

Buyers Guide to Shoreline Property

Great Lakes
and St. Lawrence River

Get The Most
From Your Investment
By Avoiding The Hazards



The Conservation Authorities



**Buyers Guide to Shoreline Property
is a co-operative project of:**

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A Beautiful Place To Live...



The shorelines of the Great Lakes and St. Lawrence River have some of the most attractive real estate in Ontario.

Owning lake shore property can be a dream come true; but that dream can become a nightmare if you haven't adequately researched your shoreline purchase.



Be Aware of Potential Risks

Some shoreline areas along the Great Lakes and St. Lawrence River are at risk to flooding, erosion and dynamic beach processes.

You need to research your shoreline property before you buy it to ensure that you don't wind up with an expensive surprise instead of a pleasant investment.

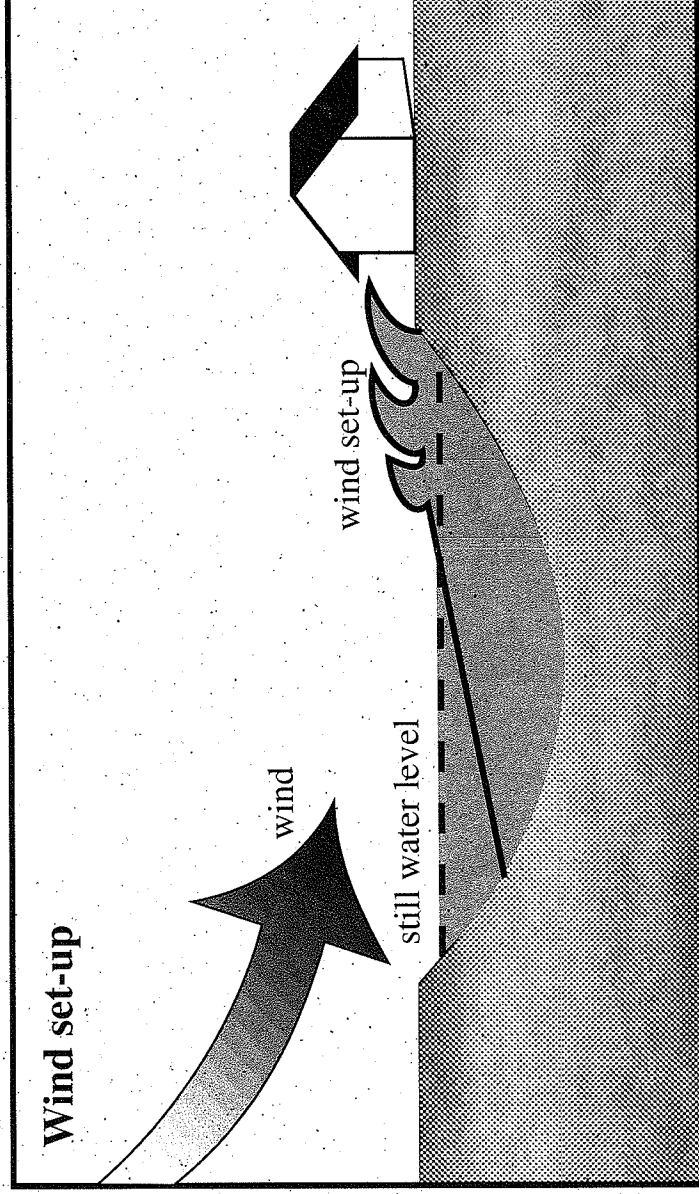


About the Great Lakes - St. Lawrence System

The Great Lakes and St. Lawrence River make up the largest system of fresh surface water in the world. Called "inland seas" by early explorers, the Great Lakes have shorelines that are shaped by forces similar in many ways to those that shape a sea coast.

Like the seashore, lake shores and beaches can be eroded and flooded by severe storms and high water levels. The daily action of currents and waves continually reshapes the shoreline. While not subject to tides in the same way that oceans are, the Great Lakes do experience changes in water levels due to a number of factors:

- Levels change over periods of years due to climatic and weather trends;
- They change seasonally as water supplies vary; and,
- Levels can change in hours as strong winds blow over the lakes, causing a phenomenon known as "wind set-up" (see diagram).



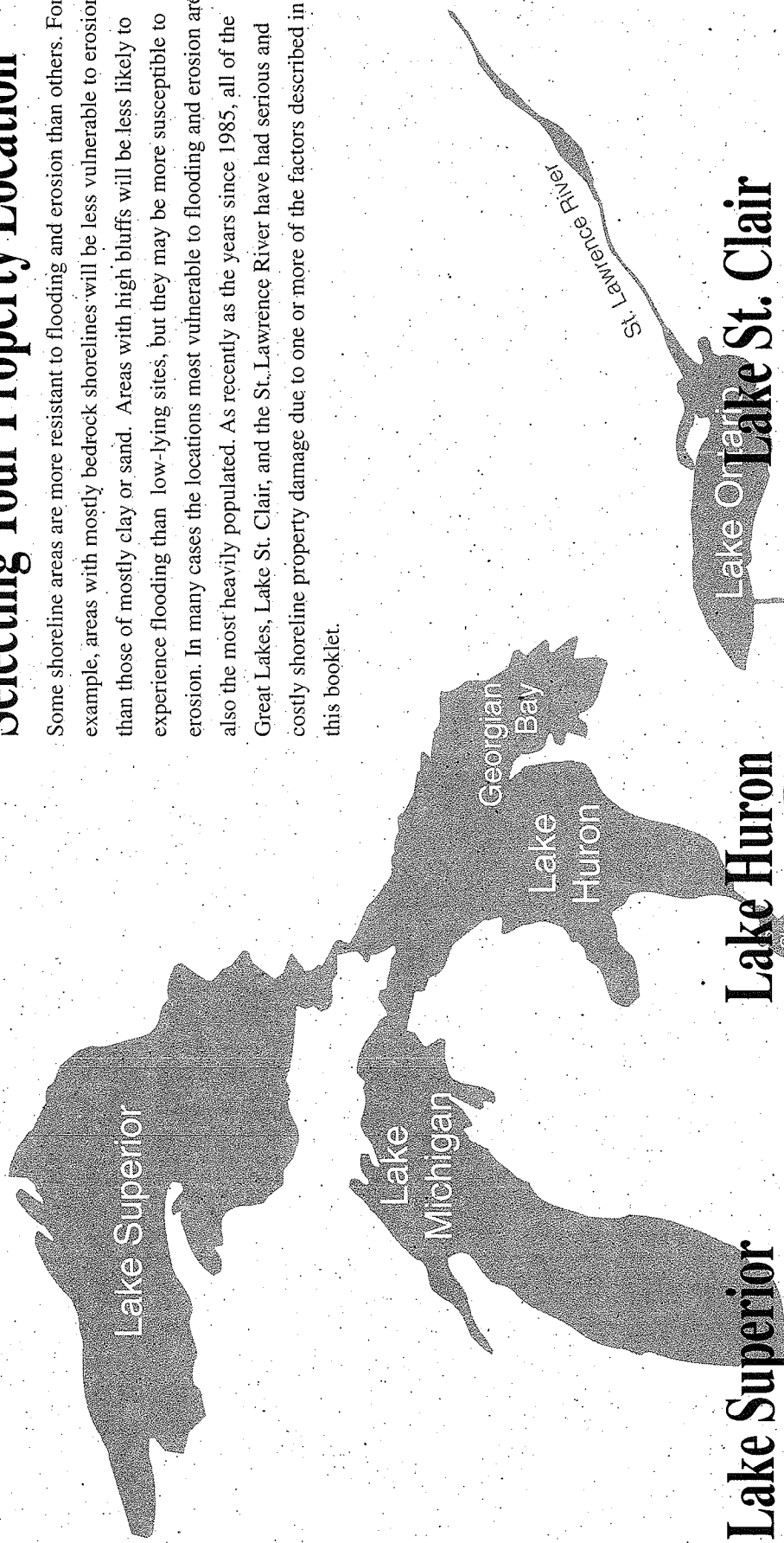
As water levels change, so do shorelines. Usually, as levels increase, erosion problems accelerate in areas already susceptible, and the chances of flooding increase. The combined effects of storms and high water can sometimes produce catastrophic results.

Even when water levels are normal, erodible shoreline will continue to wear away, and beaches will continue to change shape.

This booklet will help you recognize whether the property you are considering is at risk.

Selecting Your Property Location

Some shoreline areas are more resistant to flooding and erosion than others. For example, areas with mostly bedrock shorelines will be less vulnerable to erosion than those of mostly clay or sand. Areas with high bluffs will be less likely to experience flooding than low-lying sites, but they may be more susceptible to erosion. In many cases the locations most vulnerable to flooding and erosion are also the most heavily populated. As recently as the years since 1985, all of the Great Lakes, Lake St. Clair, and the St. Lawrence River have had serious and costly shoreline property damage due to one or more of the factors described in this booklet.



Lake Superior

Lake Superior is less vulnerable to flooding caused by wind set-up, and much of its shoreline is composed of erosion resistant bedrock. However, some of the populated areas are more prone to erosion than the remainder of the lake's typically rocky shores.

Lake Superior is one of the two Great Lakes with regulated outflows. Regulation helps keep the lake's level within a target range, but it does not prevent erosion and flooding.

Lake Huron

Many of the popular residential areas along Georgian Bay and Southern Lake Huron are located in areas of sandy soils in the form of beaches, dunes and bluffs. These continually change their shape as water levels rise and fall, and as waves and currents transport sediment along the shoreline.

Parts of Lake Huron — particularly the southern and eastern shores, as well as southern Georgian Bay — are susceptible to wind set-up. This phenomenon can flood low-lying areas, aggravate erosion problems and alter beaches and dunes.

Lake Ontario

Lake St. Clair is much smaller and shallower than the Great Lakes. Some shoreline areas are vulnerable to wind set-up. Virtually all of this lake's shoreline is low-lying and prone to flooding. This lake can also be dramatically affected by ice jams in the St. Clair or Detroit Rivers.

Lake Ontario

Lake Ontario's shoreline is the most diverse of all the Great Lakes; but like the other lakes, popular residential areas are among the most likely to experience erosion and flooding. However, due to its depth and geographic orientation, this lake is not as vulnerable as other lakes to wind set-up. Lake Ontario is the second of the two Great Lakes with regulated outflows. As with Lake Superior, this regulation helps keep the water level within a target range, but it does not prevent flooding and erosion.

Lake Erie

As with other lakes, many of the most popular areas for residential development on Lake Erie are in hazard areas. Roughly one-quarter of Lake Erie's Canadian shoreline is composed of high bluff, which is often subject to erosion. This erosion has two main causes: 1. wave action at the toe of the bluff; and 2. runoff from the land, which can create gullies on the surface or cause slumping as seepage of water undermines the bluff. Still other sections of the lake's shoreline are composed of low bluff, sand, silt, clay banks, or combinations of these — all of which are highly erodible.

This lake is particularly vulnerable to wind set-up due to its orientation to prevailing southwest winds. This can cause flooding in low-lying areas. Prolonged periods of high winds have been known to raise the still water level by more than two metres at the eastern end of the lake.

St. Lawrence River

Some low-lying shoreline areas of the St. Lawrence River experience flooding during extremely high river levels and flows. Winter ice jams can also cause flooding; and, ice may be pushed onto the shore where it can gouge shorelines and damage structures in its path. Ice jams occur occasionally despite the presence of ice booms and adjustments in river flows to encourage a stable ice cover.

The St. Lawrence River sometimes experiences periods of low water levels. These low levels occur most often between Kingston and Cornwall and are often related to the lake's seasonal decline in late summer and early fall. These low levels can sometimes interfere with recreational boating by reducing the depths of channels, exposing navigation hazards and making docks difficult to access. Shore wells can also be affected.

The Connecting Channels

Each of the four Great Lakes connecting channels — the St. Marys River, St. Clair River, Detroit River and Niagara River — is unique, and each has its own shoreline characteristics.

Of all the connecting channels, the St. Marys River is least affected by shoreline problems and ice jams. The St. Clair and Detroit Rivers are most often affected. Large portions of these rivers' shorelines are susceptible to erosion and flooding. Ice jams have been known to cause problems on the St. Clair River's shoreline and downstream on Lake St. Clair. Prolonged ice blockages in the St. Clair River can cut off Lake St. Clair's main water supply and cause its level (and that of the Detroit River) to drop dramatically, while raising the river level upstream of the ice jam. Major ice jams in the Niagara River have been significantly reduced by annual installation of an ice boom at the head of the river since 1964.

Consult the Professionals

For information that applies specifically to the shoreline property you are interested in, you should start by contacting the Conservation Authority (CA) or office of the Ontario Ministry of Natural Resources (OMNR) that covers your area. See the centre fold map to determine which office applies and find the address and telephone number. Staff in most of these offices will be familiar with the area of shoreline that interests you.

Most hazard-prone areas of Ontario's Great Lakes-St. Lawrence River shoreline have been mapped under the Canada-Ontario Flood Damage Reduction Program. You can examine these maps at the local CA or OMNR office. You can also find out about any setback, zoning or shoreline alteration restrictions that may apply to the property, and whether lot services and rights to the beach suit your intended use. If the Conservation Authority or Ministry of Natural Resources office is not close by, some of this information may be available from the nearest municipal government office. The Information & Geomatics office of Environment Canada can also help you locate hazard maps and give you information about the history of water level fluctuations in the area.

Research and Inspect the Site

You can identify tell-tale signs that the property you are considering is subject to flooding, erosion or dynamic beach hazards (See photos on pages 10 & 11.) A general rule of thumb is that if a property has a good deal of beach in front of it, it is not as likely to suffer erosion as one that has little or no beach. However, beaches and their buffer effects can be submerged by rising lake levels. In addition, dynamic beaches may look stable, but they are constantly changing. Structures in the dynamic beach zone are at risk. So, you need to know:

- The current lake level relative to the yearly range of levels;
- The history of extreme lake levels in the area;
- How wind set-up, or storm surge, affects the section of shoreline that interests you; and,
- Whether or not the property is part of a dynamic beach.

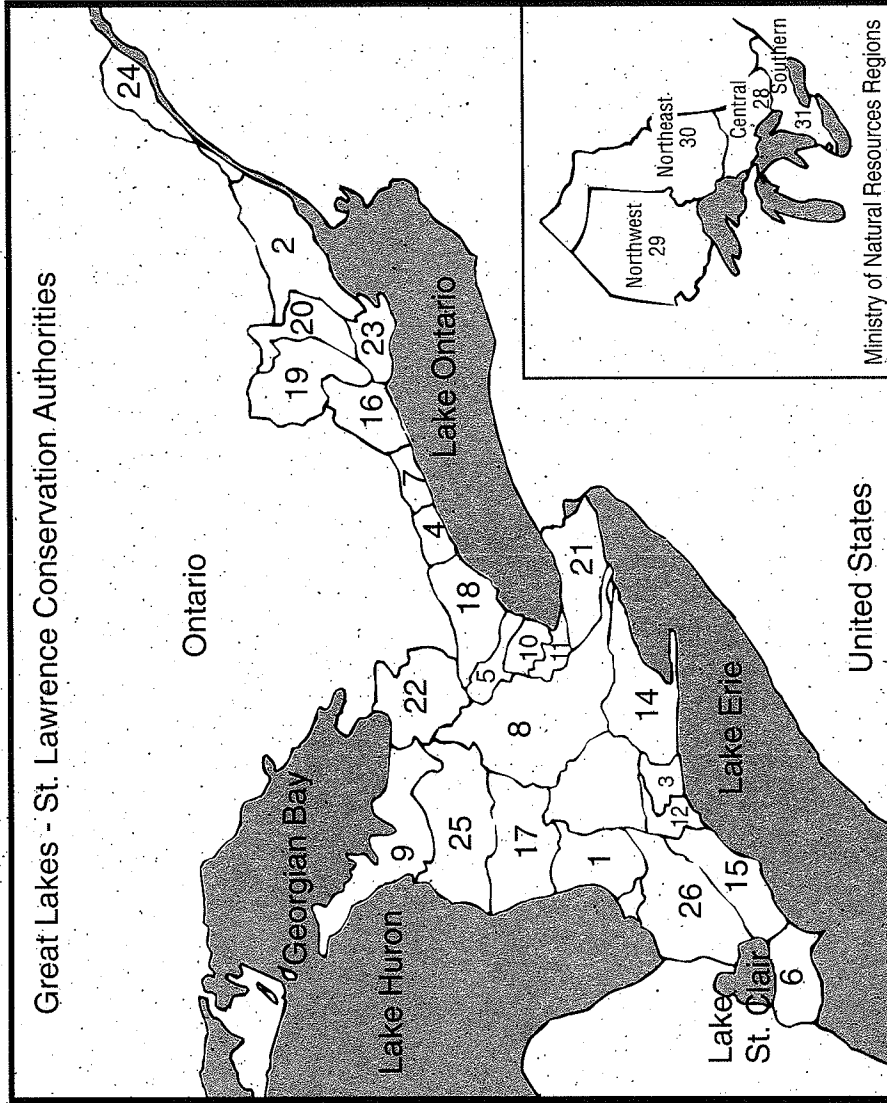
Generally speaking, a bluff — unless it is resistant bedrock — is subject to some form of erosion, either from wave action or from runoff of water from the land. You may be able to find out the historic erosion rates for the area from flood and erosion-prone area maps at the local CA, or Environment Canada's Information & Geomatics Office.

Know the Regulations and Policies

Under the Planning Act of 1995, the Ontario Government has enacted policies that govern shoreline development. These policies are implemented by Conservation Authorities and the Ontario Ministry of Natural Resources. In some areas, regulations will include setback requirements for shoreline properties. Many areas will also have shoreline alteration regulations. These will be important if you plan to make any changes or build any structures. The local Conservation Authority or municipal government office will be able to inform you about specific shoreline regulations in your area. Find out what they are before you inspect the property. You should also find out whether the beach is privately or publicly owned, and whether the current water and sewer services are adequate for your planned use of the property.

Great Lakes and St. Lawrence River

Conservation Authorities & Other Information Contacts



5. Credit Valley
1255 Derry Road West
Meadowdale, Ontario
L5N 6R4
(905) 670-1615
6. Essex Region
360 Fairview Ave. W.
Essex,
Ontario
N8M 1Y6
(519) 776-5209
7. Ganaraska Region
P.O. Box 328
Port Hope, Ontario
L1A 3W4
(905) 885-8173
8. Grand River
400 Clyde Road,
P. O. Box 729
Cambridge, Ontario
N1R 5W6
(519) 621-2761
9. Grey-Sault
Ingles Falls Road
R.R. #4
Owen Sound, Ontario
N4K 5N6
(519) 376-3076
10. Halton Region
R.R. 2, Milton
Ontario
L9T 2X6
(905) 336-1158
11. Hamilton Region
838 Mineral Springs
P. O. Box 7099
Ancaster, Ontario
L9G 3L3
(905) 525-2181
12. Kettle Creek
R. R. #8, St. Thomas
Ontario
N5P 3T3
(519) 631-1270
13. Lakehead Region
Box 3476
130 Conservation Rd.
Thunder Bay, Ontario
P7B 5J9
(807) 344-5857
14. Long Point Region
R.R. #3, Simcoe
Ontario
N3Y 4K2
(519) 428-4623

1. Ausable-Bayfield
R.R. # 3,
Exeter
Ontario
N0M 1S5
(519) 235-2610
2. Cataraqui Region
1641 Perth Road, P.
O. Box 160
Glenburnie, Ontario
K0H 1S0
(613) 546-4228
3. Catfish Creek
R.R. #5,
Aylmer
Ontario
N5H 2R4
(519) 773-9037
4. Central Lake Ontario
100 Whiting Avenue
Oshawa
Ontario
L1H 3T3
(905) 579-0411

Conservation Authorities

15. Lower Thames Valley
100 Thames St, Chatham
Ontario
N7L 2Y8
(519) 354-7310
21. Niagara Peninsula
2358 Centre Street
Allanburg, Ontario
L0S 1A0
(905) 227-1013
27. Sault Ste. Marie
Region
1100 Fifth Line East
R.R. #2,
Sault Ste. Marie
Ontario
P6A 5K7
(705) 946-8530
16. Lower Trent Region
441 Front St.
Trenton, Ontario
K8V 6C1
(613) 394-4829
22. Nottawasaga Valley
R. R. #1,
Angus, Ontario
L0M 1B0
(705) 424-1479
28. Ministry of Natural
Resources
Central Region
Box 9000,
Brendale Square,
Manominee Street
Huntsville, Ontario
P0A 1K0
(705) 789-9611
17. Maitland Valley
Box 127
Wroxeter, Ontario
N0G 2X0
(519) 335-3557
23. Prince Edward
Region
Box 310,
Picton, Ontario
K0K 2T0
(613) 476-7408
18. Metro Toronto
& Region
5 Shoreham Drive
Downsview, Ontario
M3N 1S4
(416) 661-6600
24. Raimin Region
P. O. Box 10,
Marrtown, Ontario
K0C 1S0
(613) 528-4823
29. Ministry of Natural
Resources
Northwest Region
Suite 221,
435 South James Street
Thunder Bay, Ontario
P7E 6E3
(807) 475-1261
19. Moira River
Box 698
Belleville, Ontario
K8N 5B3
(613) 968-3434
25. Saugeen Valley
R.R. #1,
Hanover, Ontario
N4N 3B8
(519) 364-1255
30. Ministry of Natural
Resources
Northeast Region
P. O. Box 3000,
140-4th Avenue
Cochrane, Ontario
P0L 1C0
(705) 272-7050
20. Napanee Region
25 Ontario St. W.
Napanee, Ontario
K7R 3S6
(613) 354-3312
26. St. Clair Region
205 Mill Pond Crescent
Strathroy, Ontario
N7G 3P9
(519) 245-3710
32. Great Lakes-St. Lawrence
Water Level Information & Geomatics Office
Environment Canada-Ontario Region
867 Lakeshore Road
Burlington, Ontario L7R 4A6
(905) 336-4581
33. Association of Conservation Authorities
of Ontario
418A Sheridan Street
Peterborough, Ontario K9H 3J9
(705) 749-9131

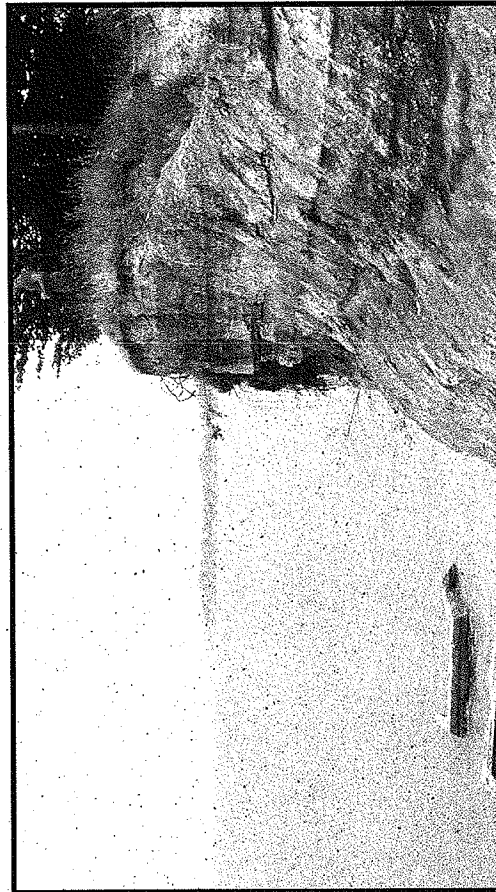
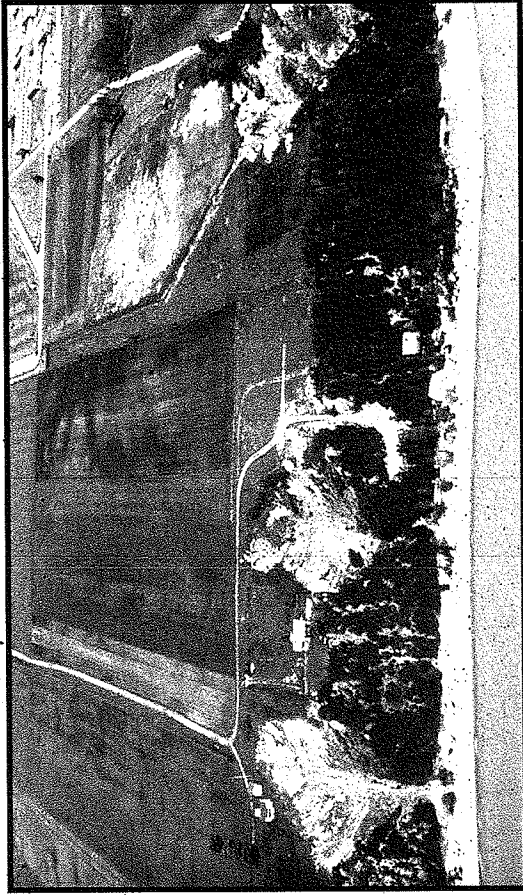


Look for Evidence of Problems

The higher the land elevation, the less the likelihood of flooding. Local officials, the Conservation Authority, or the Information & Geomatics Office of Environment Canada can tell you the flood levels for your area and whether your property is subject to flooding.

In any case, you will be looking for a property on which the structures are set well back from the shoreline. The closer a home or cottage is to the edge of a bluff, or to the beach, the greater the likelihood that it is in danger from erosion, flooding or the beach's dynamic processes.

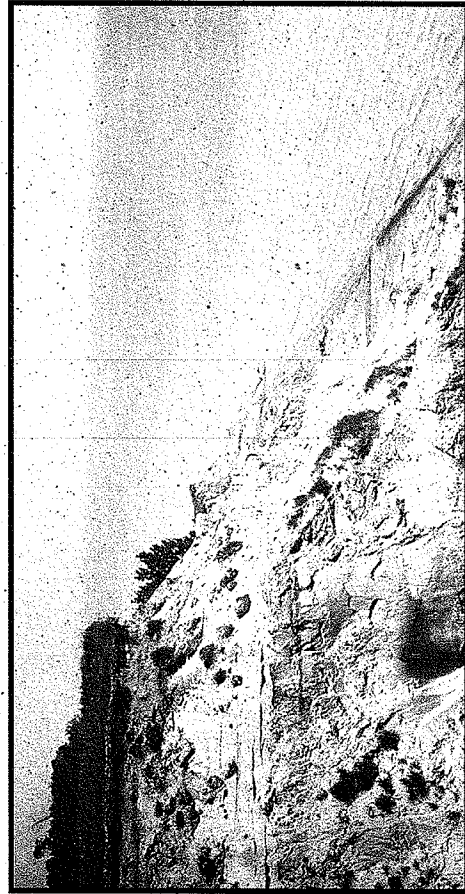
A partially vegetated bluff could be an early sign of gully erosion due to surface runoff, groundwater seepage, or past bluff slumpage.



A vegetated bluff might appear stable, but trees leaning toward the lake indicate slow mass movement.



A bluff with no vegetation suggests active erosion occurring at a rate too rapid for vegetation to take hold.



Narrow beaches can be submerged, particularly if lake levels begin to rise, and leave the bluff vulnerable to wave erosion.

What Is The Soil Type?

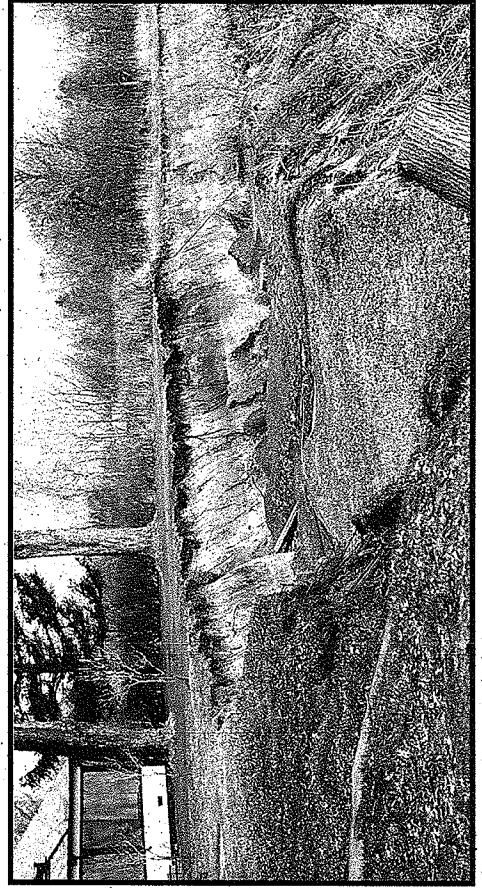
It is important to know the composition of your prospective property's shoreline. Your CA or OMNR office can help you here. Generally, all bluffs erode, but those composed of a higher proportion of sandy soil erode more quickly than those with greater amounts of cohesive clay or compact, fine grain soils.

Beaches, on the other hand, are continually changing as waves and alongshore currents remove and replenish sand. For this reason, they are referred to as "dynamic". This year, your beach may be perfect for summer recreation; but by next year, it may change. Long-time neighbours of the property may be able to tell you about annual or long-term changes in the beach's appearance.

Is There Shore Protection?

Shore protection is a buffer against flooding or erosion. It can be structural (such as the seawalls, bulkheads or revetments pictured on the next page) or non-structural (such as vegetation or naturally occurring dunes). The presence of structural shore protection usually guarantees that the property has been, and still is, subject to erosion and/or flooding.

While shore protection can help preserve a vulnerable property, it does not guarantee against future problems. In fact, poorly chosen or constructed "protection" can actually aggravate erosion problems, either for the property it is intended to preserve, or for its neighbours. In addition, some types of protection destroy natural fish and wildlife habitat.



Cracks can appear some distance back from the edge of a bluff. Eventually, the entire section in front of the crack will break off.

Consider the Costs & Implications

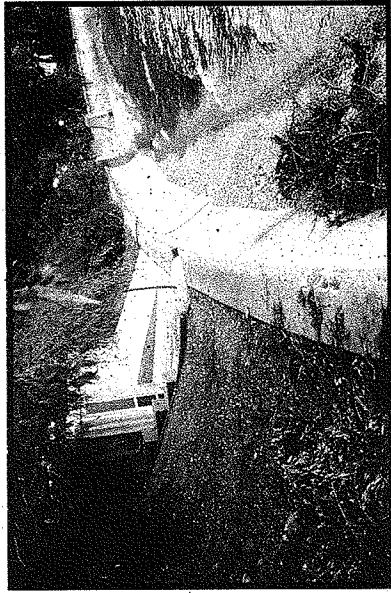
It is a good idea to weigh the costs and benefits of leaving an erodable or flood-prone shoreline in its natural state, or of instituting non-structural protection. Even if you want to build a structure, regulations or access problems may not permit it. If you are able to build protection, consider that the most effective structural protection is co-ordinated with neighbouring properties to cover long stretches of shoreline.

Regardless of its effectiveness, structural shore protection will require maintenance over the years, an expense for which you will need to budget (about 5% of the structure's total cost annually).

By virtue of its function as a buffer between your property and the lake, even the most effective shore protection will deteriorate.

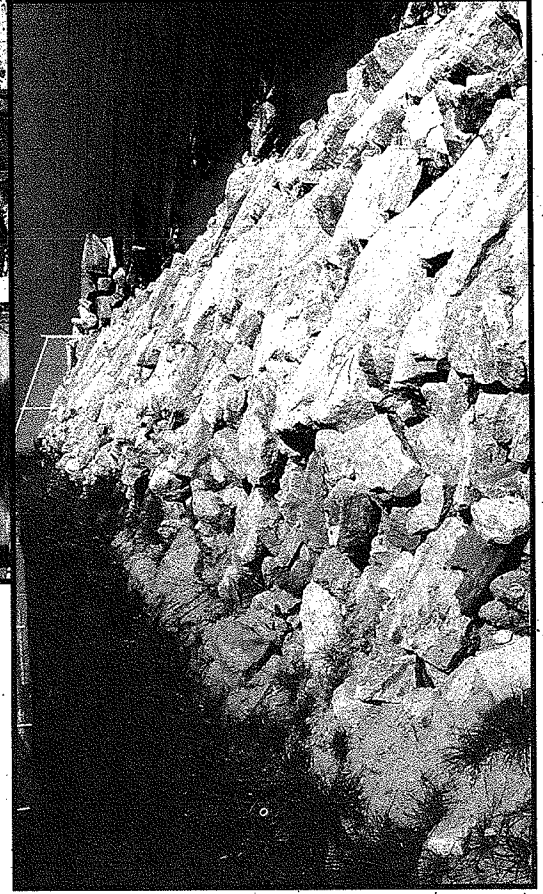
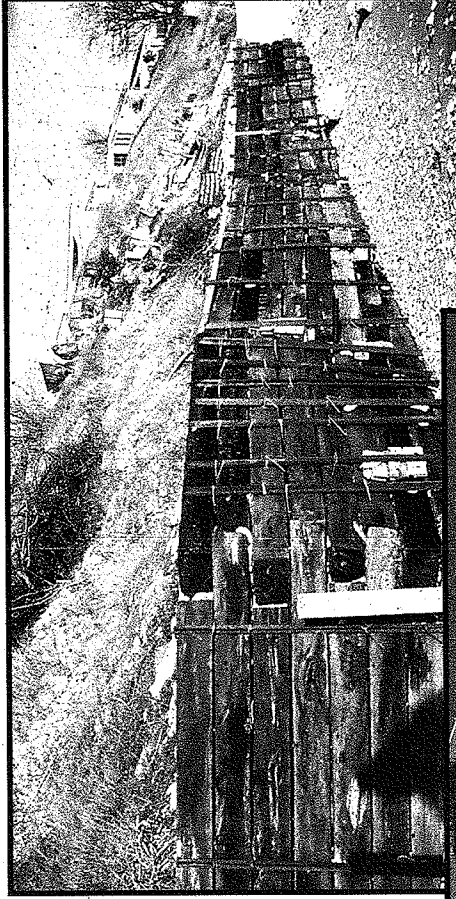
Before you buy, you may find it well worth your while to have the existing protection assessed by an expert to determine its suitability for the location, its state of repair, how much it will cost to maintain or replace, and whether it complies with regulations.

If the structure needs repairs or replacement, be sure to consult a reputable consultant or contractor. The lowest priced job may not be the best — and it could cost you more money in the long run.

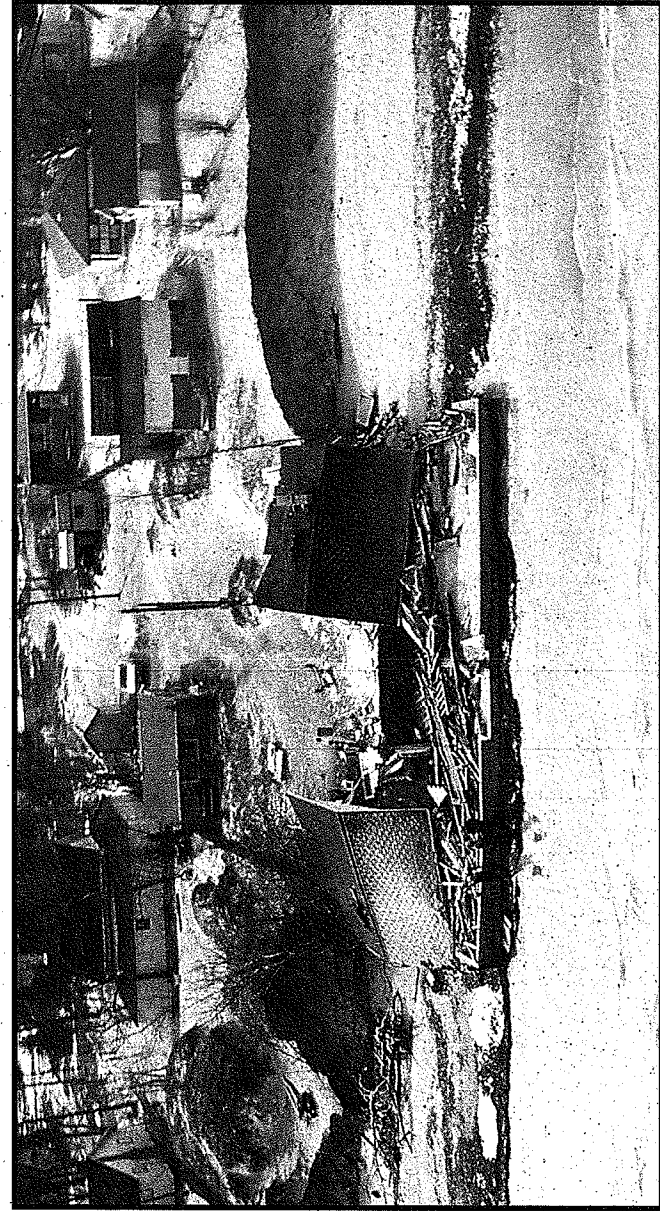


Most types of shore protection are an indication that the property is vulnerable to erosion. Structural protection, like the seawall or bulkhead shown here can seriously disrupt the shoreline ecosystem.

Bulkheads can be a combination of steel sheet piling, concrete, or timber cribbing filled with stone.



A revetment is a sloped facing, usually of stone or concrete, used to maintain the stability of an embankment. The revetment pictured here is rip-rap, which consists of large, angular rocks.



Get Professional Advice on Shore Protection

The best way to ensure that your prospective property's shore protection suits the particular type of shoreline is to contact the local Conservation Authority. Where there is no Conservation Authority, contact the Ministry of Natural Resources office closest to your property (see centre pages). In many cases, these offices provide a technical advisory service that can assess the specific shore protection needs of each property; and they can also tell you about any regulatory restrictions that apply to the property.

Regulatory restrictions are meant to ensure that shore protection is environmentally sound and that it will serve its intended function. You should also coordinate with your neighbours to ensure that the combined effect of all your structures is positive rather than negative. If you have plans to build a dock, or if a dock already exists, it will also be subject to specific regulations.

The CA, OMNR or municipal government office will be able to tell you whether existing shoreline structures comply with regulations that cover shoreline alterations. If you find that you will need to install new shore protection, or repair the existing structure, you will need to ensure that you meet all the regulatory requirements.

Allow Time For Approvals

Of course, permit applications will take time to process, and there may be costs involved as well. You can avoid many disappointments by adequately researching your proposed shoreline project, and ensuring that your application contains the required information for approval. You should take these factors into consideration when planning for your purchase.

If Your Prospective Property Is In A Hazard Area...

If you have determined that your prospective property is in a flood or erosion-prone area and you still want to buy it, there are some things you can do to help reduce your risks:

If your property is prone to flooding or erosion, you may be able to move buildings back from the shoreline. You may also be able to raise them, or institute other flood-proofing measures. Consult your Conservation Authority or Ministry of Natural Resources office before you attempt any of these measures.

Find out whether your prospective property includes a dynamic beach. Provincial regulations do not permit development on dynamic beaches, and natural beach processes may put your shoreline structures at risk.

Consider installing structural shore protection only after you have explored all the alternatives. Structural protection is the most expensive alternative, the most likely to damage the surrounding ecosystem and most difficult to have approved.

Get professional advice before you consider making any changes to the shoreline, or to existing shore protection. Don't try to design shore protection yourself.

Weigh the environmental as well as the financial costs and benefits of shoreline alterations. Keep these changes to a minimum. Whatever you build, it will alter the environment that you are looking forward to enjoying.

Know and obtain the permits required for alterations to property and shoreline, and allow sufficient time for the approval process.

Include the continuing maintenance costs of protecting your property in your budget.

Most of these activities constitute major expenses in addition to the purchase price of the property.

Be aware of your community's emergency preparedness procedures for high lake level events, and identify safe escape routes.

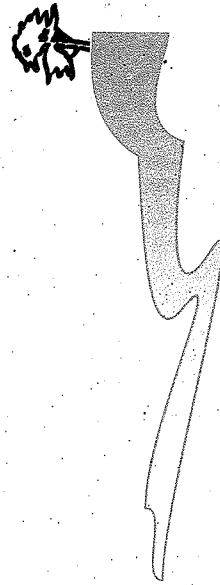
Again, your CA or municipal office can help you here.

Know whether potential damage to your property can be covered by insurance. In most cases, flooding and erosion damage is not covered by private insurance. Currently, there are no provincial or federal government programs to fund repairs to privately-owned shoreline property.

In extreme cases of widespread damage, disaster assistance may be available from governments. However, this type of assistance usually only applies to principal residences and places of business and would be unlikely to provide full replacement costs.

The Final Decision...

Ultimately, the decision to buy a property rests with you. But, remember that by choosing to live on the shoreline, you are choosing to live with some measure of risk. You owe it to yourself to be fully aware of the extent of risk. The information resources listed here can help you. To obtain any of these materials, contact either the Conservation Authorities, Ministry of Natural Resources offices, or the Great Lakes-St. Lawrence Water Level Information & Geomatics office at the addresses and telephone numbers given on the centerfold pages.



Comprehensive Set of Policy Statements. Government of Ontario (March 1995), policies for Great Lakes-St. Lawrence River system shorelines (Policy A3.1).

Environmental Living: Protecting the Environment when Building or Buying your Dream Cottage. Ontario Ministry of Environment and Energy. 24 pages, illustrated. Provides tips on permits, water & sewage and landscaping.

Flood and Erosion Hazard Maps of sections of Great Lakes shoreline. Environment Canada and the Ontario Ministry of Natural Resources. Lines on these maps show the 1:100 year flood and erosion lines for various stretches of shoreline. These maps may be viewed at Conservation Authorities, offices of the Ministry of Natural Resources, or at Environment Canada's Information & Geomatics Office.

**Flooding & Erosion Part 1: The Hazards*. Environment Canada and the Ontario Ministry of Natural Resources. A slide-tape show designed to make prospective Great Lakes property owners aware of the potential hazards associated with residential lakeshore property.

**Flooding & Erosion Part 2: Avoiding the Hazards*. Environment Canada and the Ontario Ministry of Natural Resources. A slide-tape show that illustrates potential shoreline hazards to prospective property owners.

Great Lakes-St. Lawrence River Regulation: What it Means and How it Works. Environment Canada, (revised 1993). A 12-page illustrated booklet describing the history and operations of the regulation plans for Lake Superior and Lake Ontario.

Great Lakes-St. Lawrence River Technical Guide. Ontario Ministry of Natural Resources (Summer 1995). Detailed guide on shoreline hazards and environmental impacts of shoreline development.

Great Lakes Water Levels. Environment Canada, (revised 1993). A 20-page illustrated booklet describing how the Great Lakes-St. Lawrence River system works.

Guide to Shoreline Approvals for Landowners. Toronto Waterfront Regeneration Trust, (to be published in 1995). A flow chart which takes the property owner through the types of activities planned and points to the types of approvals required.

* Information sources for this publication

Level News. Environment Canada, a 2-page newsletter about Great Lakes water levels and related subjects. Mailed regularly with *Water Levels: Great Lakes and Montreal Harbour* (see below)

Natural Hazards: Implementation Guideline. Government of Ontario (March 1995).

Natural Hazards: Technical Manual. Ontario Ministry of Natural Resources (Fall 1995). Supports the province's comprehensive set of policies.

The Role of Vegetation in Shoreline Management: A Guide for Great Lakes Shoreline Property Owners. Great Lakes Basin Commission. A 32-page, illustrated booklet with an information directory and references. It provides a comprehensive review of shoreline and bluff erosion problems; explanations of why these problems occur; guidelines to help identify specific problems; and suggestions for remedies.

Shoreline Management Plans. Several Great Lakes Conservation Authorities have developed shoreline management plans in consultation with municipal governments and citizens in their areas. These plans may be viewed by contacting the Conservation Authority concerned.

Shoreline Protection: Your Guide to the St. Lawrence River. Raisin Region Conservation Authority. 12-page, illustrated fold-out pamphlet of Do's and Don'ts.

Water Levels: Great Lakes and Montreal Harbour. Canadian Hydrographic Service. Graphs of long-term average, actually recorded and forecast water levels for the lakes and Montreal Harbour. Mailed regularly along with the *Level News* (see above).

**Working Around Water*. Ontario Ministry of Natural Resources and Fisheries and Oceans Canada. 12-page illustrated booklet gives general guidelines for ensuring that shoreline projects meet Ministry guidelines and do not interfere with fish habitat.

Other Technical Guides Available from the Ontario Ministry of Natural Resources:

- Geotechnical, Slope Stability — Terraprobe (1994)
- Wave uprush, Overtopping — Atria (1993 and 1995)
- Numerous other detailed reports commissioned by the Ministry of Natural Resources.

Seven Keys To Peace Of Mind

This booklet gives you the tools to answer these questions *before* you purchase shoreline property. If you are satisfied with the answers, you will be well on your way to making a sound decision.

1 Is the property subject to flooding and/or erosion?

2 Is structural or non-structural shoreline protection a viable option?

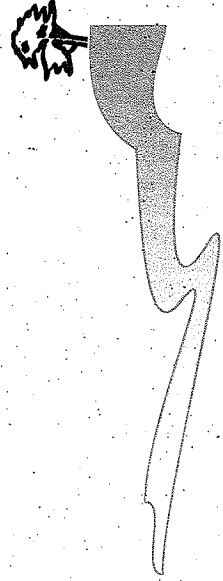
3 If you need structural protection, will it be allowed, and can you afford it?

4 If structural protection already exists, is it effective, and can you afford to maintain or repair it?

5 Does, or will, shore protection do its job without interfering with the natural environment?

6 Are the available lot services (such as water and septic/sewer) adequate for your intended use?

7 Will you own the beach, or is it public property?



This Information Is Provided By:

Suggested Price \$3.00