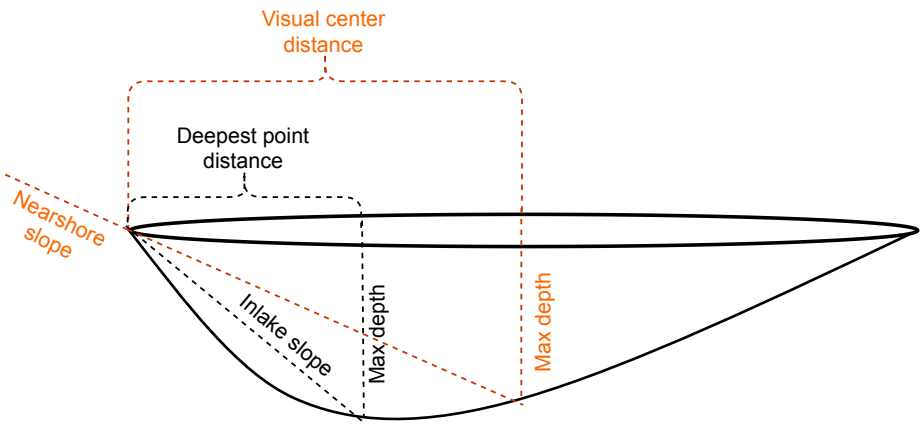

Figure 1: Diagram showing the relations between true (black) and proxy (orange) metrics of lake geometry. Geometric depth calculated via Equation 1 requires a single distance and slope metric.

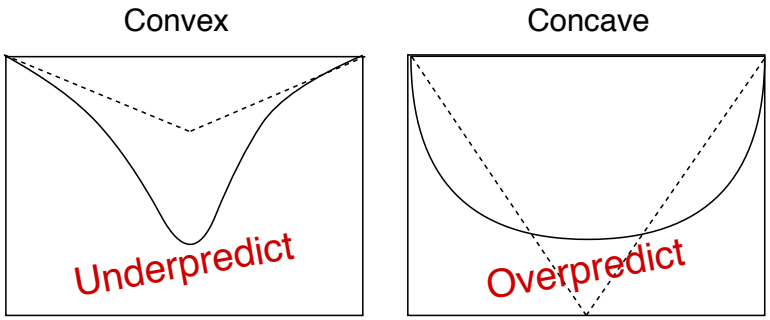

Figure 2: Diagram showing our expectation that slope-based models of lake depth will under predict true depth in convex lakes (left) and over predict true depth in concave lakes (right). Dashed lines represent extrapolated nearshore slope while solid lines represent the lake bottom.

Variable	Median	Q25	Q75	n
Max depth (m)	8.2 (7)	4.6 (3.7)	14 (12)	4850 (17700)
Elevation (m)	300 (340)	180 (210)	400 (460)	4850 (17700)
Area (ha)	55 (33)	21 (11)	140 (100)	4850 (17700)
Island area (ha)	0 (0)	0 (0)	0.18 (0.076)	4850 (17700)
Perimeter (m)	4400 (3500)	2500 (1800)	8100 (7300)	4850 (17700)
Shoreline development	1.7 (1.7)	1.4 (1.4)	2.1 (2.2)	4850 (17700)
Watershed-lake ratio	7.8 (10)	3.9 (4.4)	17 (28)	4850 (17700)
Deepest point distance (m)	180 (-)	110 (-)	290 (-)	4850 (-)
Visual center distance (m)	240 (-)	160 (-)	380 (-)	4850 (-)
Inlake slope (m/m)	0.046 (-)	0.024 (-)	0.079 (-)	4850 (-)
Nearshore slope (m/m)	0.077 (-)	0.051 (-)	0.11 (-)	4850 (-)

Table 1: Summary of lake depth and predictor variables for computing random forest offsets (and for lakes in the contiguous United States from <LAGOSUS-Depth citation>). Predictor variables used in Eq 2 are printed in bold face. Dashes (-) indicate an identical sample size among this study and that of the contiguous United States.

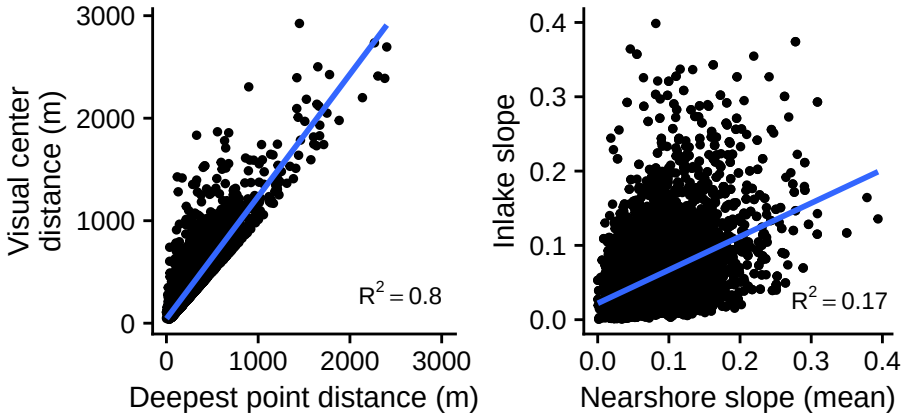

Figure 3: Comparison among proxy and true values of lake geometry for A) distance to deepest point versus distance to lake visual center and B) nearshore slope versus inlake slope. A best-fit line and coefficient of determination is shown to illustrate representativeness.

slope	distance	rmse	rsq
true	true	-	-
true	proxy	4.23 m	0.73
proxy	true	6.87 m	0.26
proxy	proxy	6.61 m	0.31

Table 2: Model fit and predictive accuracy metrics for all combinations of true (inlake slope, deepest point distance) and proxy (nearshore slope, visual center distance) metrics.

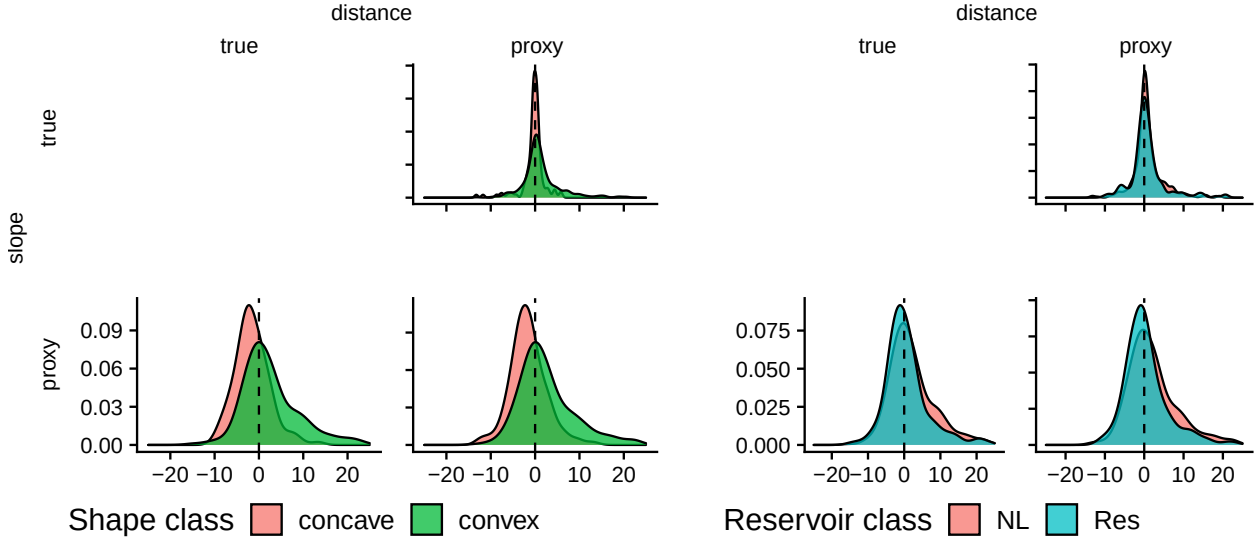

Figure 4: Depth model residuals in meters by cross-section shape and reservoir class.