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Shapeshifters: Toronto's changing watersheds, streams and shorelines

"The Valley of the Don, a winding stream that flows on the east of the city, offers the prettiest bit of scenery in the neighbourhood." (Canadian Illustrated News, June 10, 1871)



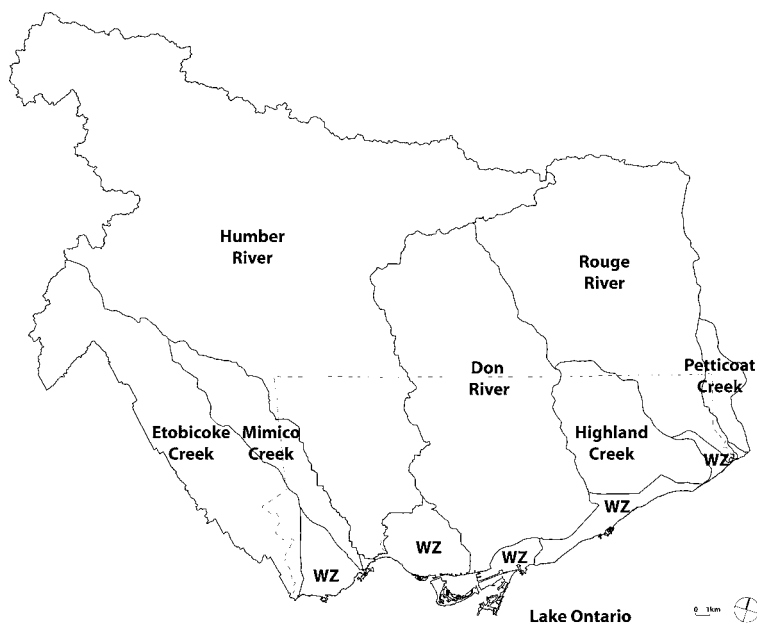
Mutability is part of the fluid character of water. Some dynamics are natural, like the meander of a stream across its flood plain, its fluctuations in volume across the year, the cyclical rise and fall of lake levels, the building up and breaking down of sandspits, dunes and beaches. Over the past 200 years, however, humans have played a more critical role than nature in reshaping the aqueous landscape in Toronto. A good way to understand the character and impact of change is to take some big-picture snapshots of Toronto's watersheds, streams and shorelines, sketching out both the current shape of these features and a sense of how Euro-Canadians first knew them. It's primarily about providing extended captions for lines on maps – examining the structure and form of Toronto's surface water, rather than its quantity or quality.

1. LAKE ONTARIO SHORELINES BETWEEN THE HUMBER RIVER AND VICTORIA PARK AVENUE, 1834–2008

Toronto's waterfront has been a most movable entity. Since the mid-1850s, repeated waves of lake-filling have made land for railway entrances, industry, port functions and recreation across Toronto. Many agencies were involved at different times in this transformation, including the city government, the Toronto Harbour Commission (now the Port Authority), the provincial government and the TRCA. Notable moves evident at this scale include the filling in of Ashbridge's Bay to create the Port Lands, which mainly took place between 1914 and 1930, and the creation of the five-kilometre-long Leslie Spit, beginning in 1959. Toronto Island has also grown (though Gibraltar Point has seen rapid erosion in recent years), and new purpose-built lakefill parks – Ontario Place and Ashbridge's Bay Park – were added in the 1970s.

Perhaps the one constant in all this work is the progressive hardening of the waterfront edge – a process that also holds true for most surviving watercourses in Toronto. The imposition of engineered geometries over the softer profiles of nature is well-illustrated by the Ship Channel, developed by the Harbour Commission in the 1910s to access the interior of the Port Lands. This concrete-walled feature, perhaps best appreciated from the Cherry Street bascule bridge, now extends over 2,800 metres – the distance from Yonge Street to Strachan Avenue.





2. TORONTO'S WATERSHEDS, 2008

The *Canadian Oxford Dictionary* defines a watershed as 'the area drained by a single lake or river and its tributaries.' Seven named watersheds currently pass through the City of Toronto. The Etobicoke, the Mimico, the Highland and the Petticoat are the smaller drainages, rising at relatively low elevations on the flattish South Slope and Peel Plain below the Oak Ridges Moraine. The largest watersheds – the Humber, the Don and the Rouge – have their headwaters higher up on the rugged moraine,¹ the crest of which marks a north/south divide for Toronto's surface water.²

Toronto's watershed complexities are highlighted in data supplied by the TRCA.³ The Don watershed makes up one-third of Toronto's land area, and nearly 60 percent of the watershed lies within the city. The Don has been front and centre in Toronto's mind since the British planted the town site in 1793. And given how the Don sprawls across the centre of the city, stretching from Keele almost to Brimley Road and taking in most of Yonge Street, we can justify viewing the Don as 'Toronto's river.' Highland Creek is, however, another worthy candidate for this title. It may occupy only 15 percent of Toronto's landmass, but 95 percent of the Highland's watershed lies within the city. The Humber occupies the middle ground. It's easily the largest watershed in the Toronto region – at

1 The Humber's headwaters are actually shared between the Oak Ridges Moraine and the even more impressive Niagara Escarpment.

2 *Surface* needs emphasis because groundwater is a much more mysterious entity. One hydrogeological study found that groundwater coursing through the face of the Scarborough Bluffs had its source in Barrie, on the far side of the moraine.

3 What (major) watershed do you live in? The answer is on a detailed Toronto region map in the 'Resources' section at www.torontorap.ca.

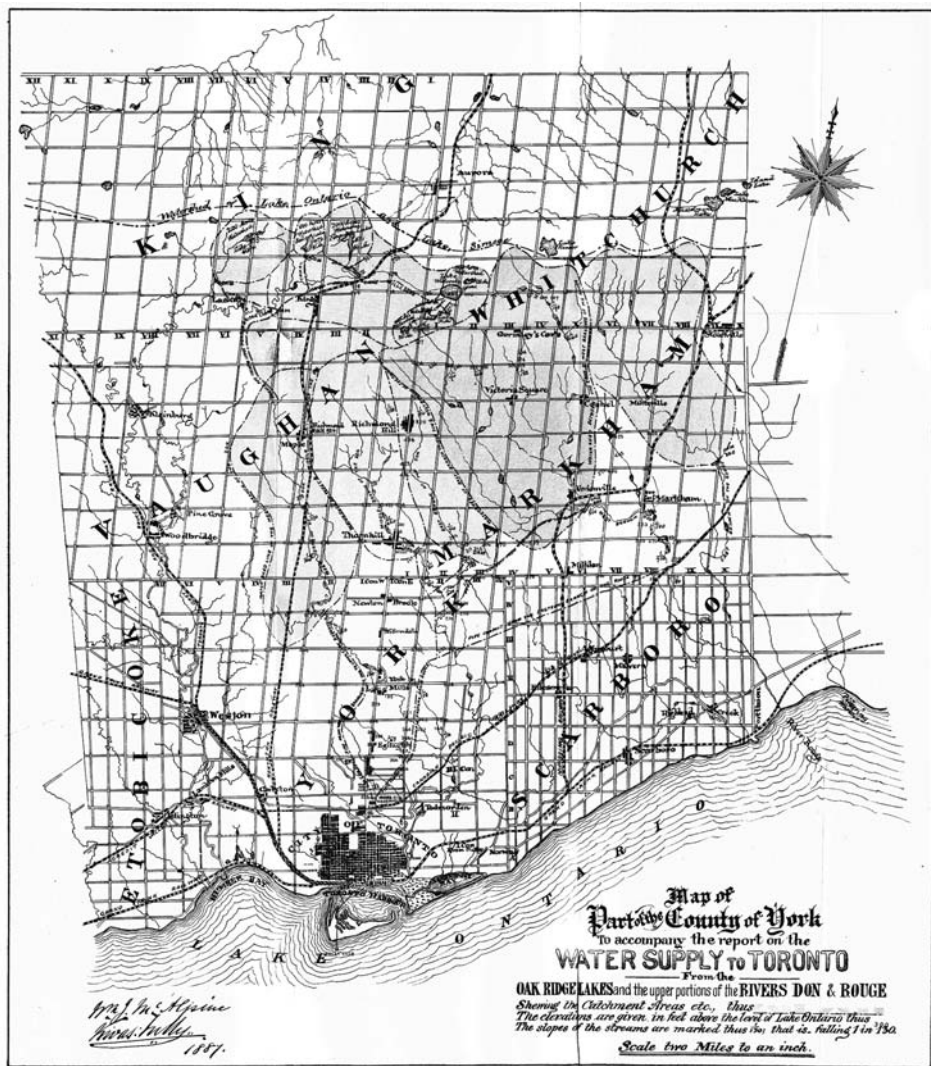
<i>Watershed</i>	<i>Area of watershed in City of Toronto (ha)</i>	<i>Watershed as percentage of City land area</i>	<i>Total watershed area (ha)</i>	<i>Percentage of City land in watershed</i>
Don River	20,632.6	32.5	35,806.0	57.6
Etobicoke Creek	1,478.6	2.3	21,164.8	7.0
Highland Creek	9,614.0	15.1	10,157.8	94.6
Humber River	13,731.9	21.6	91,077.8	15.1
Mimico Creek	2,900.5	4.6	7,709.1	37.6
Petticoat Creek	240.3	0.4	2,682.2	9.0
Rouge River	3,395.5	5.3	33,288.8	10.2
Waterfront Zone (wz)	11,587.9	18.2	11,587.9	100.0
TOTAL	63,581.3	100.0	213,474.4	29.8

91,000 hectares, more than two-and-a-half times as big as the Don – but occupies ‘only’ 22 percent of Toronto’s area.⁴ The Etobicoke, the Mimico and the Rouge each take in between 2 and 5 percent of the city. The Petticoat Creek watershed is so far out on Toronto’s northeastern periphery, it barely registers in our civic consciousness. It occupies only 240 hectares, or 0.4 percent, of Toronto’s land area, and lies entirely, and rather confusingly, within Rouge Park. The stream itself flows through Markham and less than a kilometre of Toronto before emptying into Lake Ontario in Pickering.

To muddy the waters even further, the TRCA adds a category called the ‘waterfront zone.’ The wz comprises six discrete tracts of land along the lakeshore that span a remarkable 18 percent of Toronto’s land mass. These tracts don’t drain into any of the big rivers, and they now have little, if any, surface water of their own. These are the historical drainages of Toronto’s lost rivers. The zone between the Etobicoke and Mimico creeks includes North Creek and Jackson Creek. It’s not clear which minute streams drained the zone between Mimico Creek and the Humber River. The zone between the Humber and the Don rivers takes in Taddle Creek, Garrison Creek, Russell Creek and tinier streams that flowed during the early days of the Town of York. Toronto Island is its own zone, once full of many lagoons and ponds, but too sandy for running water. The fifth zone extends from the Don River to Highland Creek, embracing creeks that once flowed into Ashbridge’s Bay, plus the deep gully drainages along the Scarborough Bluffs.⁵ The sixth zone, between the Highland and the Rouge, continues to carry fragments of Adams Creek.

4 The Humber River is unique in that, since 1999, it’s been Toronto’s only designated Canadian Heritage River. The Canadian Heritage River System was established in 1984 by the federal, provincial and territorial governments to conserve and protect the best examples of Canada’s river heritage, to give them national recognition and to encourage the public to enjoy and appreciate them.

5 Water still flows for most of the year in Gates Gully, the largest ravine along the bluffs, which is located near the foot of Bellamy Road. In the nineteenth century, this ravine was the principal means of accessing the Lake Ontario shoreline from Scarborough’s tablelands.

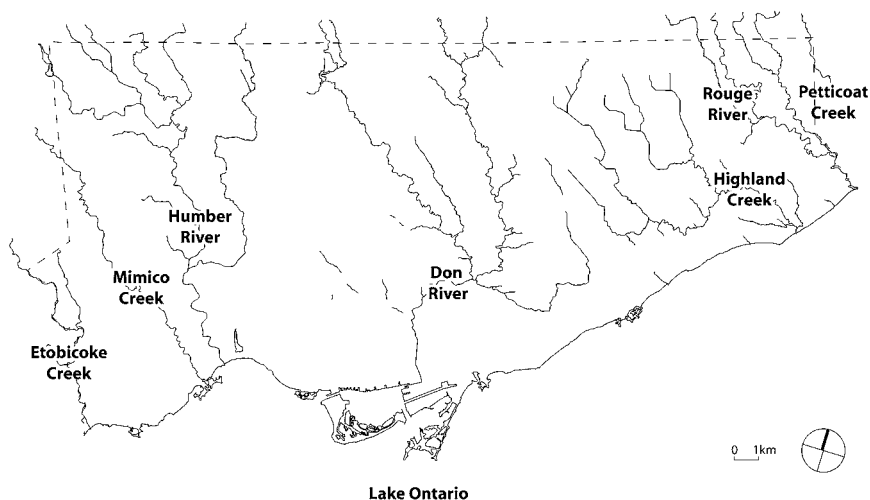


3. A PROPOSAL TO TAKE TORONTO'S DRINKING WATER FROM THE HEADWATERS OF THE DON AND ROUGE WATERSHEDS, 1887

It's difficult to reconstruct Toronto's watersheds as they were at the time of Euro-Canadian settlement. While contours had to be known for individual engineering projects, systematic mapping of Toronto's relief began only when the federal government started drawing topographic maps in 1904. By that time, many of our streams were long buried, and much of the landscape had been reworked to urban ends. The latter process meant two things: surface contours had been levelled either up or down to produce the neutral grade favoured for property development; and the notion of natural drainage areas had been further eroded by the arrival of sewer systems.

Toronto's natural watersheds gave way to cultural features better described as sewersheds. Thanks to pipes underground and pumping stations on the surface, the City now moves stormwater and sewage across historic watershed divides with relative ease. Watershed maps as recent as the mid-twentieth century have become obsolete, as the Etobicoke Valley in Toronto demonstrates. As late as 1954, its eastern boundary followed a meandering course along the natural height of land. Technology has now pushed the boundary further east, where it runs razor-straight for 5.6 kilometres along Highway 427 and Browns Line. Water that once drained into North and Jackson creeks is now piped into Etobicoke Creek.

Probably the earliest watershed mapping of the Toronto region dates from the late 1880s. For nearly a century after its founding, Toronto had an uneasy relationship with Lake Ontario as its source of drinking water. Purer supplies were seen to be had north of the city, high up on the forested Oak Ridges Moraine – a view that gave rise to an incipient watershed consciousness. In 1886, City Council retained William McAlpine and Kivas Tully to examine alternative water sources. The two engineers tramped across the Don and Rouge watersheds, hatching a scheme to draw water from the Oak Ridge lakes on the moraine and bring it to Toronto by way of aqueducts and conduits. The scheme didn't amount to much – Council came to its senses and accepted the Great Lake on its doorstep as its sole water source – but Torontonians certainly gained an appreciation of the city's watershed context and the (expensive) possibilities of it for water resource extraction.



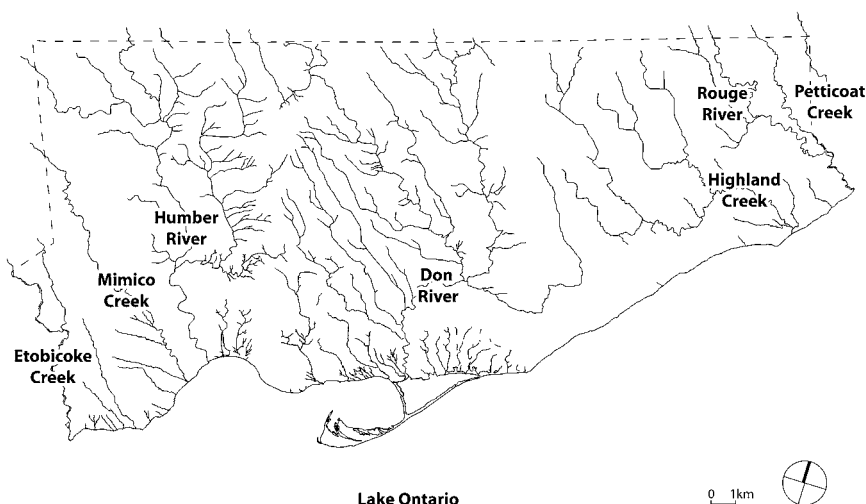
4. TORONTO'S WATERCOURSES AND BODIES OF WATER, 2008

The current shape of water within Toronto includes the six waterways that drain to the city's lakeshore (the Etobicoke, the Mimico, the Humber, the Don, the Highland and the Rouge),⁶ the ignored or forgotten Petticoat Creek and the Lake Ontario waterfront (including the Inner and Outer harbours, Humber Bay, the lagoons of Toronto Island and the surviving fragment of Ashbridge's Bay). Toronto has 371 kilometres of watercourses and 157 kilometres of shoreline.

Almost invisible at this scale are our inland natural and artificial bodies of water. In terms of surface area, the largest are Grenadier Pond in High Park (19.4 ha), the reservoir in G. Ross Lord Park (14.3 ha), unnamed ponds in Etobicoke's Centennial Park (5.1 ha) and in L'Amoreaux Park (1.74 ha) and Topham Pond in Eglinton Flats Park (1.69 ha). There is also a growing number of much smaller 'stormwater management facilities' (forty-three, according to Toronto Water) and wetland restoration projects that contain standing water at some point in the year.⁷

6 For more comprehensive characterizations of these rivers, see various TRCA watershed strategies and report cards in the 'Protecting Our Water' section at www.trca.on.ca.

7 For a sample of restored ponds and wetlands, call 416-392-0401 for a free Lower Don map produced by the Task Force to Bring Back the Don.



5. TORONTO'S ORIGINAL WATERCOURSES AND BODIES OF WATER

Tracing the evolution of Toronto's surface water is easier than charting the changing shape of our watersheds, though the picture gets murkier the further back in time you go. This illustration of 'original' or 'historic' conditions is a compilation of dozens of maps from the late 1780s to the mid-1850s, and draws on the forensic hydrology practiced by the Lost Rivers Project.⁸ 'Original' in this sense could be defined as water as we first reliably knew it, which varies greatly as we scan the entire city. No single map tells us what all of Toronto's water features looked like to the British military or Euro-Canadian settlers. Our knowledge of many individual streams is similarly vague and fragmentary; for example, no map exists showing all of Taddle Creek when it flowed on the surface.

At this scale, it's difficult to make out all the manipulations – be they partial channelizations or outright burials – to which our watercourses have been subjected since the early 1790s. Save for the Don River and a tiny portion of Taddle Creek, all of the streams that drained directly into Toronto Bay have now been lost. The Don's tributaries have fared little better, though some fragments of water still flow along the courses of Castle Frank Brook, Yellow Creek, Mud Creek, Cudmore Creek, Walmsley Brook and Burke Brook.



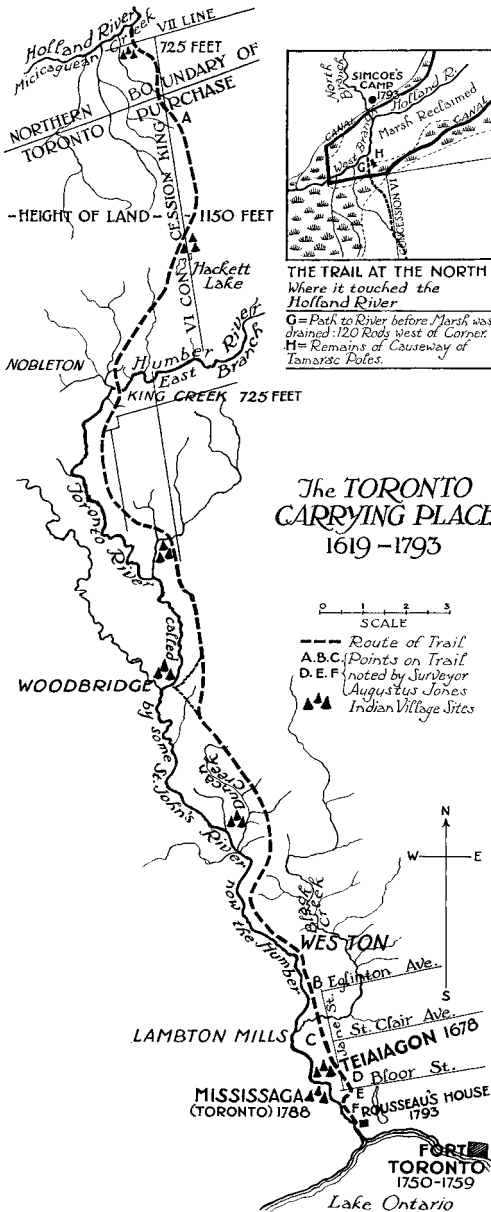
The past and present shape of water in central Toronto. Original conditions are in grey; current conditions are in black.

⁸ See the maps and narratives at www.lostrivers.ca.

6. THE TORONTO CARRYING PLACE AND OTHER FEATURES ALONG THE HUMBER RIVER, 1933

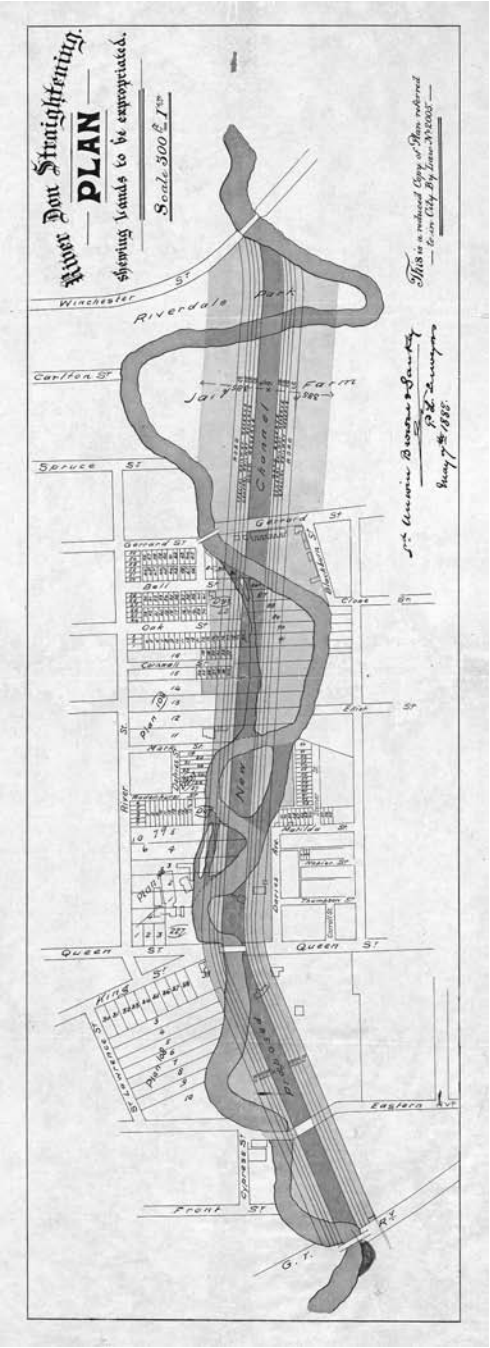
Originally published in his 1933 book *Toronto During the French Régime*, Percy J. Robinson's map is a wonderful collage of time and culture, and a bridge between watersheds and watercourses in the Toronto region and beyond.

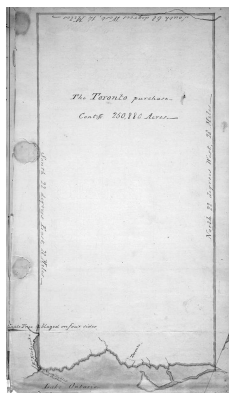
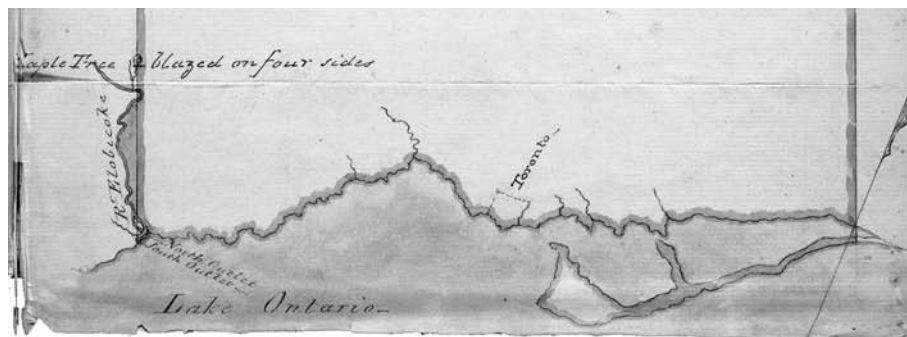
There are no First Nations maps of earliest Toronto. Our cartographic understanding of Aboriginal life reflects 'discoveries' made by Euro-Canadians beginning in the late seventeenth century. Robinson's rendering of the Toronto Carrying Place from Lake Ontario to the Holland River depicts First Nations' use of the land against subsequent Euro-Canadian trade and settlement. He shows the ancient portage route between the lower and upper Great Lakes and the Aboriginal villages astride it and the Humber River, all in relation to French trading forts and posts, early British survey work and even modern (that is, early 1930s) Canadian communities and roads. The map does not record nineteenth-century milling activities, which, by impounding and diverting water, affected the Humber's shape at the micro-scale. Robinson's work also precedes the extensive flood and erosion control works built after 1954 in response to Hurricane Hazel.



7. THE DON IMPROVEMENT PROJECT, 1888

Although Toronto has hatched many big plans for its waterfront and waterways over the past 200 years, most have come to nothing. The Don River is an unfortunate exception. Pitched as a way to relieve the Don's unsanitary state and bring shipping upriver, the 'Don Improvement' actually brought the Canadian Pacific Railway into downtown Toronto and created new land for industry on the flood plain in the late 1880s. Sheet-piling and filling eliminated the Don's meandering course between the Grand Trunk rail corridor and Riverdale Park. Today, the Lower Don Recreational Trail occupies the abortive 'dock reserve' on the west bank of the river, while the Don Valley Parkway hugs the east bank.





8. THE TORONTO PURCHASE, 1787

A final look at Toronto's water harkens back to its first detailed rendering – and a pivotal moment in the relationship between Aboriginals and Europeans and their concepts of property. In 1787, Sir Guy Carleton, 1st Baron Dorchester and governor-in-chief of British North America, cast about for a site that would eventually become Ontario's capital. Dorchester arranged a meeting with three Mississauga chiefs and his deputy surveyor general, John Collins. Out of this meeting came the Toronto Purchase and the Crown's acquisition of 250,880 acres of land.⁹ Dorchester and Collins imposed a previously unknown form of order on the landscape: a rectangle perfect on three sides, 22.5 kilometres across the top and 45 kilometres down each of the two long sides. But along the bottom, they could not avoid the ragged reality of the Lake Ontario shoreline.

In a roadless wilderness, Collins began surveying the Toronto Purchase from the southern outlet of Etobicoke Creek. The eastern boundary lay (by accident or design?) at the head of Ashbridge's Bay, near the foot of Woodbine Avenue. In between, Collins mapped the lower reaches of what appear to be Mimico Creek, the Humber River, Garrison Creek, Russell Creek, Taddle Creek and the Don River. The last three streams are shown draining into the north shore of the spit-sheltered Toronto Bay. Collins placed 'Toronto' against the west bank of Garrison Creek, on the site of today's Fort York. When Dorchester ordered up a more detailed survey within the year, the town site found a safer place inside the harbour. This protected water played a key role in the founding of the Town of York in 1793, and in York becoming the capital of Upper Canada three years later. And those decisions led to the inexorable shifting of the shape of Toronto's water.

⁹ Defects were soon recognized in the Toronto Purchase, though a new deed confirming the 1787 agreement was not executed until 1805. A claim under this treaty by the Mississaugas of the New Credit First Nation is in negotiation with Canada. See the 'Claimsmap-Ontario' section at www.indianclaims.ca.