WHITE LAKE PROPERTY OWNERS ASSOCIATION ENVIRONMENT VOLUNTEERS

# ENVIRONMENT BULLETIN

*Conrad Grégoire and David Overholt*

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# The Power of Ice

When White Lake freezes over and becomes covered with a single sheet of ice it doesn't remain dormant all winter. Almost everyone is familiar with eerie moaning sounds coming out from under the ice as well as the very loud cracks and booms heard both during the day and at night.

These effects are collectively referred to as 'ice heaving' or 'ice jacking'[1] and are the results of temperature changes in the ice itself.

When ice cools it contracts and tends to crack. These cracks are infilled with water from below, which then freezes into a solid mass. When temperatures rise again, the ice expands further and the process is repeated. Thermal expansion of ice occurs when a period of colder weather is followed by a rapid increase in temperature from warmer weather. For example, a 1 km sheet of ice which is warmed by 20C will expand about 1 metre. Bare ice is more susceptible to large changes in temperature than ice insulated by a layer of snow.

If the ice is not very thick it will not be strong enough to remain in one piece and very often will buckle and form an ice ridge such as the one shown in the photo above. This

[1] Ice jacking is also called 'ice ridging', 'ice heaving',' ice push' or 'ice shove'.

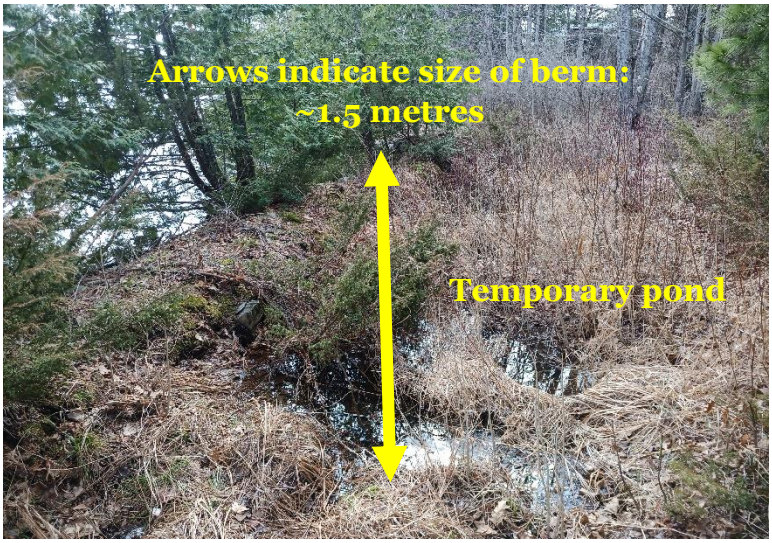
ridge was photographed on January 8, 2019 and was about half a metre in thickness. The ridge ran from Barry's Island on the western side of the lake all the way across to the eastern side of the lake.


A less familiar process can occur if the expanding ice is too thick to cause the ice sheet to rise and form an ice ridge. In this case, the powerful pressure from the ice is directed towards the shoreline. This is best called 'ice jacking' because over the coldest part of the winter, ice expansion occurs repeatedly. Every cold-warm cycle result in a ratcheting effect hence the term 'jacking'.

Most of the shoreline around White Lake can take the expansion of the ice sheet in stride as the ice moves higher towards the shore. Shallow areas of the lake as well as solid-rock shorelines fit this category.

In other parts of the lake, such as the western shore, the shoreline is made of rock rubble (as shown in the photo above). This type of shoreline found anywhere on the lake including parts of Three Mile Bay is subject to ice jacking.

Ice jacking results in the formation of a berm (see photo below) which can be very beneficial for the lake and the lake ecosystem. The berm creates a buffer zone (a transition for aquatic organisms between land and lake), and fosters plant growth along the shoreline. The berm forms a natural barrier to runoff and prevents nutrients from flowing directly into the lake. During the spring and early summer, water collected behind the berm serves as a nursery for amphibians and other animal life.




Unfortunately, some property owners 'back fill' these areas behind the berm to increase access to the lakeshore.

Nature will not rest however, and over time, the berm will be restored to its natural function.