

Lakeshore Capacity Assessment: The Facts

What are LCA and LCM?

Lakeshore Capacity Assessment (LCA) is a planning tool developed by the Ontario Ministry of the Environment (MOE) to predict the impacts of shoreline development on water quality of inland lakes on the Canadian Shield. The LCM, or Lakeshore Capacity Model, is one component of the LCA approach. The model is used to determine the maximum allowable development that can occur on the shorelines of a lake without impairing water quality.

Why should cottagers care about LCA?

Protection of water quality is essential to protecting the environmental, recreational, economic, and property value of a lake. Therefore, it is in the best interest of cottagers' associations and residents living on lakes to safeguard their water resources. LCA is one way that municipal planners can help protect the water quality of lakes from excessive development along their shores.

What does lakeshore capacity assessment tell lake managers?

The LCM allows lake managers to determine the carrying capacity of a lake in terms of the maximum allowable total phosphorus (TP) concentration (i.e., 'predevelopment' or 'background' [TP] + 50%). For example, a lake with a modeled background TP of 10 µg/L would have a water quality objective of 15 µg/L (i.e., 10 µg/L + 50%). This P limit can be translated into a development capacity, which states the number of future shoreline developments (e.g., residential, cottage lots) permitted on the lake before water quality is impaired.

What circumstances might trigger the need for a lakeshore capacity assessment?

- 1) When municipalities are developing or updating their official plans
- 2) If significant improvements to road access are being considered, or have occurred, increasing the use of residences from seasonal to extended seasonal or permanent
- 3) If significant developments are being considered within 300 m of a lake or permanently flowing stream within its watershed
- 4) If significant or unusually large amounts of development are proposed for a lake beyond the 300 m boundary
- 5) If water quality problems (e.g., elevated levels of P, loss of water clarity, or algal blooms) are noted
- 6) If lake trout populations are present

What level of government has authority over water quality in Ontario?

The provincial government maintains jurisdiction and legislative authority for water quality and quantity under the Ontario Water Resources Act and the Environmental Protection Act. However, municipalities have obligations under the Planning Act and the Provincial Policy Statement (2005) to protect water quality and fish habitat and to evaluate the effect of development on the local environment.

Are municipalities legally required to use LCA?

No. LCA is a planning tool, not a legally binding requirement. The MOE has provided the municipalities with the model to guide them with their planning decisions. If municipalities use the model to inform their decision-making process the planning will meet the intent of the PPS

(as stated above). In practice, this means that the technical model will be implemented primarily by municipal planners and technical staff. In some cases, municipalities have hired environmental consultants to conduct LCA on lakes or across regions. The MOE may provide technical support to municipal planning authorities or review model outcomes.

Are there cases where the MOE is responsible for LCA?

In Ontario, planning and development decisions are made at the local (municipal) level. However, one exception is in northern regions of Ontario where there are no organized municipalities. In the northern regions, the Ministry of Municipal Affairs and Housing (MMAH) relies on the MOE to assist them with applying the model.

How are LCM predictions incorporated into municipal planning and policies (e.g., official plans, zoning bylaws)?

In some cases, the LCM predictions may indicate that a lake has reached its development capacity. Municipalities are encouraged to incorporate these predictions into planning decisions and official plans. In other words, lakes that are found to be at or above their development capacity should be documented in the municipality's official plan and zoning bylaws. For example, a zoning bylaw may state that "the following lakes are zoned no more development" OR, "are subject to a prohibition on new development".

Are there cases where the LCM does NOT apply?

The LCM was developed, calibrated and tested on a set of headwater lakes located on the Precambrian (Canadian) Shield. Therefore, the model was intended for application to Canadian Shield lakes. However, there are cases where the model has been successfully applied to boundary lakes (i.e., lakes partly off the Canadian Shield). Caution should be exercised when applying the model to off-Shield lakes.

The model was not intended for application to the following lakes:

- 1) Off-Shield Lakes
- 2) The Great Lakes
- 3) Shallow lakes
 - average water depth less than 5 metres
- 4) Tea-stained lakes
 - dissolved organic carbon (DOC) greater than 10 mg/L (e.g., northern lakes that are highly coloured due to humic/fulvic acids from wetlands)
- 5) Small lakes
 - surface area less than 25 hectares

*Note: the area within 300 metres of a lake or permanently flowing stream is considered to be the area of influence for phosphorus loading (i.e., the area within which phosphorus from septic systems may move to the lake or stream).

Further information is available in the *Lakeshore Capacity Assessment Handbook: Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield* online at <http://www.ene.gov.on.ca/publications/7642e.pdf>. A link is also available from the FOCA website Lake Partner pages.

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