

The History of Flood Control in the TRCA

The need for authorities

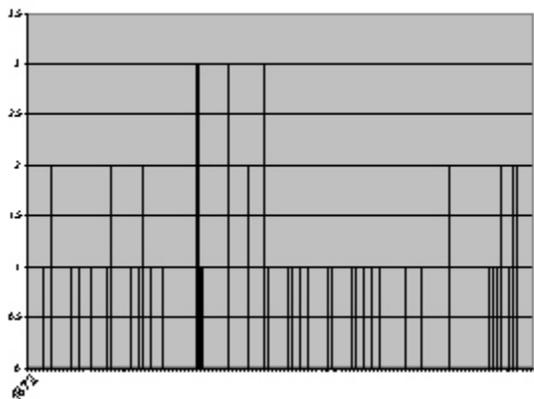
In the 1940's development increased in previously unurbanized areas. As a result, natural resources, including water, were becoming commodities which needed to be regulated and controlled. In 1944 a decision was made to find a new approach to water resource conservation in Ontario and a conference, in London was organized to discuss what needed to be done¹. From this conference a conservation branch in the provincial government was born². Its first task was to prepare a bill which would become the Conservation Authorities Act³. In 1946 the act was passed⁴. In the Toronto area several Conservation Authorities, including the Etobicoke Conservation Authority, were created to deal with pressing flood control issues⁵. In total four conservation authorities were created. They comprised of the Etobicoke-Mimico Creek C.A., the Humber River C.A., the Don River C.A., and the Rouge-Duffins-Highland-Petticoat C.A. These four Conservation Authorities mainly dealt with local flooding issues and reforestation within their watersheds. In 1957 the four Conservation Authorities were amalgamated into the Metropolitan Toronto and Region Conservation Authority (MTRCA).



Flooding in the region

The first written account of a flood in the Toronto region was in 1797⁶. Records since that time have shown that flooding has been a problem in the region throughout the area's history. The first severe flood, in recorded history, to hit the Toronto region was in 1878⁷ when five inches of rain fell in less than seven and a half hours⁸. Downtown Brampton was flooded, bridges were washed out, stores and houses were flooded, and almost every mill and mill dam in the area was badly damaged or destroyed⁹. This flood and the others that followed started the motion towards flood control in the greater Toronto area.

Hurricanes Affecting Ontario 1872-2000



According to historical data, most floods occurred and continue to occur in the spring as a result of snowmelt and ice jams. As well, in the summer months southern Ontario experiences tropical storms or their remnants on average once every two years. Hurricanes, such as hurricane Hazel, are tropical storms with winds greater than 64 knots¹⁰. These storms usually result in large amounts of precipitation and can act in combination with other factors such as high flows or saturated soils, thereby increasing the chance of flooding¹¹.

Hazel

On October 15th and 16th 1954, 210 millimetres of rain fell within a period of 12 hours¹². Flooding was inevitable due to several factors which included steep slopes along rivers and little or no natural water storage capacity^{13 14}. As well, previous rainfall had already saturated the soils thereby preventing any infiltration and thus funnelling most of the rain directly into watercourses¹⁵. An estimated 90% of the rainfall washed into the watercourses as runoff¹⁶. As a result “the flows in the Humber River were four times greater than previously recorded”¹⁷.



Hurricane Hazel was the most severe flood in the Toronto area in recorded history. In total, 81 lives were lost, thousands of people left homeless and the total economic losses undeterminable. Most of the bridges on the west side of Toronto were destroyed or badly damaged as were many on the Don river. Many roads, parks, public utilities, and even an entire street of houses were washed out. The tangible damages were astronomical reaching an estimated \$25 million in 1954 (\$169,500,000 in 2000 dollars).

Three stages in flood control

Hurricane Hazel jump-started the MTRCA’s flood control program. After Hazel, the Provincial government amended the Conservation Authorities Act to enable an Authority to acquire lands for recreation and conservation purposes. In 1959 The Plan for Flood Control and Water Conservation was finalized. Within this plan 15 large control dams were pinpointed to be built, as well as 4 major flood control channels and the initiation of an erosion control program¹⁸. In addition, 7,200 acres were identified for acquisition at a cost of \$11,600,000¹⁹. In 1960 the Lands Acquisition Program was implemented as the first stage in the flood control plan. The intent of this program was to transfer the liability of floodplain land from private hands to the Authorities and to acquire lands necessary for the construction of flood protection works.

The second stage which coincided with the first was the flood control works. The intent of this program was to construct as many structures as was necessary to control flooding. The works consisted of dams, reservoirs, channel improvements, and other infrastructure. These works at an estimated cost of \$22,500,000 in the 1959 plan were designed to control damage in flood prone areas²⁰.

Pinpointed Projects

Claireville Dam
Ebenezer Dam
Lower Bolton Dam
Nashville Dam
King Creek Dam
Lower East Branch Dam
Woodbridge Channel
Weston Channel
Snelgrove Dam
Haviland Dam
Finch Dam
Westminster Dam
Willowdale Upper “B” Dam
York Mills Channel
Milne Dam
Audley Dam
Green River Dam
West Hill Dam

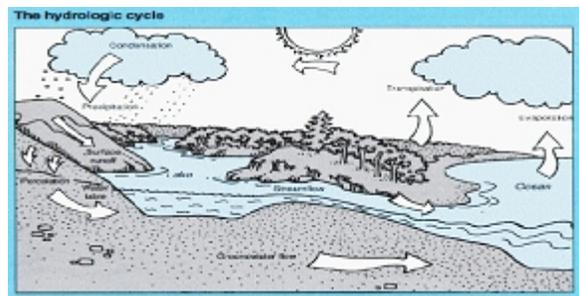
In addition to the MTRCA initiatives, Provincially, an eleven year process to develop and implement a flood plain planning policy was initiated. Within this process the province began the development of flood plain regulations and the updating of the Conservation authorities act to allow for fill regulations. In essence, flood plain regulations were implemented to restrict future development and land use in flood hazard areas thereby reducing potential flood damage²¹. The implementation of new regulations was the third stage in the flood control plan.



Other flood control programs

Two other major programs were implemented to enhance the flood control plan. These included the flood forecasting and warning program and the stormwater management program. The flood warning and forecasting program was designed to monitor watershed conditions including snow, precipitation, and flows, as well as to issue flood messages to municipalities when conditions warranted. The program also dictated the operation of flood control facilities. Gauging stations became operational and a rainfall observer network organized. These were designed to forecast and warn against potential flooding in the area. Operational practices were designed to deal with immediate conditions. With forecasting, warning and operational facilities steps could then be taken to minimize potential flood damage.

The stormwater management program was initiated in 1980, in recognition of the impact urbanization had and will have on the hydrologic cycle. The impacts of urbanization related to flooding and erosion. The program evolved from 1980 to include water quality and temperature impacts, source control, and retrofitting of facilities which do not meet current design standards.



What we've accomplished

Between 1959 and 1995 major flood control remedial works were carried out. Three of the originally pinpointed fifteen dams were constructed including Clairville dam in 1964, Milne dam and G. Ross Lord dam in 1973, plus two not previously identified, at Stouffville and in Black Creek at Sheppard. In addition, 12 major flood control channels and 2 major flood dykes have been implemented. In addition, over 280 erosion control works have been completed.

Lands Acquired By TRCA

Watershed	Lands Acquired	
	During 1999	To Date
Etobicoke Creek		374
Mimico Creek		40
Humber River	43	6,741
Don River	3	917
Highland Creek		395
Rouge River	7	1,113
Duffins Creek	69	2,316
Petticoat Creek		134
Carruthers Creek		25
Lake Ontario Waterfront	8	1,322
Total	130	13,377

In total 32,000 acres have been acquired through the land acquisition program. All of these lands were acquired for flood control purposes. A significant portion of these lands in Toronto have been turned over to the parks department and now provide for an integrated parks system. The greenspace along each watercourse not only provides social infrastructure but also an area for wildlife to flourish, in an ever populating area. The lands have become a wildlife corridor not only for permanent species but also for migratory species as well. What began as a flood control project has helped turned Toronto into a unique, green and beautiful city.

Where we are now

At present, a new Water Management Plan is being developed as the next step in managing water as a natural resource. Although flood control is only one part in this plan it is vital in ensuring a healthy watershed environment. The Water Management Plan will aid in “protecting and enhancing water as a vital and integrating element of the watershed ecosystem”²².

In the future

Today, the Conservation Authorities of Ontario own 340,000 acres serving a population of 9,000,000. The Toronto and Region Conservation Authority (TRCA) alone owns 32,000 acres and serves approximately one third of Ontario’s population. With increased human stresses on watercourses and the sprawl of urbanization, flooding will continue to be a significant risk and our need to adapt our flood control policies and procedures will be great. Working together with provincial and federal governments, community representatives and non-government organizations, the TRCA will continue to take a lead role in flood control and water management.

Endnotes

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