

# 2023 NORTHEAST AQUATIC BIOLOGISTS CONFERENCE

## THE EVOLUTION OF LAKE HABITAT ASSESSMENTS: FINDING THE MISSING LINK

Conversion of natural vegetation to anthropogenic development along lakeshores degrades littoral habitat. Efforts to quantify the degree of habitat degradation in Northeastern US lakes have progressed in recent years by adapting National Lake Assessment methods to create multi-metric indices that evaluate littoral habitat condition. Some assessment results remain questionable, especially when habitat conditions score lower than expected in lakes with mostly naturally-vegetated shorelands. Water-level fluctuations, which have been shown to adversely affect littoral habitat condition, have been suspected as a contributing factor but sufficient data to affirm this correlation have not been widely available. Recent advances in image analysis techniques allow for high-frequency measurement of lake area using data captured by Copernicus Sentinel-1 satellites. These satellite images of lakes, captured in approximately bi-weekly flyovers (starting in 2017), are processed in Google Earth Engine and transformed into estimates of lake surface area. By inferring that changes in lake area relate to changes in water level, and subsequent dewatering and rewatering of the littoral zone, we are now able to account for the effect of fluctuating water levels in the assessment of littoral habitat condition in lakes. This 'missing link' in the analysis will inform lake habitat condition assessments by helping to disentangle the compounding effects of shoreland development and water level changes on littoral habitat condition.

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