Waking up and saving shorelines

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Screenshot from Dr. Timothy James' presentation illustrating the different stages in lake-aging. /submitted

Often we hear about lake health, lake ecology, and the importance of both, but Dr. Timothy D. James believes we need a new perspective on the discussion regarding lake health and the impact enhanced wake-sports have on our lakes.

Last weekend, Dr. James was the keynote speaker at Environment Haliburton's AGM. "Enhanced wake-sports have really started to take their toll on our lakes over the last five years affecting our ability to enjoy them," said Dr. James.

A long-time cottager in Haliburton county and now full time resident, Dr. James feels the discussion can benefit from the context of the natural history of our lakes and how they age through time. He has experienced the "truly dramatic effect these boats can have on our lakes" first-hand. Dr. James, is a board member of Safe Quiet Lakes, and also a member of the Safe Wakes Coalition.

The geology and birth of our Ontario lakes

The last ice age ended approximately 11,000 years ago in central Ontario. As the glacial ice sheet that covered central and southern Ontario receded, hundreds of thousands geological and glacial depressions were exposed that quickly filled with water. "That was the process by which Ontario lakes were born," explains Dr. James. "At that time, the lakes had been covered by ice for over two millions years, and therefore held very little nutrients."

The process of accumulating nutrients and increasing productivity is called eutrophication, which in some ways is similar to the process of 'lake aging.' The nutrient content in lakes takes thousands years to build up, emphasizes Dr. James. "It's 11,000 years since the last ice-age and we still have many lakes that are still low in nutrients in the county, such as Kennisis, Redstone, and Halls Lakes," he said.

"Eventually with enough time, aging lakes become eutrophic," explained Dr. James. "This means the lakes have accumulated high nutrient levels and high productivity, characterized by excessive plant and algae growth, reduced water-clarity and lower oxygen levels."

As lakes become eutrophic, they tend to become less clear, because the lakes are supporting a more diverse range of plant and algae and their decomposition adds to lower oxygen levels, which ultimately affects aquatic life.

Over thousands of years, these glacial lakes gradually built up nutrients with natural processes like erosion and decomposition, causing sediments and nutrients to accumulate in the lakes, encouraging plant and animal growth, known as a positive feedback cycle. "Once the lakes can support a diverse ecosystem of vegetation and fish, they are classified as mesotrophic. "Many lakes in Haliburton cottage-country are mesotrophic," explained Dr. James.

Dr. James points out that we often think of eutrophic lakes as unhealthy, but this isn't necessarily the case. These lakes are characterised by excessive plant and algae growth and lower water clarity, but "they are important eco-systems in their own right. Typically, these lakes are not great for human recreation" explained Dr. James. "So we want to do what we can to prevent our lakes from becoming eutrophic."

The human effect on natural lake cycles

Not surprisingly, humans can contribute to lake eutrophication by accelerating the rate at which nutrients are driven into the lake, fast-tracking the natural lake-aging process.

Human-contributed aging is known as "cultural eutrophication." Septic systems, hard shorelines, vegetation removal, and activities that cause shoreline removal are all contributing factors many of us are aware of. However, the rate at which these activities increase lake-death is not common knowledge. "Uncontrolled, human activity can contribute thousands of years of aging to a lake in a short time," he said.

Dr. James noted that through the implementation of bylaws, protecting water-sheds, and septic inspections, we have done a good job at mitigating our human impact. The problem is that we risk undoing all our hard work if new pressures are not regulated as they arise.

Dr Timothy D. James. /submitted

Enter enhanced wakes from wake-boats

Wake-boats are engineered with ballast and mechanical devices to create substantial waves on bodies of water that naturally would never have waves that large. Wake-boats create wakes six to twelve times more powerful than traditional motor boats.

"To bring this into context, the largest waves in the great lakes, the waves powerful enough for a human to surf, are only generated during the larger storms", said Dr. James. The majority of lakes here in the county would naturally never see waves that size.

"I feel that wake-boats are the largest impact our lakes have sustained in the last 11,000 years. With the continued use of these wake-boats, we are undoing all of the positive things we achieved," emphasized Dr. James. "The boats have a place, in size-and depth-appropriate waters, where they don't affect the lakes."

Wake-boats: different than traditional motor boats

There are two main issues with wake-boats supported by a significant volume of research, explains Dr. James. Firstly, "the high-angle of attack when these boats are in wake-surfing mode, means the prop wash can reach up to nine meters of depth, stirring up dormant sediment that has not been disturbed for literally thousands of years, thereby adding nutrients to the water-column at an accelerated rate."

In addition, vegetation is uprooted and fish habitats and nurseries are greatly impacted. Phosphorus and nitrogen are just some of the nutrients made readily available to the plants and algae. These unnaturally high-levels of nutrients accelerate lake aging.

The second element is the boat-wake itself, which reaches up to over a meter, affecting the shoreline, further washing organic materials into the lake at an unnatural rate, contributing to nutrients in the water-column. They can also add to the contribution of invasive species, and disturb natural habitat, such as loon nesting and fish habitat.

How we can help

According to Dr. James, an outright ban is not necessary. Education is important but works best when combined with operational limitations leading to sustainable usage.

Regulating for sustainable usage where enhanced wake-boats are permitted must be based on science to mitigate environmental impacts and property damage.

There are already two key parameters, based in science, that can significantly mitigate the damage: minimum proximity to the lake bottom and minimum proximity to shore. The science is clear: the effects of wake-boats are incompatible and unsustainable in shallow waters.

Dr. James posits that a minimum depth of six metres is required for lake-safe operation. However, in cottage country's fragile ecosystem, he recommends up to nine meters of depth, to preserve fish spawning beds and nurseries.

"Even the boating industry acknowledges this is an issue. They try to inform people when they are buying the boats, but the guidelines are not as area-specific as they should be," indicated Dr. James. Environmentally safe distance-from-shore guidelines vary widely and are highly dependent on shoreline and lake-bottom characteristics.

The industry generally recommends a minimum of 200 feet (60 metres) from the shoreline.

Overwhelming response from Haliburton county for SafeQuiet.ca survey

"Every four years, the charity Safe Quiet Lakes (safequiet.ca) undertakes a survey, with an overwhelming response from Haliburton county in 2025," said Dr. James.

The recent local survey found that up to 95 per cent of respondents put relaxing by the water, swimming, and enjoying nature at the lake at the top of their most important cottage activities. While 50 per cent plan to be in traditional motor boats, only seven per cent of respondents had wake surfing high on their list. "Many people do not realize the damage these wake-boats do, but when we tell them, often their first response is surprise and they ask 'how can I help?'" recalled Dr. James.

In short, choosing an appropriate boat for the size of the lake is just one of the ways to help. "This is a perfect example of: Just because we can do something does not mean we should do something," said Dr. James.

New legislation has come into effect

Transport Canada via the Vessel Operation Restriction Regulations (VORR) under the Canada Shipping act has recently modernized rules for limiting engine power or types of propulsion, limits on horsepower, and waters in which towing a person on any recreational or sporting equipment is prohibited except during certain hours, for public safety and to protect the environment, but now a new VORR addresses wakesurfing specifically.

"Better Wake Zone" map launching for Canada Day long weekend

Together with Safe Quiet Lakes and the newly formed Safe Wakes Coalition, Dr. James is creating digital maps that can be used on your smartphone or marine GPS to show areas of lakes that are more compatible with sustainable wake-boat usage. They are advising that you stay at least 250 metres from shore and in at least nine metres of water to keep your shorelines and neighbours safe. Stay tuned to SafeQuiet.ca for information and video links, and the launch of the digital map system.