Supplementary Materials:

Craig Mahoney ^{1,*}, Ron J. Hall ², Chris Hopkinson¹, Michelle Filiatrault², Andre Beaudoin³, and Qi Chen⁴



Figure 1. Visualization of the k-NN optimization for stand height. Component (**a**) illustrates which Minkowski distance parameter minimizes the mean squared error (MSE); (**b**) illustrates which number of predictors is best (three in this case); (**c**) illustrates which combination of 3 predictors minimizes MSE (combination 104); and (**d**) optimizes predictor combination 104 for k (found to be six in this case, indicated by black point) and weighting kernel (inverse distance in this case).



Figure 2. Visualization of the k-NN optimization for crown closure. Component (**a**) illustrates which Minkowski distance parameter minimizes the mean squared error (MSE); (**b**) illustrates which number of predictors is best (seven in this case); (**c**) illustrates which combination of 7 predictors minimizes MSE (combination 40); and (**d**) optimizes predictor combination 40 for k (found to be 10 in this case, indicated by black point) and weighting kernel (inverse distance in this case).



Figure 3. Distributions of all transect LiDAR and optimal Geoscience Laser Altimeter System (GLAS) data utilized to drive k-NN models for: (**a**) stand height; and (**b**) crown closure. Descriptive statistics

(minimum, maximum, and mean) associated with each data source demonstrate the similarities or differences.

Figure S1: Visualization of the k-NN optimization for stand height, Figure S2: Visualization of the k-NN optimization for crown closure, Figure S3: Distributions of all transect LiDAR and optimal Geoscience Laser Altimeter System (GLAS) data utilized to drive k-NN models.