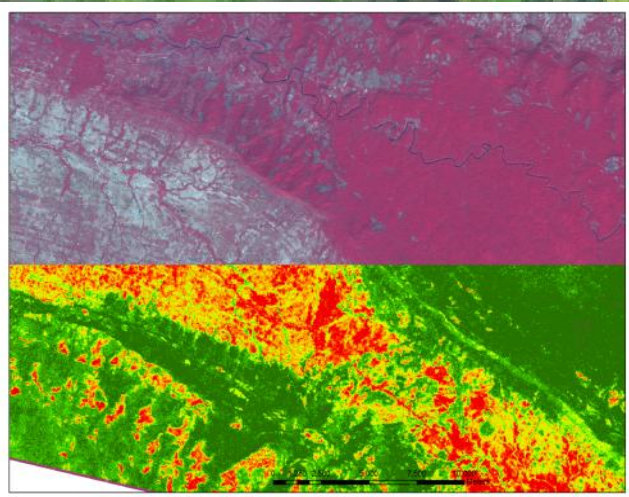


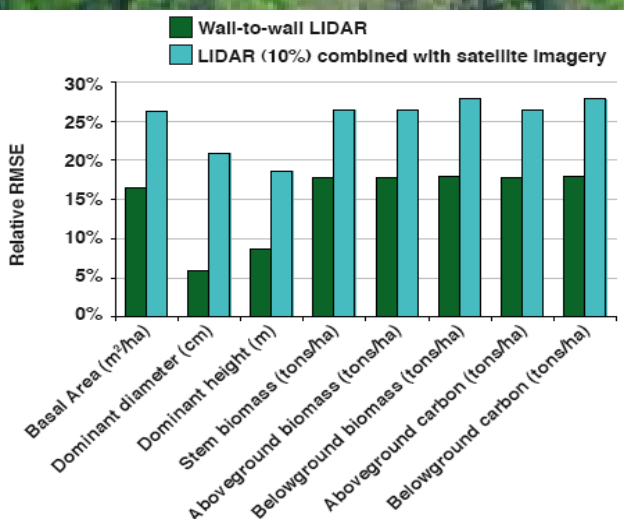
# arbolidar

ArboLiDAR is a forest inventory process developed by Arbonaut Ltd. The technology is able to produce estimates for both forest biomass and the amount of above ground and below ground carbon in forests.

ArboLiDAR's data analysis is based on non-parametric estimation methods which produce unbiased estimates of forest stand characteristics and statistical reports about estimation accuracy.



Density raster from LiDAR and satellite image



The forest inventory process employed in ArboLiDAR is based on a Bayesian statistical model of the response of different types of forest to laser scanning. This model has been developed by Virpi Junttila and Tuomo Kauranne of the department of Mathematics and Physics at Lappeenranta University of Technology, and it is based on the Sparse Bayesian algorithm introduced by Michael Tipping in 2001.

The Sparse Bayesian method for forest inventory is fully automatic. It builds adaptively an optimal linear model that converts a histogram of laser scanned heights and intensities plus a number of aerial image features into estimates of timber volume, height, diameter and number of trees, per up to three different tree species. Model building is based on the Maximum Likelihood principle. The Sparse Bayesian method carries out an automatic variable selection up to an optimal number of variables, based on the residual obtained with different numbers of explanatory variables.

For REDD applications, this method is applied to a combination of airborne laser and optical satellite imagery, with good accuracy



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