EcoLab
Laboratoire
Ecologie fonctionnelle
et Environnement

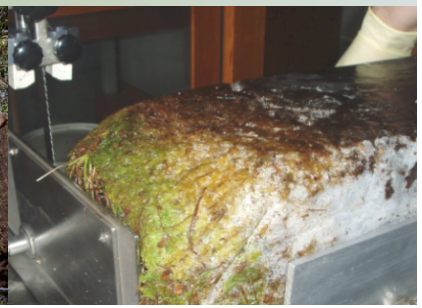
PEAT
Past Environmental Archives Toulouse

cnrs
dépasser les frontières

Selecting, coring and sub-sampling peatlands
An integrated approach





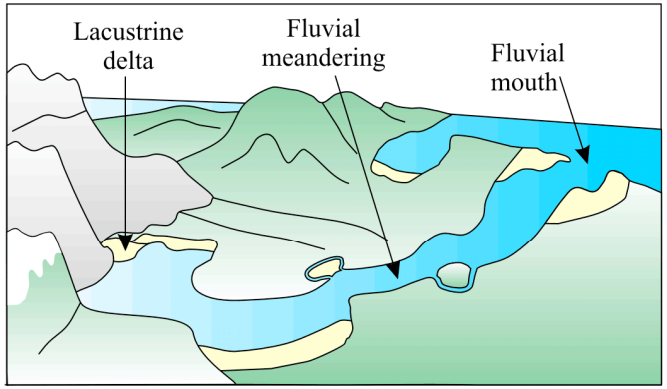


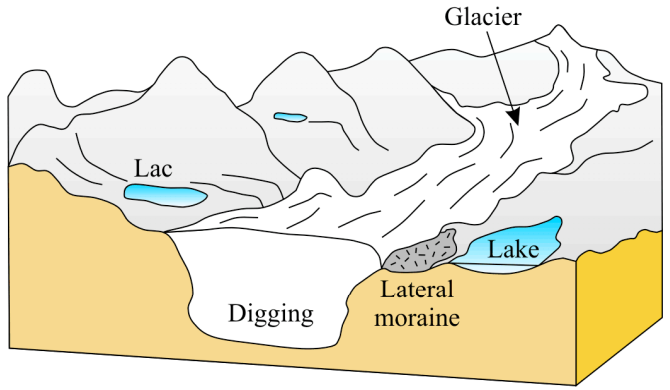
Rigorous approach in selecting, coring and subsampling

What is a peatland?

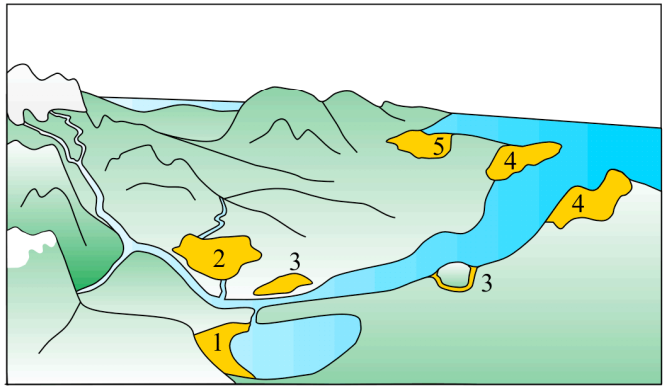

1 cm

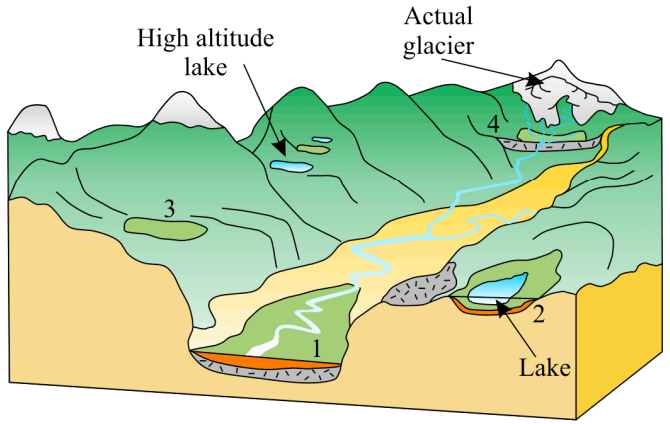
Where to find a peatland?

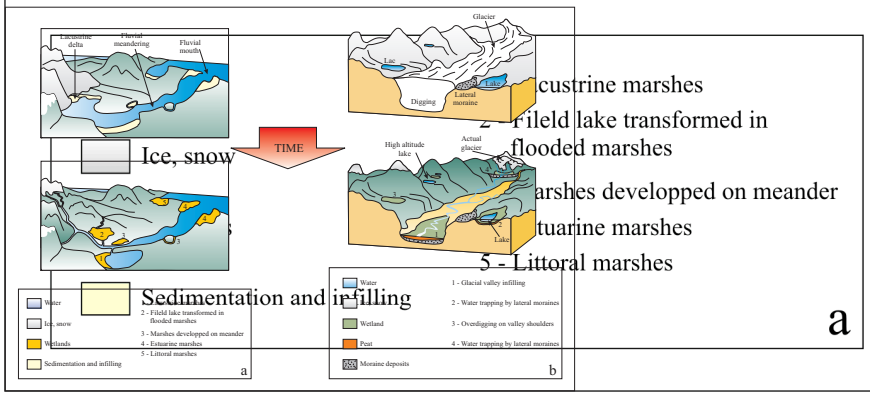




TIME







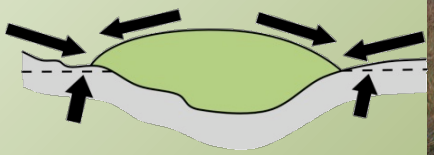
Water	1 - Glacial valley infilling
Ice, snow	2 - Water trapping by lateral moraines
Wetland	3 - Overdigging on valley shoulders
Peat	4 - Water trapping by lateral moraines
Moraine deposits	

b

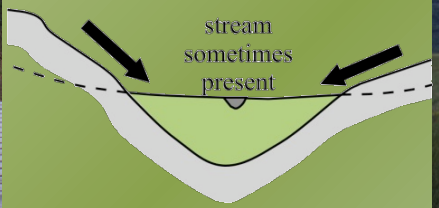
(redrawn after Manneville et al., 1999)

Types of peatlands (Charman, 2002)

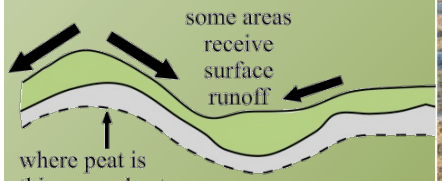
Raised mire ('bog')
Surface 'raised' in centre.



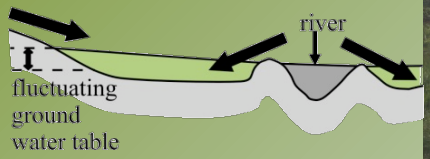
Valley mire ('fen')
Peat restricted to valley bottom receiving water from surface and runoff, groundwater and stream flow



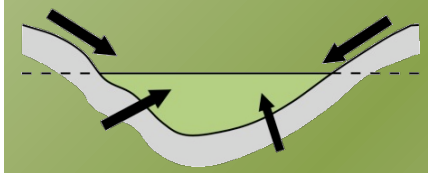
Blanket mire ('bog')
Peat covers most of landscape excluding steepest ground.



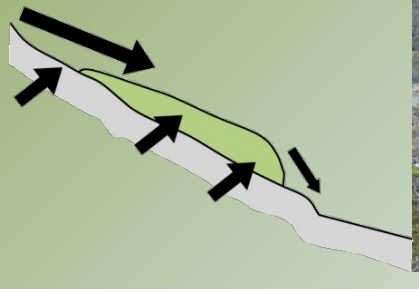
Floodplain mire ('fen')
Water supply from river floods, surface runoff and/or groundwater. Water table often fluctuating seasonally.

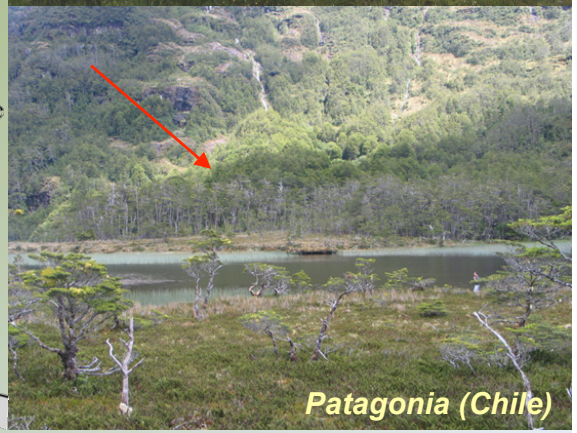


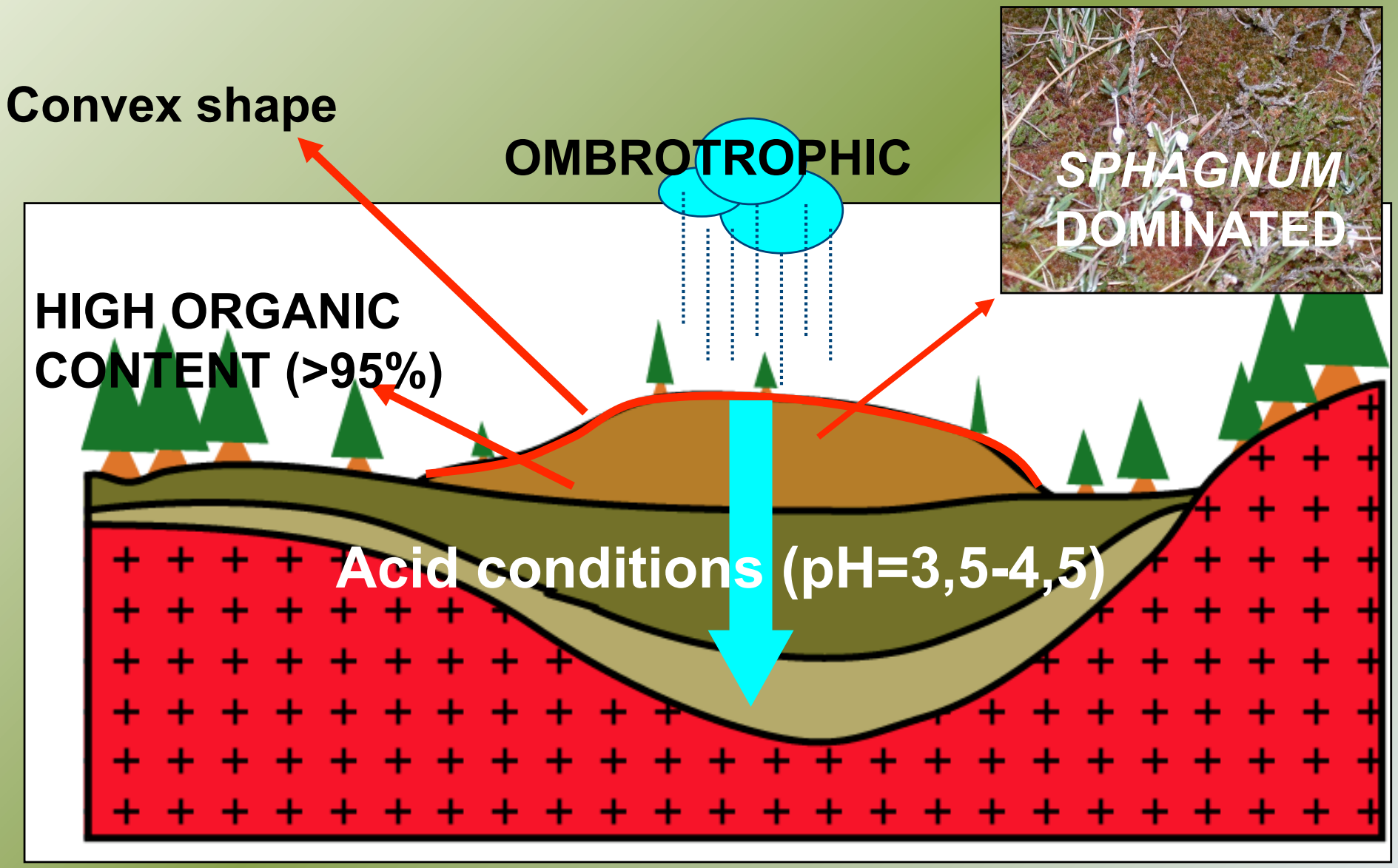
Basin mire ('fen')
Peat restricted to topographic low. Water table maintained by surface runoff and groundwater.



Sloping mire ('fen')
Peat on sloping terrain. Water from runoff and groundwater. May be concentrated as spring. Highly variable setting and morphology.



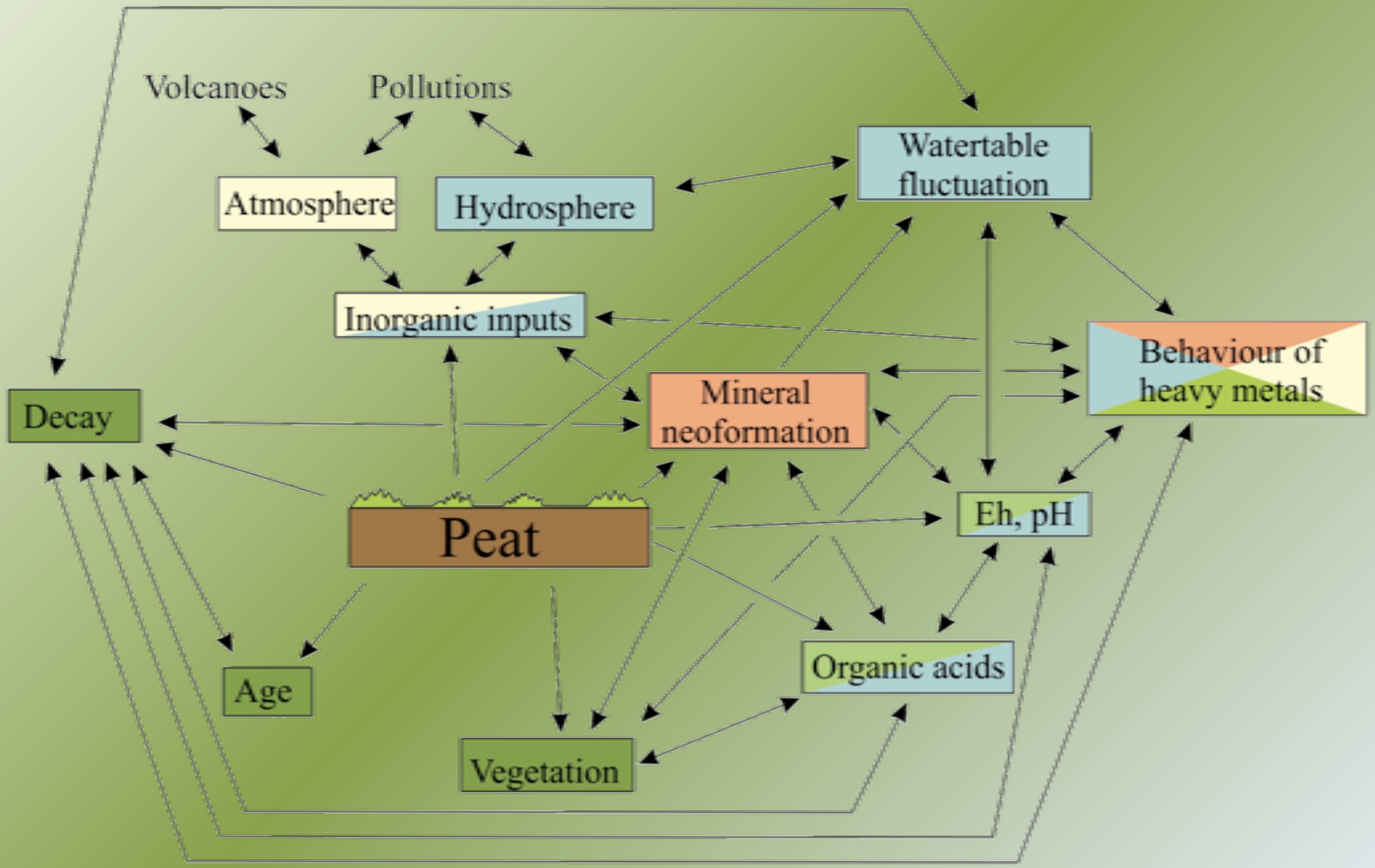



Convex shape
OMBROTROPHIC
SPHAGNUM DOMINATED
HIGH ORGANIC CONTENT (>95%)
Acid conditions (pH=3,5-4,5)

fen

peat bog

A dynamic ecosystem



Advantages

Ice cores

500.000 yrs

Lake sediments

10.000 – 100.000 yrs

Peat bogs

10.000 yrs

1.000.000 yrs

Marine cores

Corals

speleothems

100.000 yrs

Archaeology

10.000 yrs

Loess

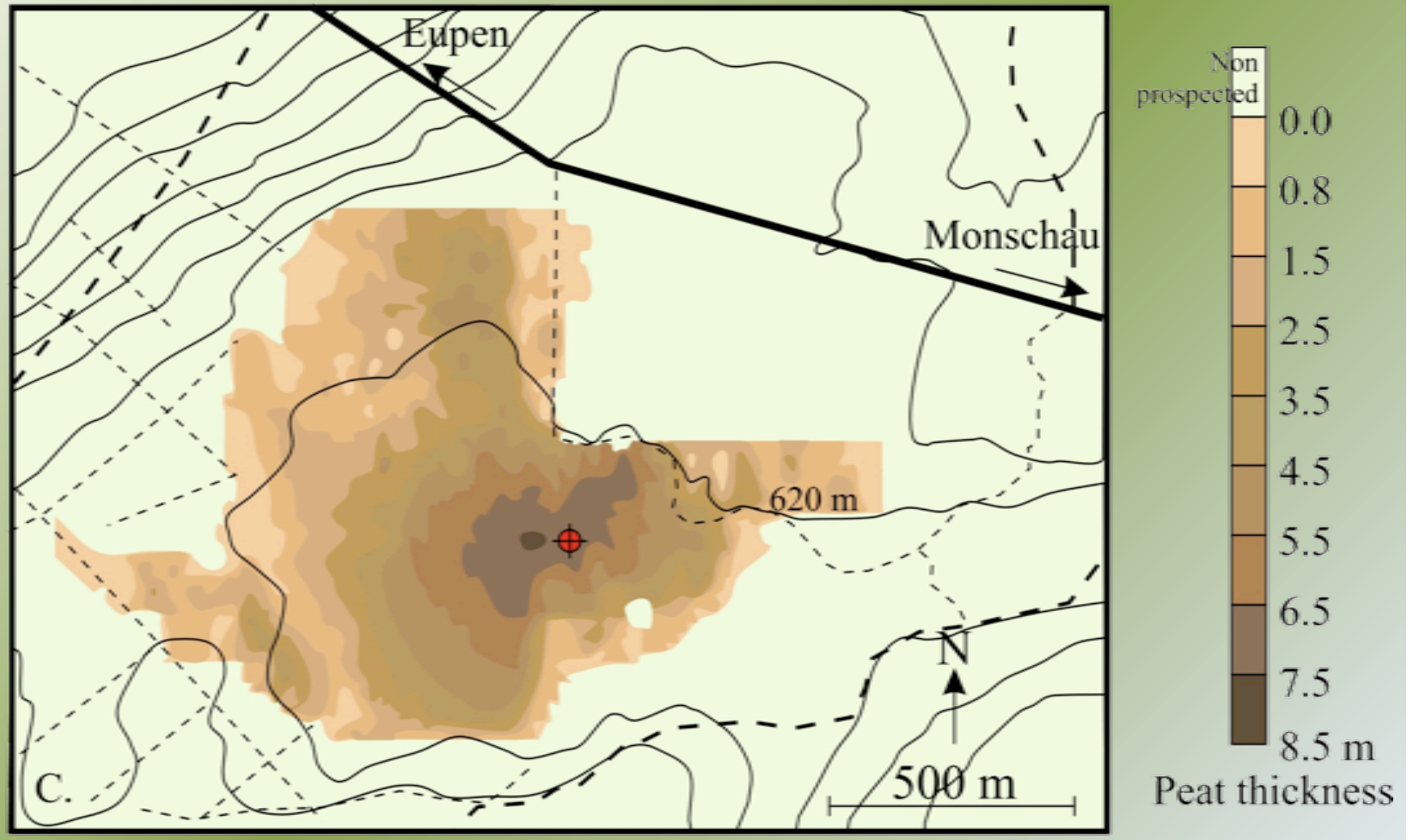
1.000.000 yrs

dendrochronology

untill 100.000 yrs

- anoxic conditions → maximum preservation
- good temporal resolution
- relatively easy to sample
- good traps for atmospheric particles

Peat thickness

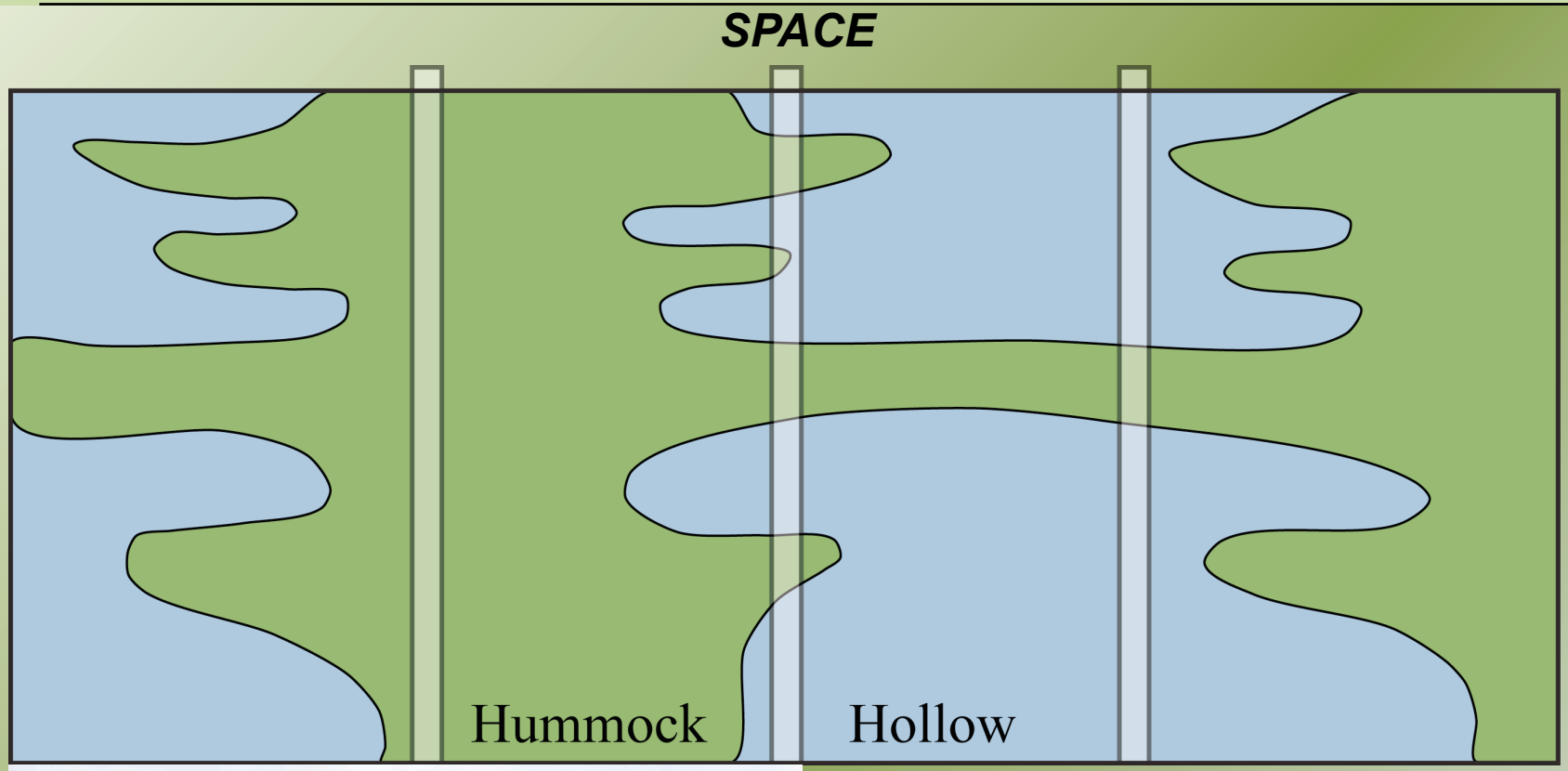


(Wastiaux et Schumacker, 2002)

Peat thickness

Peat thickness

Where to core



From Aaby (1976)

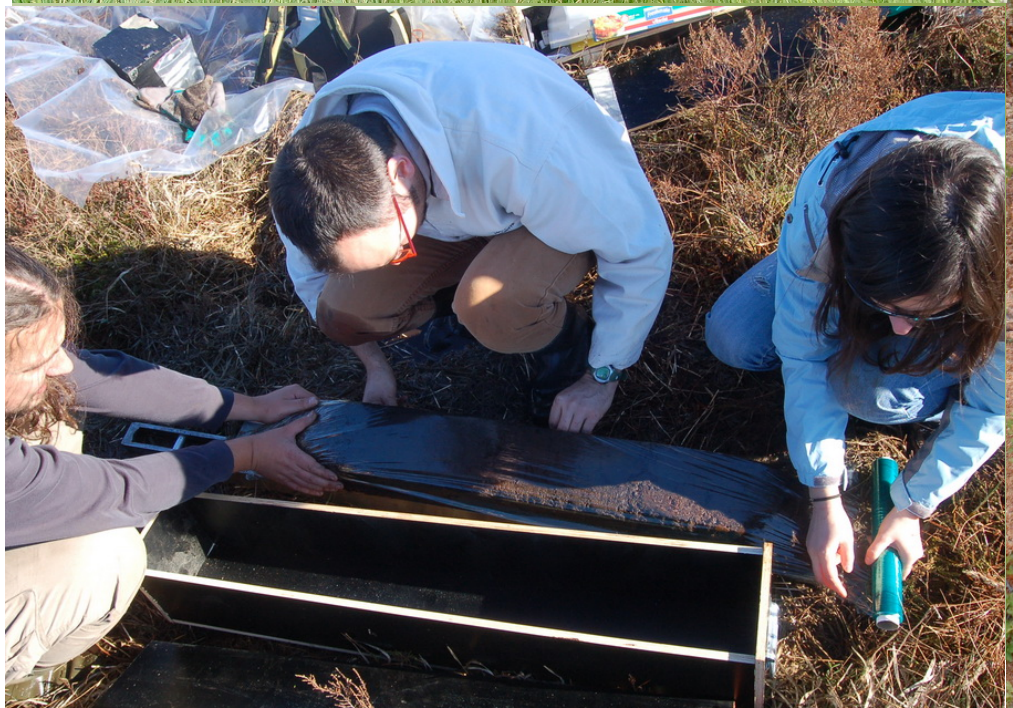
Keep in mind your scientific objectives:

-What parameter
-Which proxy
-Which time span
-…

Peat coring

- **Wardenaar cores and monoliths: for subsurface**
- ***Russian corer: for deeper layers***
- ***Trench monoliths***

Wardenaar cores



Peat monoliths

Peat monoliths

Peat monoliths

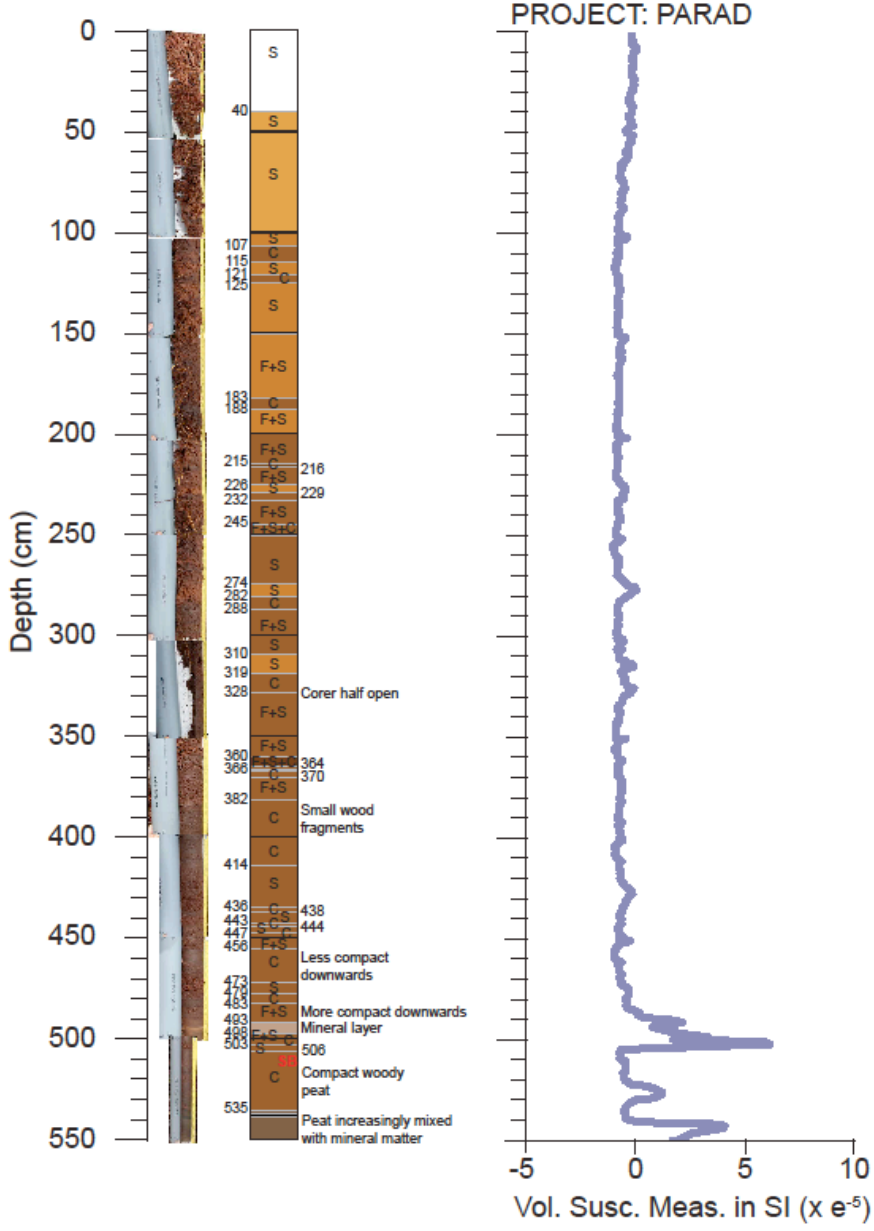
Russian coring


PA12-PB01 (0-50)
0
50

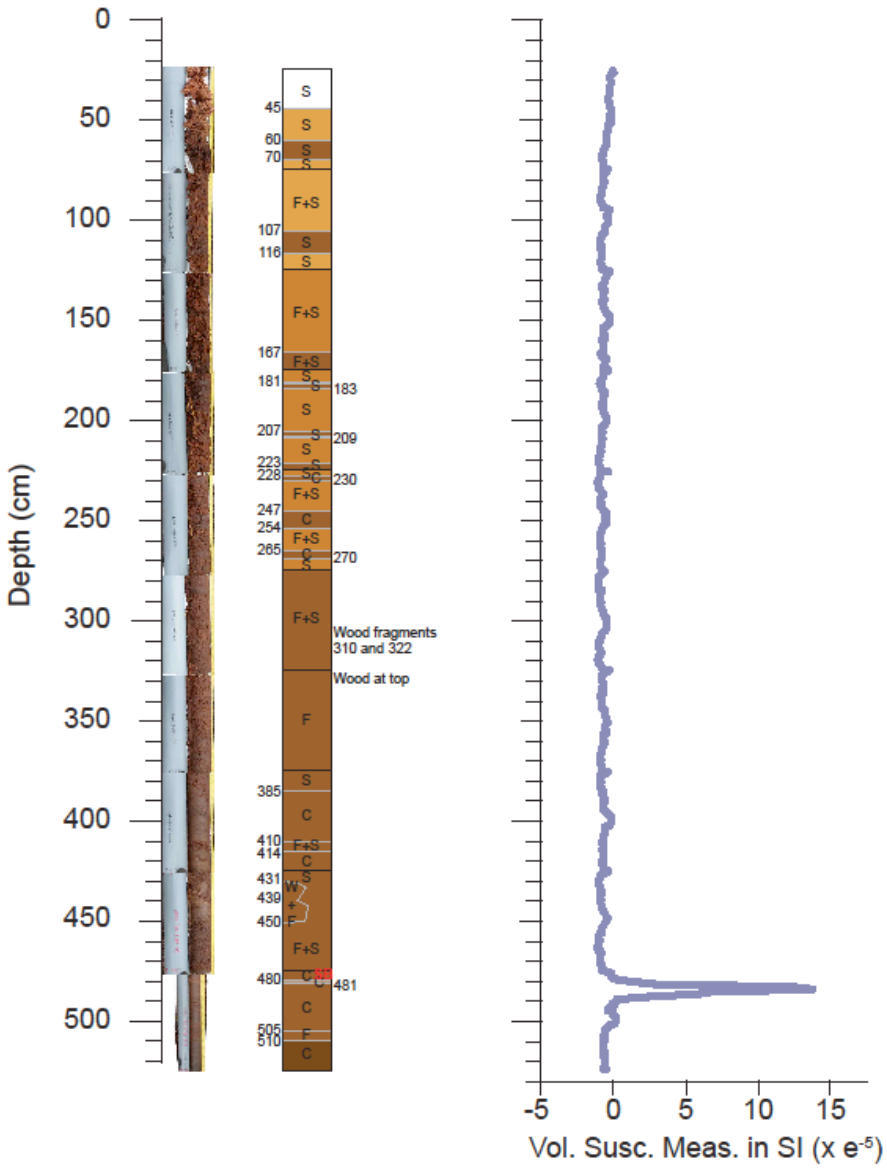

PT 910 PVC Ø 100-EU-M1-03/11
PA12-PB01 (150-200)
150
200

Overlapping and sketching

CORE NAME: KAR12-PB02A
LOCATION: ESTANCIA ESCONDIDO, KARUKINKA PARK, CHILE
COORDINATES: S 53.86124, W 69.5807
CORING DAY: 07/02/12
PROJECT: PARAD

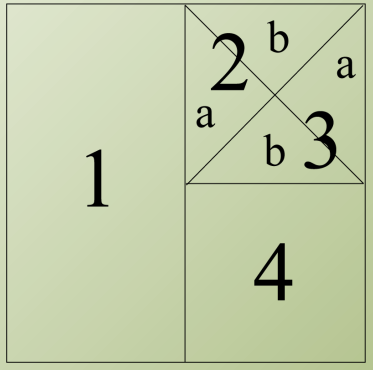


CORE NAME: KAR12-PB02B
LOCATION: ESTANCIA ESCONDIDO, KARUKINKA PARK, CHILE
COORDINATES: S 53.86124, W 69.5807
CORING DAY: 07/02/12 PROJECT: PARAD



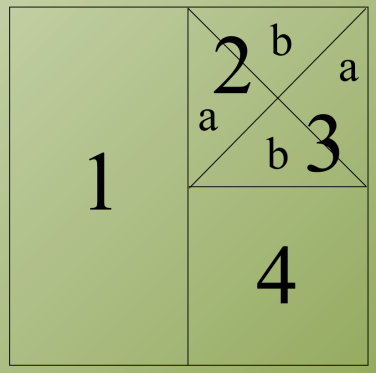
Transporting

01W



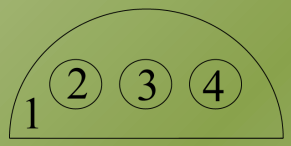
1. ^{210}Pb
   Géochimie
2. a.Pollens - b. Cendre et humification
3. a. Azote - b. Thécamoebiens
4. Macrorestes et ^{14}C

04W et 05W

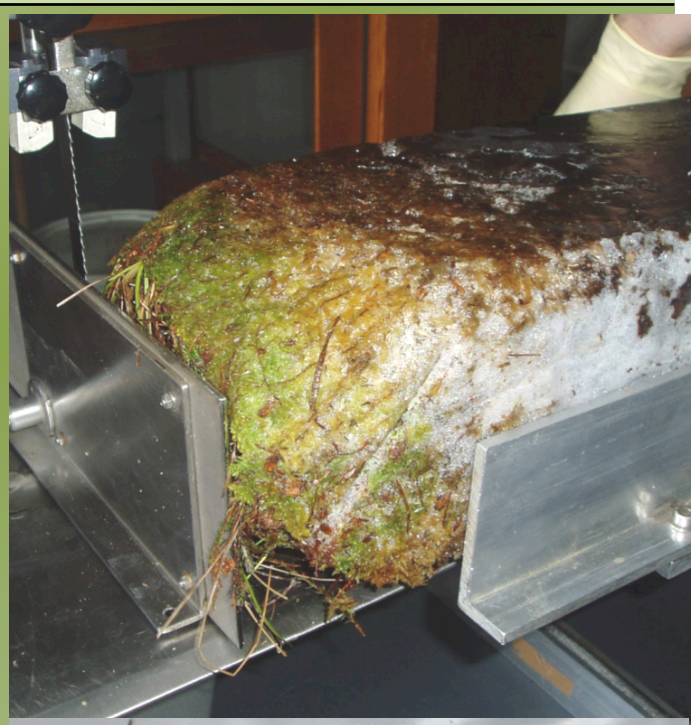


1. Archive
2. a.Pollens - b. Cendre
3. a. Humification - b. Archive
4. Macrorestes, ^{14}C et archives

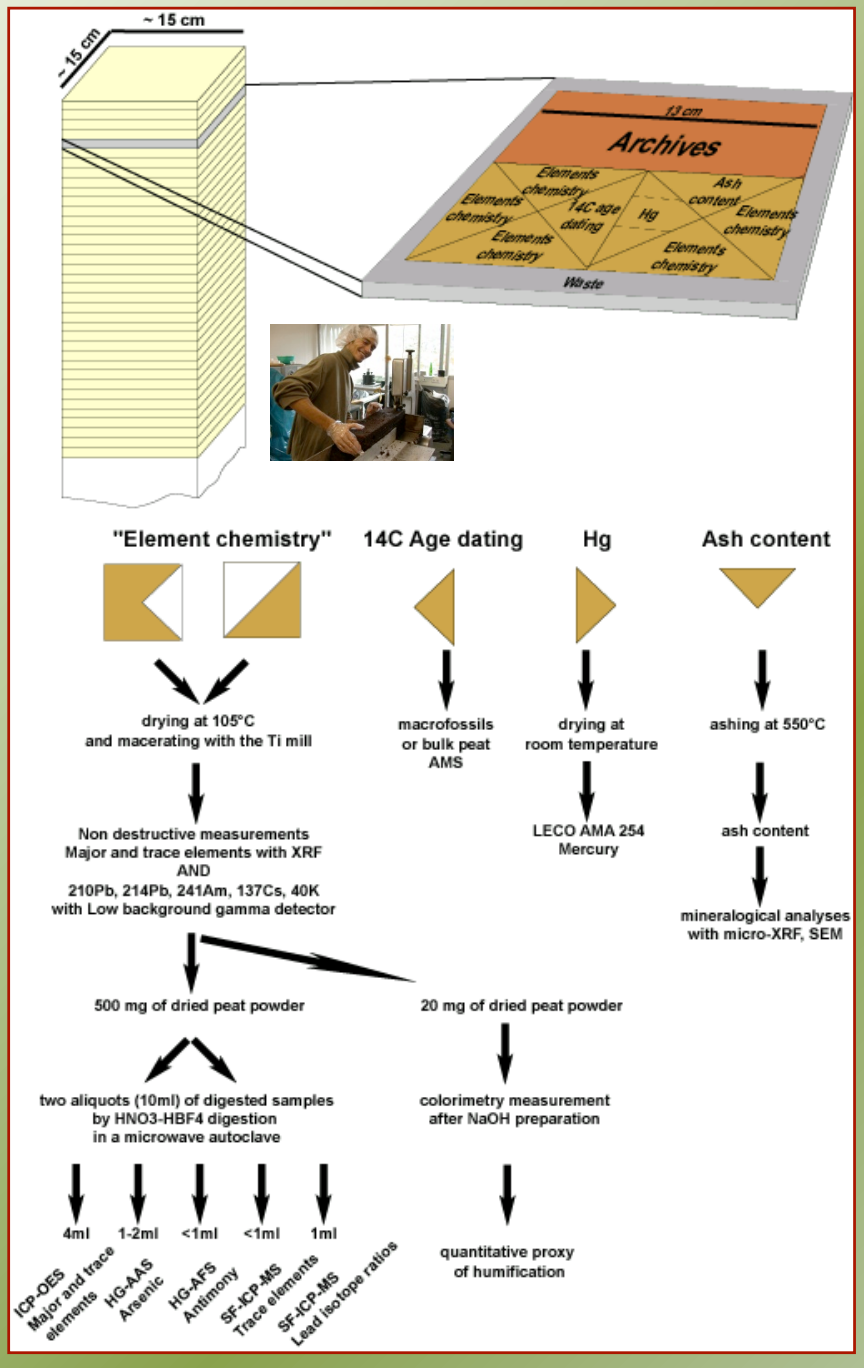
01b



1. Géochimie, ^{14}C
2. Pollens, densité
3. Azote
4. Humification, cendre



Sub-sampling



Conclusions

- **Explore the sites before coring**

- **Define what you would like to study: DEFINE YOUR SCIENTIFIC QUESTIONS**

- **Select and characterise the site**

- **Choose a suitable way to core**

-**Make a cheklist !**

-**Organise your subsampling**

Some references:

-**Mires and Peat special issue (online scientific journal)**
-**Givelet et al., 2004 – JEM**
-**PAGES special issue on peatlands**
-**Manneville et al., 1999**
-**Charman et al., 2002**