkins were ready two months before Halloween.

Early into summer, temperatures climbed right across southern British Columbia, peaking at 30°C for the South coast and approaching 40°C in the Interior. Vancouver didn't break any one-day maxima in June, but the city got “oh so close” to breaking the record for the hottest month in 119 years. June 2015 averaged 17.9°C. The record was set in 1958, when the average temperature was 18°C. Further, the city's May-to-July average temperature was 17.5°C – the second warmest on record. On the other hand, the Okanagan had its record warmest May to July in over 100 years. During the last weekend of June, a whopping 64 same-day temperature records were broken across the province. Record warmth continued into August on the 12th and 13th with afternoon temperatures soaring to the high 30s and above 40°C.

An even bigger story was the lack of rain. In a normal year, Vancouver receives 154 mm of rain from May to July inclusive. In 2015, only 36 mm fell. At Victoria International Airport, the total rainfall from May 1 to August 31 was 34 mm, which is only 30 per cent of normal and the lowest rainfall total in history for the four-month period. A hot, dry spring and summer meant residents had to use more water for their lawns, gardens and other outdoor chores than in past years, putting pressure on water levels in reservoirs and potentially setting the stage for stringent water restrictions. British Columbia's heat wave also sparked worries about wildfires, fish habitats and human heat stress.

Low river flows and hot water combined to create lethal conditions for the annual sockeye migration. In the Pacific Ocean, the warmth led to a massive and harmful toxic algae bloom stretching from California to northern Vancouver Island – one of the largest ever recorded and massive enough to shut down elements of the seafood fishery. With fruit ripening early in the hot weather, there were more black bear sightings and attacks. And arborists worried that the prolonged drought would have lasting effects on trees. In late July, the long-awaited rains finally came. Across Vancouver Island and the Lower Mainland more rain fell in three days than the combined amount over three months, helping to reduce daily water consumption somewhat but not enough to replenish water in the region's dwindling reservoirs.

## 6. The Prairie's Stormy Summer

While most of the weather talk across the West in 2015 was about drought and wildfires, it was actually summer storms that cost more money and disrupted more lives. A total of 310 severe weather events, including tornadoes, heavy rainfalls, strong winds and hail, hit Alberta, Saskatchewan and Manitoba compared to an average of 234. Tornado occurrences were down – 8 in Manitoba (normal is 9), 7 in Alberta (normal is 11) and 2 in Saskatchewan (normal is 12) – while hail strikes were way up and accounted for 70 per cent of the severe weather occurrences. Some of the more significant and disruptive storms were as follows:

- On the May long weekend, a slow-moving storm out of Colorado made nastier by cold Arctic air, brought wind, rain, and a mix of snow, ice pellets and freezing rain to southeastern Saskatchewan and southern and central Manitoba. For Manitoba residents, it might have been the most miserable three days of weather ever experienced at that time of year. Instead of shorts and sandals it was toques and hot toddies. Most communities got a mix of heavy rain or heavy snow, with Melita getting the most rain at 90 mm and MacGregor the most snow at 15 cm. It was mostly rain in Winnipeg until 12 hours of snow and blowing snow in -9 wind chills hit early on the holiday Monday. Nasty weather caused sporadic power outages everywhere with thousands having to spend the Victoria Day weekend in the dark. Travel on highways and roads was often slippery and made more treacherous by whiteouts. For thousands of farmers, re-seeding was necessary when frost damaged early sprouts.
- A strong low-pressure system fed by warm humid air across southern regions of the three Prairie provinces triggered thunderstorms behind a trailing cold front in the afternoon and evening of June 12. The storm inflicted property damages across southern Alberta beginning at 10 a.m. and worsened as the storm intensified in the afternoon. Medicine Hat took the brunt of the storm around 3 p.m. with hail and wind damages. Storm cells popped up in Saskatchewan later in the day and into the evening, especially around Assiniboia and Weyburn. The active weather featured hail, wind gusts of 119 km/h, heavy rain and frequent lightning. Storms also raced through Manitoba by 8 p.m. Insured non-crop losses from the storms exceeded \$70 million.
- More losses from severe weather were incurred on successive days in July across extensive regions of southern and central Alberta and Saskatchewan totalling more than \$250 million from 25,000 insurance claims. The humidity-charged storms travelled across central Alberta on July 21 and 22. The highest observed wind gusts peaked at 154 km/h east of Calgary and south of Drumheller. A second supercell formed near Airdrie. Calgary got little rain but experienced wind-driven golf ball-sized hail. A twister touched down 10 km north of Priddis leaving downed trees, twisted hydro towers and a landscape littered with building debris carried by 110 km/h winds and flooding rains of 75 mm. The system then moved into Saskatchewan, where winds split trees, knocked down fences, and blew away backyard swings and trampolines. In Moose Jaw, the wind ripped the roof from a public school and knocked down power lines. But the storm saved its greatest punch for Kerrobert, where wind-propelled, baseball-sized hail and rainfall intensities of 300 mm/h left vehicles and every dwelling damaged. Outside of town, the storm brought down countless utility poles and trees and caused substantial crop damage.
- On July 27, a strong low-pressure system and associated cold front tracked northward from Montana into the eastern Prairies leaving 10,000 customers in Saskatchewan without power. In the evening, a large tornadic supercell developed just north of Pierson and tracked northward to Reston reaching Virden by 11 p.m. Weather experts determined the tornado was a high-end Enhanced Fujita Scale 2 (EF2) tornado with



wind speeds between 180 and 220 km/h, which caused a real stir among meteorologists in North America. On radar, it initially appeared to stay on the ground for two and a half to three hours, which would have made it the second longest-track tornado ever recorded in the world. It was later determined that the wedge-shaped tornado formed and dissipated several times over its three-hour lifetime. The storm inflicted extensive crop damage, tore off roofs, ripped up asphalt, toppled anchored grain bins, snapped trees and lifted cars off the ground. Although the track was long, damage was surprisingly light, with just a few farm outbuildings levelled between Tilston and Reston. Besides strong winds, the storm packed quarter-sized hail and up to 75 mm of rain.

- Storms on successive afternoons in August emanating from a slow-moving weather system and an unstable air mass terrified Calgary residents. On August 5, a severe thunderstorm formed west of Calgary and intensified as it moved through the northern and central parts of the city. A half-hour later a second weaker storm cell tracked through southern neighbourhoods pounding property with a steady burst of toonie- to golf ball-sized hail propelled by 75 km/h winds. Wind damage was extensive and heavy rains measuring between 80 and 90 mm over a one-hour period flooded roads and quickly filled downtown underpasses. Outside of Calgary, hail slashed crops near Standard and a tornado touched down northeast of Langdon. The next afternoon and evening were even worse when a powerful supercell thunderstorm delivered slashing hail with larger stones, stronger winds of 100 km/h and flooding rains. Calgary was under a thunderstorm warning almost continuously for seven hours. The storm extended beyond Calgary to Drumheller, Claresholm, Canmore and Vulcan. In Sunde and Olds, hail piled to a depth of 30 cm leaving vehicles unable to move. Near Foremost, an EF0 tornado with winds between 90 and 120 km/h touched down. All told, Calgary officials logged nearly 2,000 reports of downed trees and water-filled basements over the two-day, two-storm period. City crews took days to clean up the destruction, including splintered trees, broken windows, blocked sewers and missing roofs. Despite the damage, which was estimated at \$160 million across southern Alberta, no serious injuries were reported.
- On August 22, a strong low-pressure system from the Dakotas ushered in a series of severe thunderstorms once again into southern Manitoba with heavy rain, large hail and strong northwesterly winds. High heat and humidity helped fuel the storm. In Winnipeg, the noon-hour soaker had storm rainfall totals exceeding a month's worth of rain in a couple of hours. As much as 121 mm of rain sent floodwaters into a shopping centre and into buildings at the University of Manitoba. The city received 300 calls reporting downed trees, blocked catch basins and flooded basements. Other wet spots were Beaconia with 140 mm of rain, Selkirk 125 mm, Beausejour 92 mm and Steinbach 83 mm. Large damaging hailstones left holes in cottage walls and gazebo roofs, and cracked the windshields of many parked cars.

## 7. Super Bowl/Groundhog Day Storm

On Super Bowl Sunday (February 1), a major winter storm originating from Colorado tracked south of the Lower Great Lakes bringing widespread heavy and blowing snow to southern Ontario before pushing across Quebec and Atlantic Canada on Groundhog Day (February 2). For southern Ontario, it turned out to be the biggest storm of the winter with close to 40 cm of snow falling between Windsor and Hamilton, propelled by 75 km/h winds. The ensuing whiteouts caused dangerous driving conditions that left some Super Bowl partygoers hungry when pizza deliveries were put on hold for hours. The Monday morning commute was no picnic either, featuring multiple spinouts and collisions. Snow combined with high winds cut visibility to nil in many areas, leaving schools and colleges closed and numerous services – from transit to garbage pick-up – cancelled.

In Montreal, February 2 was a horrendous day with 14 hours of snow and blowing snow powered by wind gusts of 60 km/h in whiteout conditions and a dangerous wind chill of -36. The storm moved farther east, rejuvenated by warm ocean waters, before dumping more of its misery across the Maritimes. A day later it delivered plenty of winterish weather to Newfoundland and Labrador with all the elements of a nasty nor'easter, including strong winds, limited visibility and an assortment of messy precipitation that ended in a flash freeze.

Moncton and other parts of southeastern New Brunswick reported 45 cm of snow in eight hours of blizzard conditions and an additional 60 hours of blowing snow over four days. As the storm departed, residents were left with another massive clean-up in bitterly cold temperatures and deathly wind chills. It was also another "snow day" in what was becoming a record year for school closures. Of real concern, emergency vehicles were taking a lot

longer to navigate through narrowing and blocked streets. In Saint John, 126 cm of snow lay on the ground compared to an average of 20 cm, shattering the previous record for snow cover on that date – 78 cm in 1987. The weather prompted the city to declare a downtown parking ban and a local state of emergency, which was the first in 30 years. In Halifax and across mainland Nova Scotia, 20+ cm of snow fell along with a few millimetres of freezing rain. For Cape Breton Island, there was an equal mix of rain and snow, making conditions even messier. Across the province, the ensuing temperature drop of 18 degrees in six hours prompted a rare flash freeze, causing pooling water and slush to freeze rapidly, and further frustrating motorists who desperately tried to free their encrusted vehicles. Weather was less problematic in Charlottetown given it was all snow. Even still, the 64 cm that fell closed university and college campuses, libraries, daycare centres and stores, and forced the cancellation of several community events, countless flights and ferry services.

In western Newfoundland it went from windy and snowy on the morning of February 3 to calm and warm in the afternoon. Then, in a matter of minutes, the temperature at Corner Brook dropped 17 degrees in three hours. The wind picked up, rain became ice pellets and snow, and standing water turned into slush then ice leaving treacherous surfaces. The storm then moved on to the Labrador Sea late in the day.

## **8. British Columbia's Big August Blow**

After months of record temperatures, dryness and massive wildfires in British Columbia, a dramatic shift in the weather in late August brought welcomed rains and slightly cooler temperatures. But it came at a price. Winds that hit a peak of 117 km/h on Saturna Island, 98 km/h near Powell River, and over 80 km/h off Victoria and at Vancouver International Airport caught everyone off guard, including the 710,000 hydro customers who lost power when transmission lines were blown down. It was the largest single outage in BC Hydro's history and it left some residents in Surrey and Coquitlam without power and telephone service for three days.

Reminiscent of the "Stanley Park" storm a decade ago, and more typical of a storm in October or November, the large, rapidly intensifying low crossed the southwest coast on August 29, tapping into some leftover moisture from Tropical Storm Kilo, which had brushed Hawaii days earlier. Powerful winds felled trees crushing 4,000 cars, knocked over fences, and littered roads and yards with trees, glass and building debris. In the downtown, winds smashed windows and ripped away building facades. The surprise windstorm yanked massive trees right out of the ground – many weakened by the summer's drought – leaving full-leafed trees easy prey and toppling groves seeded two centuries ago. Sadly, uprooted trees in the urban forest are a permanent loss. Some were split by the storm, leaving branches hanging, while others leaned on houses and power lines. Many public facilities and services, including Stanley Park, the Pacific National Exhibition, the SkyTrain and ferry terminals were briefly closed because of high winds and power outages. The vicious storm forced the closure of countless roads and silenced cellular phones, land lines, the Internet and emergency response communications. Hundreds of workers toiled 16-hour shifts over four days to clean up and restore services. Rainfall amounts were less than forecasted but nevertheless beneficial to homeowners, firefighters, farmers and water managers, totalling 100 mm at Port Mellon and Squamish, and 80 mm in West Vancouver. In total, insurers estimated property losses at a minimum of \$28 million.

## **9. Maritime's Valentine Storm ... A White Juan-a-be**

A hard-hitting nor'easter charged the Maritimes on Valentine weekend, forcing the cancellation of everything from church services and flights south to festivals celebrating winter. By storm's end, parts of New Brunswick had received another 45 cm of snow and Prince Edward Island a whopping 80 cm. Even winter-hardened Maritimers had had enough and struggled to deal with yet another blast.

Like so many storms that winter, the disturbance intensified over the Gulf of Maine and grew stronger as it reached the Maritimes. Twin low-pressure systems – one from the Great Lakes and another from the eastern seaboard – merged off the East coast into a classic nor'easter. Heavy snow, blowing snow and high winds accompanied the hybrid system, which was followed by a sharp drop in temperatures. The thermometer dipped to -18°C with a wind chill of -31 leading to icy conditions. Environment Canada also warned of a one-metre storm surge with ramparts of ice along New Brunswick's eastern coast leading to flooding and damage to coastal infrastructure.

Heavy snow that was blowing and drifting made travel treacherous to impossible. Whiteout conditions were so severe that snowplow operators and police were ordered off the streets. On Prince Edward Island, officials cancelled Family Day activities asking everyone to stay home. At Halifax Stanfield International Airport, the majority of flights were cancelled or delayed. No planes lifted off at airports in Moncton and Charlottetown.

Several Maritimers couldn't resist comparing the Valentine storm with the infamous White Juan blizzard 11 years earlier. By some accounts, the Valentine weekend storm was worse and certainly much longer. Whether a white Juan-a-be or a Valentine "massacre", it was another major snowstorm in a winter without end.

| <b>Charlottetown Airport</b>   | White Juan | Valentine Weekend Storm |
|--------------------------------|------------|-------------------------|
| Storm total snow (cm)          | 77         | 87                      |
| Peak wind gust (km/h)          | 104        | 128                     |
| Hours of blowing snow          | 104        | 128                     |
| Snow on ground post-storm (cm) | 112        | 117                     |
| Maximum wind chill             | -16        | -30                     |

| <b>Halifax Int. Airport</b>    | White Juan | Valentine Weekend Storm |
|--------------------------------|------------|-------------------------|
| Storm total snow (cm)          | 67         | 30                      |
| Peak wind gust (km/h)          | 75         | 82                      |
| Hours of blowing snow          | 21         | 43                      |
| Snow on ground post-storm (cm) | 75         | 72                      |
| Maximum wind chill             | -17        | -27                     |

## 10. January in July for St. John's

A year ago July, St. John's registered its hottest month on record; a year later it was one of the coldest! The average afternoon temperature was 15.8°C, which was a new record low from observations dating back to 1942 and an unbelievable 10 degrees less than the year before. July's warmest temperature was 25.3°C on the 3rd. Last year, 18 days were warmer. Throughout July, residents shivered and cursed the unprecedented chill, especially early in the month when the temperature at the North Pole actually surpassed that in St. John's. At month's end, the average temperature was 12.2°C, which ranked second lowest behind 1962. Adding to the misery, only 7 of the first 40 days of summer were dry (normal is 22). The city's total July rainfall of 181 mm made it the second wettest on record, eclipsed only in 1946 when 189 mm fell. The weather leading to July wasn't much better. For May, June and July, only 13 days had maximum temperatures exceeding 20°C (normal is 29 days), and between April 1 and July 31 there were only 28 dry days (normal is 60).

My colleague Rodney Barney of the Gander Weather Office provided some additional statistics to illustrate St. John's January in July weather:

- Cold temperatures seemed to favour Saturdays and Sundays. The average high on weekends was 2.5°C colder than what was already a record-breaking low for weekdays. Only five days reached 20°C and none of those were on weekends.
- For the last two weeks, the temperature never got to 20°C. That made for the third-longest streak of days below 20°C in any July since records began at the airport in 1942.
- It was colder than a normal September! Only once before was September warmer than July. As it turned out, September's average high was more than two degrees warmer than July's and it had over double the number of warm days above 20°C.
- There were only 23 hours when the temperature was at or exceeded 20°C versus 2014's 353 hours.

The prevailing winds in July were north and northeast, coming off Atlantic waters that were two to four degrees cooler than normal. A blocking high over Greenland kept weather systems circulating cool marine air into the

province. Mercifully, that blocking high finally broke down in August, which returned the circulation to neutral and allowed southerly winds to pump summer warmth northward.

Most townies seemed to give up when Environment Canada issued frost advisories on July 26. Residents just wrote off summer and began booking trips elsewhere. The lack of heat adversely affected outdoor businesses. Ice cream shops, bars and greenhouses struggled with the effects of cold, dark and wet weather. Only cold weather crops like lettuce and broccoli thrived, while the rest were delayed two weeks. In spite of July's misery, Newfoundlanders never lost their sense of humour. The Royal Newfoundland Constabulary conducted tongue-in-cheek arrests of two Newfoundland television weather personalities for "trafficking in rain, drizzle and fog."

Ironically, in early August, summer came calling with enough heat and humidity to be a health risk. Humidex values approached 35, a figure not often felt in Newfoundland and Labrador. The temperature on August 2 soared to 27.1°C – the first day over 20°C in St. John's in more than two weeks! In fact, the month featured an impressive run with 24 of 30 days above 20°C and 11 days at 25°C or warmer. August was also drier with only 49 mm of precipitation; there were 15 rain-free days and 22 days with less than 1 mm of precipitation. From the coldest July on record to the fourth warmest August and a top 10 finish for warmth in September, combined with going from one of the wettest Julys on record to one of the driest Augusts, nothing about St. John's summer weather was predictable in 2015.

## Runner-up Stories

1. A "Hurricane" with Snow
2. A No-Snow Winter in British Columbia
3. Ides of March Storm
4. Flooding in New Brunswick
5. Ontario and Quebec ... Dry then Wet
6. Ice – the Thick and Thin of It
7. Eastern Nunavut's Miserable July
8. Triple Storms Ruin British Columbia's Thanksgiving Weekend
9. Hurricanes – Quiet in the Atlantic, Active in the Pacific
10. Super El Niño Postpones Winter

### 1. A "Hurricane" with Snow

On January 27 and 28, a massive storm from the eastern United States blasted Atlantic Canada with snow, rain, freezing rain, wicked winds and a coastal storm surge. It was the season's first "big one", although residents were still digging out or mopping up from a storm three days earlier. It followed a similar track to the previous storm but moved much slower, which gave it more time to spread its payload of freezing rain, snow and high winds. Even before the first snowflakes fell, utility companies brought in electrical contractors from Quebec in preparation for power outages. The majority of flights were cancelled the day before and ferry crossings were either cancelled or delayed before the first blows. On arrival, the intense nor'easter brought hours of blizzard conditions and near-zero visibilities across the Maritimes and the Gulf of St. Lawrence before moving into Newfoundland and Labrador late on the 28th. Snowfall totals included 59 cm at Moncton and 51 cm at Saint John. Strong winds were also a factor, with peak wind gusts of 117 km/h in Moncton, 154 km/h at Wreckhouse, and above 140 km/h at St. Anthony and Sagona Island.

The tempest wrapped much of the Maritimes in a fierce icy grip, leaving many residents and travellers hunkered down to wait it out. Many streets were quickly covered in snow that fell over a challenging layer of ice beneath. Blowing and drifting snow paralyzed vehicular transportation, forcing buses and taxis off the roads and prompting a no-travel advisory for all of southern New Brunswick. The fierce storm shuttered up dozens of communities, closing schools, ice rinks, government offices, stores and restaurants. A few gas stations and mini-marts remained open, but only those with power. So crippling was the storm that mail and garbage services were suspended throughout the region. Even Canadian Red Cross offices closed with only disaster personnel remaining on standby. Some winter

resorts called it the “million-dollar storm”, although few could open while howling winds prevented snow enthusiasts from heading for the hills.

## **2. A No-Snow Winter in British Columbia**

Globally, winter 2014-2015 was the warmest spanning 135 years of records. Residents in British Columbia called it the year without winter. Along the Pacific coast and in the British Columbia interior, December 2014 to February 2015 inclusive was the warmest winter on record for the province in 68 years of observations – a whopping 3.1°C warmer than normal. Instead of the typical Polar Vortex and Arctic Outflows one would expect, the winter featured a warm Pineapple Express and Pacific blobs that kept the cold and snow away and sea-surface waters off British Columbia a consistent two to three degrees above normal.

At Victoria Gonzales Heights, where record-keeping goes back 116 years, average temperatures for both February 2015 (8.9°C) and the winter of 2014-15 (7.6°C) were by far the warmest ever. After New Year’s Day, there were no days in January and February below freezing. It was so mild in Victoria that no measurable snow fell at the airport. Typically, Victoria gets 30 cm of snow from December through February, but this year all precipitation fell as warm rain. Vancouver had a meagre 2 cm of snow in November 2014, but it vanished the next day never to return.

Although the winter seemed drier than usual, rain levels were normal but fell in larger downpours rather than day-after-day drizzles. With British Columbia in perpetual spring between November and March, mountain range snowpack depths were some of the lowest ever seen, causing concern for food producers, fishers and forest fire crews. Of course, the mild temperatures, strong winds and heavy downpours meant a huge disappointment for snow enthusiasts. Nearly all ski resorts in the far west either partially closed or shut down their operations completely by mid-February. In the middle of a winter that resembled spring, with mud and rock exposed, zip-line trails replaced snow tracks and hikers vastly outnumbered skiers. At sea level, sun lovers crowded seawalls and filled sidewalk cafés. Eager gardeners emptied garden centres of stock early on. And with plums and cherries in full bloom by February, it was no surprise that spring allergies from tree and grass pollen kicked in earlier than usual.

## **3. Ides of March Storm**

With spring just days away, winter-weary Maritimers battled yet another dirty, nasty storm on March 15. The all-day snowfall whipped by high winds choked city streets and made driving along highways treacherous. The storm formed near Cape Cod on March 14 and strengthened as it tracked south of Nova Scotia the next day before moving eastward towards Newfoundland and Labrador. Heavy, blowing and drifting snow, and high winds gusting to 80 km/h propelled the blizzard in near-zero visibility. Among the snowfall/peak wind gust combinations were: Charlottetown (48 cm / 87 km/h); Sydney (59 cm / 82 km/h); and St. John’s (48 cm / 85 km/h).

The conditions were so bad that organizers of the annual St. Patrick’s Day parade in Halifax cancelled the event because downtown streets were choked with too much ice and snow. Floats just wouldn’t be able to manoeuvre through the narrow streets. Several church services were also cancelled, as was an annual Irish concert in Sydney. In spite of the snow, many local pubs and restaurants went ahead with St. Patrick’s Day reveling to standing-room-only crowds. Many may have walked to the festivities given most motorists and pedestrians heeded police warnings and stayed home. For those who took transit, the trip may have been extended as some services took “pauses” from the blowing snow. Just prior to that, on the 15th, the Confederation Bridge linking New Brunswick and Prince Edward Island was closed to all traffic. Blowing snow was especially challenging for exhausted crews clearing streets and those mending water main breaks and fire hydrants. Several stores, businesses and agencies simply did not open. Schools and colleges closed again and health services cancelled all appointments. Power outages occurred in all provinces but were surprisingly few and scattered. In some wide-span buildings, creaking roofs and bending beams prompted worker evacuations. Even some ski hills closed – not so much from the snow dump as from wickedly high winds.

## **4. Flooding in New Brunswick**

With record snows across parts of southern New Brunswick, the possibility of overland flooding and filled basements was a real concern. By mid-April, most regions were bathed in double-digit, twice-the-norm spring

temperatures. Concerns became warranted in the flood-vulnerable community of Perth-Andover, which sits along the banks of the St. John River when a massive ice jam on April 18 forced the evacuation of 300 people. Schools within the area were closed and patients at the local hospital were evacuated as a precaution. Fortunately, the ice jam gave way the next day, dropping water levels half a metre and easing fears of major flooding. Elsewhere, ice movement along the Saint John, Nashwaak and Tobique rivers raised the potential for ice jamming. Adding to the flood concern, the ground – already near saturation – had little room to absorb more rain or melt water. In late April, with the occurrence of “maple syrup” weather (warm days and cool nights), a slow steady melt ensued. Combined with less rain than forecasted, it brought much relief when river levels began falling. Rains that did fall actually helped by breaking up the ice jams. In late April, water levels along the St. John River began to stabilize with only minor increases after May 1.

At the end of September, worries of flooding resurfaced when a major storm stalled over Nova Scotia yielding tropical storm-sized rainfalls of 175 mm across New Brunswick. More than a month’s worth of rain fell in five hours flooding roads, closing schools and forcing people from their homes. Fredericton recorded a whopping 128 mm of rain on September 30, the second heaviest single-day deluge in the city’s history with records dating back to 1871. In the community of Hoyt, sections of roads and culverts disappeared and brooks ran wide damaging bridges. Repairs on New Brunswick highways alone exceeded \$15 million.

## 5. Ontario and Quebec ...Dry then Wet

Parts of southern and eastern Ontario were on track to have the driest spring on record. Through March, April and until the last two days of May, near-record low precipitation amounts gave the landscape a bone-dry, cracked look. For homeowners that meant hauling out sprinklers to water lawns and gardens in a month typically known for April showers. Water-starved trees began shedding their leaves and at the Royal Botanical Gardens, emergency watering had to be done on Earth Day. Hamilton had a record low 90 mm of spring rains up to May 29 when the average is more than 215 mm.

Following the scarcity of rains, skies opened up across the region on May 30 and continued to soak the south through June with more than enough rain for the entire summer. It rained hard and often – leaving sprouting plants standing in water and fields waterlogged. Some localities received two to three times the normal monthly rainfall. The contrast between dry and wet was stark. Over 37 days, between April 23 and May 29, Kitchener-Waterloo-Guelph received a paltry 4.5 mm of rain on four days. Then, over the next month, they got 215 mm. It was even wetter in the southwest. Over the same period, Windsor recorded 274 mm. The city has never seen a wetter 30 days. From May 29 to June 28, Windsor had 22 wet days including 9 in a row, 6 with 25 mm or more, and record daily amounts of 63 mm, 55 mm and 36 mm of rain. Unusual for summer, on some days it rained non-stop. Total May and June rainfall was 351 mm; the previous record total was 290 mm in 1968.

It was too wet for farmers to get machinery onto their fields for seeding or replanting. One Essex grower said it was the worst spring for planting he’d seen in 25 years and the numbers proved it. By the end of June, water was standing knee-high with acres of soybeans and tomatoes completely submerged. An estimated 40 per cent of the corn and soybean crop either didn’t get planted or needed replanting. In rural areas, floodwaters overtopped roads and wave action led to some property erosion. At times, heavy rain sent untreated sewage into the Great Lakes and closed countless beaches to swimmers. Frequent rains also led to the cancellation of several summer events or forced them to move indoors. And while it was not too wet for fish, it was too wet *to* fish when a popular fishing derby at Long Point was cancelled for the first time ever.

Other notable wet weather facts:

- In Peterborough, there were 19 wet days between May 30 and July 1 for a total of 199.3 mm (234 per cent of normal).
- London had 213 mm of rain (237 per cent of normal) between May 30 and June 30.
- In Toronto, the last three weeks of June were seven times wetter than the previous five weeks. While June rainfall in downtown Toronto was not a record, it was the wettest since 1870 and the second wettest since observations began there in 1840.
- In Kingston, it was the second wettest June since 1872.

In Quebec, late May and June were also soggy although rainfall amounts were not as spectacular as in Ontario. Nevertheless, Sherbrooke recorded 240 mm of rain over 37 days, 80 per cent more than normal and one of the wettest such periods on record.

## **6. Ice – The Thick and Thin of It**

### **Atlantic Coast and the Great Lakes**

Early on in one of the coldest winters in decades, sea ice in Atlantic Canada started blocking shipping lanes and worsened as the long, hard winter progressed. The effects on fishing and transportation are usually not evident until late March or early April; this year the ice became concentrated in early February and had an impact until May. At times, ice pans ranged between one-half and one metre in thickness, with widths of 500 to 2,000 metres. Officials with Marine Atlantic requested help from Coast Guard icebreakers to keep ferries moving on their daily runs between Port aux Basques and North Sydney, with delays reaching six hours or more. By March 23, eight icebreakers were working in the Atlantic region and at times even these powerful vessels had a difficult time navigating the ice. For fishers the news was particularly bad when a lack of ice-breaking winds from the west and southwest and a prevalence of easterlies that kept the ice inshore, adversely affecting the spring crab, oyster, and lobster and scallop fisheries. Some said it was the worst ice and snow conditions they had ever seen.

The St. Lawrence Seaway delayed its opening almost a week – from March 27 until April 2, which was the first time it has opened so late since 1997. Several winter storms in February, accompanied by strong winds and record cold, led to the rapid growth of thick ice. Like last year, Great Lakes ice coverage was extensive but nowhere near the thickness of 2014.

### **Arctic Ocean**

According to the National Snow and Ice Data Center (NSIDC) in the United States, April 2015 saw the second lowest Arctic ice extent in the history of satellite recordings back to 1981. Sea ice averaged 14 million square km, but it was thicker than in recent years, particularly off Greenland and around Canada's Arctic islands where winter temperatures were the coldest since 2000. Arctic sea ice typically reaches its minimum in mid- to late-September following the summer melt season. According to the NSIDC, Arctic sea ice fell to the fourth-lowest level on record, with all four years since 2007, continuing its decades-long decline. At its minimum extent on September 11, four days earlier than average, the ice extent in the Arctic Ocean measured 4.41 million square km. It also appeared that both the Northwest Passage and the Northern Sea Route opened up again simultaneously, a previously rare but now more frequent occurrence. The Arctic region is warming at two to three times the global average – a trend that has helped sea ice in the region decline about 40 per cent since the late 1970s. Further, the once solid sheet of multi-year ice is now fragmented into smaller floes that are more exposed to warm ocean waters and strong winds.

## **7. Eastern Nunavut's Miserable July**

The first half of summer in Iqaluit was cold, wet and dreary. Fog was excessive and snow-covered sea ice clogged the harbour well beyond July 1. On July 13, temperatures finally tipped to double-digits – which was something to celebrate – but it was short-lived. An average summer in Iqaluit has 27 days at 10°C or higher, but 2015 experienced only 4 such days. In fact, the maximum temperature in Iqaluit in the first 25 days of summer averaged 5.6°C (normal is 9.6°C). Not only was the weather cool, it was wet too. Over those 25 days, it rained on all but 2 of them with 101 mm falling in total. The norm for that period is 36 mm and 10 days. Summer storms in 2015 were excruciatingly slow-moving, resulting in an unending period of wet weather; not drenching rain days, but slower, relentless “water torture” days.

Endless rain and fog delayed flights in and out of Iqaluit, Cape Dorset, Pangnirtung and other communities, stranding many travellers. The lingering fog and thick ice caused major delays in food shipments, barring store shelves. Cargo planes could not bring in perishable goods for a week or more because of fog. At the same time, prevailing southeasterly winds kept thick ice fastened in Frobisher Bay, preventing supply ships from docking and delaying hunters and fishermen from getting their boats in the water. Ice persistence also allowed polar bears to

wander into town. After weeks of delay, favourable ice and weather conditions finally gave way mid-month, allowing a Canadian Coast Guard icebreaker to carve a path to Iqaluit's shore for the season's first supply ships.

## **8. Triple Storms Ruin British Columbia's Thanksgiving Weekend**

A succession of post-tropical storms that developed from the remnants of Hurricane Oho slammed into British Columbia's North and Central coasts spoiling the Thanksgiving weekend for thousands of residents. While winds and rains were less than expected, the blustery wet weather lashed the province for five days. At its worst, wind gusts blew at 175 km/h. Kitimat was clearly the rain target with nearly 250 mm, while most other locations got rain over several hours totalling between 75 and 110 mm. The storm hit hardest between Haida Gwaii and Prince Rupert with sustained winds of 80 to 100 km/h. Central coastal regions experienced over 150 mm of rain with even more in adjacent mountain regions with the potential for localized flooding, debris flows and landslides. The province's River Forecast Centre issued a high streamflow advisory for the North and Central coast. High waves were also a threat in the Hecate Strait with peak heights of 14 metres. Vancouver and Victoria were on the southern edge of the system, with stormy weather that featured more hours of fog than rain. BC Hydro reported a few power outages across the Lower Mainland and Sunshine Coast but too few to disrupt Thanksgiving turkey dinners.

## **9. Hurricanes – Quiet in the Atlantic, Active in the Pacific**

The Atlantic hurricane season was fairly quiet and uneventful with 11 named storms that included four hurricanes (Danny, Fred, Joaquin and Kate). Hurricane forecasters explained that the inactivity was due to the presence of a strong, intensifying El Niño in the equatorial Pacific. The storm-disrupting El Niño makes it difficult for tropical storms to form and strengthen in the Atlantic Ocean and Caribbean Sea because of added vertical wind shear, stronger sinking motion and drier air. Tropical storms Claudette and Henri moved into or near Canadian waters on July 14 and September 1, respectively, bringing gale- to storm-force winds, heavy downpours and a rough surf with three- to five-metre waves to parts of Nova Scotia and Newfoundland and Labrador. While storm impacts from Atlantic systems were minimal in 2015, El Niño worked as expected in the eastern and central Pacific where it encouraged a very active hurricane season with record numbers of both storms and high-intensity storms.

Surprisingly, remnants of Pacific storms had a much greater impacts on Canada than their Atlantic counterparts. On August 29, an early "fall" storm crossed the southwest coast of British Columbia, tapping fuel from Tropical Storm Kilo, which had brushed Hawaii days earlier. Powerful winds felled thousands of trees and knocked out power for over 700,000 customers. On Thanksgiving weekend, a series of post-tropical storms that developed from the remnants of Hurricane Oho slammed into the north and central British Columbia coasts. But it was the remnants of Hurricane Patricia that had the most far-reaching impact. Hurricane Patricia was the most intense tropical cyclone ever recorded in the Western Hemisphere and came ashore on Mexico's west coast on October 23, bringing with it blustery wet weather that reached southern Ontario, eastern Quebec and New Brunswick a week later. The storm drenched parts of the East with between 40 and 60 mm of rain. High winds with gusts as high as 100 km/h blew along the shores of Lakes Erie and Ontario and across the St. Lawrence. Winds, along with strong autumnal tides, caused localized coastal flooding, especially in the city of Percé when the promenade along the shore was destroyed by the heavy surf. The water also took out a dock in Sept-Îles.

## **10. Super El Niño Postpones Winter**

Almost on cue, warm Pacific breezes waffled across North America during November and December delaying any hint of winter for much of the continent. Up to Christmas Day, especially in Eastern Canada, many cities recorded both their warmest temperatures and lowest snowfalls on record for the last two months of the year (see following Table). Dry and mild air originating from the Pacific streamed across the Prairie provinces, through Ontario and Quebec, and on to the Atlantic coast. Combined with abundant sunshine and little to no snow cover, maximum temperatures soared to record levels at dozens of places on more than one occasion. On the Prairies, farmers used the unseasonable warmth to complete their harvest – a sharp contrast to the previous year when -30°C temperatures and -40 wind chills prevailed. On December 4, afternoon temperatures in Morden rose to an unbelievable 14.1°C making it the warmest spot in all of Canada. In Ontario, traditional winter cities such as North Bay and Sault Ste. Marie set records for their highest November/December average temperature, smashing the previous high from 2001. At Sioux Lookout, record rains fell in November while in Geraldton they had the least amount of snow for a



November since records began in 1981 when only 13.2 cm fell. Until winter arrives in the north, it's not going to come to the south. Montreal typified the unusually warm dry start to winter in the East with only six all-freezing days in November and December compared to a normal 21.

The unseasonal weather had a wide-ranging impact. Skiers and snowmobilers were cursing the warmth, as were ice wine producers in Quebec and Ontario who saw their meagre grapes turn into a feast for the birds. Efforts to create outdoor skating rinks were also thwarted, including refrigerated rinks that just couldn't handle the unseasonable warmth. In Ottawa there are more than 250 natural outdoor rinks, yet not a single one was open until after Christmas. For some charities, the unseasonal weather put a damper on holiday campaigns as less people tend to feel that giving spirit in less festive surroundings. In fact, residents of "guaranteed white Christmas" cities such as Regina, Saskatoon, Sault Ste. Marie, Sudbury and Quebec were shocked when Christmas Day came and went without measureable snow on the ground. Even those in Yellowknife were surprised as the city experienced not a single day below -30°C (normal is 10) up to Christmas Day. On the flip side, municipalities and provincial governments were happy with the absence of snow because it helped reduce budgetary deficits from previous winter snowfalls. Poor Mother Nature was caught somewhere in between. The unseasonable warmth produced a surge of ladybugs that invaded homes and buildings, enabled squirrels and raccoons to fatten up, and delayed bear hibernation and bird migration. It also meant low snow loads that made it easier for deer, elk and moose to forage for food.

Anyone searching for a reason for the unseasonal weather didn't need to look far. If it looks and feels like El Niño, then it probably is. The prevailing circulation of westerly and southerly mild air kept afternoon temperatures in the double digits long after early to mid-fall. Adding to the tropical nature of the air mass was the occurrence of thunder and lightning on several occasions.

**November 1 to December 22 Average Temperatures (°C) and Lowest Snowfalls (cm) for Selected Cities  
Normal in brackets [ ]. Previous record with year follows 2015 figures.**

|          |             |            |             |              |
|----------|-------------|------------|-------------|--------------|
| Toronto  | 5.3°C [0.8] | 4.4°C/2001 | 0.8 cm [33] | 1.6 cm /2006 |
| Ottawa   | 3.1 [-2.4]  | 1.5/2001   | 0.6 [76.4]  | 23.2/1982    |
| Montreal | 3.5 [-1.7]  | 2.1/2001   | 3.4 [70]    | 11.3/1979    |
| Halifax  | 3.6 [0.6]   | 3.4/1953   | 12.4 [62.5] | 7.0/2014     |

## Atlantic – Regional Highlights

### Fine Line Between Rain and Snow

A series of low-pressure systems featuring ample rain and snow affected Newfoundland on February 5 and 6. Total storm snowfalls exceeded 50 cm in Stephenville and Deer Lake and 70 cm at Cow Head. On the warmer side, Burgeo got 63 mm of rain. Wind gusts blew in Gander, St. John's and Placentia at over 112 km/h. Over southeastern Labrador, northeasterly winds intensified and drove falling snow into blowing and drifting snow before changing to rain.

### Another Winter Blast in St. John's

A week later another fast-moving weather system tracked across the Avalon Peninsula of Newfoundland and Labrador packing with it 45 cm of snow and 90 to 130 km/h winds in a classic nor'easter blizzard. There were countless flight cancellations, closures of school and government offices, suspended mail delivery and city buses pulled from the streets in St. John's.

### Air Canada Crash in Halifax

A Halifax-bound Air Canada flight from Toronto, carrying 133 passengers and five crew members, crashed-landed hard and bounced off the snow-covered main runway at Halifax International Airport shortly after midnight on March 29. Earlier in the evening, snow was falling heavily and drifting, visibility was poor and wind gusts exceeded 100 km/h. On touching down 70 metres before the runway, the Airbus A320 bounced and slid for more than 600 metres before coming to rest at the side of the runway. Passengers huddled together for about an hour in biting cold with a -15 wind chill and 25 were transported to hospital.

## **Flooding in Newfoundland**

A series of stationary upper lows off the Grand Banks brought periods of heavy rain (75 mm) to parts of central and northeastern Newfoundland on April 28 and 29. The copious amounts of rain combined with a late-season snowpack and still-frozen ground to trigger localized flooding. In Springdale and Hare Bay, rising waters covered main roads and washed out road shoulders.

## **Flash Flooding in Fredericton**

Severe thunderstorms rolled through Fredericton on May 28, knocking out power to thousands of customers. Inside one hour, wind gusts blew at 82 km/h, rain exceeded 40 mm and hundreds of lightning flashes struck. The powerful storm toppled trees, snapped branches and took down traffic lights, while rushing waters popped manhole covers and flooded streets.

## **August Flash Floods**

Hours of heavy rain generated serious flooding and washouts across Nova Scotia on August 9. The heaviest rainfall occurred in Port Hawkesbury and Cape Breton Island, where 106 mm fell in rates of 10 mm/h. The next day the storm struck Newfoundland and Labrador with strong southwesterly winds and abundant rains. Deer Lake got 40 mm, while Burgeo got soaked with 110 mm.

Two weeks later, more flash flooding occurred when a wicked storm laced with 110 mm of rain and thousands of lightning strikes hit Cape Breton Island and Prince Edward Island. The Chéticamp River rose 1.6 m in five hours forcing the evacuation of 250 people from a campground. Four days later, thunderstorms combined with a sopping wet atmosphere unloaded 50 to 100 mm of rain in a few hours around the Bay of Fundy and Prince Edward Island, leading to street flooding and bubbling storm sewers.

## **Atlantic Heat Wave**

In mid-August, torrid 33°C temperatures and a sultry humidex in the high 30s prevailed for almost a week across parts of the Maritimes. It was even too warm for lobsters. Fishers took extra measures to keep their catches fresh with lots of ice. Restrictions were placed on salmon fishing in parts of the Miramichi River because of hot waters and low water levels.

## **Late Summer Heat**

Near the end of summer, several high temperature records were eclipsed across the Maritimes between September 17 and 19. Summerside hit 28.7°C on the 17th, beating the old 1999 record by more than two degrees. Several New Brunswick stations also broke heat records, including Moncton which topped 29°C but felt like 36 with the humidex. No one in Canada was hotter on September 17 than Miramichi at 30.4°C.

## **Winter's First Arrival**

A series of weather systems during the first week of December brought a mix of precipitation to Atlantic Canada. Wet sticky snow froze to tree branches and powerlines. With high winds, thousands of customers lost power prompting authorities to call in reinforcements. Blowing snow reduced visibility forcing schools and businesses to

close and creating treacherous driving conditions. Among the heavy snow spots were Nappan at 24 cm, Charlottetown 27 cm, Fredericton 22 cm and St. John's record 30 cm, along with 94 km/h winds at Cape Race.

## **Quebec – Regional Highlights**

(Adapted from MSC-QC Media Bulletins prepared by André Cantin and Simon Legault)

### **Post-Holiday Weather Misery**

They year began with a rough start in Quebec, which suffered through a major freezing rain storm around January 4. Blackouts in Montreal and across the province impacted 150,000 households, mostly the result of winds of up to 80 km/h combined with an ice build-up on tree branches and power lines that caused breakages. Freezing rain of 10 to 20 mm fell after 15 to 30 cm of snow, leaving some Quebecers digging and chipping away for the better part of three days. Drivers and pedestrians faced treacherous black surfaces, and hospitals experienced more ER visits for wrist and ankle injuries due to falls.

### **Spring Storm Brings Rain, Snow and Thunder**

On April 10, a major spring storm moved across Quebec bringing a variety of precipitation. North of the St. Lawrence River, including Québec City, 20 to 35 mm of rain fell while regions farther north experienced the freezing variety. Still farther north in Abitibi, the North Shore and Gaspé, 5 to 20 cm of snow fell. Strong winds approaching 80 km/h also blew between Montreal and Québec City. On the heels of the spring storm came summer's first warmth and sounds of thunder south of the Gatineau region and as far as the Eastern Townships.

### **Lines of Thunderstorms**

Hot humid air prevailed across southern Quebec at the end of May until an approaching cold front coupled with unstable air produced lines of thunderstorms stretching from the Outaouais to Rimouski. The storm clouds yielded as much as 60 mm of rain at Fôret-Montmorency, while Sherbrooke got hit with 53 mm in two thunder cells on May 30 and 31. Wind gusts of between 75 and 80 km/h buffeted Lac Saint-Pierre, Varennes, Rimouski and Île du Bic.

### **Stormy Last Half of July**

At the end of the third week of July, hot humid air and an undercutting cold front produced some nasty weather across southern Quebec. Between July 19 and 22, thunderstorms generated heavy rain, hail and strong gusty winds. Blows in excess of 70 km/h broke several trees in the Eastern Townships. Near Rivière-du-Loup, 75 mm of rain led to some river flooding and the evacuation of 40 homes. Similar atmospheric conditions prevailed during the last week of July, with rotation and funnel clouds adding to the interesting weather. At Gaspé a barrage of hail 3 cm in diameter damaged several vehicles, in Rouyn-Noranda wind gusts of 80 km/h scattered debris and in Drummondville heavy rains led to flooded streets. Between Saint-Césaire and Saint-Paul-d'Abbotsford, hailstones the size of golf balls whipped by wind gusts of 105 km/h shredded leaves and brought down branches, trees and hydro lines. In Montreal, there were numerous power outages, along with an unfortunate incident when lightning struck a cyclist in the side of the head as he stood with his bicycle under a tree near the city's Botanical Gardens.

### **More Hail and Flooding Rains**

Once again a line of severe thunderstorms feeding off warm, humid air in an unstable atmosphere, raced through southeastern Quebec on August 3. Wind gusts in the 80 to 100 km/h range uprooted trees or broke branches, triggering several power outages. Hail up to 3 cm in diameter fell between Stanstead and Coaticook punching holes and denting more than 2,000 cars. Heavy rains fell in downtown Trois-Rivières with as much as 40 mm in 30 minutes causing significant flooding.

### **Summer Heat Wave**

The first real heat wave of the summer in Quebec came in the middle of August. The southern part of the province recorded five days with temperatures at or above 30°C. Even Gaspésie and Magdalen Islands had their hottest dog days of summer during that time.

### **Expensive Flooding in Charlevoix**

On August 24, Petite Rivière St-François in Charlevoix received an infusion of more than 100 mm of rain in less than two hours. The heavy downpours flooded homes and inflicted more than \$1 million in damages.

### **Labour Day Storm**

Lines of thunderstorms developed late on a warm humid day on September 7 over southern and central Quebec. Among sites setting new warm temperature records were Rouyn, Gatineau and Gaspé. When a cold front moved in it triggered a thunderstorm yielding 30 to 50 mm of rain and whipping winds between 80 and 110 km/h that left more than 23,000 Hydro-Québec customers without power. The hardest hit areas were the Laurentians, Centre du Québec and Thetford Mines.

### **November Storm**

On November 6, a vigorous cold front swept across Quebec from west to east. High winds between 80 and 100 km/h inflicted extensive tree damage and caused power outages north of the St. Lawrence River, with the strongest winds hitting Fermont, Schefferville and Chibougamau where branches fell across the highway between the town and Lac St-Jean. In Témiscamingue, winds pushed over barns and at the Gouin Reservoir the force lifted cottages off the ground and snapped trees.

## **Ontario – Regional Highlights**

### **Rideau Canal Sets Record**

Ottawa had 38 days last winter with temperatures below -20°C, which is the most since 1934. So it was no surprise that the world's largest naturally frozen skating surface, the Rideau Canal skateway, set a record for most consecutive skating days. On March 10, its record-breaking streak came to an end after 59 uninterrupted skating days. The previous record was 46 days in 2003-04.

### **More Power Outages**

Snow whipped by fierce winds and a dose of freezing rain created massive power outages across Toronto, Hamilton and southern Ontario early in March affecting more than 250,000 residents. Several people noted it was Toronto's fourth major power outage in three years. The outage was caused by inclement weather, as well as a mix of road salt and ice that glued to hydro equipment and caused more than 50 hydro poles to catch fire.

### **30°C Followed by Frost**

On May 8, the temperature in Ottawa soared to 30.7°C. Two weeks later frost hit – something that has never happened before. And it wasn't just a touch of frost; it was six hours with killing temperatures dipping to -3°C.

### **End of May Drencher**

At the end of May, a microburst – a small, intense column of sinking air spawned within a thunderstorm – inflicted significant roof and tree damages across the province. Wind speeds likely hit above 140 km/h just ahead of it. Thunderstorms brought torrential downpours with reports of flash flooding across parts of southwestern Ontario,

including Windsor, which received 74 mm, Grimsby 73 mm and Waterloo 60 mm. Also embedded in the storm cell was Ontario's first confirmed tornado of the season – an EF1 tornado with 175 km/h winds between Thorndale and Bryanston.

## **Expensive Summer Storm**

Several rounds of thunderstorms with nearly continuous lightning – 40,000 flashes in total – ripped eastward across southern Ontario on June 22. Local rainfall amounts of 30 mm or more occurred in a swath extending from Sarnia to London and on to Toronto and Kingston. London got 50 mm of rain overnight. Wind gusts blew at 80 to 96 km/h causing power outages for 100,000 customers and inflicting extensive property damage to roofs, pools and small rural outbuildings. Vehicles and recreation trailers also sustained damages. In total, insured property losses exceeded \$32 million.

## **Blooming Algae**

A stinky, scummy algal bloom once again appeared in Lake Erie, adversely impacting swimming, fishing, boating and tourism. The bloom was triggered in part by copious amounts of rain from late May and June storms, a warm-up in July and higher phosphorus loadings from farmlands. Some southern Ontario locations recorded 2.6 times their June rainfall.

## **Drencher in the North**

On July 16, a moist air mass along with a warm front spawned numerous thunderstorms with heavy two-hour downpours in northwestern Ontario. Rainfall was the heaviest in Dryden, which got 72 mm, followed by Sioux Lookout with 65 mm and Red Lake with 44 mm. Residents in those communities reported flooded basements, overwhelmed sewers and road ponding.

## **Gold Medal Weather for Pan-Am Games**

It is hard to imagine the weather being more perfect in Toronto and southern Ontario during the staging of the Pan American and Parapan American Games in July and August. Over 17 days of competition, the average maximum temperature between July 10 and 26 inclusive was 27.3°C and the minimum was 16.0°C – both very close to norms for that time of year. Only three days were at or above 30°C. Further, there were only two hours with a humidex above a dangerous 40 and four days when the humidex got above an uncomfortable 35. At Toronto Pearson International Airport, there were 14 hours with rain (only two wet days with a total of 7.8 mm), four hours with fog and no occurrences of thunderstorms, making the weather for the Games worthy of a gold medal.

## **Province-Wide Hot**

A hot air mass dominated the weather across Ontario over the last few days of July. High temperatures eclipsed 32°C at Kapuskasing, Timmins, Sault Ste. Marie and Sudbury, while at Moosonee the maximum reached 34.0°C. On July 29, the hot and humid weather engulfed southern Ontario with some of the highest temperatures of the summer. Ottawa broke its 66-year-old heat record for the day reaching 34°C, but it felt like 41 with the humidity. In Hamilton the thermostat hit 33°C, which was warm enough to buckle sidewalks and melt asphalt. GO trains slowed because of expanding rail tracks.

## **Ontario's Stormiest Summer Day**

The largest outbreak of severe summer weather occurred in the midst of the August Civic holiday long weekend when several rounds of violent thunderstorms developed in the south. The storms came in waves over a six-hour period with many of the same areas hit in both the afternoon and evening. In the end, almost 50,000 hydro customers lost power and extensive damages occurred to trees, power lines and dwellings. The day featured four tornadoes: EF2 tornadoes (180-220 km/h) in Teviotdale and Lebanon; and EF1 tornadoes (peak winds of 135 to 175 km/h) confirmed in Marsville and Millgrove. Equally destructive straight-line winds tore up property in Utica and Lucknow.

## **Wild Weather in Lake of the Woods**

On August 22, a vigorous low-pressure system moved into the Lake of the Woods area from the south and then promptly slowed down. Moist air and unsettled conditions led to heavy showers that left rainfall of 101 mm in Ear Falls and 80 mm in Kenora in less than one hour.

## **Exceptional Fall Weather**

The fall was uncharacteristically long and exceptionally mild. Across southern and eastern Ontario it was the third warmest in 68 years. At Toronto Pearson International Airport, it was the warmest September-to-November period on record. Warm air and abundant sunshine made November days feel like September. In early November, temperatures climbed above 20°C breaking records from Windsor to North Bay, with both cities approaching 24°C on November 3 and 4. The unseasonably warm weather continued well into December, with Ottawa breaking high temperature records on December 11 and 12. And for both Ottawa and Toronto, it was their least amount of snow ever recorded to mid-December.

## **Prairie Provinces – Regional Highlights**

### **Summer in January**

A mild flow of Pacific air brought unseasonably mild temperatures across the Prairies in the last week of January, resulting in a slew of new daily record-high temperatures. Lethbridge was in the low to mid-twenties – the same as Los Angeles. Calgary recorded a daytime high of 17.2°C on the 25th, leaving city arborists worried that previously injured trees experiencing the record January thaw would be vulnerable when winter weather inevitably returned. Warm Chinook winds prompted a wind warning in the southwest corner of the province, where gusts were clocked between 80 and 110 km/h.

### **Late Winter Mildness**

A week before spring a southwesterly flow of warm dry air blanketed the Prairies. Combined with a non-existent snow cover, record-high temperatures occurred in Saskatchewan at Estevan, where it hit 17.0°C, Leader with an even warmer 19°C and Maple Creek, which reached 20.9°C. In Manitoba, Portage la Prairie climbed to 16.6°C, while the Winnipeg James Armstrong Richardson International Airport topped out at 13.2°C – both new records. And with double-digit temperatures hovering around 16°C, three Calgary golf courses opened on March 13.

### **No Spring Flooding**

The Prairie provinces suffer through spring flooding almost every spring, but in 2015 it was almost a worry-free season owing to a warmer-than-usual winter/spring and below-normal snowfall amounts. The peak spring run-off for most rivers in the south occurred very early on.

### **Early Summer Severe Weather in Manitoba**

On June 24, a brief weak tornado (landspout) touched down 3 km east of Manitou, while numerous funnel clouds were reported from Pilot Mound eastwards. Later in the day, a severe thunderstorm developed in northeast Winnipeg producing nickel- to quarter-sized hail and heavy rain. Three days later, communities across southern Manitoba were cleaning up and assessing the damage after scattered thunderstorms dumped more heavy rain and hail. A series of tornado warnings turned into the real thing for those near Carman. Hail dented just about every car in town, while in the nearby community of Roseisle tennis ball-sized hail hammered personal property and crops.

### **Stormy 4th of July**

On July 4, a storm marched from Brandon to Winnipeg and eastward, unleashing rain, winds and hail. Flooding occurred in Fraserwood, which got 95 mm of rain, and in Gimli where 82 mm fell. Nickel-sized hail pummelled Minnedosa and MacGregor, while hail the size of golf balls slammed Steinbach and Elkhorn with machine-gun rapidity for half an hour denting siding, outdoor furniture and cars. It was also a death knell for crops.

### **From Dry to Deluge**

Abundant rains finally fell across parts of southern Alberta from Airdrie through Calgary and onto Chestermere and Langdon on July 12. Though the wet weather was certainly needed, nobody was happy with the way the prolonged dryness came to an end. Radar estimates put rainfall totals at 150 mm over a three-hour period, which filled some basements to the rafters. The rain came early in the day in Calgary, disrupting the morning commute as the storms shuttered traffic lights and turned major intersections into pools. In Langdon, residents paddled kayaks through their neighbourhoods when rains overwhelmed the wastewater system.

### **August Heat Wave**

The warmest days of the summer occurred during the second week of August when temperatures that were 9 to 12 degrees above the seasonal norm soared into the mid- to high-thirties. Hot spots included Calgary at 34°C, Winnipeg at 36°C and Medicine Hat at 38.3°C. Other sites that broke all-time records were Estevan, Weyburn, Broadview, Brandon, Cold Lake and Drumheller.

### **Ominous Looking Weather**

September 4 began cloudy and muggy, but the skies over Winnipeg quickly darkened. Street lights flashed on and skies lit up with near-continuous lightning. Then the rain began to fall and soon streets, parking lots and underpasses were flooded, leaving stalled vehicles. One Winnipeg weather station observed 80 mm of rain with peak wind gusts of 90 km/h. Localized heavy rainfall was also reported in Brandon, La Salle and Gretna.

### **A Hot and Wind-Whipped Thanksgiving Weekend**

Record warm temperatures on October 10 and 11 preceded a wild wind storm that inflicted considerable property damage across the Prairies. Winds in Swift Current blew at 120 km/h, sufficient to cause structural damages and strip trees of their remaining leaves. The wind also wreaked havoc with plenty of Thanksgiving dinner preparations as it knocked out power to thousands of Saskatchewan residents.

## **British Columbia – Regional Highlights**

### **Winter's First Storm**

Snow, heavy rain and freezing rain pounded the province's South coast when the first and only winter storm of 2015 struck on January 4 and 5. Heavy rain lashed Metro Vancouver and snow fell at higher elevations. On the Sea-to-Sky Highway, slick roads and snow slowed traffic, while other highways had to be closed due to avalanche risks and rock slides. Three days of snow also forced the closure of schools in at least five districts. Kelowna was one of the heaviest hit with as much as 34 cm of snow – just shy of a two-day record snowfall of 39 cm set in December 1949. The coming of winter was welcomed at local ski hills starved of natural snow.

### **Pineapple Express – Wet and Warm**

A Pineapple Express on January 23 brought heavy rain to the Lower Mainland. Rainfall amounts over 36 hours included Port Mellon with 102 mm, Coquitlam with 98 mm and North Vancouver at 95 mm. Central coast residents faced washouts near rivers, creeks and culverts. Following two days of wet, a record warmth hit the coast. On

January 25, the mercury reached 14.1°C at Vancouver International Airport, beating the previous record set in 1992 by over two degrees.

### **Another Hawaiian Punch**

An intense winter storm battered the North coast and inland on February 5 and 6 with heavy snowfall and blowing snow. Snowfall accumulations over the two days were 160 to 170 cm. The northern towns of Kitimat and Terrace were buried in nearly two metres of snow that cut power to thousands of hydro customers. Following the storm, the First Nation community in Kitimat ordered the evacuation of 700 residents. In Terrace, more than 5,000 customers lost power for three days. The same system dropped copious amounts of rain over the South coast, including 159 mm on Squamish.

### **Avalanches**

Avalanche Canada reported that unusual weather conditions created a complex and unpredictable snowpack in parts of the western mountains. There were not a lot of avalanches, but the ones that did occur were significant with several close calls. In spite of a scanty snowpack, what did exist was affected by unseasonably warm temperatures that stressed deeper weak layers. The season's eight avalanche-related deaths were below the average of twelve, with one of those occurring in Quebec.

### **Cache Creek Flash Flood**

Two of the province's major highways were closed in both directions on May 22 after a slow-moving thunderstorm caused flooding at Cache Creek in the Interior. The line of strong thunderstorms packed hail, intense lightning, strong wind gusts and heavy rain. The raging Bonaparte River moved houses and mobile homes off their foundations and swept cars and garages away. About 10 per cent of residents had to be evacuated when flooding swamped the local fire hall and damaged some 50 homes – half a dozen of them beyond repair. After the storm, the town was left covered in mud and the mayor declared a state of emergency.

### **Kamloops Deluge**

A late-afternoon thunderstorm on June 30 dumped torrential rains on Kamloops, flooding a trailer park where more than a metre of water collected and forcing the evacuation of about 100 residents. The same storm cut power to about 2,800 hydro customers.

### **King Tides and Storms**

Early in November, work crews sandbagged stretches of property along the exposed Pacific coast to guard against the possibility of storm-driven flooding during the annual occurrence of storm surges and king tides at the end of the year. With perfect timing, the first storm hit just after on November 12 and 13 bringing a nasty mix of wind, snow and rain that swept across the South coast. It was all snow in the higher elevations of the North Shore Mountains, while elsewhere winds of 130 km/h and rain amounts of 130 mm occurred leaving thousands of residents without power. The Gulf Islands appeared to be the hardest hit. Less than a week later another classic fall storm swept through the same region with gale-force winds that cut power to 110,000 customers in the Lower Mainland. At Vancouver's Stanley Park, winds and waves caused a portion of the seawall to collapse. On December 3 and 4, and again on December 6, a parade of strong fall storms moved across the South coast with 100 km/h winds, 90 mm of rain and record mild temperatures of 16°C.

### **Skiers Elated**

Repetitious November storms ushered in by cold frontal weather systems pleased skiers as most resorts opened earlier with deep snows. Several reported over half their runs open by November 21, raising hopes of a much better snow season than those experienced over the last two years.



## **The Good and Bad of December Storms**

Late fall storms blew almost continuously across the South coast of British Columbia in the first three weeks of December. Most were full of moisture, warm and packed powerful winds. While storms are nothing unusual during the month, it was the mere 12-hour reprieve between them that was uncommon as they moved quickly one after the other. Victoria had rain on every day from December 1 to December 13. Winds had a subtropical feel to them as several warm temperature records were set across the coast on several days. Power to thousands of customers was cut more than one occasion – some two or three times over three weeks – forcing BC ferries to cancel multiple sailings. Heavy rains soaked hillsides, caused road ponding and filled rivers to overflowing. On Vancouver Island, the rising of the Somass River near Port Alberni caused a state of emergency for a First Nation community. Boiling water advisories were also in effect for 45,000 residents in and around Courtenay and Comox. On the other hand, the abundant rains helped to erase half the water deficit that accumulated in the spring and summer. At higher elevations, the snow dump delighted skiers and snowboarders. One mid-December storm over the weekend packed winds of 100 km/h, including 156 km/h at Solander Island, rainfalls of 70 mm in West Vancouver, and snowfalls of 50 to 75 cm in Seymour and Cypress. In one incident, 300 guests and 100 staff spent the night at the top of Grouse Mountain after high winds shut down the SkyRide gondola.

## **The North – Regional Highlights**

### **Too Cool for School**

In the first two months of the year, Iqaluit registered 14 days with wind chills below -50, including five days in a row between February 11 and 15. An incredible wind chill of -68 occurred at 3 a.m. on January 26 when the air temperature dipped to -43.1°C and the wind blew at 57 km/h. With such dangerous conditions, authorities were forced to close schools often. In fact, January and February was the coldest period in 22 years at Iqaluit. On average, minimum temperatures would normally drop to -30°C on 36 days in the two-month stretch. In 2015, there were 56 raw days below -30°C, including 5 days below -40°C.

### **Spring Warmth in the Northwest**

A warm upper ridge brought above-normal temperatures to much of the Northwest Territories in the first half of April. Among the new record-high temperatures was 17.7°C at Fort Smith and 11.1°C at Yellowknife. In the Mackenzie region, average temperatures in March, April and May made for the third-warmest spring in 68 years at almost 3.5°C warmer than normal. In Fort Simpson, a five-day heat wave in mid-May broke a 118-year-old record with maximum temperatures hovering around 29°C – 10 degrees warmer than the usual high. Fort Liard was the hot spot with maxima of 30°C on May 11 and 31.1°C two weeks later, clobbering previous records. The Yukon also shattered records between May 20 and 23. Among them, Dawson City reached 29.6°C, Whitehorse and Faro hit 27.4°C, and Mayo climbed to 28.9°C.

### **Low Waters**

For the second straight summer, low water levels on the Mackenzie River raised concerns for people living along the shores. On the Snare and Bluefish systems, levels were at all-time lows measuring roughly 1.5 metres lower than last year. At Great Slave Lake, water levels were about 20 cm, which was not surprising given the snowpack in the Peace River basin was nearly 50 per cent less than normal.

### **November Warmth**

Warm southerly air pushed right across Baffin Island on November 20 bringing unseasonable warmth and rain into the area. Pangnirtung recorded the same temperature as Toronto at 6°C. Although the air was warm, slippery roads made for dangerous driving, prompting school closures.