

Table S1: LiDAR flight specifications. LiDAR flight descriptions and specifications for source datasets used.

Survey Date	Altitude Above Ground	Program	Multiple Returns	Swath Width	Scan Angle	RMSEz	Average Post Spacing	Average Point Density
Jan-March 2001	12,000FT	NC Floodplain Mapping Program	5 returns per pulse	3,411m	25°	20cm	3m	0.11/m ²
January 2014	5,499FT	NC Floodplain Mapping Program	4 returns per pulse	1,025m	34°	11.7cm	0.7m	2.0/m ²

Table S2: Landsat imagery specifications. Specifications of Landsat imagery for 2001 and 2014 along with Palmer Drought Severity Index (PDSI) for relative dryness that ranges from -10 (dry) to 10 (wet).

Date	Source	Cloud Cover (%)	Precipitation (in)	PDSI*
2000/11/28	Landsat 7 ETM+	0.00	3.2	-0.64
2013/11/24	Landsat 8 OLI	0.10	3.59	0.9
2001/04/05	Landsat ETM+	0.00	1.85	-1.69
2014/04/01	Landsat 8 OLI	36.43	4.73	1.61

Table S3: Random Forest classification Landsat predictor variables. Metrics used in the Random Forest classification and regression models, derived from spectral bands of Landsat data.

Spectral Index	Description
NDVI	Normalized difference vegetation index
Average NDVI	Average NDVI value of pixels from cloudless portions of all 32-day composites from May through August for 2001 and 2014
Maximum NDVI	Maximum NDVI value of pixels from cloudless portions of all 32-day composites from May through August for 2001 and 2014
EVI	Enhanced vegetation index
Average EVI	Average EVI value of pixels from cloudless portions of all 32-day composites from May through August for 2001 and 2014
Maximum EVI	Maximum EVI values of pixels from cloudless portions of all 32-day composites from May through August for 2001 and 2014
TCW	Tasseled cap wetness index
TCB	Tasseled cap brightness index
TCGRN	Tasseled cap greenness index

TCWGD	Difference between TCW and TCGRN
Blue Band	Band 1 in Landsat 7ETM+; Band 2 in Landsat 8OLI
Green Band	Band 2 in Landsat 7ETM+; Band 3 in Landsat 8OLI
NIR Band	Near infrared; Band 4 in Landsat 7ETM+; Band 5 in Landsat 8OLI
SWIR Band	Short wave infrared; Band 7 in Landsat 7ETM+; Band 7 in Landsat 8OLI

Table S4: Random Forest classification LiDAR predictor variables. Metrics used in the Random Forest classification and regression models, derived from LiDAR data by binning the appropriate statistics at 30-m grid resolution.

Variable	Description
Mean Vegetation Height	Mean value of non-ground points
Median Vegetation Height	Median value of non-ground points
Maximum Vegetation Height	Maximum value of non-ground points
Std. Vegetation Height	Standard deviation of non-ground point values
Standard Error Vegetation Height	Standard error of non-ground point values
Minimum Vegetation Height	Minimum value of non-ground points
Variance Vegetation Height	Variance of non-ground point values
Vegetation Height Skewness	Skewness of non-ground point values
Vegetation Height Kurtosis	Kurtosis of non-ground point values
CV. Vegetation Heights	Coefficient of variation of non-ground point values
Vegetation Density	Non-ground returns/Non-ground returns + ground returns
Prop. Stratum 1	Proportion of non-ground points that are $\leq 4.5\text{m}$
Prop. Stratum 2	Proportion of non-ground points between $>4.5\text{m}$ and $\leq 10\text{m}$
Prop. Stratum 3	Proportion of non-ground point between $>10\text{m}$ and $\leq 20\text{m}$
Prop. Stratum 4	Proportion of non-ground points between $>20\text{m}$ and $\leq 30\text{m}$
Prop. Stratum 5	Proportion of non-ground points $>30\text{m}$
Elevation	Ground elevation interpolated from ground points
Aspect	Aspect calculated from interpolated ground points

Slope

Slope calculated from interpolated ground points

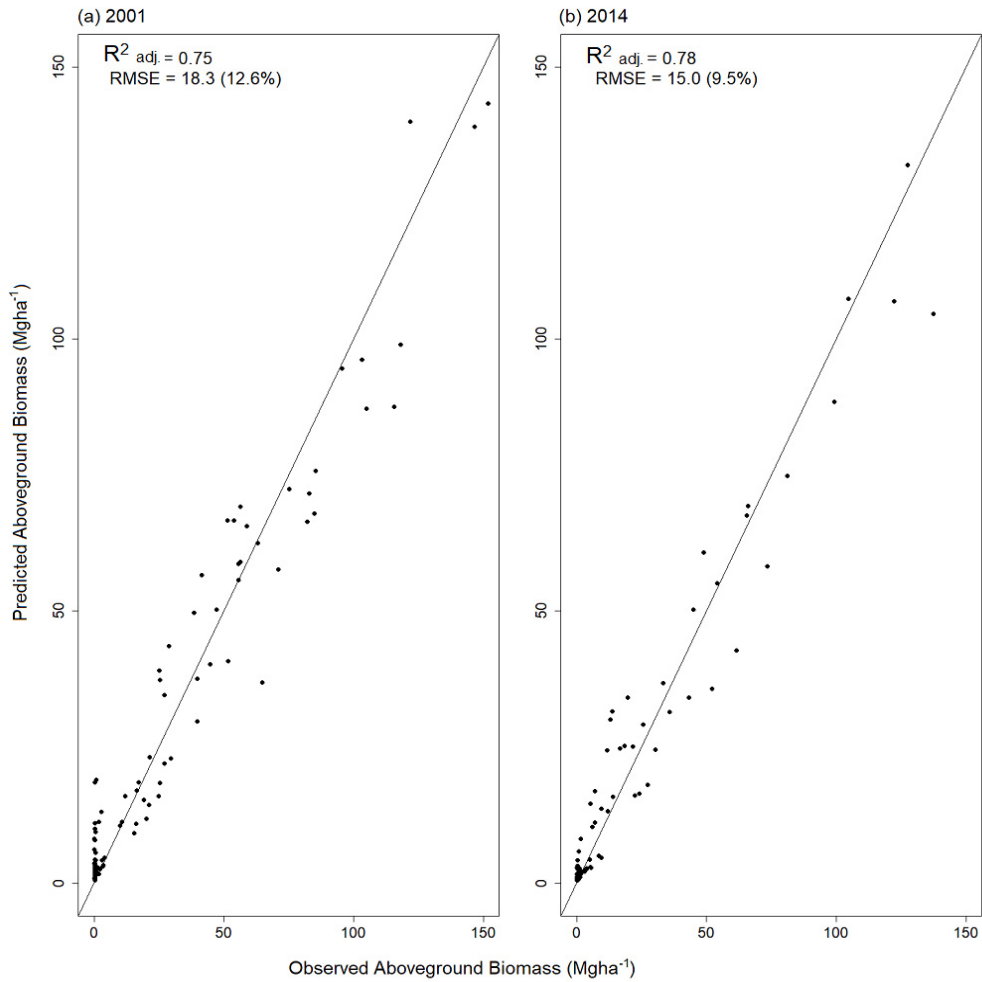


Figure S1: Observed vs. predicted biomass. Observed biomass (from the 98 field plots) plotted against the modeled Random Forest biomass estimates for (a) 2001 and (b) 2014.

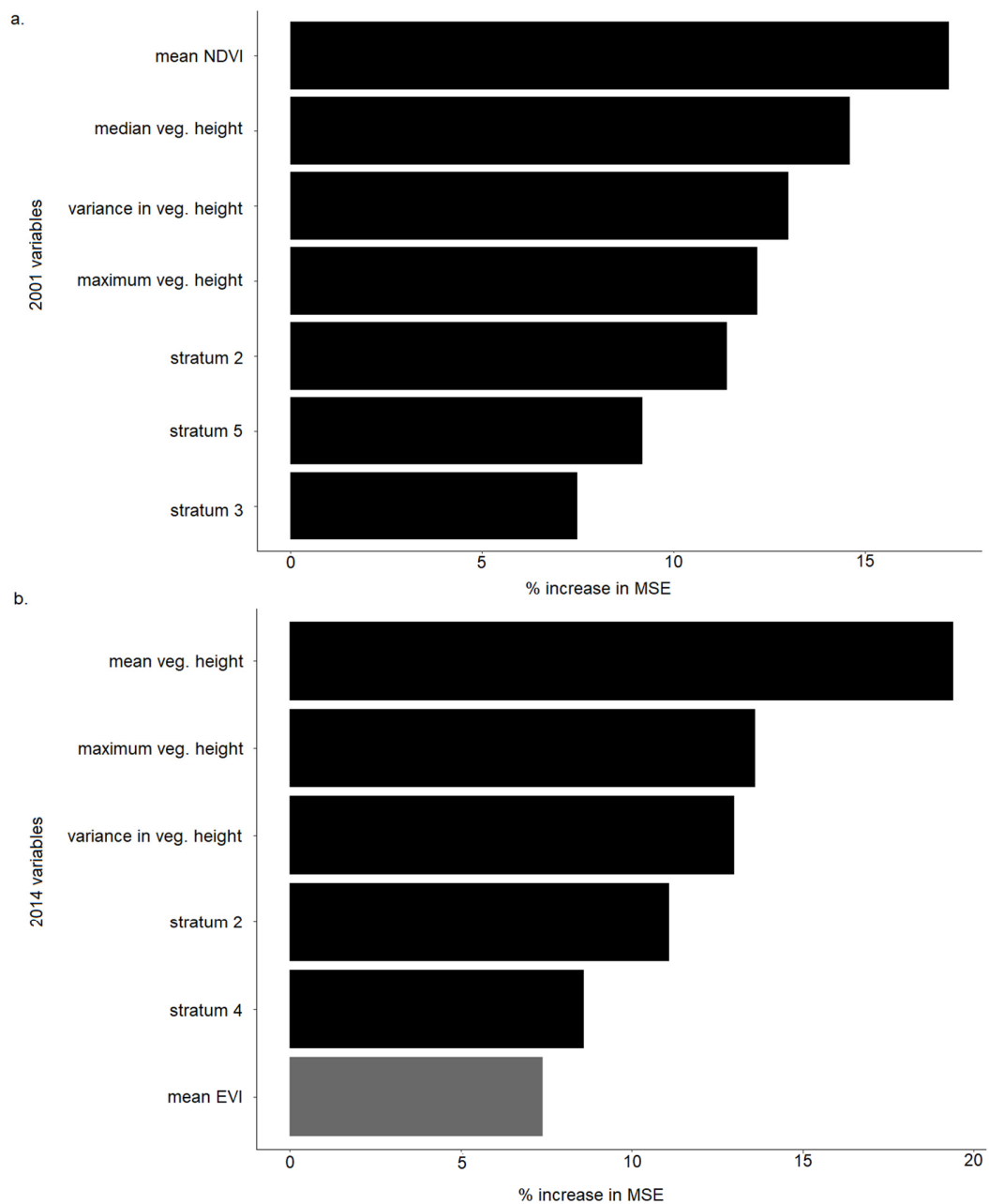


Figure S2: Predictor variable permutation importance in RF classification. Permutation importance of predictor variables derived from 1,000 permutations of the final fitted Random Forest models for (a) 2001 and (b) 2014. Percent increase in MSE is the increase in mean square error of predictions as a result of each variable being randomly permuted. The higher the increase, the more important the variable. Black color indicates contribution is statistically significant.

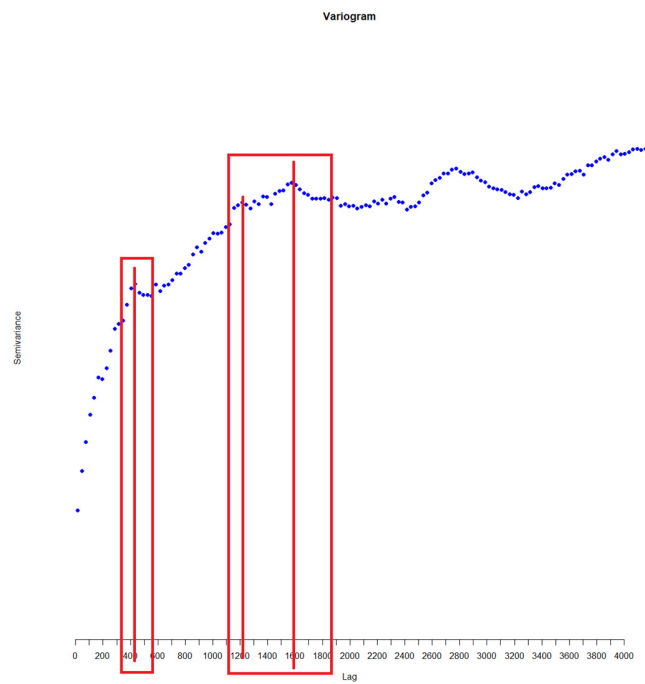


Figure S3: Variogram. Variogram used in the selection of modeling unit, or grid cell size. Initial plateau occurred at 450m^2 , which was selected as the modeling unit for further analysis.

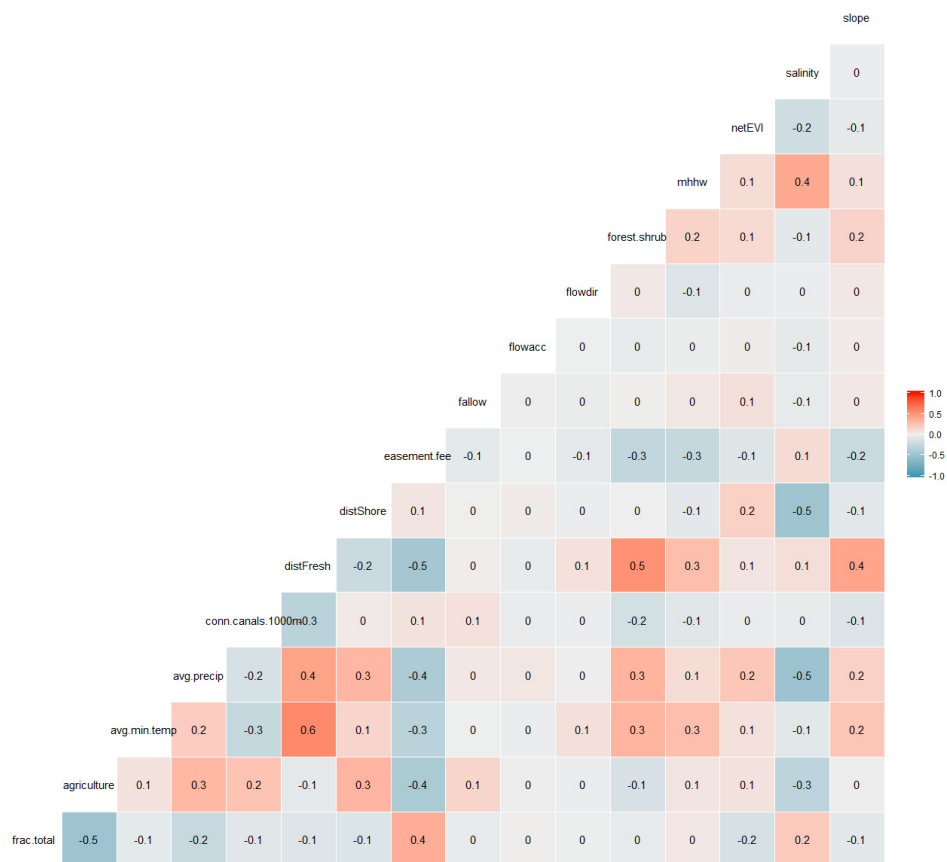


Figure S4: Correlation matrix. Correlation matrix of all potential predictor variables. The variables selected for further examination had correlation values < 0.50 .