


Linking forest dynamics modelling with close-range photogrammetry and biodiversity assessments

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Inter-COST cooperation



3DForEcoTech

CA20118

Three-dimensional forest ecosystem monitoring and better understanding by terrestrial-based technologies



PROCLIAS



BOTTOMS-UP

CA18207

Biodiversity Of Temperate forest Taxa Orienting Management Sustainability by Unifying Perspectives



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COST ACTION CA20118

Three-dimensional Forest Ecosystem Monitoring and Better Understanding by Terrestrial-based Technologies



WG1: Laser- and Image-based Data Collection

The WG1 primarily focuses on different aspects of data collection by novel terrestrial-based technologies suitable to capture and generate 3D point clouds of individual trees as well as forest ecosystems.

WG2: Data Fusion

The WG2 focuses on the fusion of data produced by real terrestrial-based technologies data with other remote sensing data. The aim is to establish the link between terrestrial data in the frame of large-scale applications at regional, national, or even global level.

WG3: Laser- and Image-based Point Cloud Processing

The WG3 is divided into three main aspects of point cloud processing: pre-processing, processing, and evaluation of results. Pre-processing is an important step for both laser- and image-based point clouds. And it is a very crucial step for photogrammetry where the two-dimensional images are processed into 3D point clouds.

WG4: Precision Forestry

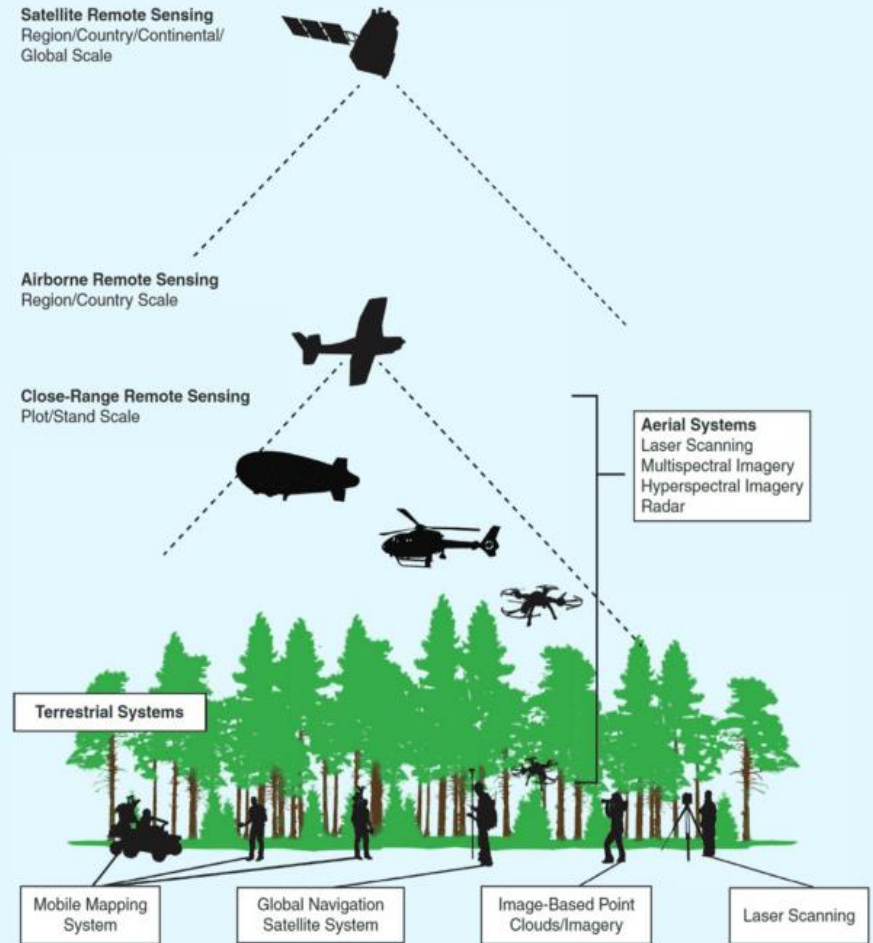
WG4 is working on the application part of the action. WG4 focuses on the usage of novel terrestrial-based techniques and techniques within precision forestry. Mainly on forest sites and individual tree parameters, that could be used for forest inventory, monitoring, and management.

WG5: Forest Ecology

WG5 is an application-oriented WG, similar to WG4. In this case, the focus is on the implementation of novel terrestrial-based technologies for forest ecology research purposes. In the beginning, it will identify already available best practices. The WG5 closely works with WG1-3 to identify all possibilities from data collection, data fusion, and processing points of view.

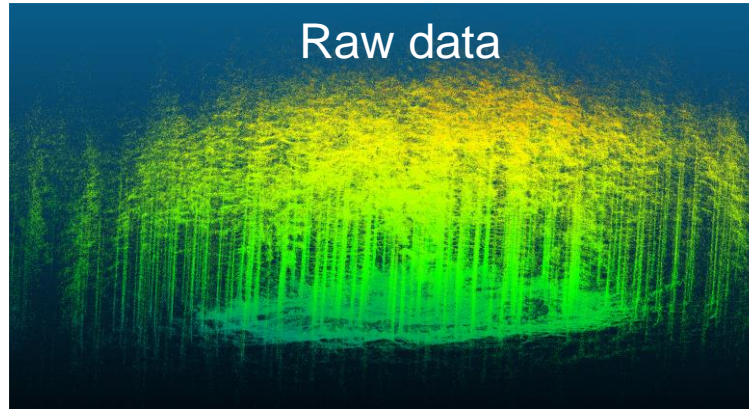
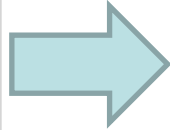
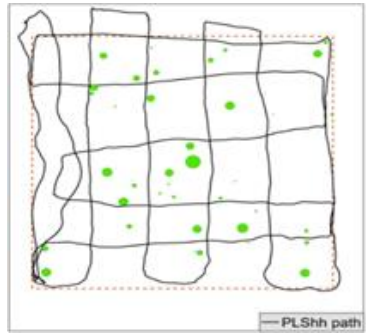
WG6: Dissemination, knowledge gaps identification, and cooperation guidance

WG6 is responsible for identifying important stakeholders and target audiences at the national, European, and global levels. It will establish correct and efficient communication with all parties, in order to disseminate the findings and results.

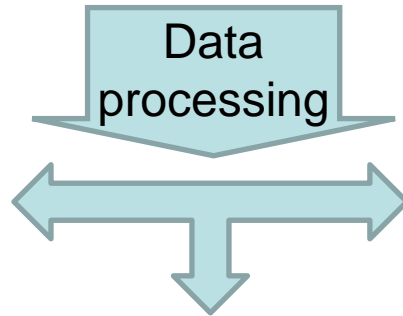




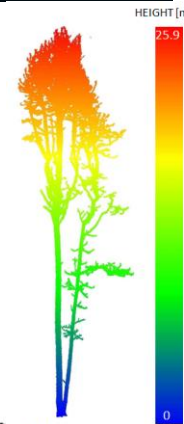
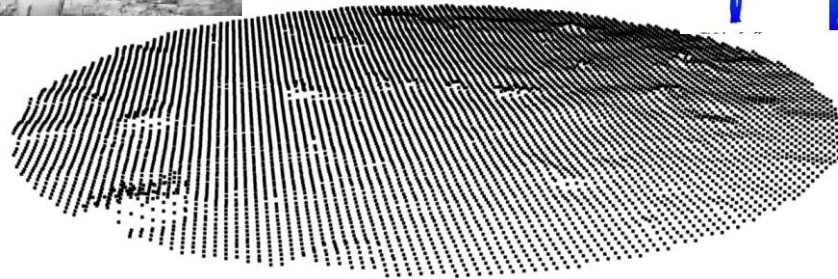
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Plot data



Terrain information

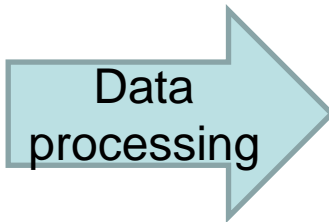
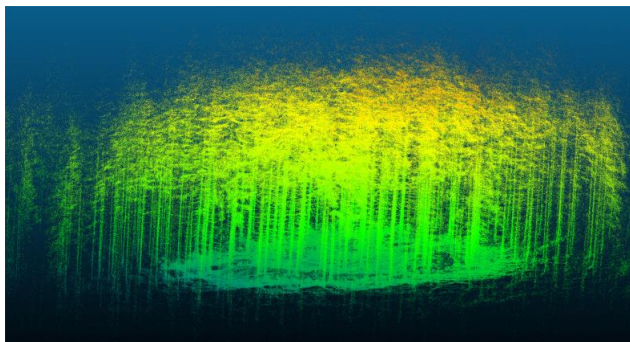


Tree data

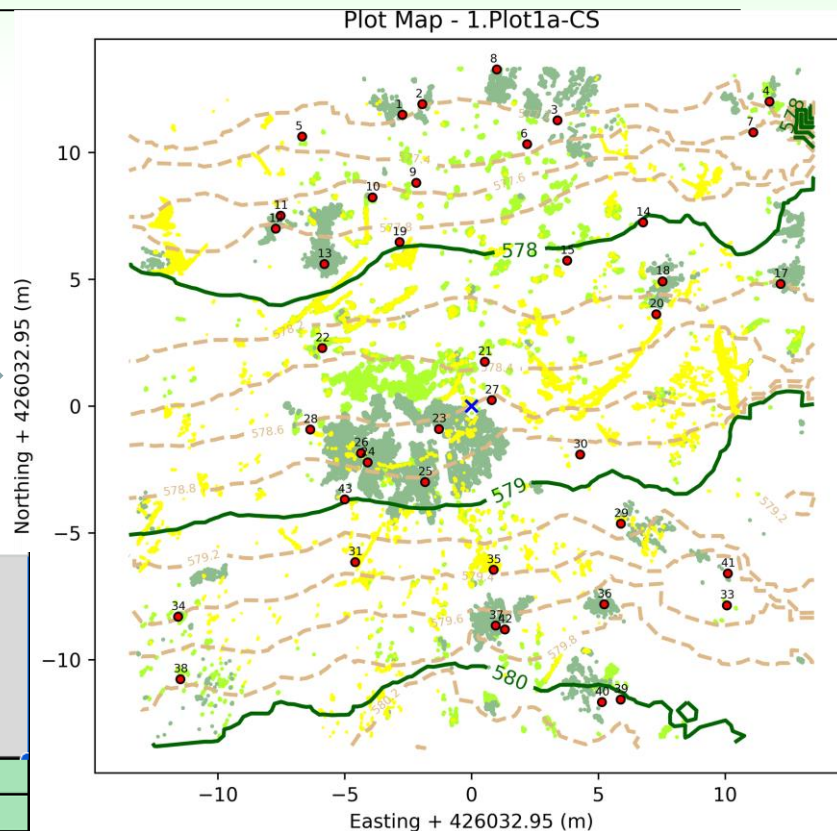




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Software	
rTLS	Individual tree detection
Crossing3DForest	DBH
TreelS	Diameters along stem
ITSMe	Tree Height
rTISDeep	Trunk Volume
brycefrank/Allometricr	Leaf-wood classification
FORTLS	LAI
Forest-taxator	QSM
TreeQSM	Crown Parameters
LeWoS	Total leaf area
Point_Cloud_Tools	Stem segmentation
TLSeparation	Percolation/empty space
FSCt	
TLStripes(fscd_line)	
treeTool	
OPALS	
VoxR	
FORTLS_new_version	
CspStandSegmentation	
LiDAR 360	
Comptree	
3DForest	
AID-FOREST	
dendrocloud	
3DFIN	



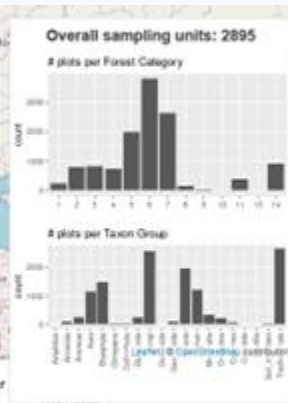


BOTTOMS-UP



- 1 - Towards common tools for forest multi-taxon research and monitoring
- 2 - Effect of management on biodiversity based on observations
- 3 - Effect of management on biodiversity based on experiments
- 4 - Habitat structures: quantity and quality needed for the conservation of forest biodiversity
- 5 - Definition of relevant SFM indicators and thresholds
- 6 - Designing strategies of SFM

Bottoms-up Shiny [Map](#) [Propose a project](#) [Want to contribute data?](#)



Countries: Belgium, Czech Republic, Denmark

Select the silvicultural treatment to filter data: coppice with standards, NA, retention c

Select the Taxa groups to filter data: Amphibia, Annelida, Araneae, Aves, Bc

Select the Forest Categories to filter data: 1 - Boreal forest, 2 - Hemiboreal forest

Select the vertical structure to filter data: even-aged, two-stored, uneven-aged

Select the Taxa to filter data: Amphibia, Annelida, Araneae, Acotmyc

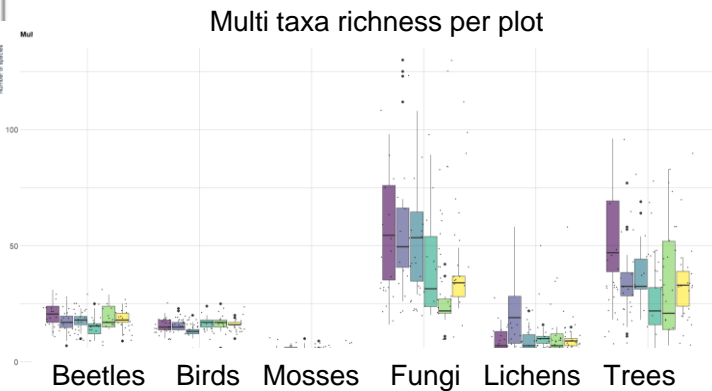
Select the Natura 2000 Habitats to filter data: 9010, 9020, 9110, 9120, 9130, 9140, S

Standing tree data: Optional

Lying deadwood data: Optional

Filter by: coppice, high forest

PROPOSE A PROJECT



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Information about plots and trees



Simulations of forest dynamics

PROCLIAS

Empirical modelling
Linking functions

Projections

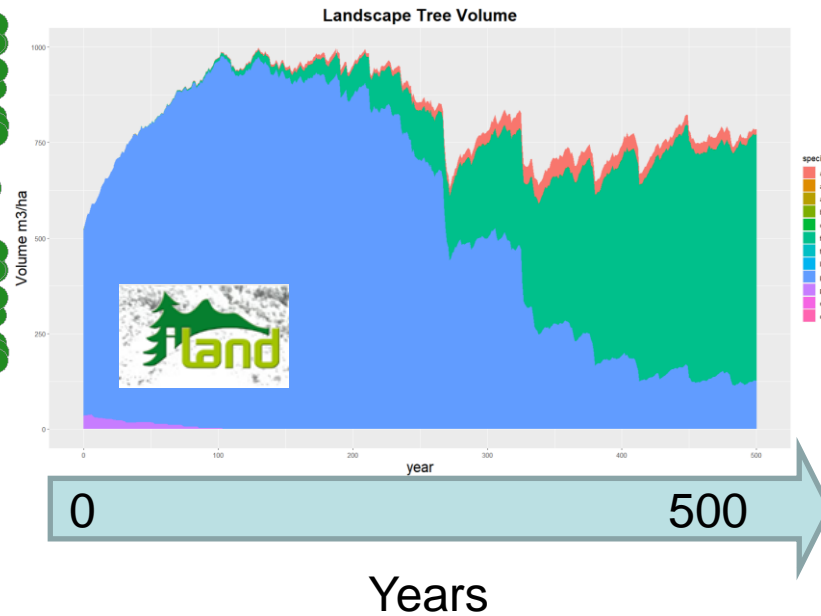
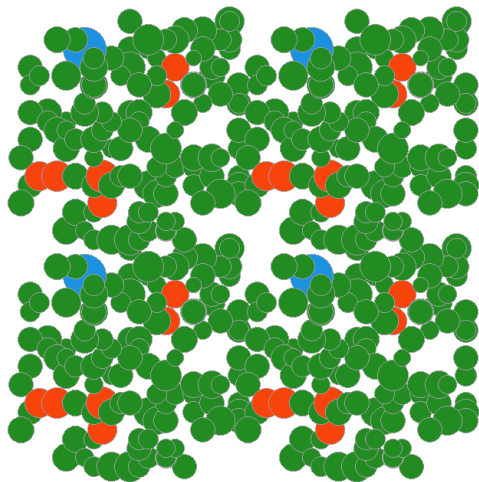
Information about current biodiversity



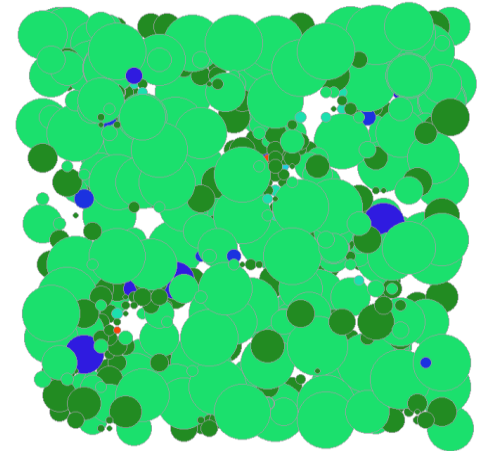
BOTTOMS-UP

Information about potential future biodiversity

Current state:
Picea abies dominated stand



Final state:
Fagus sylvatica
dominated stand

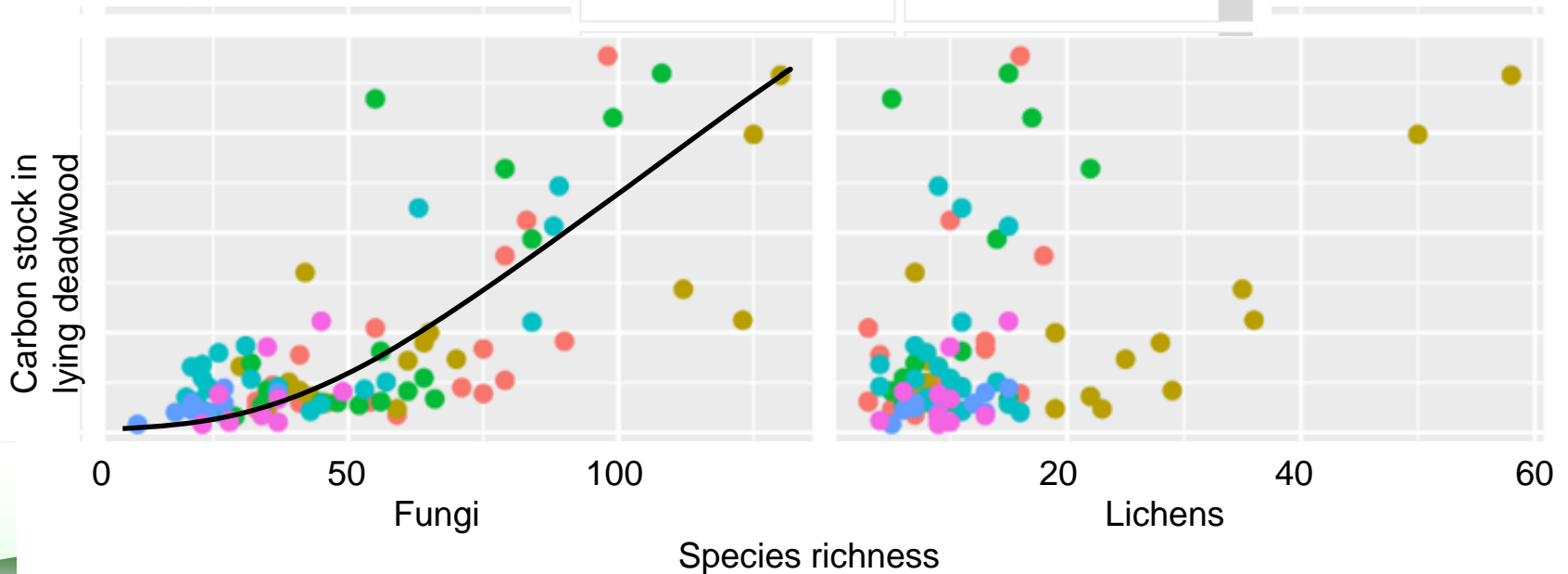


Natural dynamics without climate change

Empirical modelling – linking functions

Correlation matrix
between
multi taxa richness
&
deadwood carbon stock

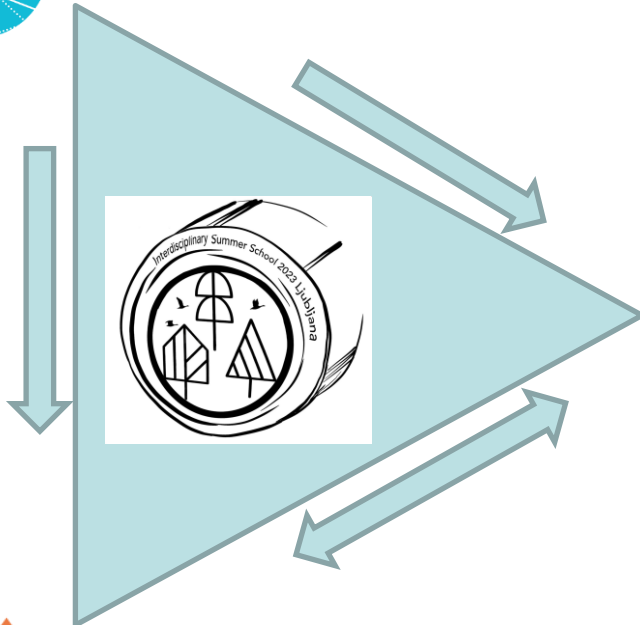
Lying deadwood	Standing deadwood	
Corr: 0.722*** CZ_JH1_L1: 0.643** CZ_JH1_L2: 0.793*** CZ_JH1_L3: 0.760*** CZ_JH1_L4: 0.748*** CZ_JH1_L5: 0.837** CZ_JH1_L6: 0.544.	Corr: 0.622*** CZ_JH1_L1: 0.647** CZ_JH1_L2: 0.693** CZ_JH1_L3: 0.922*** CZ_JH1_L4: 0.885*** CZ_JH1_L5: 0.166 CZ_JH1_L6: 0.379	Fungi
Corr: 0.455*** CZ_JH1_L1: 0.545* CZ_JH1_L2: 0.768*** CZ_JH1_L3: 0.568* CZ_JH1_L4: 0.073 CZ_JH1_L5: 0.709* CZ_JH1_L6: 0.508	Corr: 0.430*** CZ_JH1_L1: 0.530* CZ_JH1_L2: 0.707** CZ_JH1_L3: 0.750** CZ_JH1_L4: 0.272 CZ_JH1_L5: 0.310 CZ_JH1_L6: 0.542	Lichens



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BOTTOMS-UP



**INTERDISCIPLINARY
SUMMER SCHOOL
ON FOREST ECOSYSTEMS**

Technologies-Biodiversity-Modelling

10 - 14 JULY 2023

Deadline for applications **31.03.2023**
More info on 3DForEcoTech.eu

 3DForEcoTech  **BOTTOMS-UP**  **PRoCLIAS**  **COST**
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

Thank you for your attention



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