



12th SERE CONFERENCE

7th – 10th SEP 2021

online



Restoration peatland and eLTER, case of France

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1. Generalities and context – *Definitions*

Peatland: a wetland which soil is composed of peat = histosol.

Wetland: an ecosystem permanently or periodically flooded.

Histosol: a soil at least 40 cm deep, composed of at least 20% of organic matter.

Structure of *Sphagnum* peatland

- ⇒ Histosol (peat)
- ⇒ Muscinal strata: *Sphagnum*
- ⇒ Herbaceous strata: e.g. *Carex*, *Eriophorum*
- ⇒ Shrub strata: ericaceous
- ⇒ Tree strata: not always present



1. Generalities and context – *Sphagnum*

- **Bryophyte:** no roots, growth from the capitula

Requirements

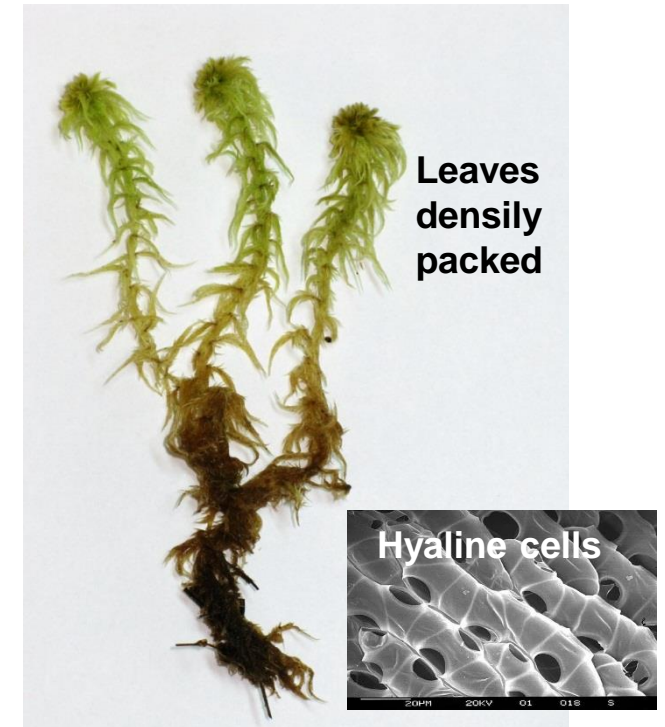
- Wet environment
- Oligotrophic conditions
- Acidic water

Characteristics

- High water retention
- N sequestration
- High CEC

generates the favorable conditions of their own growth

Sphagnum spp as engineer species



1. Generalities and context – *Sphagnum* peatlands

- Litter recalcitrant to decomposition

Litter bag experiment

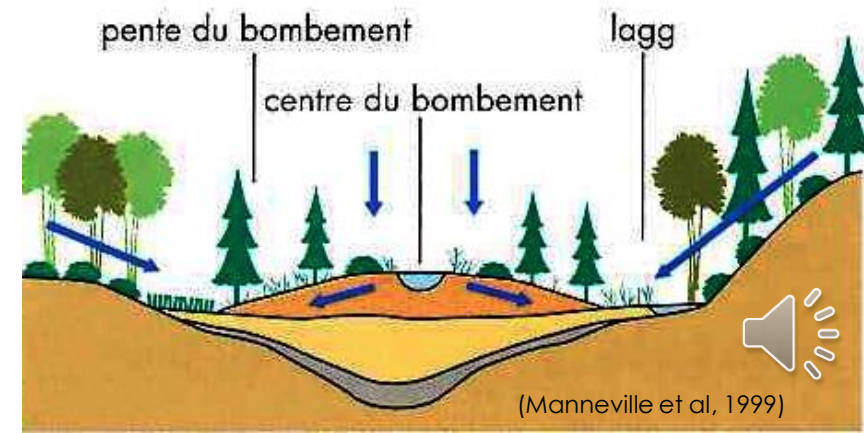
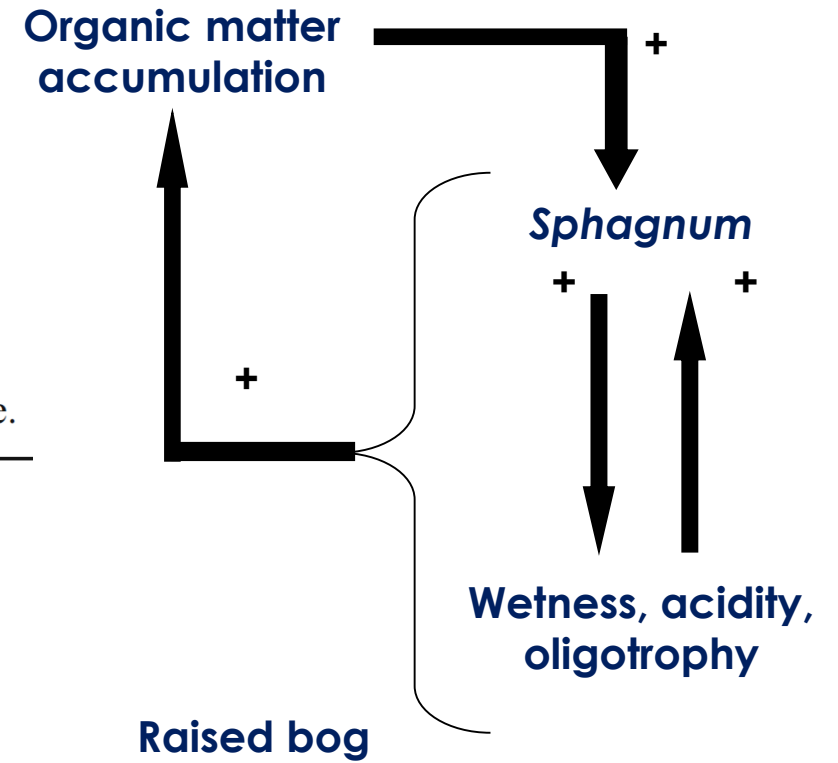
% of initial mass remaining after 1 year of decomposition

Incubation site	Litter	Mass remaining±s.e.
<i>S. rubellum</i> hummocks	<i>S. rubellum</i>	86.9±0.95
	<i>M. caerulea</i>	68.5±2.56
	<i>Betula</i> spp.	59.6±5.36

(Gogo et al, 2016)

S = *Sphagnum*

M = *Molinia*

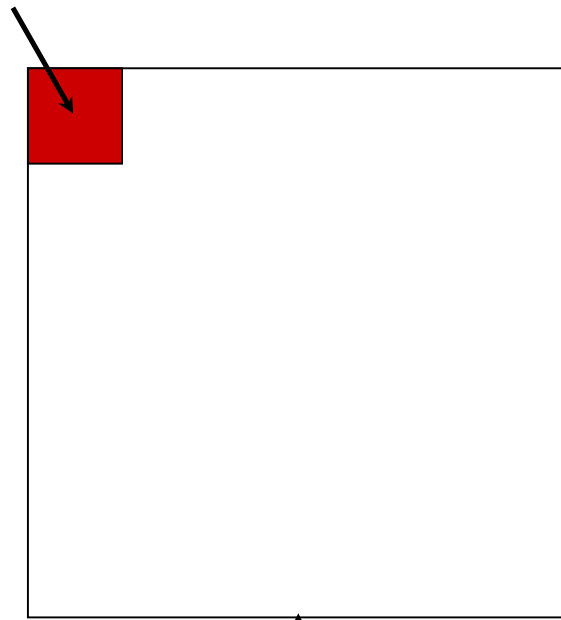


(Manneville et al, 1999)

1. Generalities and context – *Sphagnum* peatlands

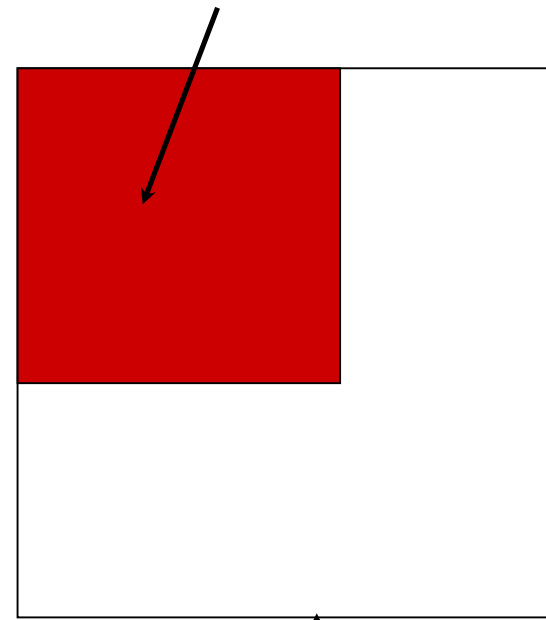
- Global C pool in peatlands

Sphagnum
peatland area (~3%)



Emerged land area

C stock in peatlands (25-33%)



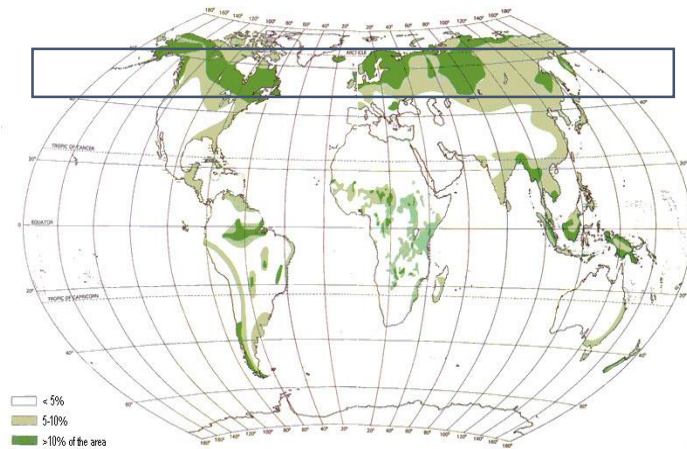
World soil carbon



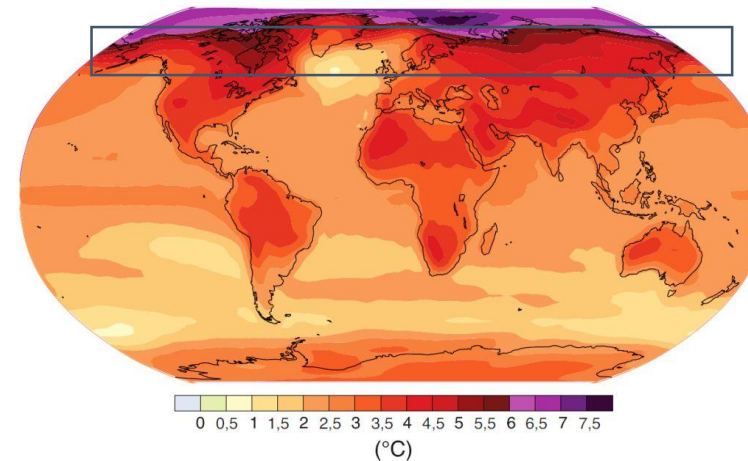
1. Generalities and context – *Global scale disturbances*

Climate change

Distribution of peatlands



Possible increase of air temperature by the end of the XXIe century, scénario A1B SRES, GIEC 2007.

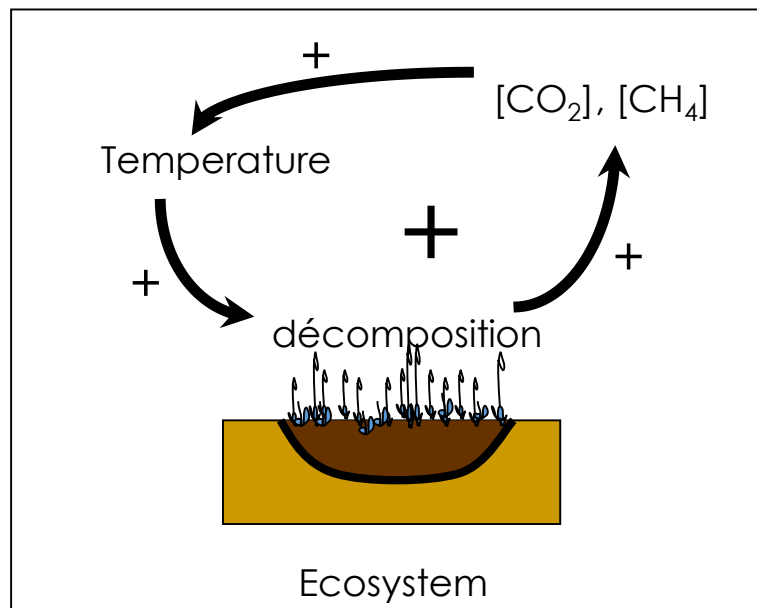


Sphagnum peatlands are experiencing significant temperature increase

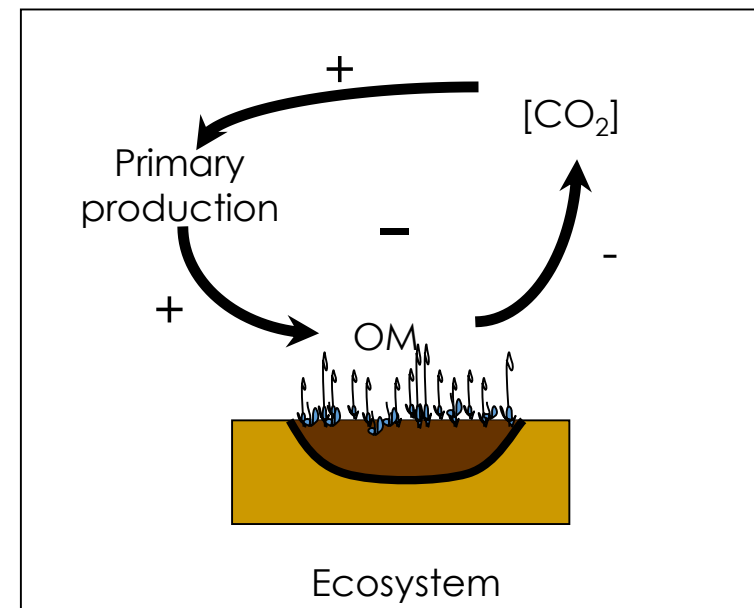


1. Generalities and context – *Global scale disturbances*

Unknown response to Climate change



Amplification



Attenuation

⇒ Which feedback will take place in peatlands?

⇒ Other factors: rainfall, **vegetation change**



1. Generalities and context – *Local scale disturbances*

Peat exploitation



Drainage



- ⇒ Extraction
- ⇒ Forestry
- ⇒ Pasture
- ⇒ Land management

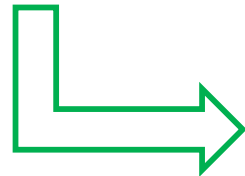


1. Generalities and context – *A change of paradigm in peatland restoration*

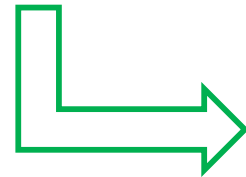
Widespread awareness of climate change

Before => Restoration focused on sites where endangered species were already present

Now => By adding a focus on functional restoration (hydrological services, C storing capacity), previous common sites for species become interesting to restore



Cost effective restoration action in terms of C storing:
unexpensive action can yield significant C storing in
very degraded sites



Need to **assess and check** C stored



2. Restoration action – *Restoration of the hydrological functioning*

Example of the Forbonnet peatland, an eLETR site

Context => A sphagnum peatland, which hydrology was profoundly modified by drains

Action => Drain blocking to recover coherent water flows with the local topography



2. Restoration action – *Restoration of the hydrological functioning*

Example of the Forbonnet peatland, an eLETR site



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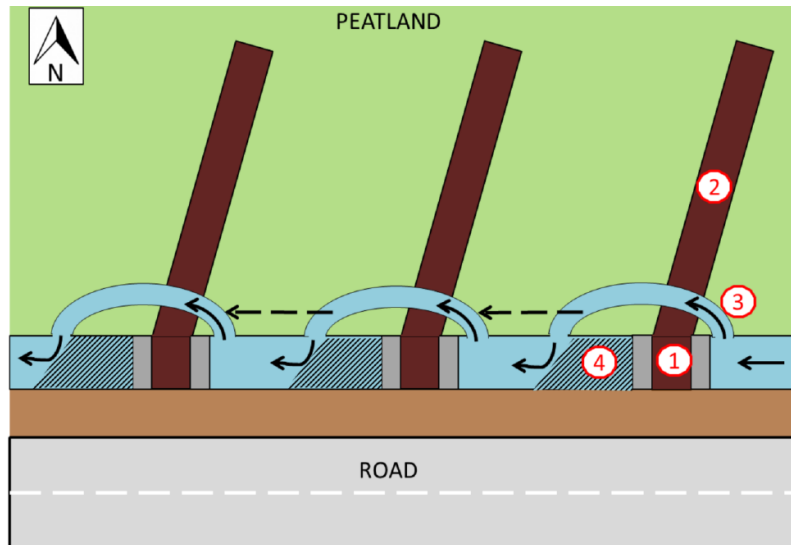
2. Restoration action – *Restoration of the C storing functioning*

Example of the La Guette peatland – action on hydrology

Context => An acidic fen dominated by *Molinia caerulea* and ericaceous shrub because of a drain at the output along a road

Action => Drain blocking and meandering of the drain close to the road

In 2014



Legend:

- 1-weir
- 2-filled trench
- 3-deviation trench
- 4-standing water



2. Restoration action – *Restoration of the C storing functioning*

Example of the La Guette peatland – action on vegetation

CarBioDiv and
CarEx projects
In 2016 (exp. Started
in 2014)



2. Restoration action – *Restoration of the C storing functioning*

Example of the La Guette peatland – action on vegetation

Care-Peat Interreg project - UE



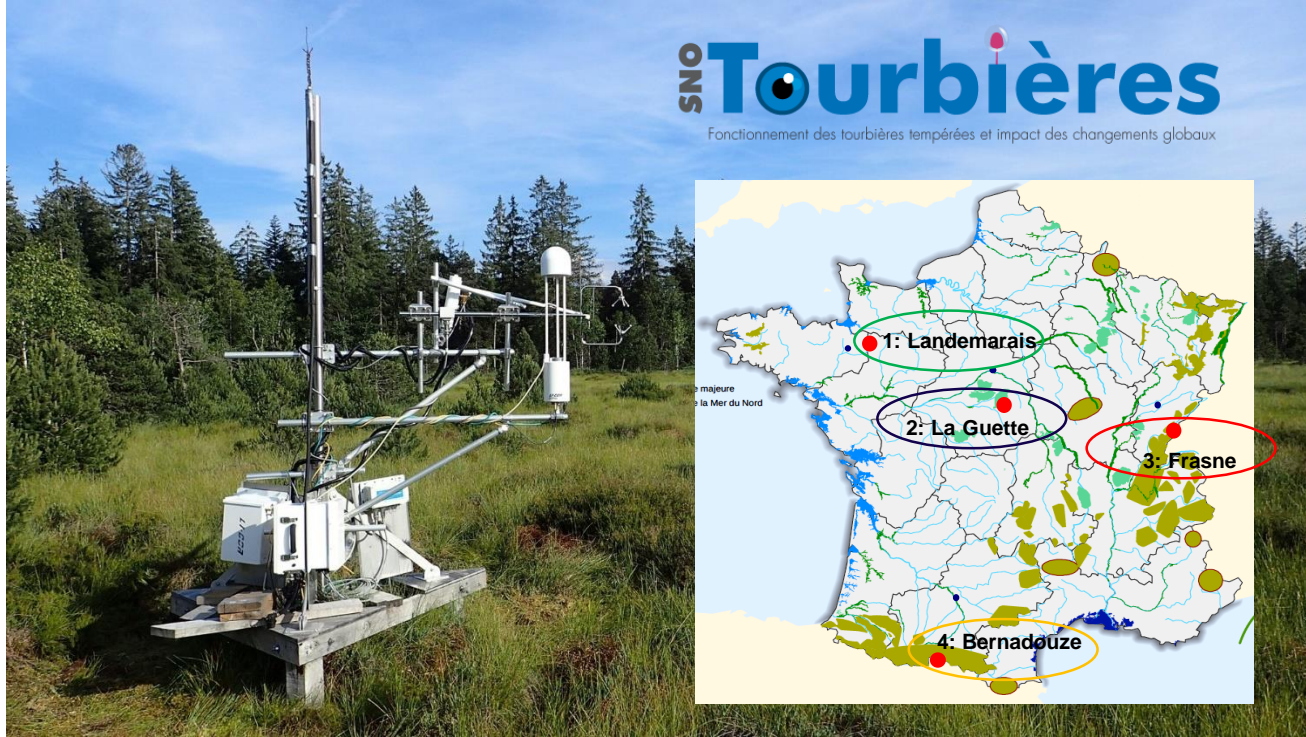
- Different restoration actions across North-west
- Economical aspects of C sequestration in peatlands
- Spreading wise restoration actions to promote C sequestration in the long-term



3. Long term organisation – *Monitoring / eLTER project*

Long-term monitoring in the framework of the SNO Tourbières

Project of eLTER platform in Jura mountains



3. Long term organisation – *Transfer of knowledge*

At the national level

Within the Care-Peat project:

- ⇒ Meeting with local managers and stakeholders in each country involved
- ⇒ Develop models to estimate C fluxes and C budget
- ⇒ Setting up a decision support tool promote C sequestration restoration actions

At the european level:

Working with Pôle Relais Tourbières:

- ⇒ Webinar organisation with stakeholders on peatland restoration and C sequestration
- ⇒ Writing technical notes



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Thanks for your attention



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