Estimating understorey aerial biomass in adult Maritime pine stands

Establishing an indicator to be used at broader scales to estimate forest carbon stocks

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FORSEE : sustainable FORest management: an EuropEan network of pilot zones for operational implementation

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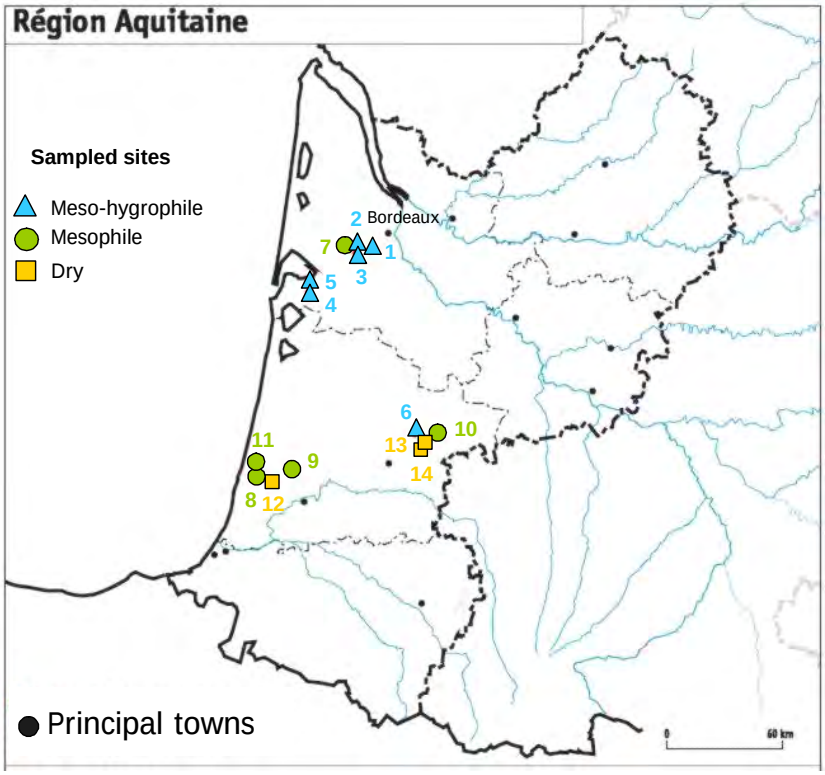
The Dream Team

UPR EPHYSE
UE Hermitage
IFN

Porté A. et al. 2005. Détermination de la biomasse aérienne du sous-bois de peuplements adultes de Pin maritime : contribution à la quantification des stocks de carbone forestier à l'aide d'indicateurs de couvert. In : Carbone, Forêt, Bois : Impacts du changement climatique, Stratégies pour la filière. VIII[ème] colloque ARBORA, 1-2 décembre 2005, ISTAB – Talence, France. 97-107.

Site sampling



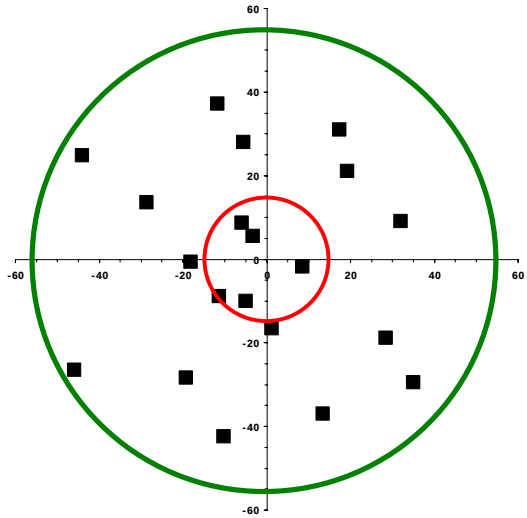
Selected stands following the criteria:

- Different hydric regimes in the Landes region
- Available past measurements of tree dimensions
- Age class: 25-35 y-old

Methods

In each stand, one hectare circle (56-m radius) for biomass sampling

In each one hectare circle, one inner small circle (15-m inner circle) for total cover estimates



Cover estimates per species: adapted from the National Forest Inventory (IFN) protocol

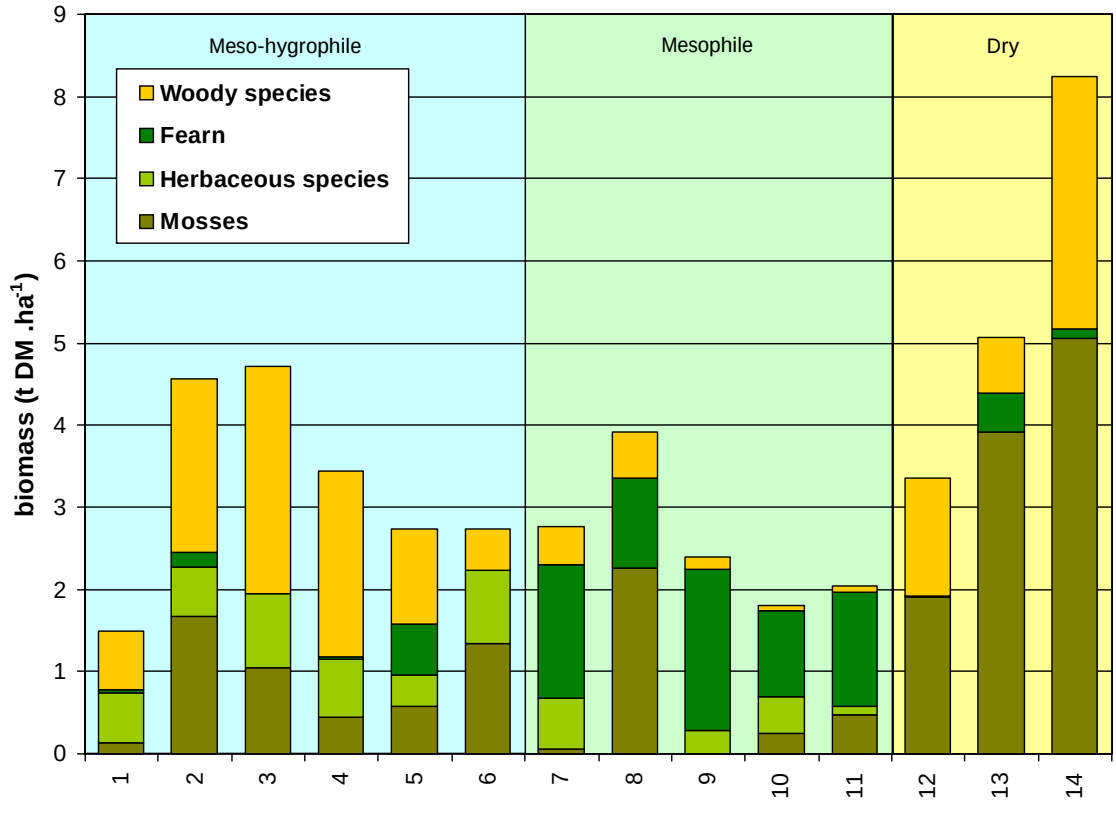
- Cover notation in 1/10 of total cover
- Average height estimate
- Done over the whole inner small circle

Biomass measurements per species group:

- Total aerial living biomass collected
- Done over twenty 1 m2 quadrats

W	Woody species Height < 2 m
F	Fearn
H	Herbaceous species
M	Mosses

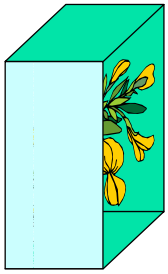
Biomass estimates t DM / ha



Calculating a volumetric index VI per species group (IFN estimation)

20 %

200 cm

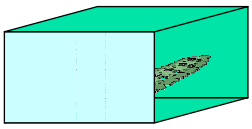


Ulex

$VI = \Sigma$ (% cover x height)

35 %

80 cm



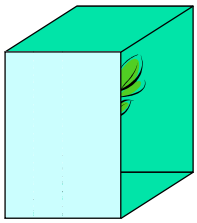
Erica

Example of VI calculation

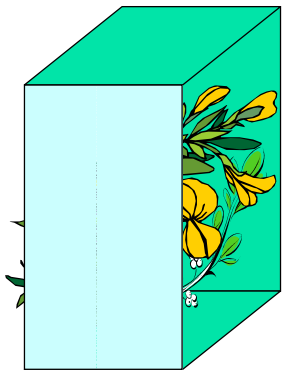
VI = 20*200 + 35*80 + 30*150

30 %

150 cm



Frangula

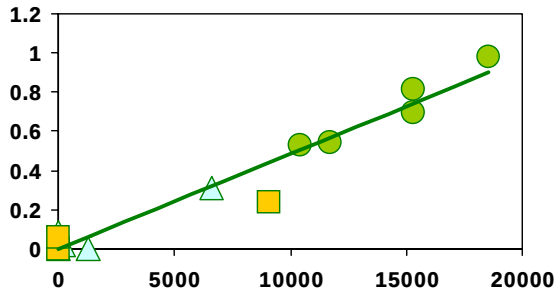


Aerial C Stocks (tC/ha) versus VI

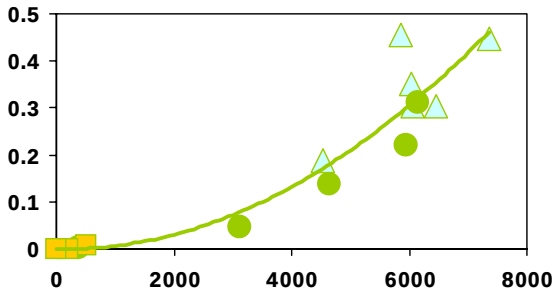
With Carbon content = 50 %

Average C Stock = 1.75 tC /ha

Fearn



Herbaceous species

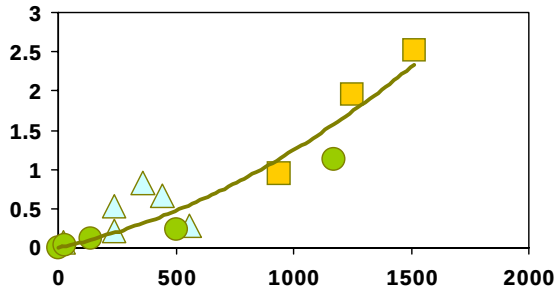


Meso-hygrophile

Mesophile

Dry

Mosses



Woody species