

**Geometric models to predict lake depth are sensitive to mis-measurement of in-lake slope**

J. Stachelek<sup>1</sup>, P. Hanly<sup>1</sup>, and P.A. Soranno<sup>1</sup>

<sup>1</sup>Department of Fisheries and Wildlife, Michigan State University, 480 Wilson Rd., East Lansing, Michigan  
48824 USA

**Contents of this file**

**Figure S1** Map of study lakes

**Figure S2** Comparison between reported depth and depth extracted from bathymetry surfaces

**Figure S3** Lake characteristics by categorical variables

**Figure S4** Hypsography classification by state

**Figure S5** Comparison among lake shape and reservoir classes for true and proxy geometry measures

**Figure S6** Importance plot for random forest variables showing increase in mean square error

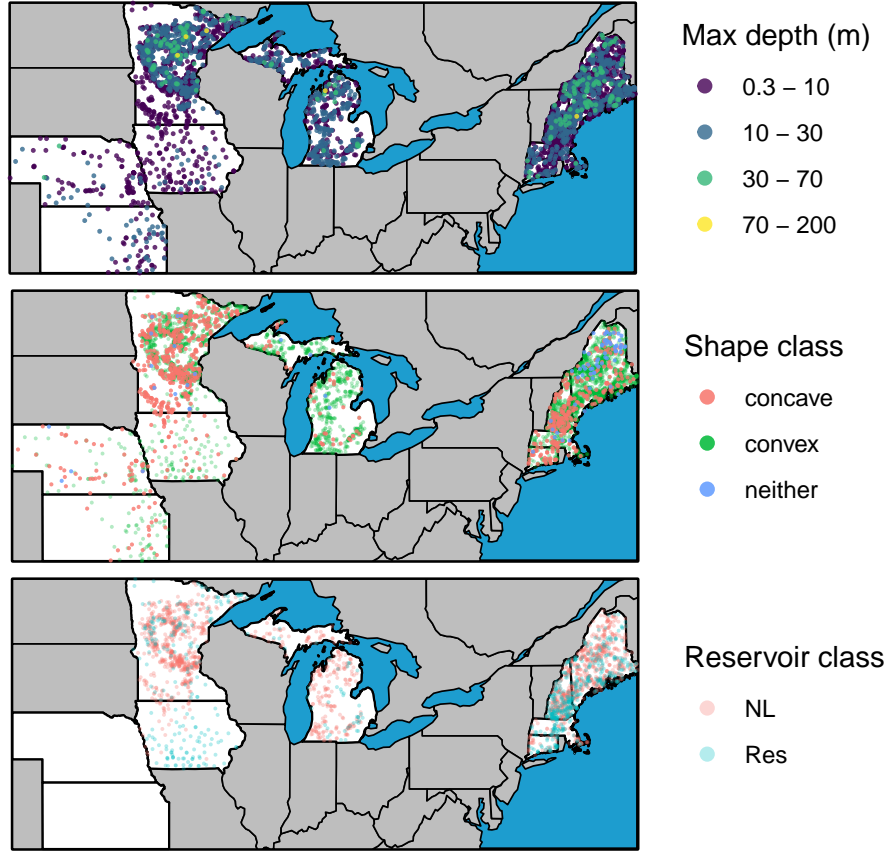


Figure S1: Map of study lakes showing A) lake maximum depth measurements, B) cross-section shape class, and C) reservoir classification.

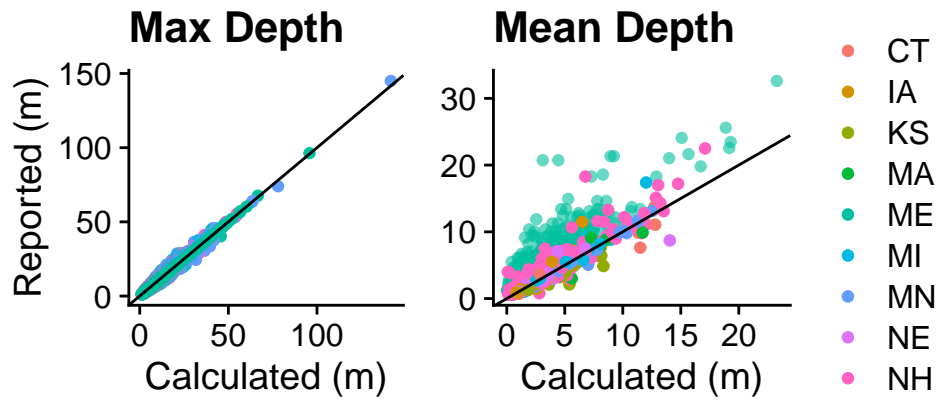


Figure S2: Comparison between reported depth and depth extracted from bathymetry surfaces by US State where reported depths come from the LAGOSUS-Depth product (citation). For this figure, no reported depth values originated from the same source as its corresponding bathymetry-derived value.

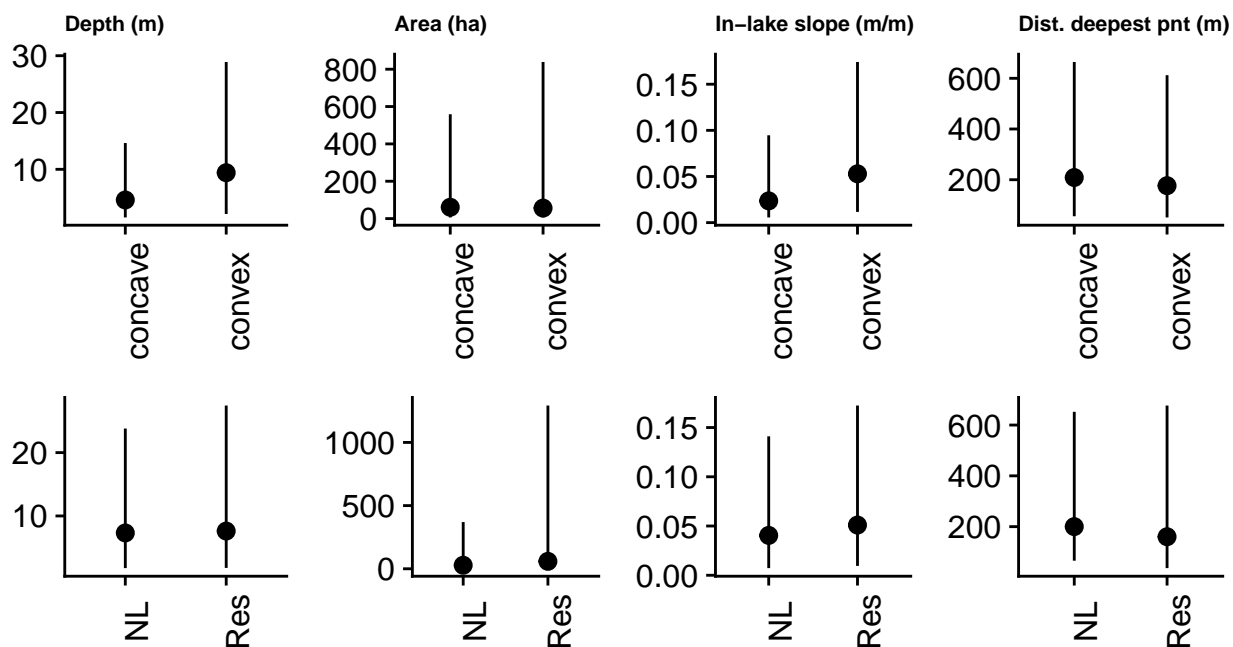


Figure S3: Lake characteristics by categorical variables.

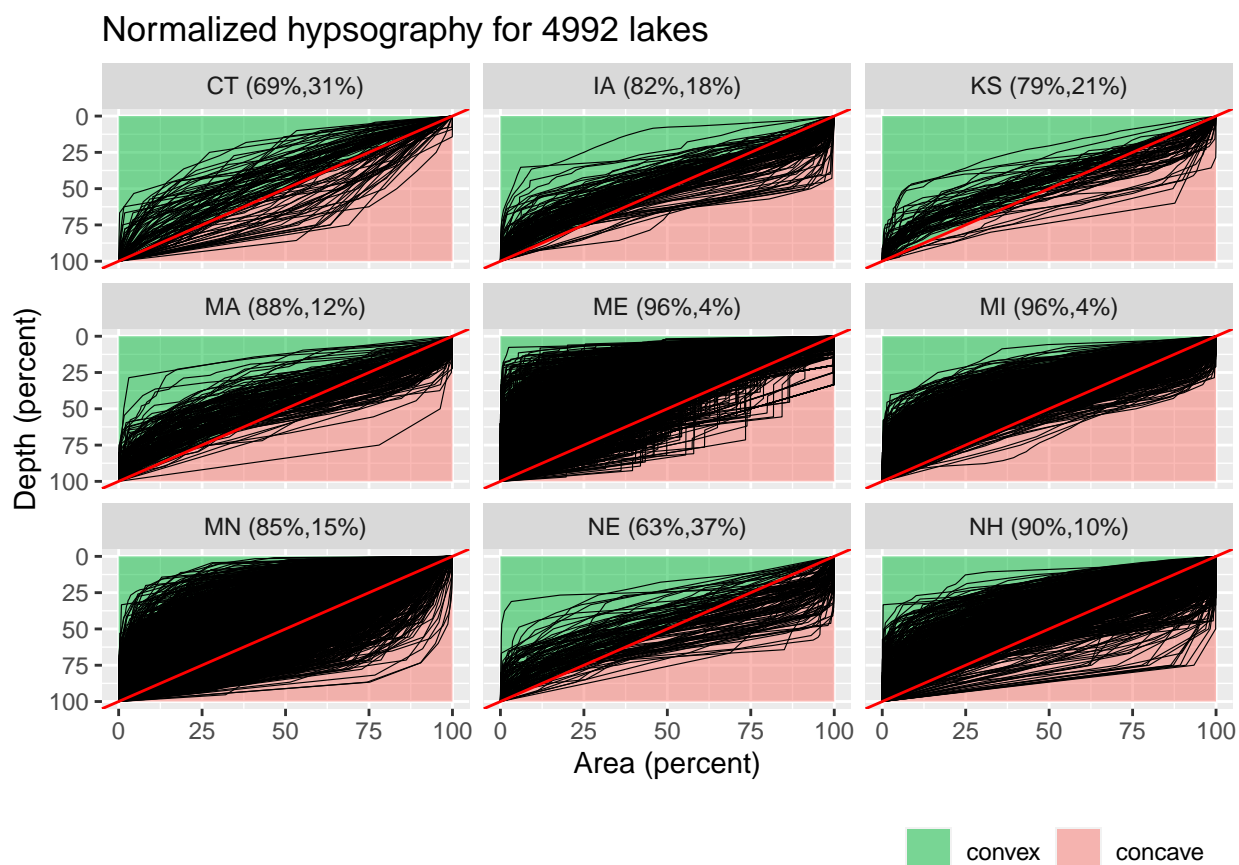


Figure S4: Hypsography classification by state. Numbers on panel labels indicate the percentage of lakes in each state with a convex versus a concave cross-section shape.

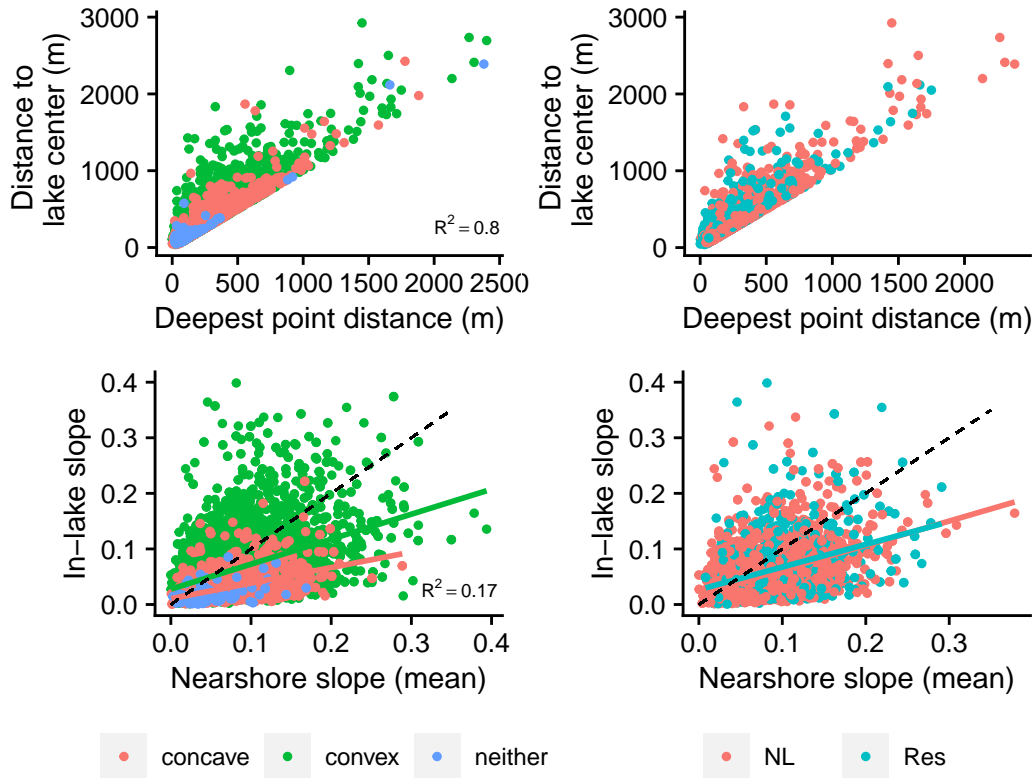


Figure S5: Comparison among lake shape and reservoir classes for A-B) distance to deepest point versus distance to lake center and C-D) nearshore slope versus inlake slope. A dashed 1:1 line is shown for comparison. Cross-section shape and reservoir class plots are not identical because not all lakes had a reservoir classification exceeding a 0.75 probability confidence level.

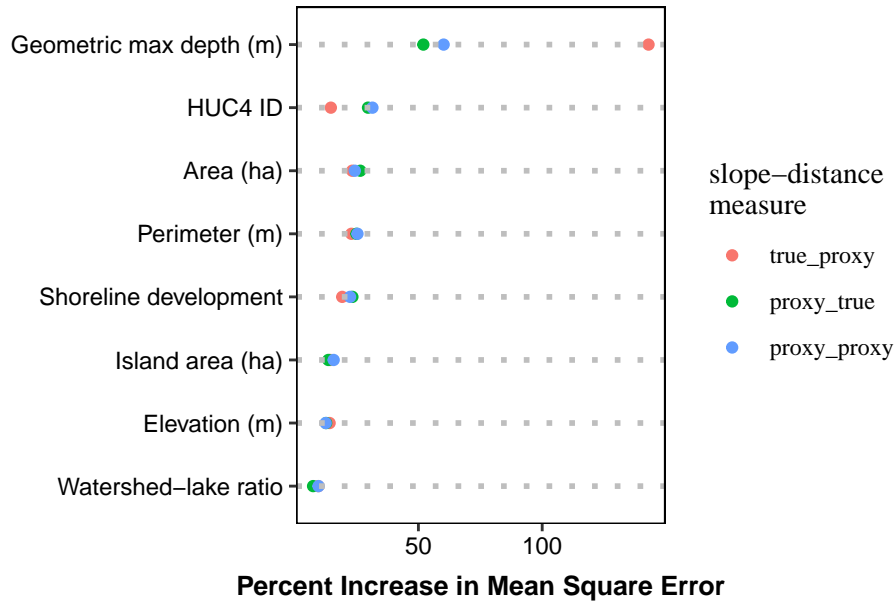


Figure S6: Importance plot for random forest variables showing increase in mean square error. Higher values indicate greater importance to model predictions. See Equation 1 for a definition of geometric max depth. HUC4 ID is a 'dummy' variable of geographic (hydrologic subbasin) location.

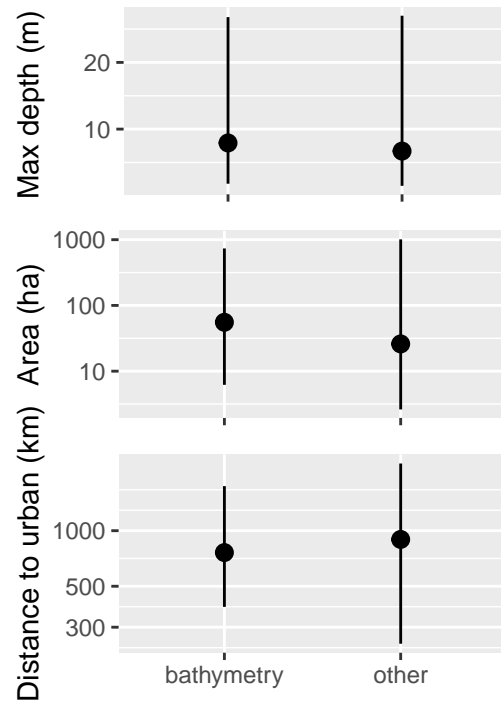


Figure S7: Comparison between characteristics of lakes with bathymetry data against lakes with depth from other sources. Distance to urban areas uses data from the 2018 US Census Urban and Rural Classification.