

# Global overview on the distribution and degradation of peatlands and organic soils

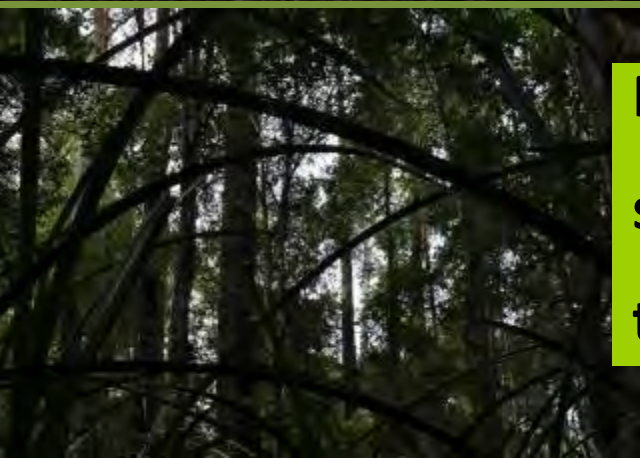
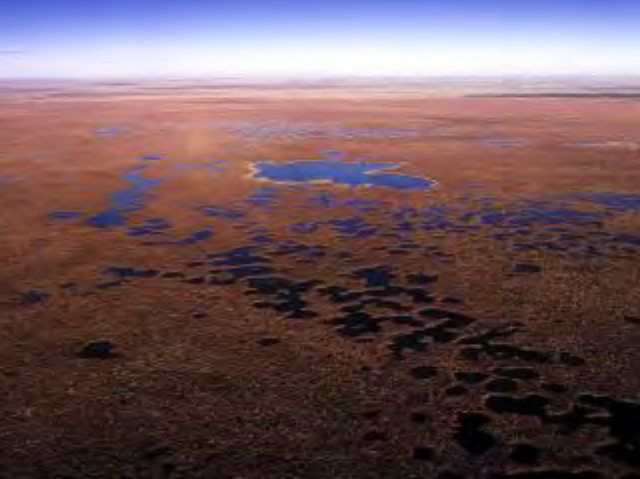


GREIFSWALD  
MIRE  
CENTRE

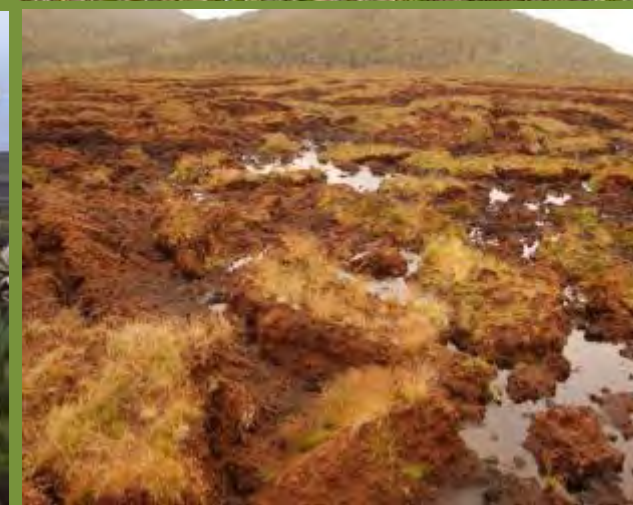
Alexandra Barthelmes

International Mire  
Conservation Group

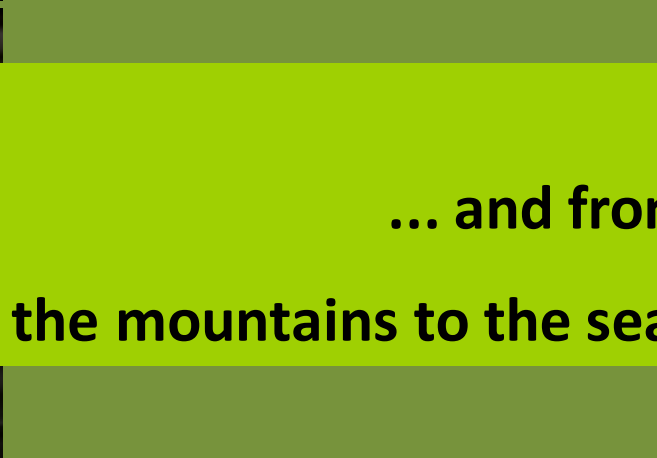
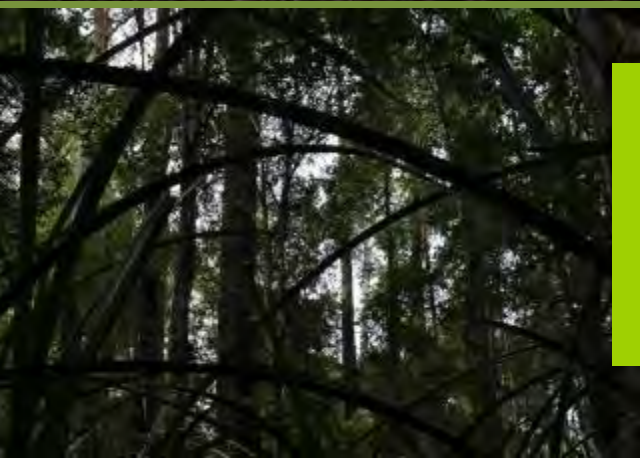
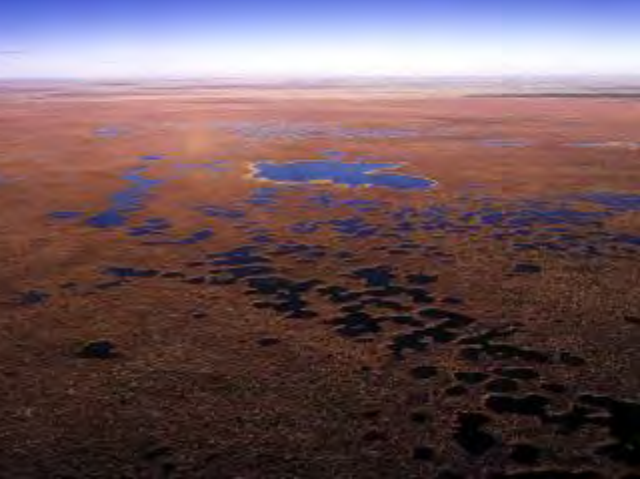




**Peatlands and organic  
soils occur from  
the tundra to the tropics...**



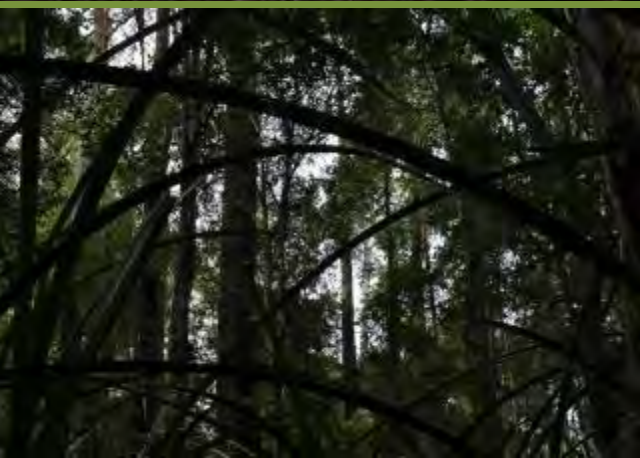
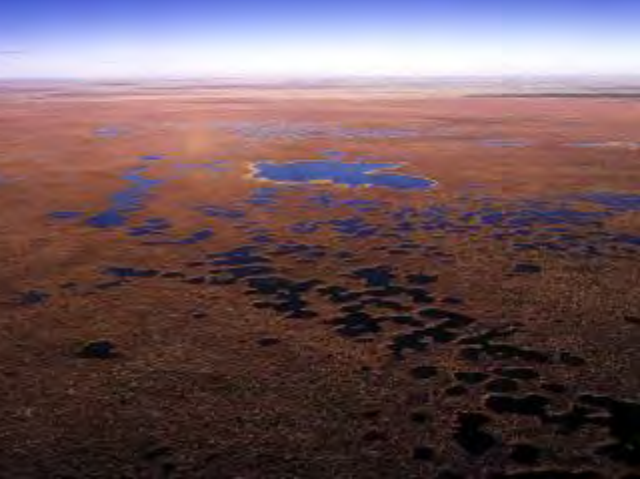




**... and from  
the mountains to the sea!**



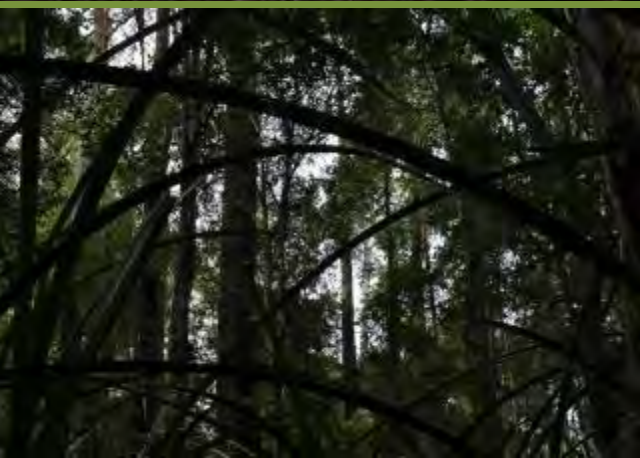
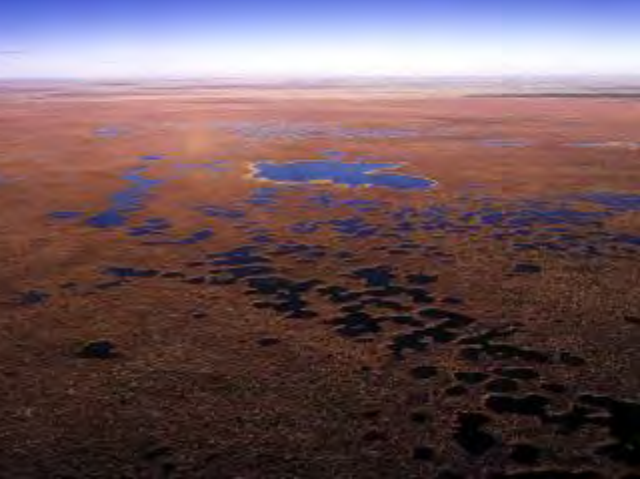




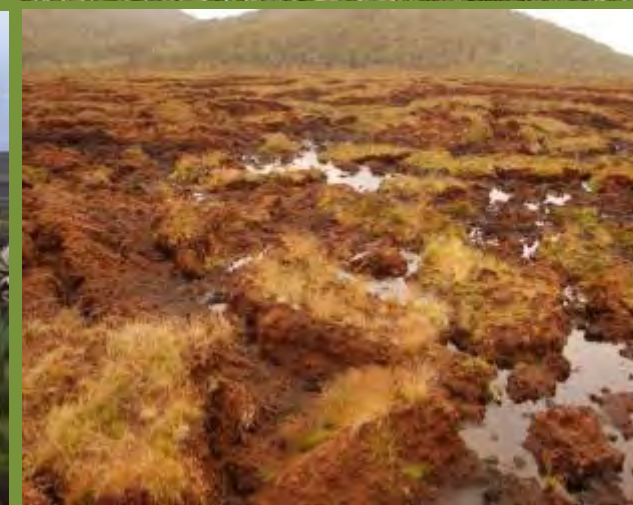
**They are impressively  
diverse...**



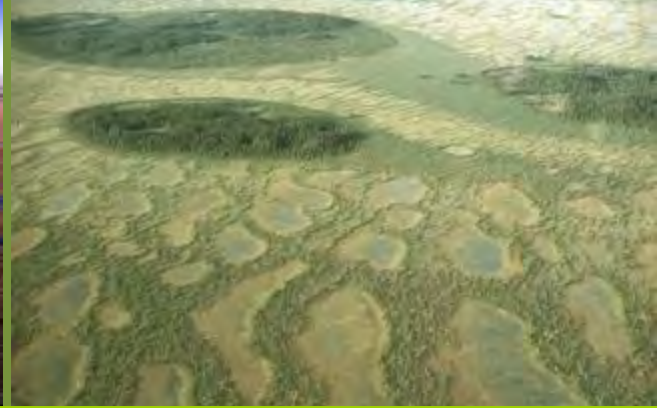
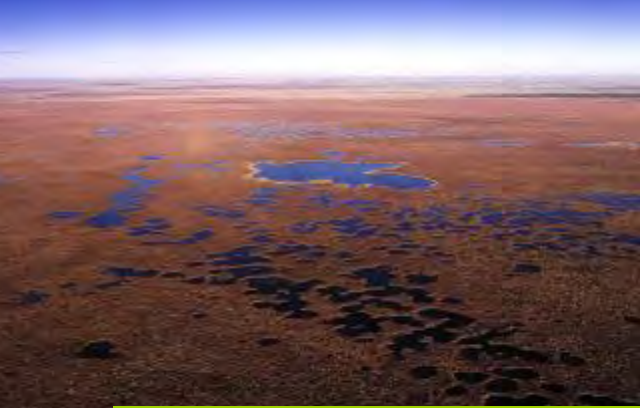




**...but their definitions  
seem to be even  
more diverse ;-)**







**In the Global Peatland Database, we consider all ORGANIC SOILS with a minimum organic matter content of 20 % (without applying a depth criterion) and suitable proxy data.**

**This allows the inclusion of almost all indicative datasets with diverse concepts and definitions.**



# Global Peatland Database (GPD)



**Area data elaborated during the 2015-update of the GPD primary sources:**

- recent projects of the Greifswald Mire Centre
- available data from peatland / soil research
- UNFCCC-reporting

**This information has been integrated to derive best estimates for organic soils and the extent of drained land use for each country.**

**Ongoing research may result in considerable area changes especially for parts of Africa, Asia, Central and South America.**

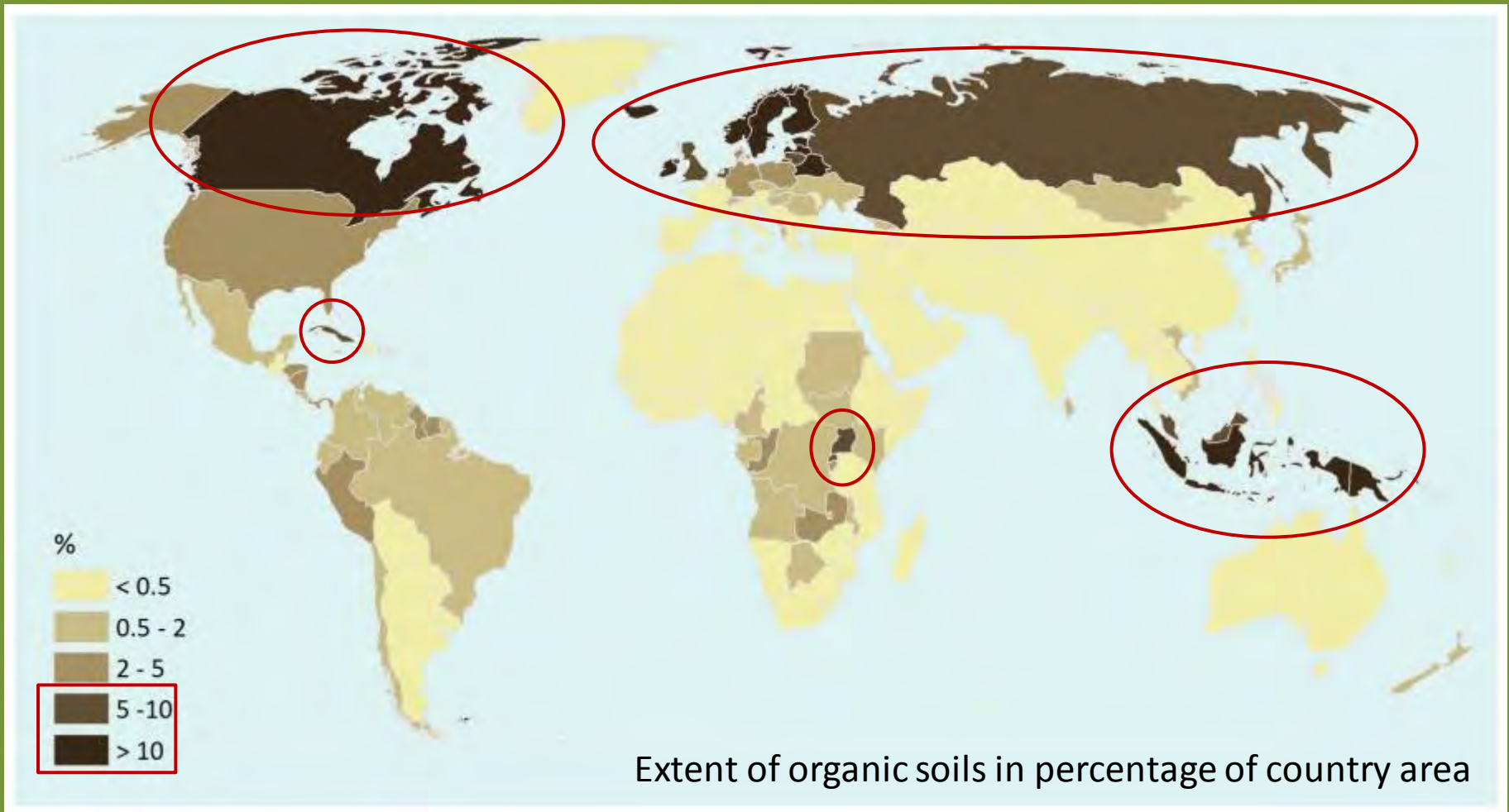
# Global distribution of organic soils (GPD)



Worldwide very few countries without organic soils...



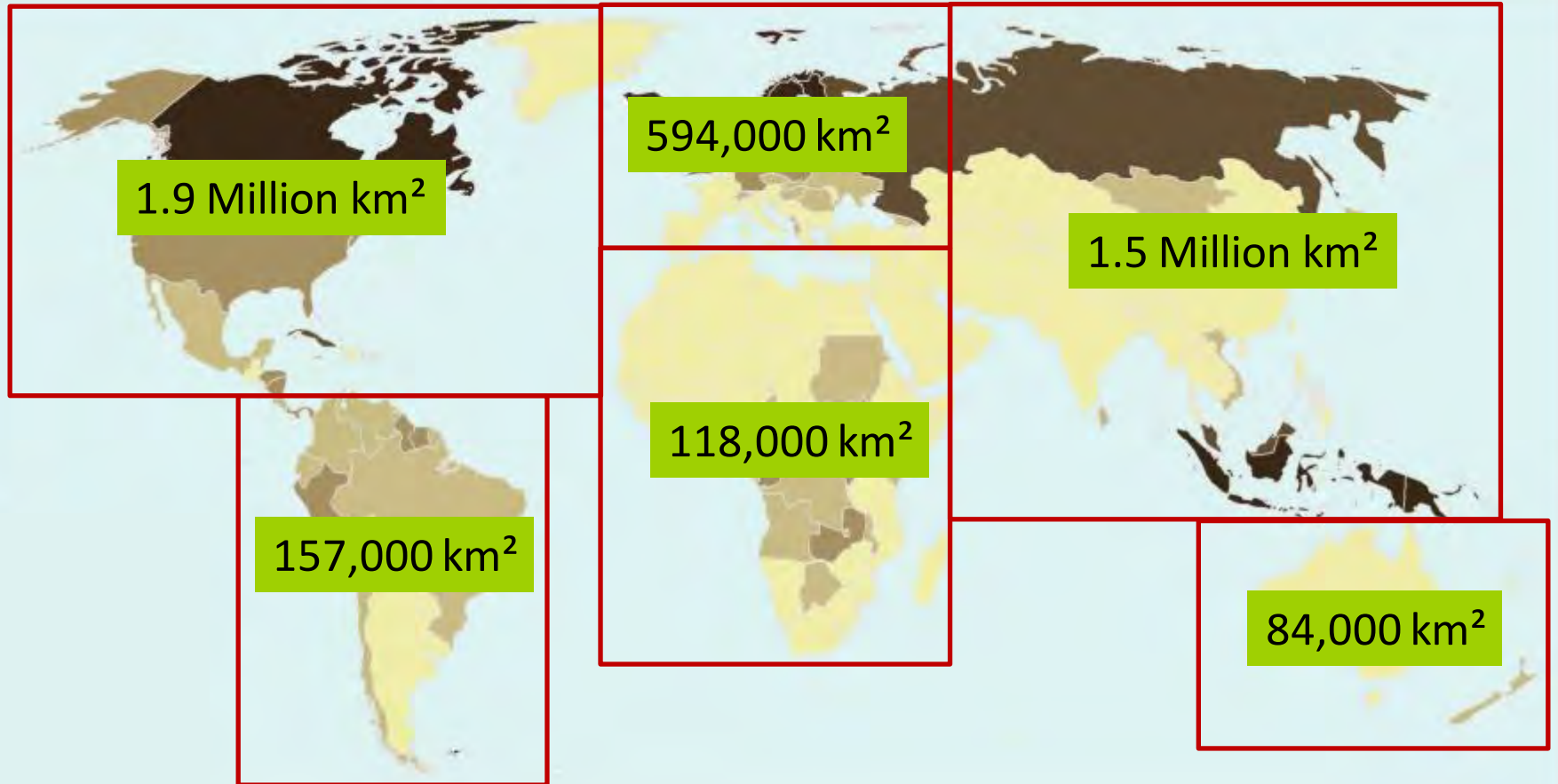
# Global distribution of organic soils (GPD)



...but also few countries that have very much of it!



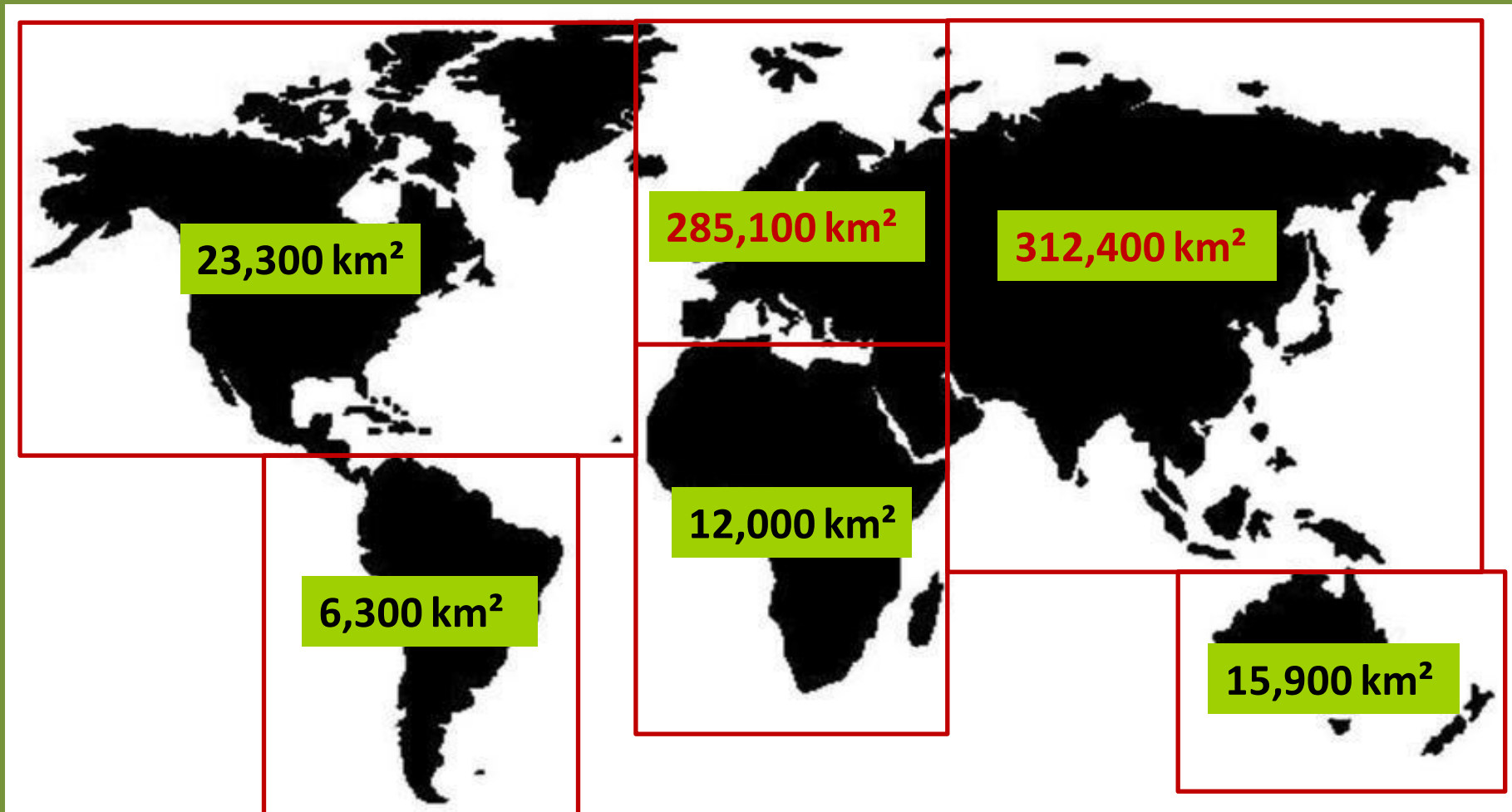
# Global distribution of organic soils (GPD)



**WORLD: 4.46 Million km<sup>2</sup> of organic soils**



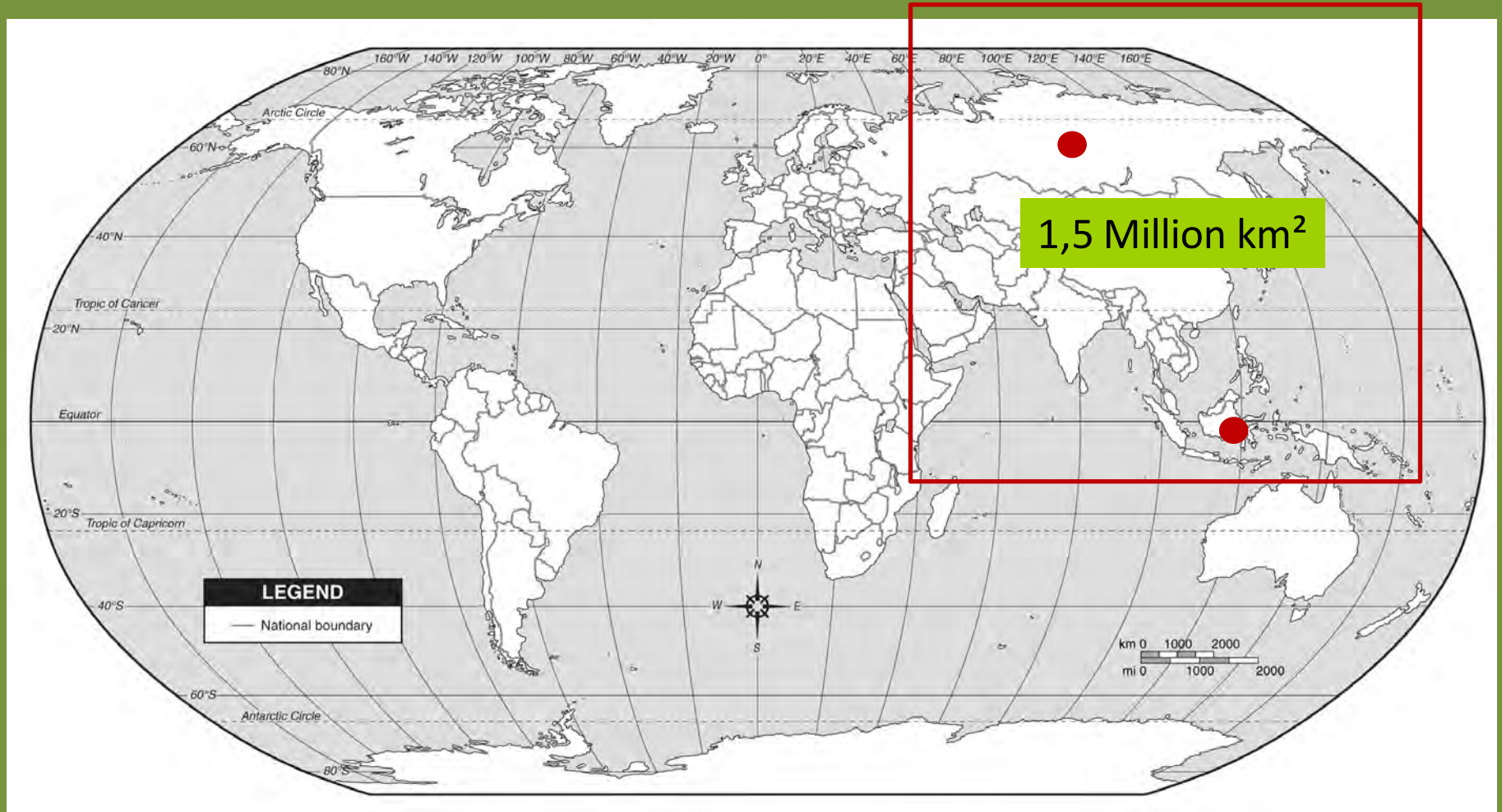
# Globally drained organic soils (GPD)



**Approximately 655,000 km² = 15% of the global organic soils are drained - 91% of them are found in Asia and Europe.**

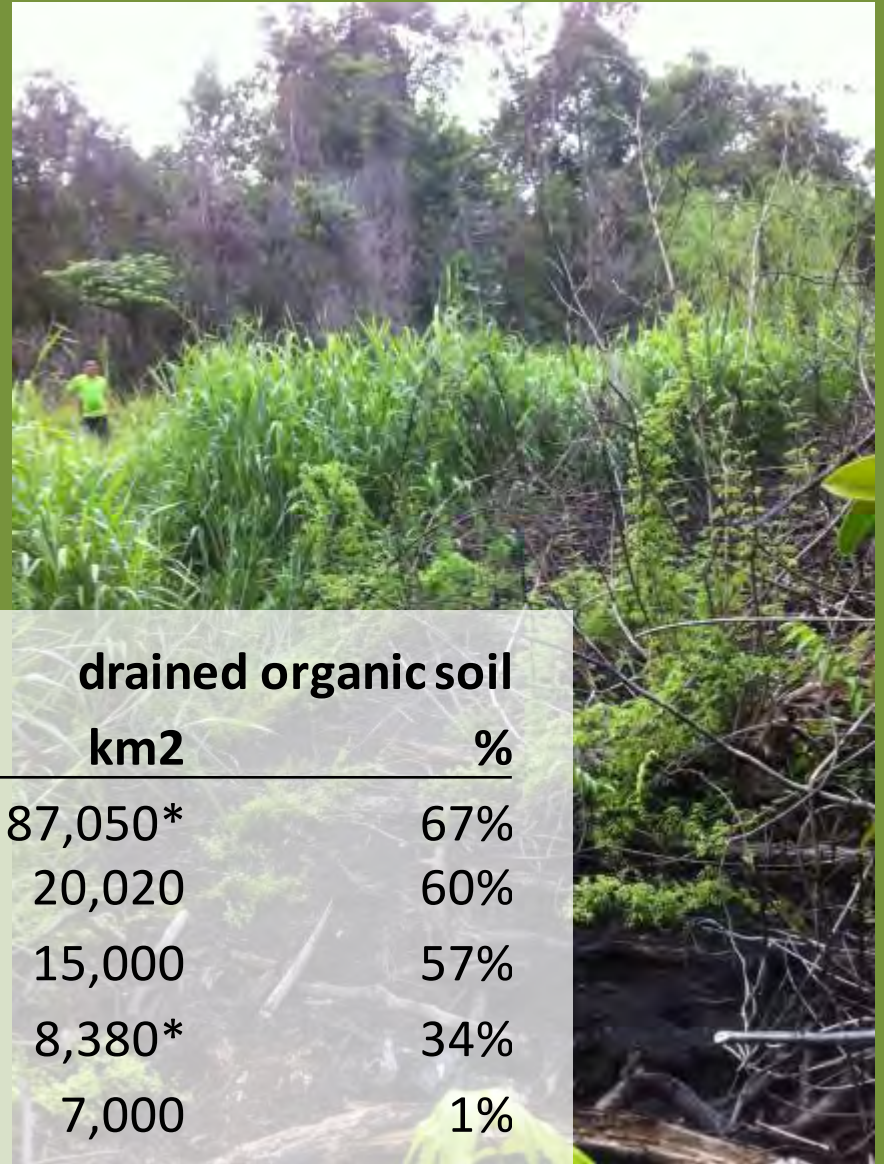


# Global distribution and degradation of organic soils (GPD)



Russia holds 82% of the total organic soil area of Asia and Indonesia 9% (together 91%).

# Global distribution and degradation of organic soils (GPD)



ASIA		
country	km2	%
W-Indonesia	87,050*	67%
China	20,020	60%
Mongolia	15,000	57%
Malaysia	8,380*	34%
Asian Russia	7,000	1%

\* Indonesia/Malaysia: data from 2010 - rapid reclamation in last few years



# Global distribution and degradation of organic soils (GPD)



**ASIA**

**country**

**drained organic soil**

**km2**

**%**

**W-Indones**

China

Mongolia

**Malaysia**

Asian Russ

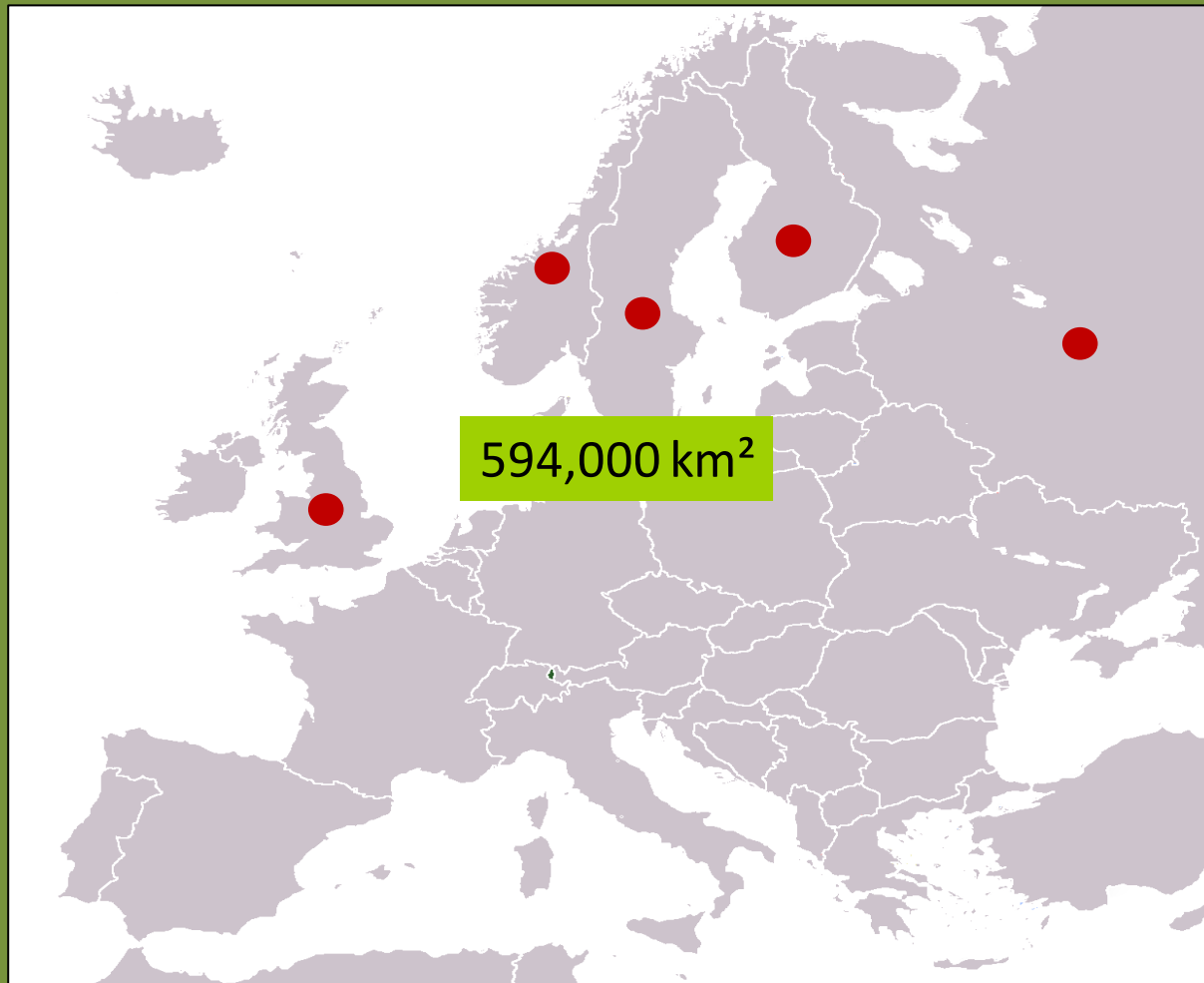
Indonesia has recently launched an ambitious program for Peat Swamp Forest restoration.

15,000

57%

Given the current rate of conversion, in 2030 all Peat Swamp Forests of Malaysia might be drained.

# Global distribution and degradation of organic soils (GPD)



Russia holds 40% of the total organic soil area of Europe, followed by Finland (15%), Sweden (11%), Norway (8%) and UK (5%) = together 79%.



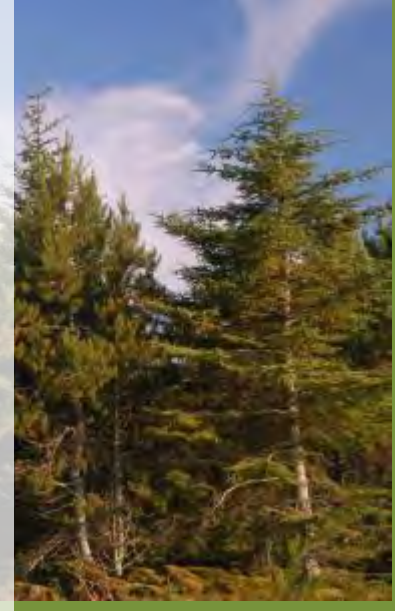
# Global distribution and degradation of organic soils (GPD)



**EUROPE**  
**country**

**drained organic soil**  
**km2** **%**

<b>Russia</b>	90,600	35
<b>Finland</b>	48,710	72
<b>UK</b>	18,090	67
<b>Belarus</b>	16,970	66
<b>Sweden</b>	15,460	23
<b>Germany</b>	12,550	98
<b>Ireland</b>	11,970	82
<b>Poland</b>	10,090	84



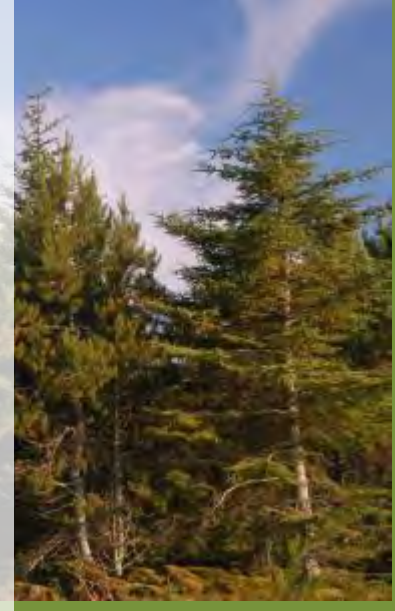
# Global distribution and degradation of organic soils (GPD)



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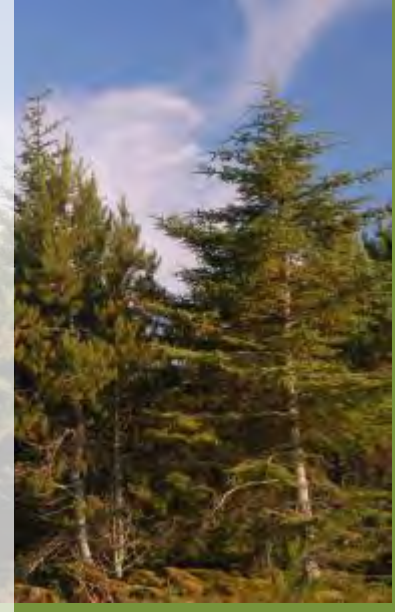
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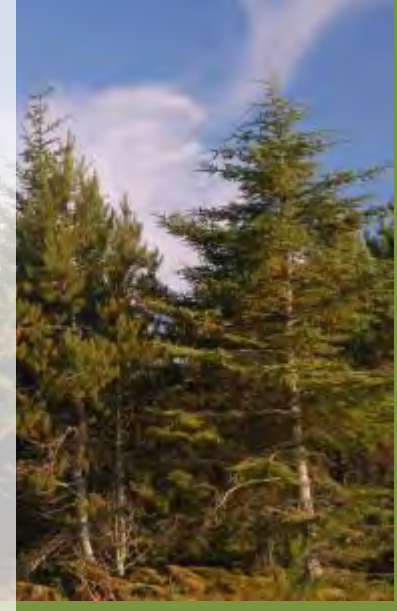
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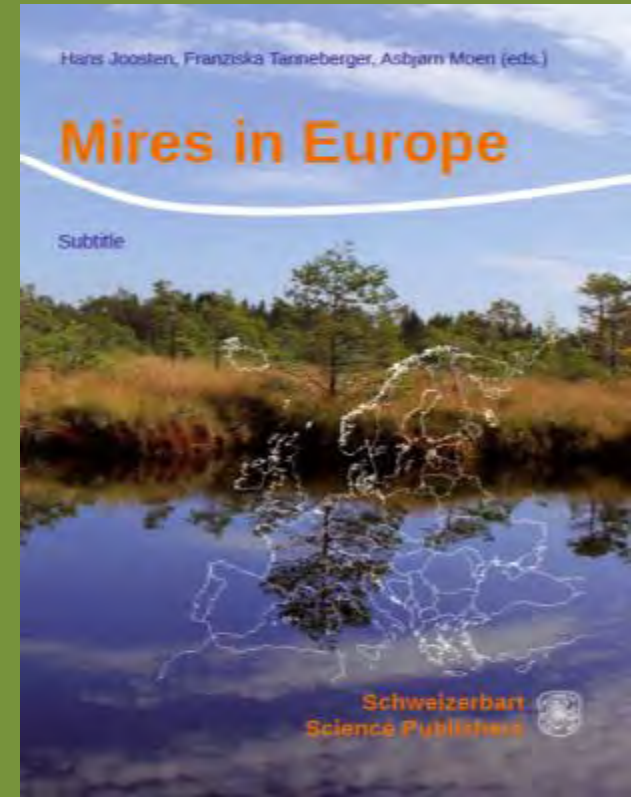


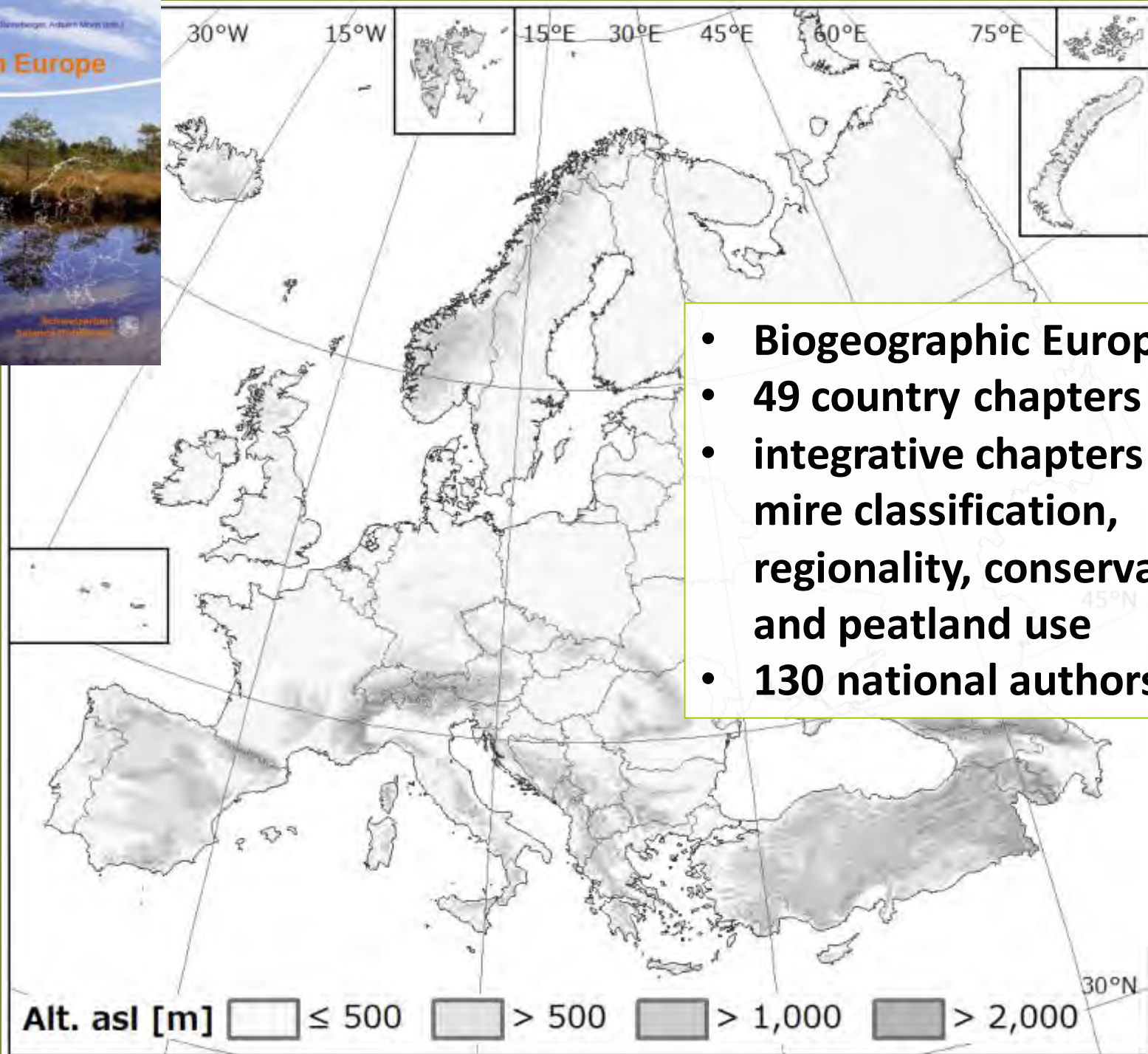


# Recent research integrated in the GPD

*Tanneberger et al. (in press.)*

- summarise recent information on status, distribution, and conservation of mires and peatlands
- IMCG project; started in 1990
- builds on various earlier works



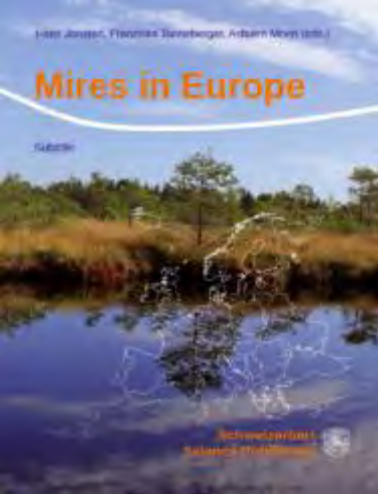


- **Biogeographic Europe!**
- **49 country chapters**
- **integrative chapters on mire classification, regionality, conservation, and peatland use**
- **130 national authors**



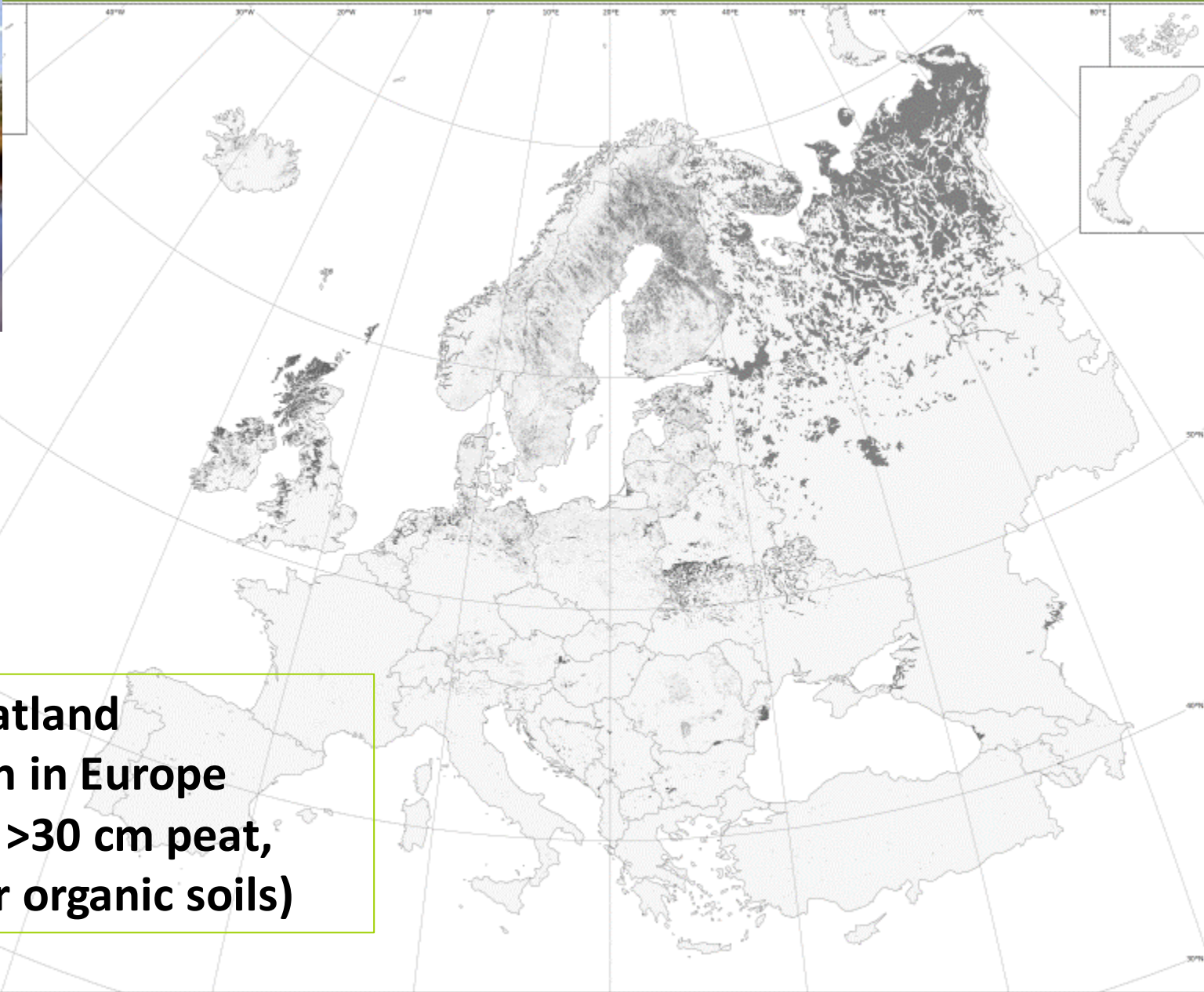
## Mires in Europe

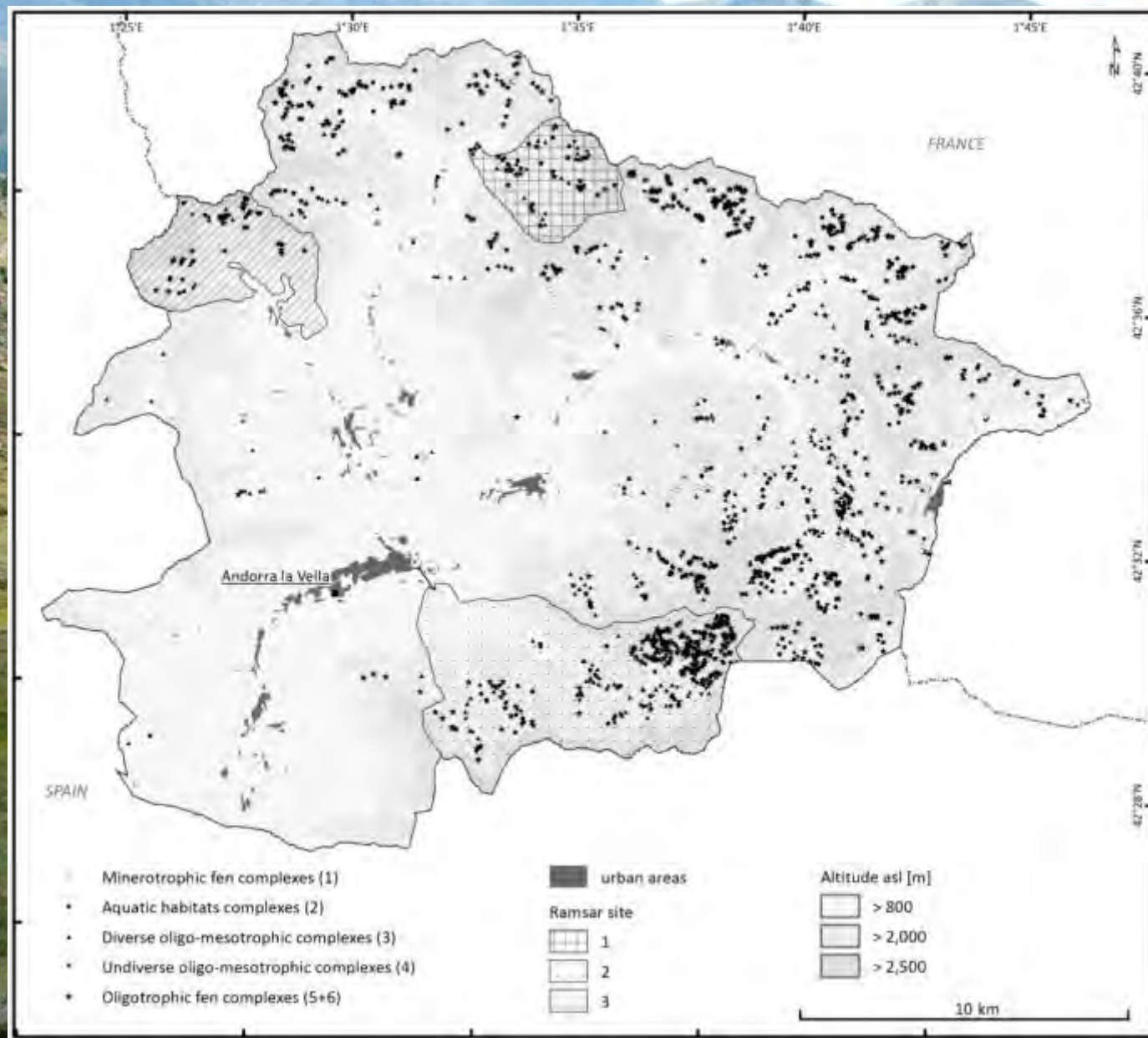
Gibson



Arden Moor  
Salisbury Moor

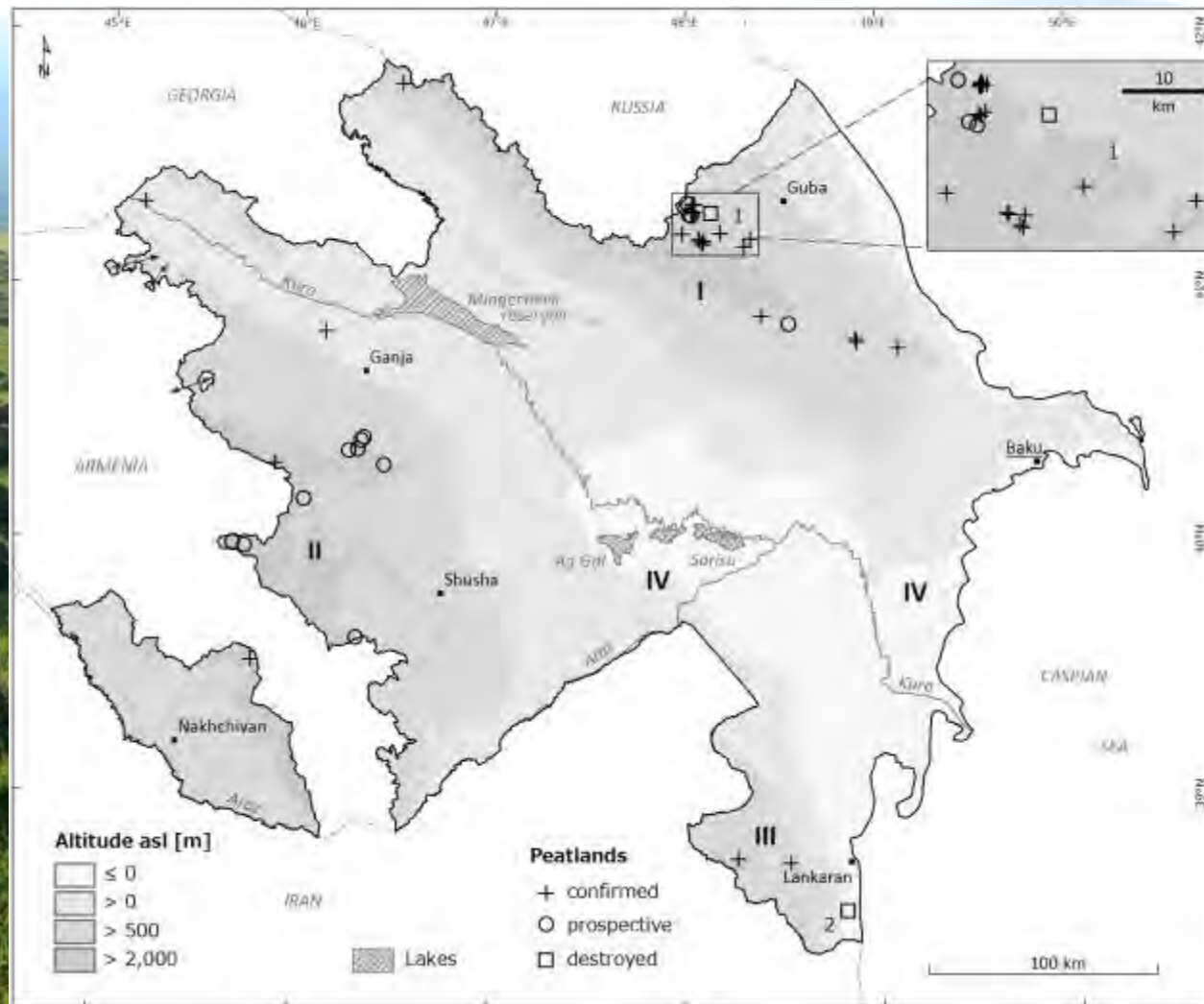
**Map of peatland  
distribution in Europe  
(peatlands >30 cm peat,  
histosols or organic soils)**





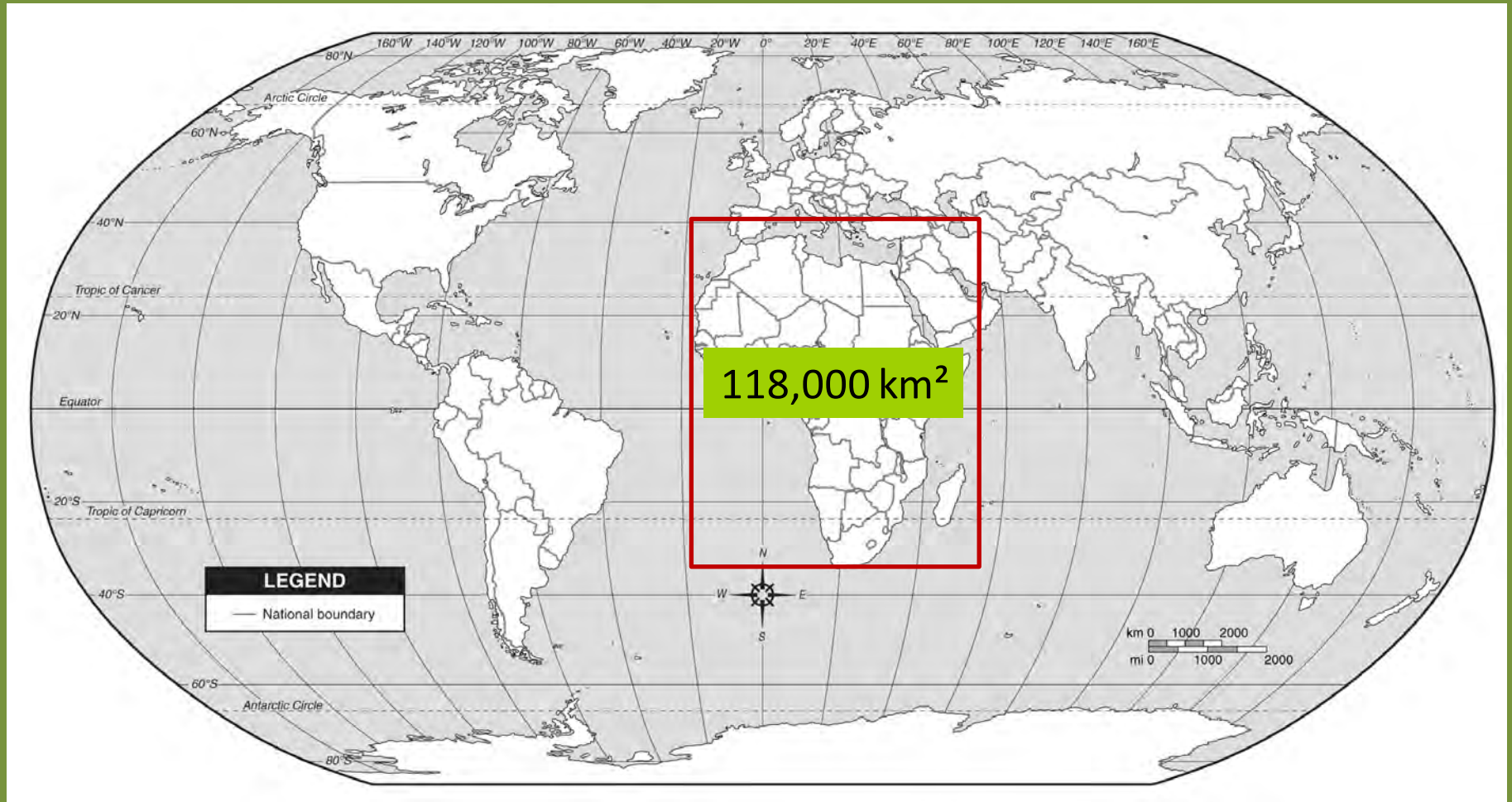
Andorra: Minerotrophic fen complex, Clots de Massat (S. Ribaz, 2009)





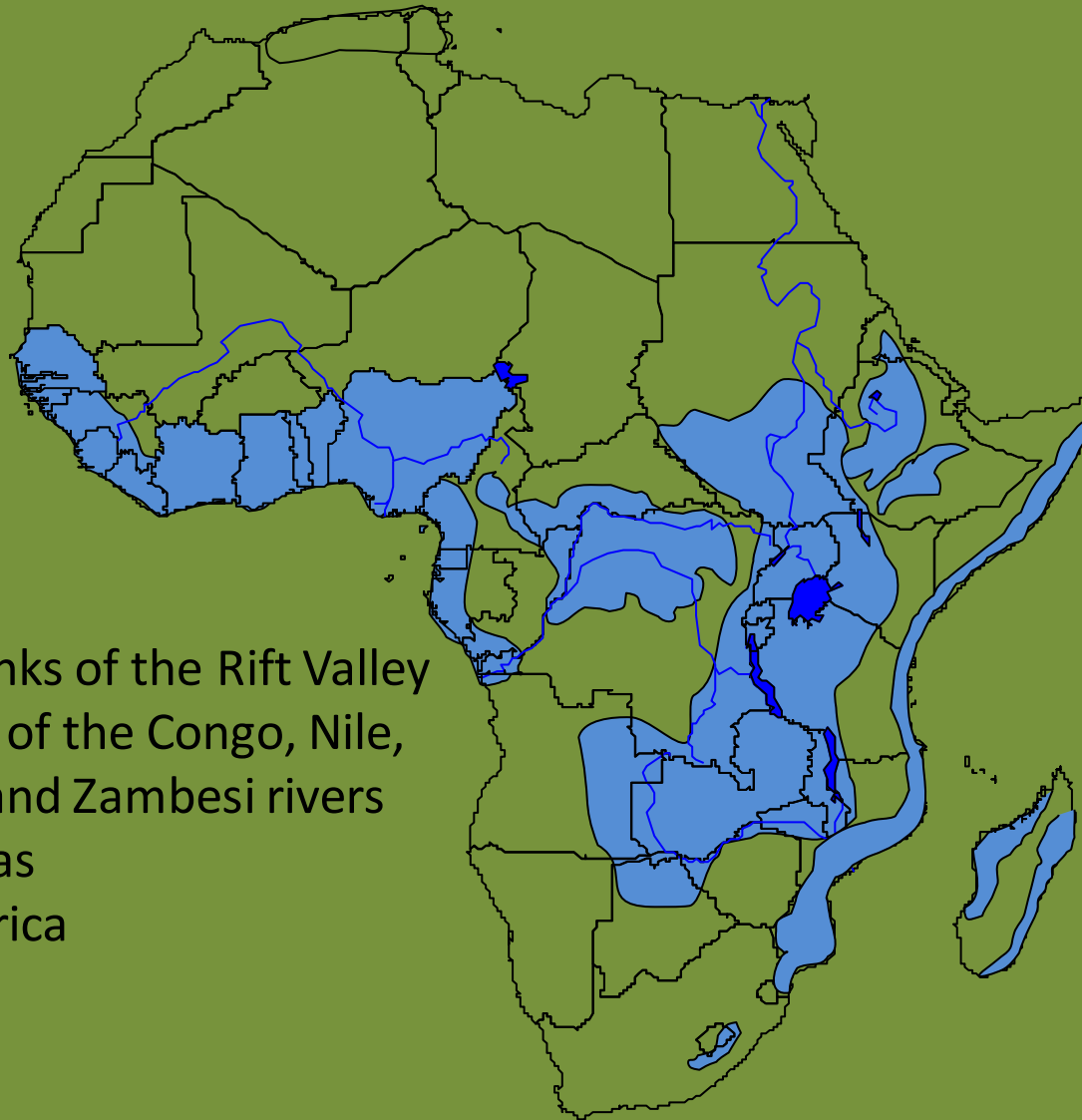
Azerbaijan: Bugry mire at Gyzylgaya on 2,600 m a.s.l. (A. Thiele, 2007).

# Global distribution and degradation of organic soils (GPD)





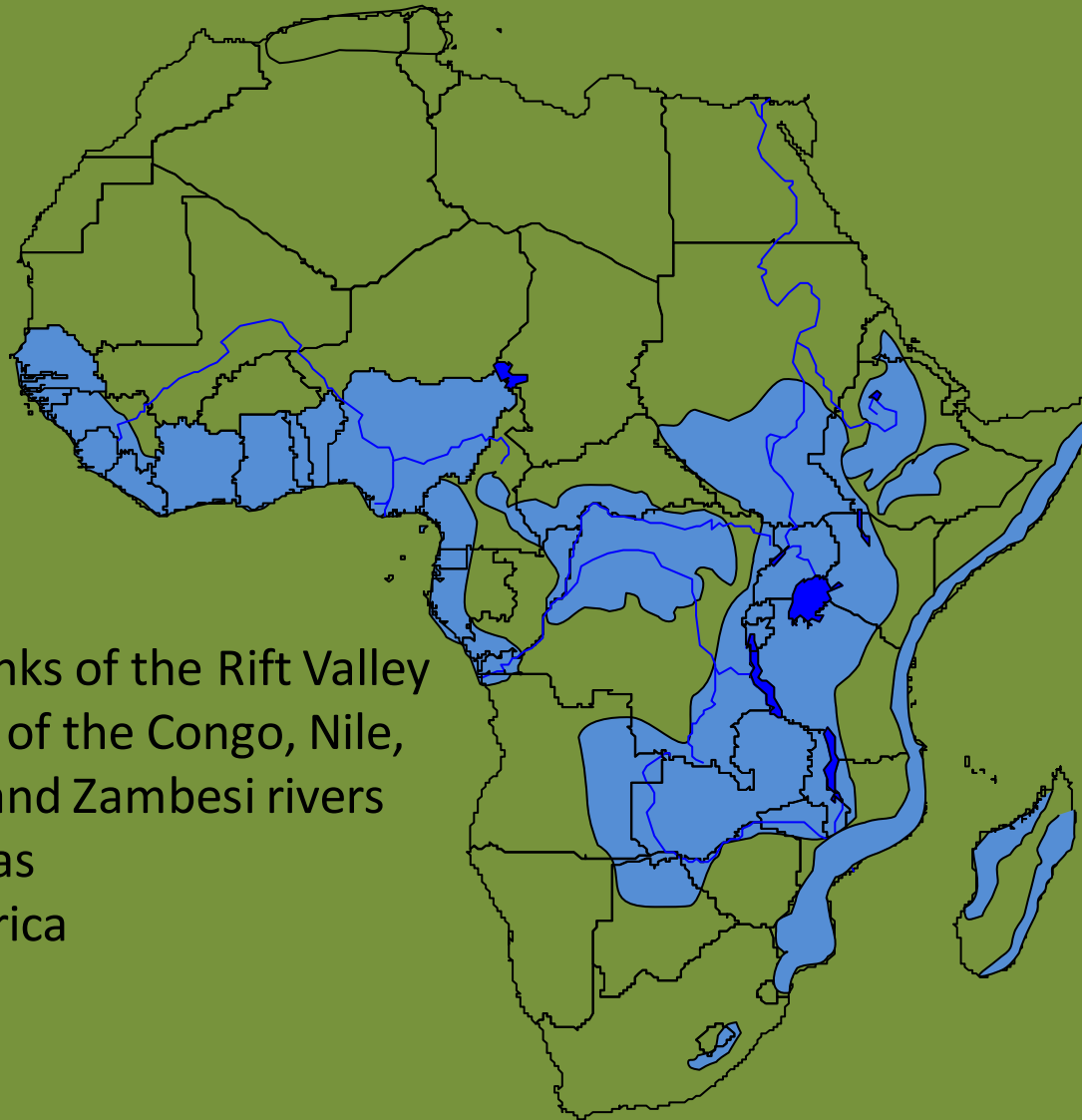
# Global distribution and degradation of organic soils (GPD)



- uplifted flanks of the Rift Valley
- floodplains of the Congo, Nile, Okavango and Zambesi rivers
- coastal areas
- western Africa

Regions of Sub-Sahara Africa with organic soils

# Global distribution and degradation of organic soils (GPD)

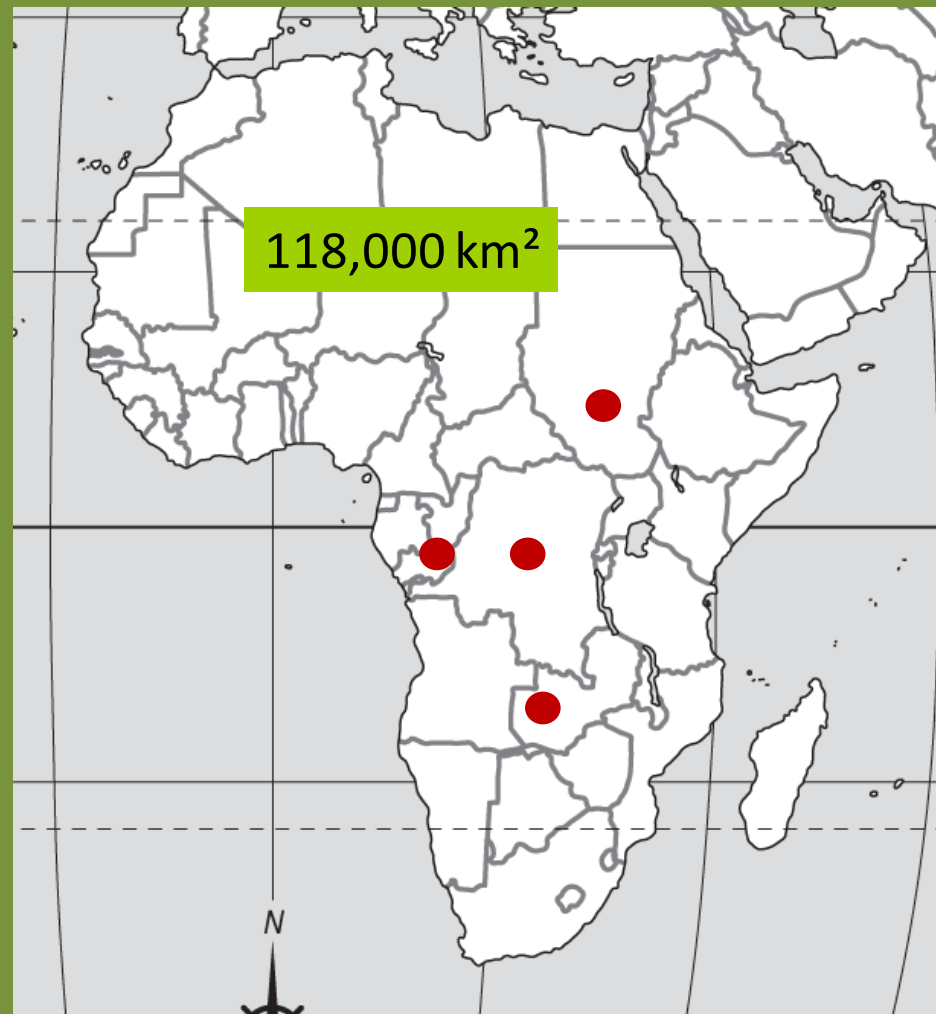


- uplifted flanks of the Rift Valley
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e.g. coastal organic soils and Congo Basin are poorly known

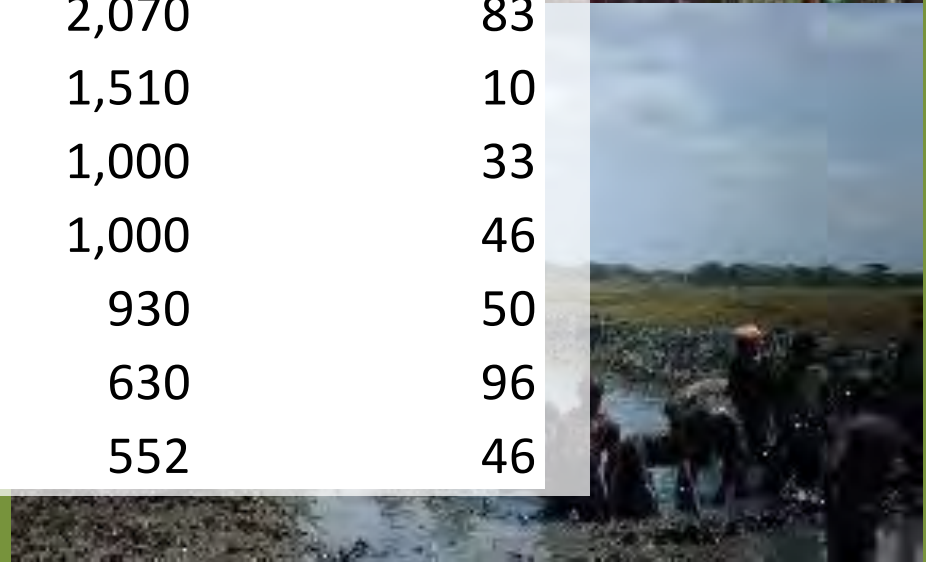
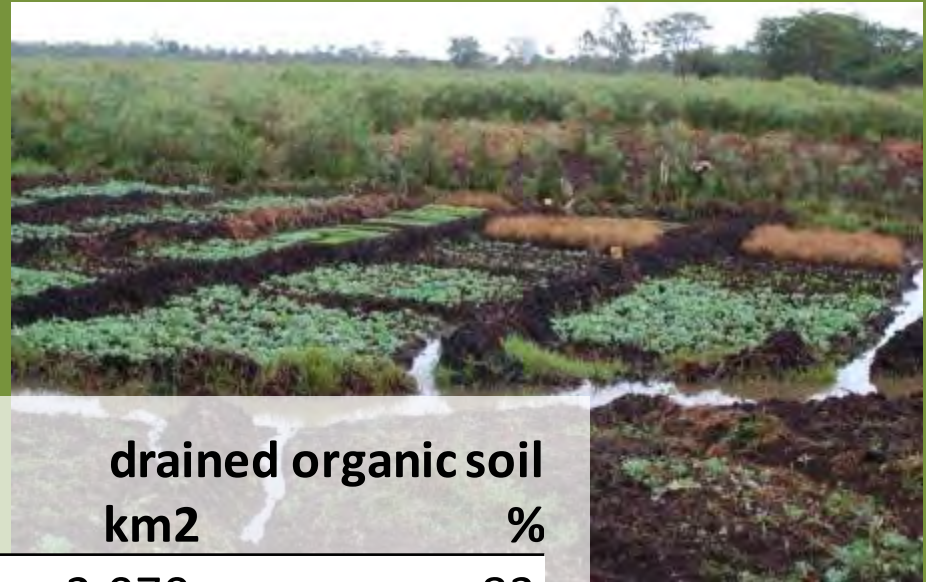
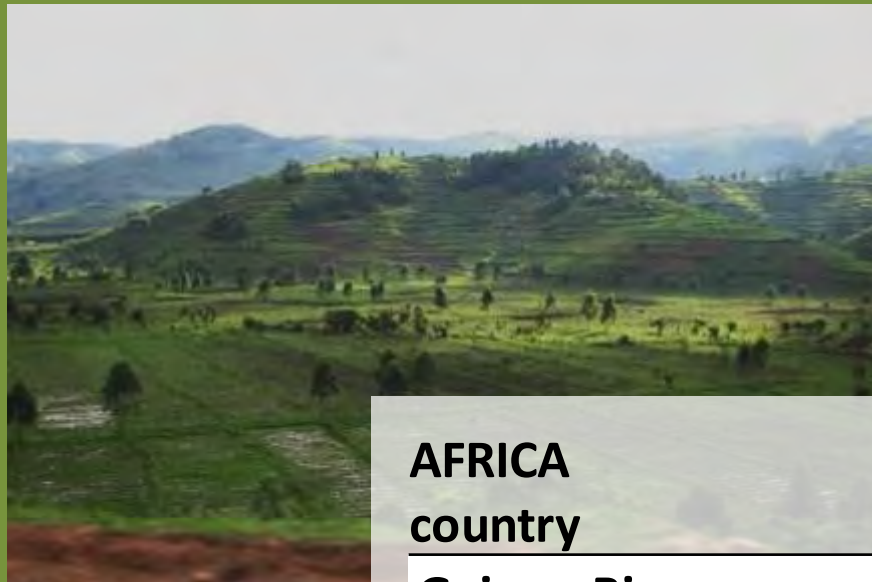


# Global distribution and degradation of organic soils (GPD)



Sudan holds 25% of the organic soil area of Africa, followed by the Rep. of the Congo (14%), Zambia (13%), and Dem. Rep. Congo (10%) = together 61%.

# Global distribution and degradation of organic soils (GPD)



## AFRICA country

## drained organic soil km2 %

**Guinea-Bissau**

2,070

83

**Zambia**

1,510

10

**Mozambique**

1,000

33

**Ethiopia**

1,000

46

**Madagascar**

930

50

**Burundi**

630

96

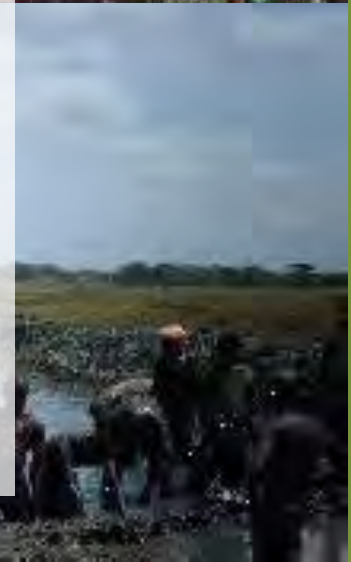
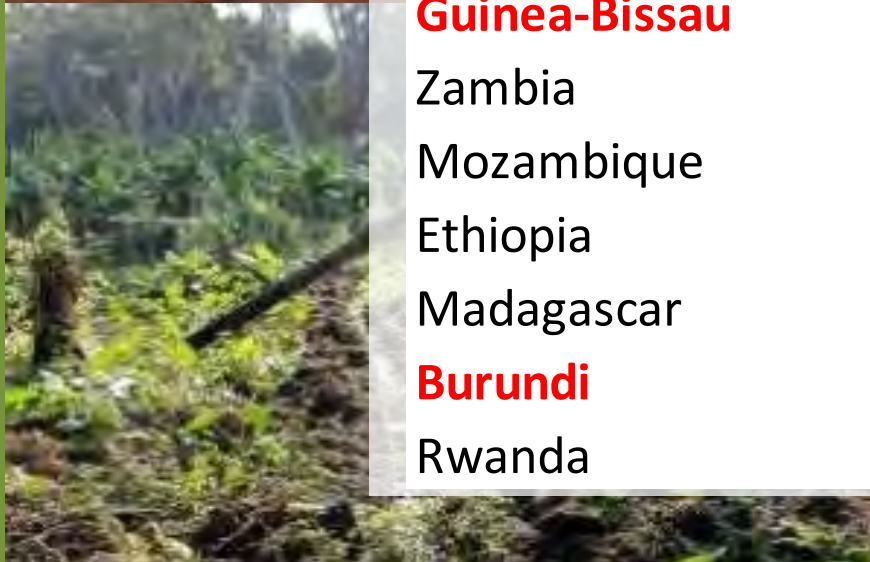
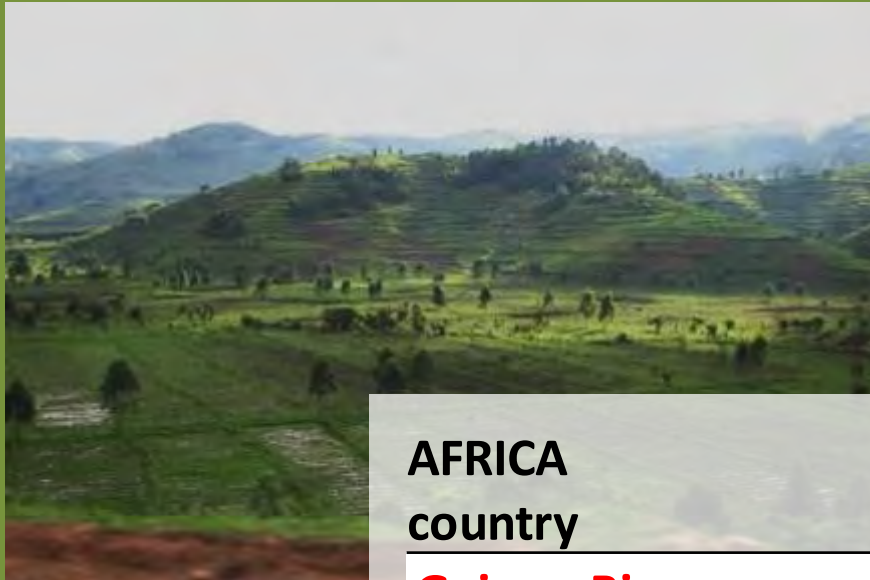
**Rwanda**

552

46



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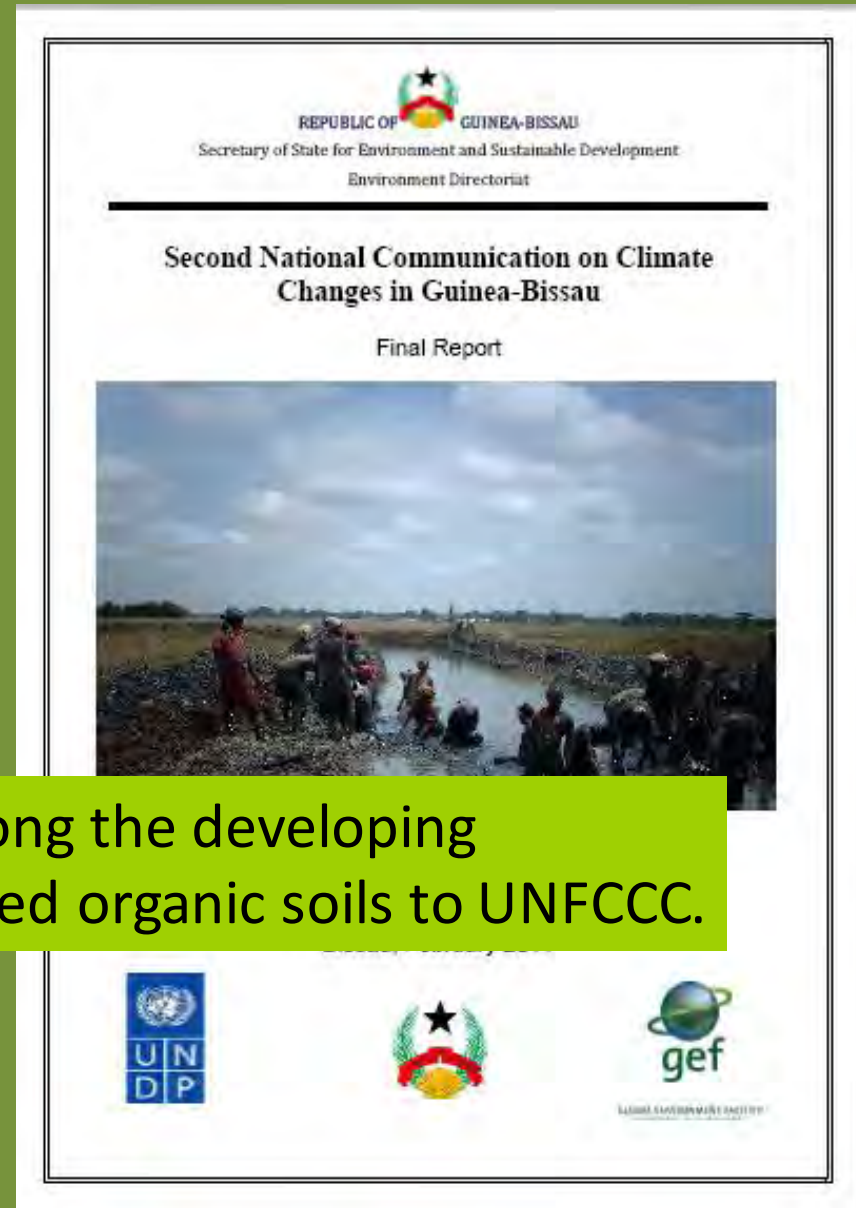
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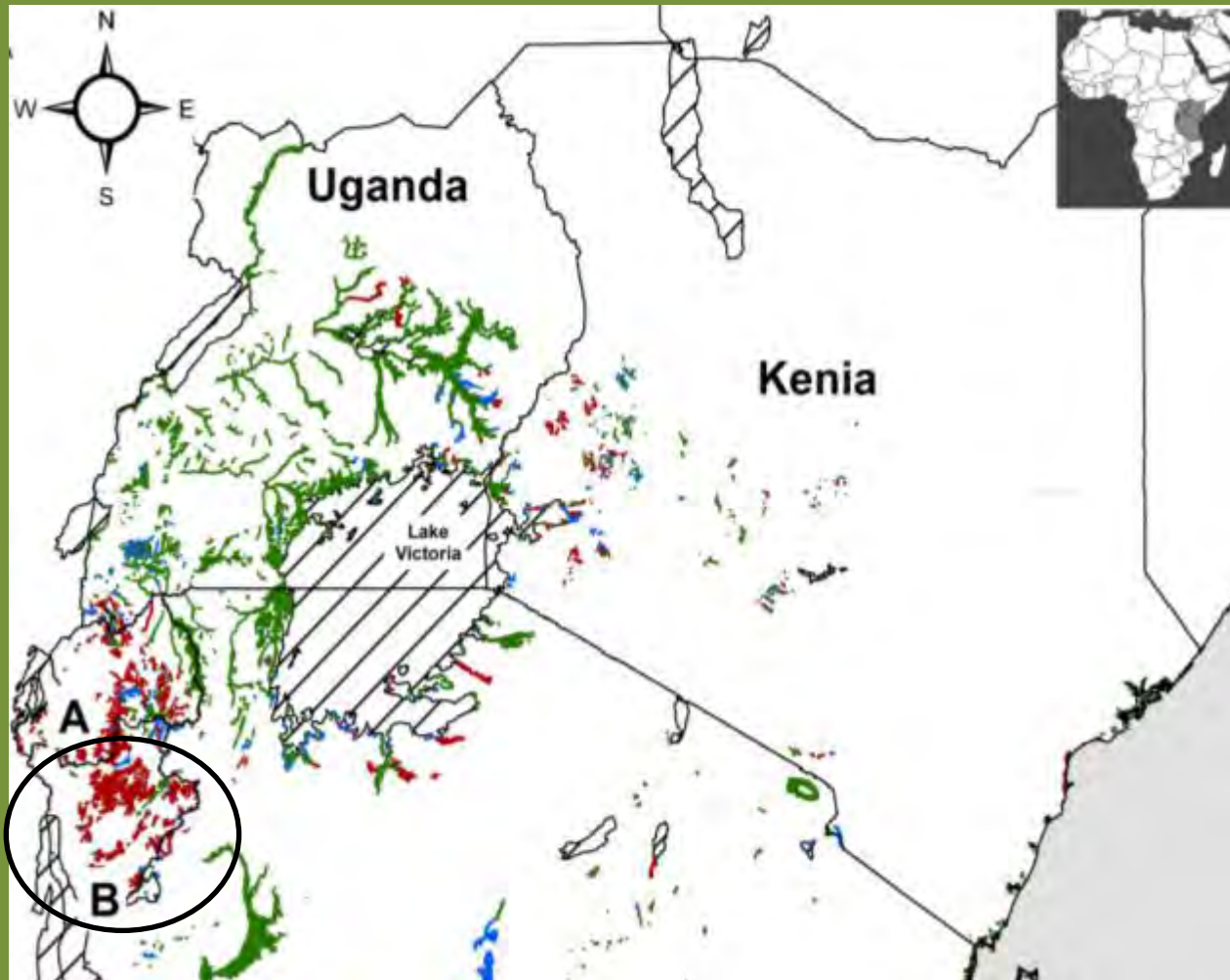
“... In this study was found that all agriculture practiced in **Guinea-Bissau** is in organic soils (...). According to data from DEA in 2006, there are (...) totally 206,737 ha that is used for agriculture...”

Guinea-Bissau is an exception among the developing countries while reporting on drained organic soils to UNFCCC.



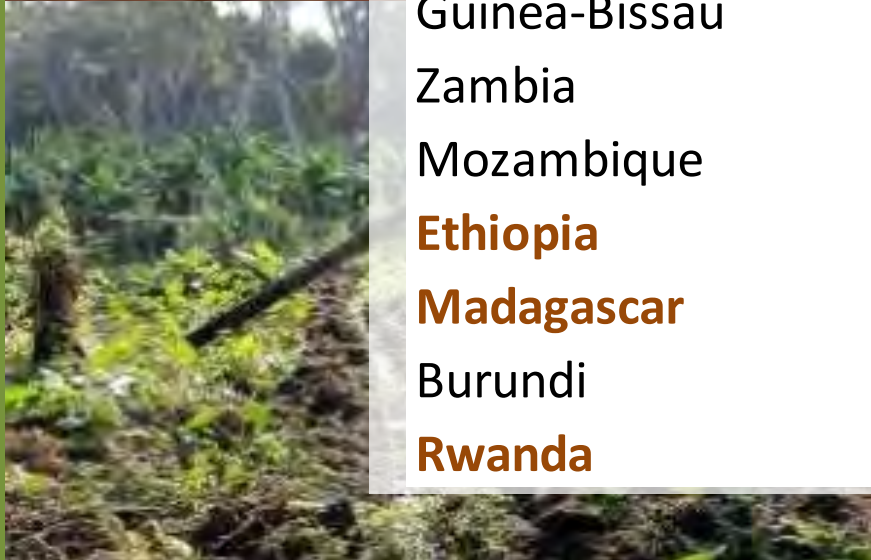
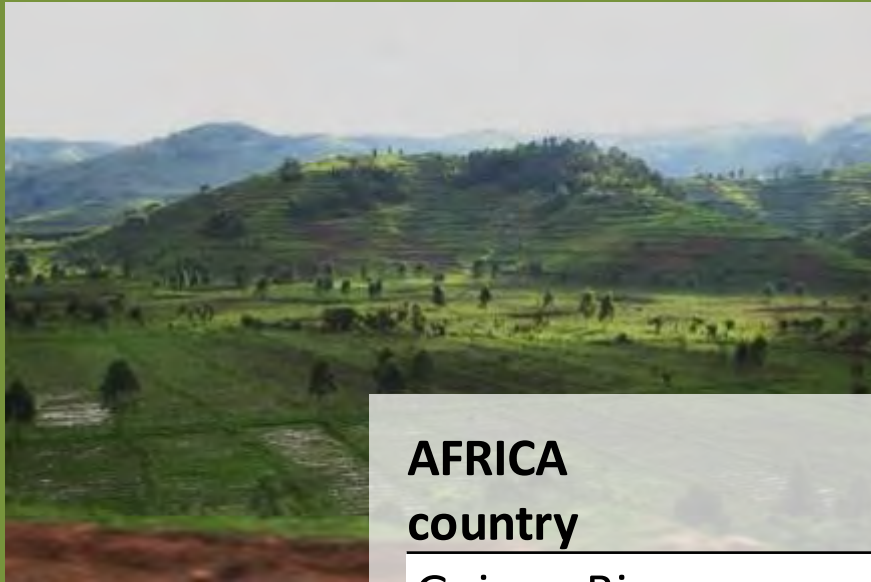


# Global distribution and degradation of organic soils (GPD)



Area data from own mapping of the Lake Victoria catchment, incl. the estimation of drainage impact. RED: heavily drained and degrading organic soils (A=Rwanda; B=Burundi)

# Global distribution and degradation of organic soils (GPD)



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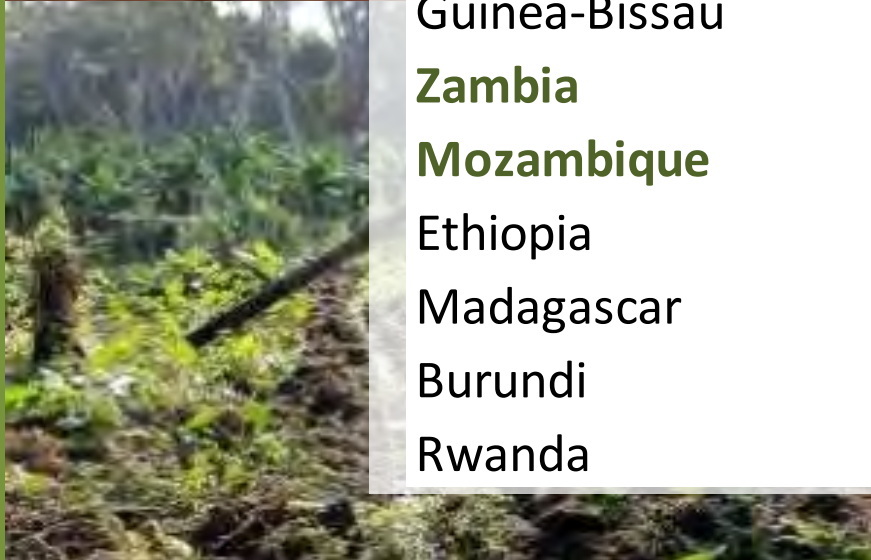
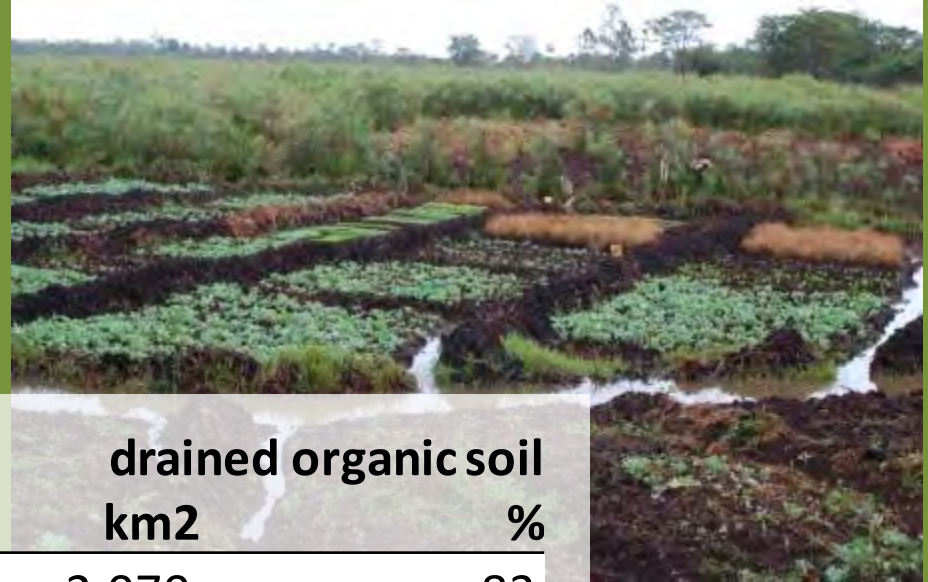
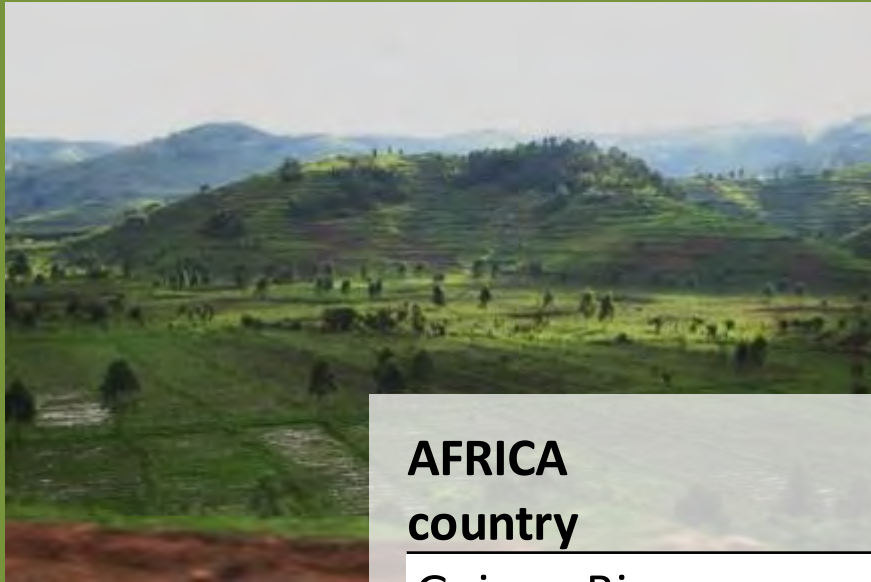
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# Conclusions

- According to recent knowledge, the global organic soil area is about 4.46 million km<sup>2</sup>. Of this, approximately 15% is drained.
- The assessment of location, extent and drainage status of organic soils is 'work in progress' - especially in tropical regions of Africa, Asia and South America.
- Huge areas of undrained organic soils still occur in the boreal zone, e.g. in Russia, Canada, Sweden and Norway.
- The floodplains of main Sub-Sahara rivers still include large areas of diverse and undrained tropical organic soils.
- Several countries of the temperate zone have drained more than 75% of their organic soils.
- Drained organic soils occur in distinct hot-spots, especially in Europe and Asia, but also in Africa.



# ACKNOWLEDGEMENTS

## Collaboration



**To ~ 130 European peatland researchers that have contributed to the *European Mires Book*, and many national authorities that provided data**



especially to Franziska Tanneberger, Cosima Tegetmeyer, Stephan Busse & Reni Barthelmes

## Funding

