WATCHING YOUR WAKE
Courtesy of the Pike Lake Community Association, May 2013

Cottagers derive a great deal of enjoyment from a host of boating activities …

Those of us with our pleasure craft licence studied specific rules of the water geared to safe & responsible boating; most of us are familiar with general boat safety & etiquette. We may not be as familiar with the impact of boat wake.

Impact of Boat Wake

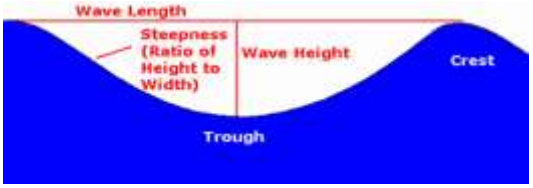
The larger the wake, the greater the potential for undesirable side effects

- Loons, & other birds that nest along the shore, choose locations that are protected from waves generated by the prevailing winds. However, boat wake, which can come from any direction, can & does drown the nests & the young, particularly in May & June.
- Inexperienced swimmers & young children are not usually in the water when wind-driven waves are high. However, they can be toppled by the size & energy of boat wake.
- Boat wake & prop wash can churn up sediments in shallow water which releases dormant nutrients that promote weed growth & algal blooms.
- Boat wake can cause erosion.
- Boat wake can cause docks & moored boats to rock severely & pull mooring hardware.

Waves

Three factors make up wind-driven waves: the speed of the wind, the length of time the wind has blown, & the distance of open water that the wind blows over called the *fetch*. Waves are measured by

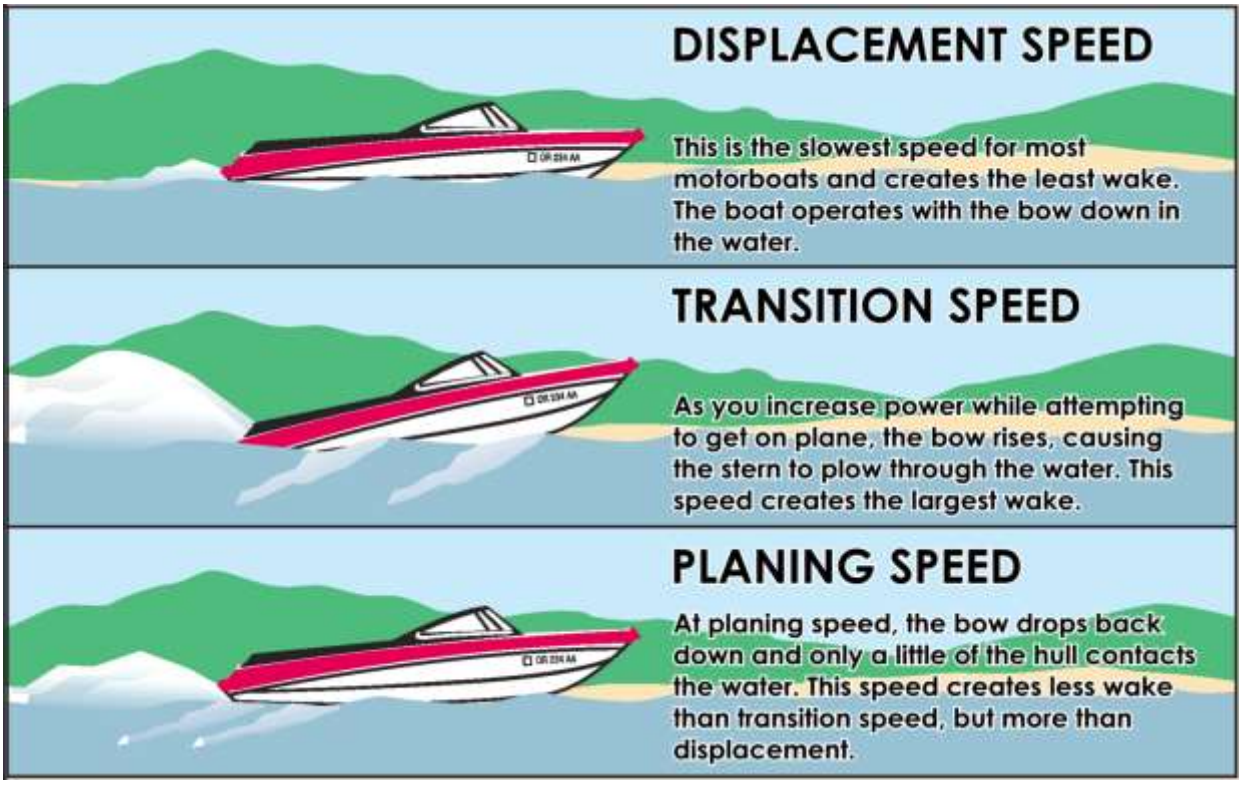
- Height (from trough to crest)
- Length (from crest to crest)
- Steepness (angle between crest & trough)
- Period (length of time between crests)



Source: Understanding & Utilizing the Secrets of Waves

Boats moving through the water create waves, commonly known as wake.

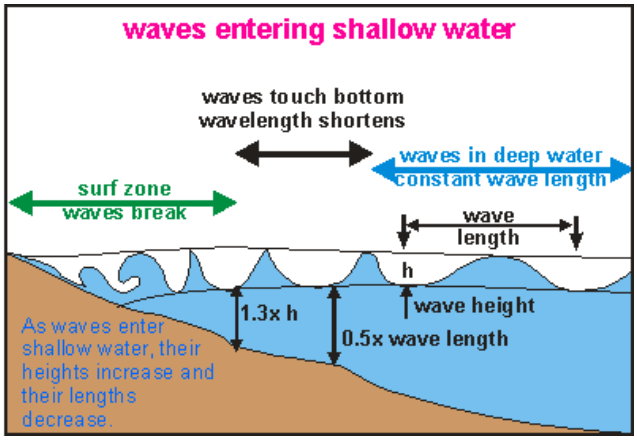
Observations made by the Oregon State Marine Board have shown the effects of three speed zones: displacement, transition & planing.



Factors that influence the size of the wake when it reaches shore include the speed of the boat & the distance the wake travels before it reaches shore.

Interestingly, the water particles themselves don't move. Rather, their energy does. A wave's energy is proportional to the square of its height (potential). Thus, a 3m high wave has 3 x 3 = 9 times more energy than a 1m high wave. *(Source: Oceanography: waves, theory & principles)*

As waves enter shallow water, they slow down, grow taller & change shape. *(Source: Oceanography: waves, theory & principles)*



The movement of the particles along the bottom of the body of water can disturb the sediment on the bottom &, thereby, release nutrients.

Waves & Erosion

Natural causes of shoreline erosion include wind-driven waves, water levels, ice, slope of the bank, & the absence of vegetation.

Human causes include the removal of rocks, trees, shrubs, & other vegetation along the shoreline, retaining walls, & wave action from passing boats.

The size of the watercourse affects the potential for erosion to occur. The greater the distance the waves are generated from shore, the more opportunity they have to dissipate before reaching shore.

Wave height is one of the most important factors in shoreline erosion. Observations made by the Minnesota Department of Natural Resources have shown that

- a wave that is 12.5 cm high (the height of a compact disk case) when it reaches the shore does not cause significant shoreline damage. Waves this high are created by boats operating at speeds under 10 km/h – a speed that is generally considered reasonable when operating close to shore
- a wave that is 25 cm high is four times more destructive than a 12.5 cm wave
- 62.5 cm high waves are 25 times more destructive
  (*Source: Shoreline Erosion caused by Boat Wake*)

Runabouts & waterski boats produce a 25 cm high wave at the stern of the boat when at planing speed.

Wakeboard boats create a wake of half a metre or more.

The large waves produced by wakeboard boats don't always have the distance needed to dissipate before reaching shore on many of our lakes in eastern Ontario. Hence, they can create a greater negative impact than other boats.

However, all boaters need to be aware of the size of wake they create.

Legislation & Recommendations

The *Small Vessel Regulations* stipulate that the legal speed limit for all motor boats is 10 km/h within 30 metres of any shore.

Waterski & Wakeboard Canada strongly recommends that wakeboard boats stay a minimum of 50 metres from any shore & in a minimum of 2 metres depth of water to reduce the effect of shoreline degradation & turbidity.

A number of governments & government agencies, as well as local organizations in Canada & the US are struggling with how to deal with the erosion & safety issues associated with wakeboarding. For example,

- The Safe Quiet Boating Association in the Muskoka Lakes area is working to change the legislation so that wakeboard boats operate 100 metres from shore.
- The District of Lake of the Woods Cottagers Association has recommended that wakeboard boats operate 300 metres from shore to allow waves to lose their energy before reaching shore.

How You can be Wake Wise

1. Be aware of the size of your wake during displacement, transition & planing speeds.

2. Position your passengers through-out the boat in order to reduce the time spent in transition speed.

3. Look behind you to see & understand the impact of your wake on shorelines, docks or other structures. Adjust your speed & direction to minimize the impact.

4. Respect the shoreline zone. Reduce your speed to less than 10 km/h within 30 metres of any shore including the narrow channels between islands.

5. Water-ski, tube, & wake-board well away from all shorelines. Try to make use of the entire length of the lake.

6. Consider the size of the wake produced when purchasing a new boat.

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