

## WILDER, WETTER, WARMER



Yarmouth, Nova Scotia, May 24<sup>th</sup> 2019 (Image: Turner Drake Valuation Division).

The end of April 2019 ushered floods into three neighbouring provinces. In New Brunswick, the St. John River crossed the highway and lapped at the edge of Fredericton's downtown; communities downstream were inundated as the river burst its banks. Widespread flooding in Quebec rendered almost 10,500 people temporarily homeless. Communities bordering the Ottawa River in Quebec and Ontario suffered from flooding. As our photo shows the weather was still wending its wicked way at the end of May, this time in Yarmouth, Nova Scotia ... whilst in Alberta an out-of-control forest fire, fueled in part by 29<sup>o</sup> Celsius temperatures, was roaring towards the community of High Level forcing its 5,000 residents to evacuate. Wetter, wilder and warmer are now the defining hallmarks of Canada's climate ... and coastal areas are particularly vulnerable. Here in Atlantic Canada we are experiencing more frequent and intense rains, higher winds, tides, and temperatures, a greater number of storms and severe weather events, the introduction of pests (such as ticks) and an increase in the number of wildfires.

### The Cost of Climate Change

Extreme weather events bring stress, heartache ... and a financial toll. It's difficult (perhaps impossible) to precisely calculate the economic cost of climate change: the impacts are broad, and not tracked by any single agency. Furthermore, government relief for climate related damages comes from a variety of sources and programmes, depending on the specific relief measures required. That said, the Insurance Bureau of Canada estimates that climate change impacts resulting in infrastructure failure and underperformance, cost approximately \$3.5 billion in 2014. Weather is frequently front of mind for Atlantic Canadians, with good reason ... consider the following, recent, events:

In 2016 Hurricane Matthew visited Nova Scotia, merging with another weather system to dump a record 219 mm of rain on the Cape Breton Regional Municipality, and causing over \$100 million in damages. In 2010, "100-year" flood incidents occurred between September and December in three widely dispersed communities: Tuskent River, Margaree, and Meat Cove, resulting in approximately \$16.5 million being allocated from the Disaster Assistance Program. In 2003, Hurricane Juan resulted in at least \$31 million in damages from wind and rain in Halifax (we've seen estimates that put it at \$100 million in damages). It was followed five months later by "White Juan", a hurricane-strength nor'easter blizzard which broke all-time 24-hour records by dumping almost a metre of snow on Halifax, Yarmouth and Charlottetown. Halifax now enjoys the dubious distinction of having the largest snow fall in this period, anywhere in the world, for cities with a population exceeding 300,000! In 2010, Hurricane Igor caused \$200 million in damages in Newfoundland and Labrador, making it the most destructive tropical cyclone to strike the province. In 2018, Prince Edward Island recorded the highest temperatures for October in over a century: Charlottetown experienced 16.1°C, 3°C above the seasonal average. Heavy spring flooding along the Saint John River in New Brunswick in 2018 resulted in over \$80 million in damages ... and was only defined as a "notable" event, not a "catastrophic" one! Consider this flood timeline: the highest flood on record in Fredericton was in 1973. 35 years later, the second highest on record was in 2008, then the third highest hit just 10 years later in 2018 ... 2019 was comparable. The four highest floods on

record have occurred within the last 45 years ... and the records go back a long way: the oldest recorded flood occurred in 1696.

### **How is Real Estate Impacted?**

Climate change is bringing severe and extreme weather on a more frequent basis. This has a significant impact on real estate, from public infrastructure to private commercial properties and homes. Sometimes it's a trickledown effect, whereby the protective infrastructure fails or underperforms, and other properties suffer in turn. Development and infrastructure can exacerbate the damage: paved surfaces do not absorb water ... and urban re-development of forests, fields, wetlands and marshes annihilates nature's natural absorption infrastructure. Higher temperatures place increased demand on power grids to meet air conditioning needs, and on water availability as a result of drought, and increase the chance of wild fires threatening homes and businesses. More intense storms mean increased snow and ice loads and higher winds, all of which threaten the structural integrity of buildings ... especially with repeated stress from more than one event.

We asked the experts at ClimAction Services Inc., a Halifax based climate and weather consultancy, to assist us identify the threat to real estate in Atlantic Canada from flooding, and its time line. Flooding emanates from three sources: pluvial (rain), fluvial (watercourses), and coastal (or surge). Sea level rise, as the ice caps melt and the ocean expands, is front of mind for owners of waterfront property but the more immediate threat is precipitation. When do ClimAction expect properties to be adversely impacted? Their answer: "After it rains." Which is to say, this is not an issue anticipated 5, 10, or 50 years hence: climate change is here now and property owners should be prepared at any moment for the damage it will bring. Existing municipal infrastructure for water dispersal was not designed to meet current exigencies, never mind the future. Excess precipitation, coupled with a storm surge, conspire to create "the perfect storm" for coastal property and since both are the outcome of a hurricane the danger is magnified.

Turner Drake has been tracking sea level rise and coastal flood risk for more than a decade (see our Summer 2007, February 2016 and August 2017 Newsletters). Climate change and sea level rise have conspired to bring storm surges with increasing frequency, threatening coastal properties and infrastructure, such as bridges and roads, with flooding and washouts. Atlantic Canada has a lot of coast line, and most of its high value real estate is located at the water's edge – not just on rural, rugged outcrops: much of it is in downtown Halifax, Charlottetown, Saint John, and St. John's. Climate change is more apparent to people living in coastal communities than those inland. The [Yale Climate Opinion Maps](#) demonstrate that such is the case in the United States. In 2018, Canadian Dr. Katherine Hayhoe, Director of the Climate Science Centre at Texas Tech University produced similar findings for Canada in her Halifax seminar on climate change. That is unsurprising, given the higher exposure people living along the coast have to coastal flooding, but more frequent and higher intensity *rainfall* events are now the leading concern for the insurance industry and government (and many homeowners). Most properties are not directly on the coast, so the greatest risk to most real estate is actually from pluvial and fluvial flooding. Pluvial flooding – caused by heavy rainfall – threatens the largest amount of real estate. Fluvial flooding – when a lake or river overflows – results from heavy rainfall and/or snow melt and ice jams. Properties near the water are at risk from heavy rainfall and fluvial or coastal flooding. When it comes to flooding, the old real estate adage "location, location, location" takes on a whole new meaning: all property is vulnerable, but just how vulnerable, and what poses the biggest risk, is site specific.

### **Government Action**

Governments have long been called upon for disaster relief in the wake of climate related damage, but there is increasing awareness of the need to be proactive in the face of increased, and more frequent, risk ... *and signs that government may be less willing in the future to provide financial support to property owners who have been adversely impacted.* Millions have been spent to repair damaged property; attention is now turning to policy decisions which can prevent or reduce damage in the first place. Some jurisdictions are now encouraging developers and commercial land owners to address climate change as part of their decision-making process. Municipal governments in particular have a vested interest in mitigating property damages, given that they are, in fact, key stakeholders in real property: the primary source of municipal revenues are property taxes. Since 2014, municipalities in Nova Scotia have been required to have municipal climate change actions plans, but face a challenge in identifying and accessing funding to assist with identified action items. Many of the planning related policies to date focus on safety concerns rather than damage prevention. For example, Halifax restricts residential uses along the downtown waterfront to the second floor and above – no flooded bedrooms on their watch – but doesn't proscribe commercial development at grade. The Town of Rothesay, New Brunswick, in addition to having similar restrictions on habitable space, requires new developments and redevelopments within flood prone areas to incorporate flood proofing into design and construction, has a policy in place to consider acquiring undeveloped lands that are prone to flooding in order to prevent

development on them, and includes a provision that developers intent on building in an area at risk of flooding *release the municipality from liability* for flood damage. At the provincial level, Nova Scotia's Coastal Protection Act (not yet in effect) is designed to protect natural ecosystems, and to restrict new construction in coastal areas to mitigate risk from sea level rise and coastal flooding. Federally, the Government of Canada now requires a climate change lens be applied to any proposal for funding in excess of \$10 million, and for applications under the Disaster Mitigation and Adaptation Fund and the Investing in Canada Plan. Between 2020 and 2025, the Canadian building codes will be adapted to include consideration of climate change impacts, including guidelines for certifying the resiliency of roofs to extreme weather events, new structural design rules for buildings to take into account the changing climate, new standards for basement flood protection, and guidelines for climate resilience for existing storm water systems.

Many of Canada's flood plain maps are out of date, a fact thrown into sharp focus by the recent flooding in Quebec. They are also prepared by municipalities: political influence and the desire to promote development may impact their validity. A recent report indicating that Canada's flood plain maps are out of date encouraged experts to suggest that the federal government update them in order to support policies that discourage or prohibit building in flood plains, as part of the broader goal of streamlining climate change considerations into mainstream urban planning processes. The insurance industry has been more pro-active: ClimAction advise us that they have access to up-to-date flood plain maps produced internationally, for the insurance industry. Municipal, provincial, and federal levels of government can access them via a local source, as can individuals and corporations. As municipal plans and by-laws are updated, more climate related policies will be put in place: property owners – and those considering buying land – are advised to check the regulations to ensure their building plans are permitted ... Turner Drake's two "on-staff" professional planners can assist you.

## **Insurance**

The insurance industry is the vanguard: they are the primary vehicle for compensating property owners impacted by flooding and are therefore very interested in implementing preventative measures to reduce the risk associated with climate change. In the United States, incorporating flood risk mapping into residential appraisals is common: the Federal Government agency FEMA produces and updates flood hazard maps in support of the National Flood Insurance Program (NFIP). However it is not yet customary in Canada to include flood hazard maps in commercial or residential property valuation reports. Nor has there been much evidence that the property market in Atlantic Canada is accounting for risk from the elements. Our Valuation Division has encountered a few instances where the market value of a coastal property was reduced due to risk of erosion, but thus far, the associated costs of shoring up shorelines for at-risk properties typically far exceed the purchase price differential versus more stable properties. Insurance companies, in contrast, are already pricing climate change risk into their policies, some by accessing and utilising the same flood risk maps used by ClimAction Services. A recent report from the Insurance Bureau of Canada (IBC), calculated that insured damage for floods, windstorms, ice storms and tornadoes reached \$1.9 billion in 2018. As a result insurance rates are increasing and some homeowners are facing double-digit rate increases. Furthermore, they may be required to implement specific preventative measures in order to get coverage, such as mainline backwater valves for sewage. IBC is partnering with the University of Waterloo and the City of Toronto to launch a pilot Toronto Home Resilience Program. This program is designed to provide emergency preparedness and flood risk reduction education for up to 200 homes. Each homeowner will get a flood protection assessment along with suggestions on how they can reduce their basement flooding. So far, there is no similar program in Atlantic Canada, but if the pilot proves successful, it is likely that it will be rolled out to other markets across the county, and across other property types. It would not be farfetched to assume that suggestions will become requirements.

## **Property Specific Risk Assessment**

Global warming and climate change are destined to outlast President Trump. So how can you incorporate the impact of climate change into your real estate development and asset management processes? By answering the following key questions: (1) How, and how often, is climate change likely to impact my property? (2) What climate hazard poses the greatest risk? (3) How can I adapt to accommodate what I cannot control? ClimAction advises on Risk & Vulnerability Assessments to help identify climate change risk and to advise on action plans to reduce threats, either during the design phase or on retrofit.