FACCE ERA-GAS

MONITORING & MITIGATION OF GREENHOUSE GASES FROM AGRI- AND SILVI-CULTURE

3DForMod

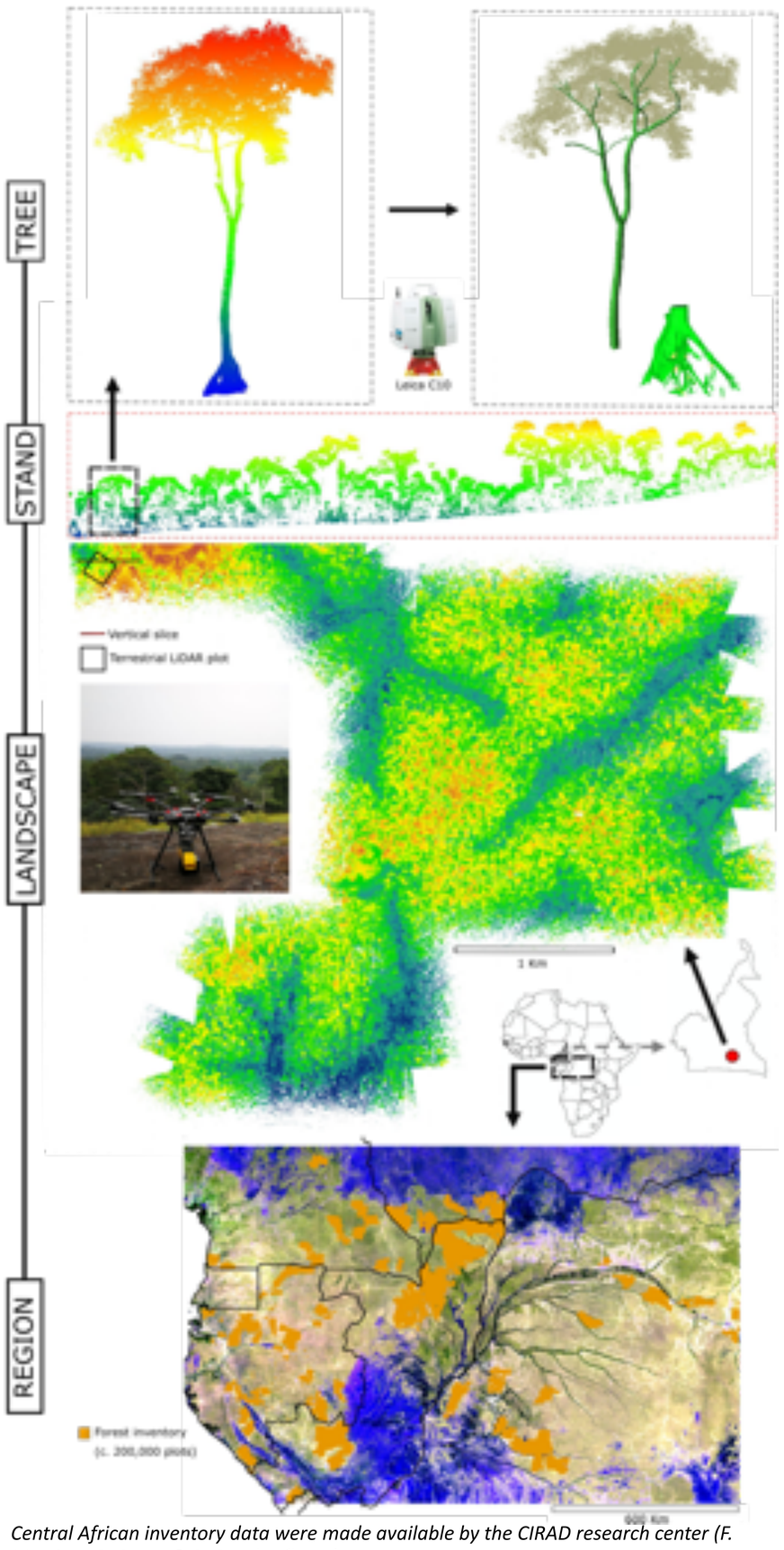
COMBINING REMOTE SENSING AND 3D FOREST MODELLING TO IMPROVE THE MONITORING OF GHG EMISSIONS IN TROPICAL FORESTS

What is 3DForMod	3DForMod focuses on emissions resulting from tropical forest degradation.
Our aim	To integrate advances in 3D forest modelling and very-high-resolution remote sensing technology to improve monitoring of forest aboveground biomass.
Our final goal	To supply stakeholders and decision-makers with reliable and accessible information on vegetation carbon stocks in forest territories along with simple predictive, GIS-based models on the consequences of forest degradation in terms of GHG emissions.

WP2: Improving tree AGB allometry by accounting for tree architecture

Scientific findings:

D2.1: Paper/report on using tree architectural features from the TLS data to improve biomass estimation
-> Wind influence on tree allometry (Jackson et al. 2018)
-> Convergence of tree architecture with ontogeny (Martin et al., in prep)
D2.2: Paper/report on improving big tree biomass estimation using TLS
D2.3: Methodological framework report to improve allometric relationship in REDD+ countries using TLS
D2.4: Paper on allometry variation in relation to ecological gradients -> *H:D variation in central Africa (Moses et al., in prep)*
D2.5 - Suggested improvements and adaptations to toolbox (report to WP1)



Central African inventory data were made available by the CIRAD research center (F. Mortier , G. Cornu & S. Gourlet-fleury)

WP1: Advance technology for tree architecture reconstruction from TLS data

Practical findings:

D1.1a: Open access calibration database of TLS-derived tree volumes with destructive control data -> *available on 3DForMod website*
D1.3a: Database of plot-level TLS scans with dendrometric control data for tree extraction -> *acquisition in progress*

Scientific findings:

D1.1b: Paper on QSM reconstruction
-> Lau et al., 2018

WP3: Scaling biomass from tree to plot and landscape and assess degradation impacts

Innovative solutions:

D3.1a: Open source Allostand software for simulating 3D stand mock-ups from plot dendrometric data and allometric equations -> *release by the end 2019*
D3.1b: Open source AMAPvox software for generating 3D scenes of vegetation density from TLS or ALS data from ray-tracing algorithm -> *available on 3DForMod website*
D3.1c: Open access database of 3D stand mock-ups with dendrometric control data from 1-ha plots in tropical forests -> *release by the end 2019*
D3.2: IT infrastructure for massive simulations of DART radiative transfer model -> *release by the end 2019*

Scientific findings:

D3.4: Paper on a canopy texture-derived method to monitor post-logging degradation and assess related emissions -> *post-logging satellite data ordered*

WP4: Reaching reliable regional mapping by inverting satellite canopy images

Innovative solutions:

D4.1a: Open source software to carry out stratification into geomorphological landscapes by automatically computing landform signatures (texture) and physiographic variables from SRTM -> *available on 3DForMod website*

Scientific findings:

D4.1b: Open access geomorphological maps of the two study regions
-> Bugnicourt et al. 2018 for the Guiana Shield
-> Central African map in prep. by Viennois et al.
D4.3a: Paper presenting formal schemes of error built-up from tree to plot to forest classes and landscapes, with an open source software implementation, tentatively integrated within the R package BIOMASS
-> Réjou-Méchain et al., 2019

WP5: Uptake by national REDD+ monitoring and GHG inventories

Policy relevants:

D5.2a: Use of TLS by REDD+ country presented at UNFCCC event
D5.2b: Updated TLS section published in GOFC-GOLD Sourcebook/GFOI MGD
D5.3: A box on the use of TLS is (approved and) included in IPCC Guidelines.
D5.4: Project synthesis for cal/val presented at BIOMASS mission event

WP6: Project Management

botAny and Modelling of Plant Architecture and vegetation

Tampere University

WAGENINGEN UNIVERSITY & RESEARCH

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