Tropical tree biomass equations from terrestrial LiDAR

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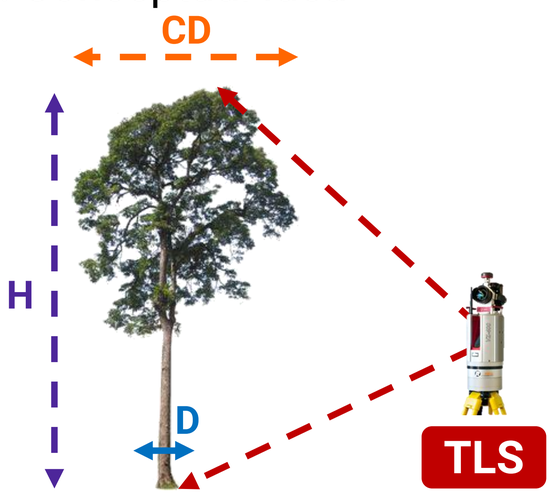
What is our objective?

We propose the use of terrestrial LiDAR (TLS) to develop local allometric models without harvesting trees.

How did we do it?

1. Conceptual idea



DBH range [11—150 cm]

TLS-derived allometric model

$Y = b_0 + b_1X$

2. Study area

3. Tree Inventory

calibration
72
TLS-derived trees

validation
26
Harvested trees

4. Tree attributes, volume, and AGB from TLS data

5. Allometric models calibration 6. Pantropical models used

AGB TLS-derived models

m1	AGB	~	D						
m2	AGB	~	D	x	WD				
m3	AGB	~	D	x	WD	x	H		
m4	AGB	~	D	x	WD	x	H	x	CD
m5	AGB	~	D	x	WD	x	CD		

AGB pantropical models

Ch05.II.3	AGB ~ WD x D x D^2 x D^3
Ch05.I.5	AGB ~ D^2 x WD x H
Ch14.H	AGB ~ (D^2 x WD x H)
Ch14.E	AGB ~ D x WD x E
Rj17.E	AGB ~ D x WD x E

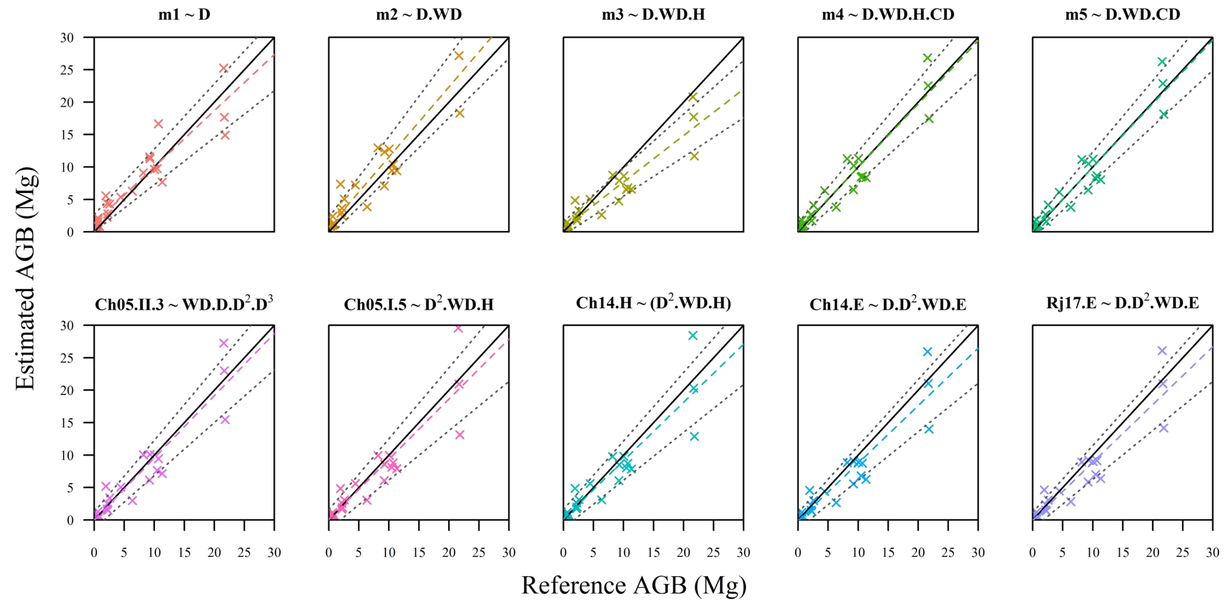
vs

AGB
Harvested trees

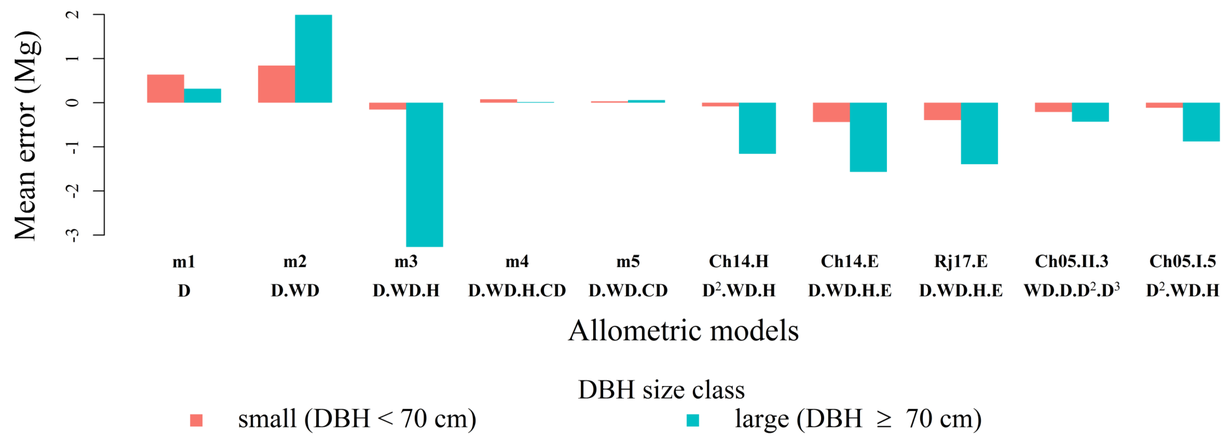
Our findings

1. Our best TLS-derived allometric model included crown diameter (m4 & m5)

2. Locally developed allometric models are not always better than pantropical models (CH05.II.3)



3. Our results showed that pantropical models tend to underestimate AGB of large trees



4. Our approach can be used to test and choose existing allometric models for remote sensing missions

Next Steps

- Validate our methodology in more countries involved in MRV systems (i.e. Suriname)

- Demonstrate the use of the new IPCC guidelines using TLS-derived allometric models

- Assess the impact of using TLS-derived allometric models for national greenhouses inventories

Take home message

We are able to develop, test and choose allometric models derived from TLS parameters without the need of harvesting trees.

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