

Quantifying Wave Energy on Minnesota Lakes

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Objectives

- Develop wind-wave energy models applicable to Minnesota lakes
- Determine how wave energy controls near-shore habitat, including aquatic plants and fish spawning sites
- Map wave energy and habitat on Minnesota Lakes of all sizes

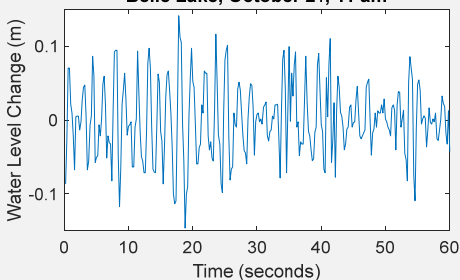
Methods

- Field measurements of wind speed, direction, and wave height on lakes
- Adjust existing wave models to take into account wind sheltering from trees
- Use wave flume to look at sediment resuspension and sorting as a function of wave height

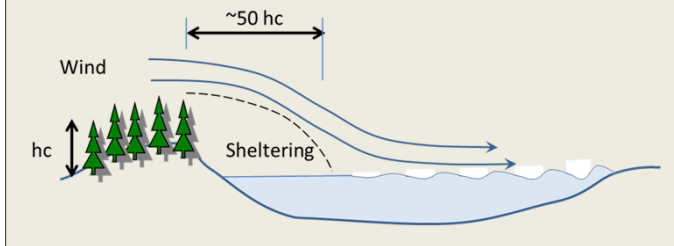
Field Measurements



Belle Lake, October 21, 11 am

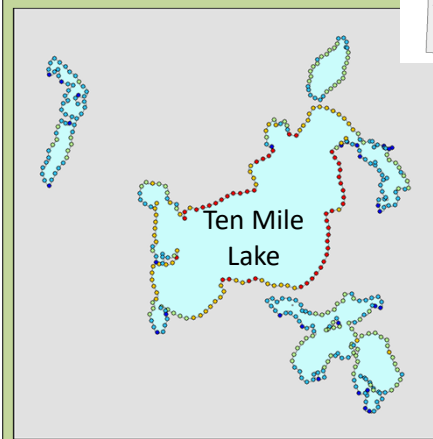
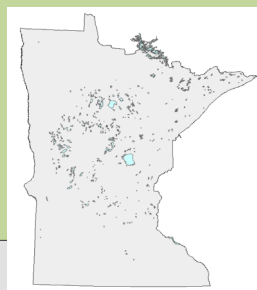


Wind sheltering reduces wind fetch and wave height



Results

Mapped wave height and energy on the shorelines of 460 Minnesota lakes



Significant Wave Height (cm)

- 16.7 - 27.1
- 11.8 - 16.6
- 8.1 - 11.7
- 4.6 - 8.0
- 0.0 - 4.5

Applications

- Identify and maintain lake shorelines with good walleye spawning habitat
- Inform shoreline restoration projects
- Identify good locations for aquatic plant restoration for improved fish habitat

Funding and Partners

Funded by Legislative-Citizen Commission on Minnesota Resources (LCCMR)

Project Partners: St. Anthony Falls Lab, Natural Resources Research Institute, Minnesota DNR