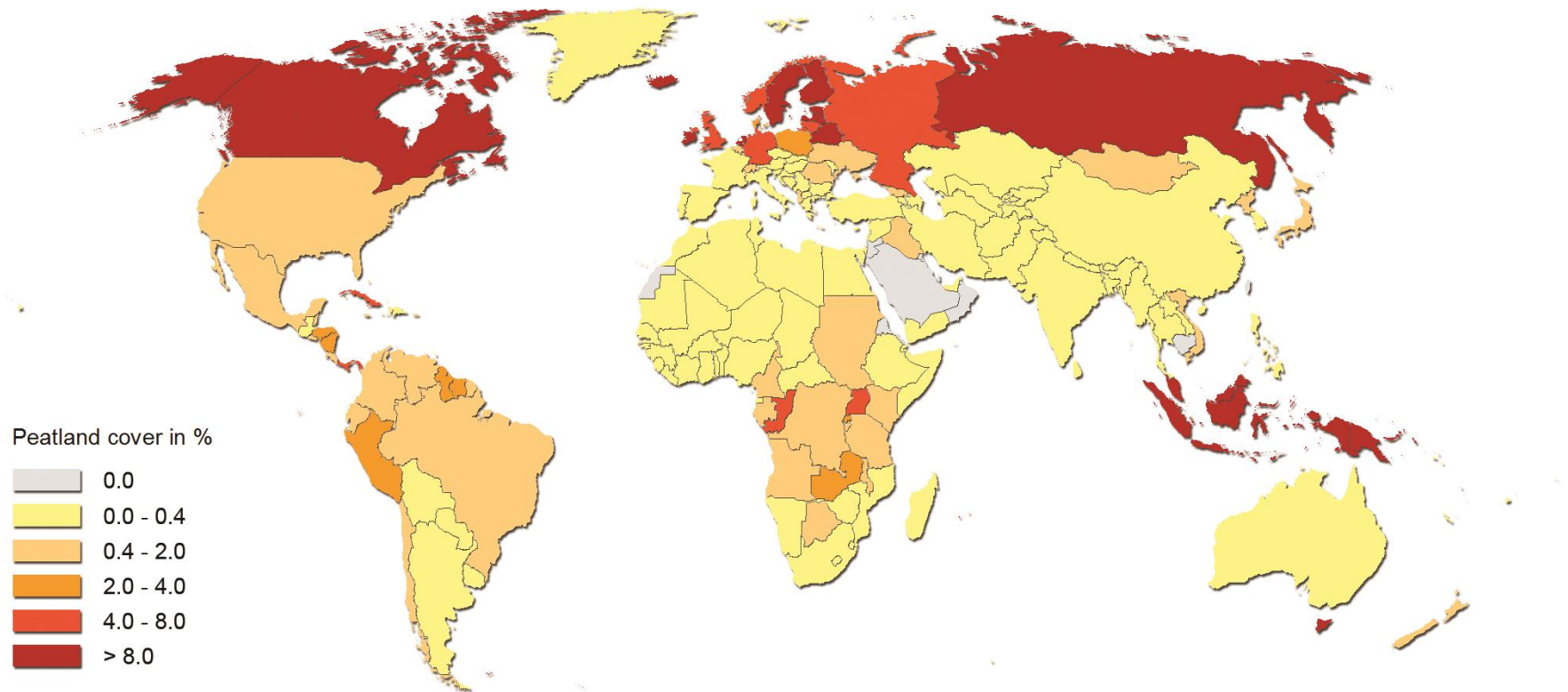


# WETSCAPES

## From understanding to sustainable use of peatlands

Excellence Initiative of  
Mecklenburg-Vorpommern

Worldwide: Peatlands cover 3% of the land surface but hold 30% of the carbon stored in terrestrial ecosystems





# Germany: Agriculture on peatlands causes climate costs of 3 billion € per year

38% of the total GHG emissions from agriculture are emitted from peat soils

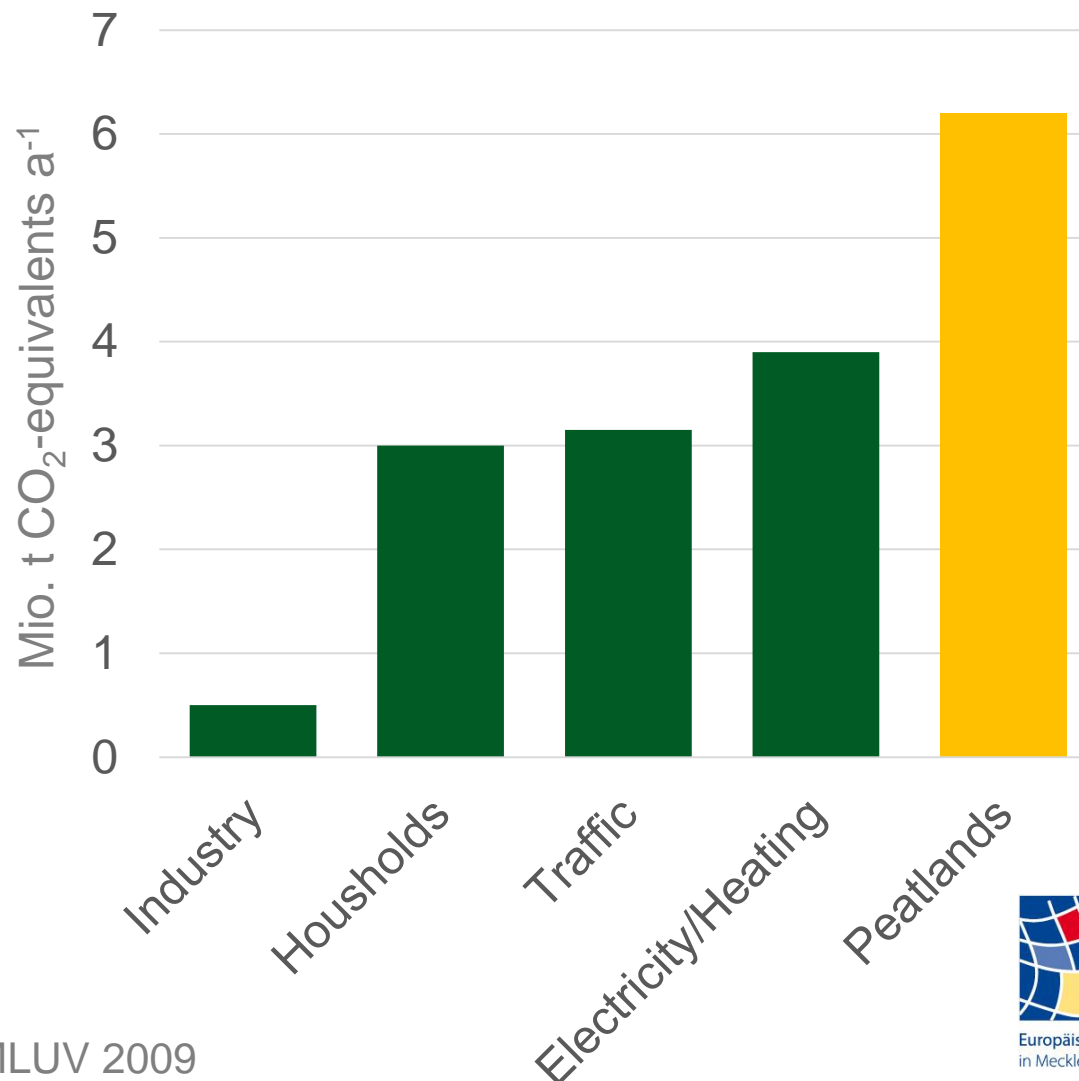


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# Mecklenburg-Vorpommern: Drained peatlands are the most important single source (35%) of GHG emissions





# Additional problems: Degradation, Subsidence, Erosion



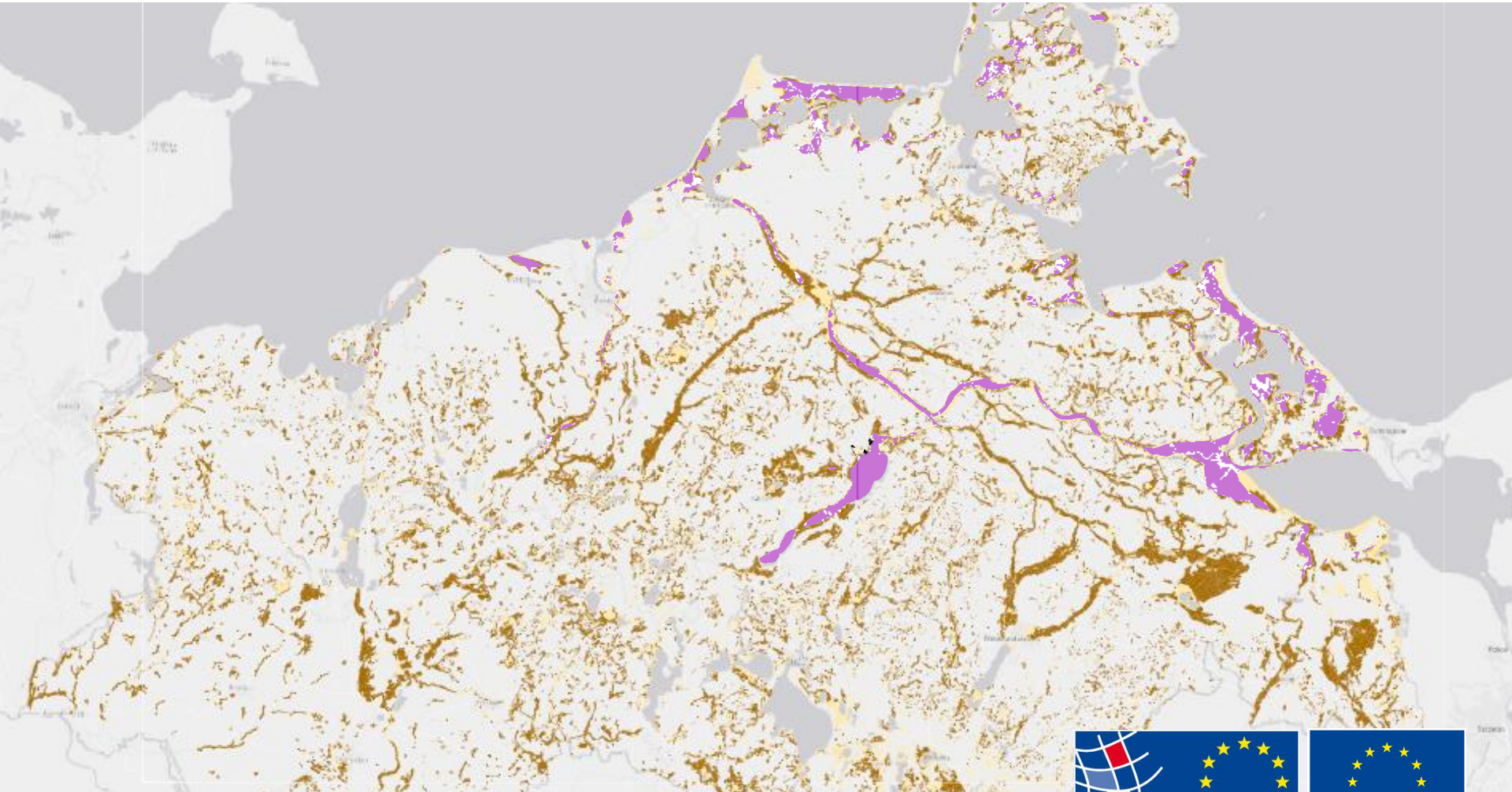
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# Peatlands in Mecklenburg-Vorpommern are often vulnerable coastal habitats prone to future flooding



Nutrient transfer might impact rivers & coastal sea



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Realized rewetting (often triggered by catastrophic events) lead to the loss of agricultural productive land



Can we combine climate adaptation, water protection & sustainable use?



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# Paludiculture is an innovative alternative



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# WETSCAPES: Establish the knowledge base for a sustainable use of peatlands

## Objectives:

- Understanding the novel ecosystems to derive strategies for a sustainable use based on knowledge
- Qualify young researchers for the future field „Sustainable use of wetscapes“
- Build the foundation for developing an internationally renowned knowledge center „Peatlands and coastal wetlands“

# WETSCAPES wants to understand the functioning of „novel ecosystems“

## Main research questions:

- Productivity: How does the water level determine the production of (herbaceous and tree) biomass and peat?
- Downstream nutrient loads: How does the transport and exchange of water and solutes through the peat body work?
- Greenhouse gas emissions: Which (microbial) processes lead to emissions and what controls them?



Together we strengthen and develop the excellence in peatland and coastal research in MV:

**Uni Rostock:** Abiotic  
Coastal research  
Agricultural and  
Environmental Sciences



**Uni Greifswald:** Biotic  
Peatland research  
Landscape research



**WETSCAPES**

**DLR Neustrelitz**  
Remote sensing



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# WETSCAPES consortium is excellent in many sectors of peatland and coastal research


 Landscape Ecology and Site Evaluation, Rostock


 Landscape Ecology and Ecosystem Dynamics, Greifswald


 Soil Science, Rostock


 Peatland Studies and Palaeoecology, Greifswald

 Soil physics, Rostock

 Bacterial Physiology, Greifswald

 Geodesy and Geoinformatic, Rostock

 Grassland and Fodder Sciences, Rostock

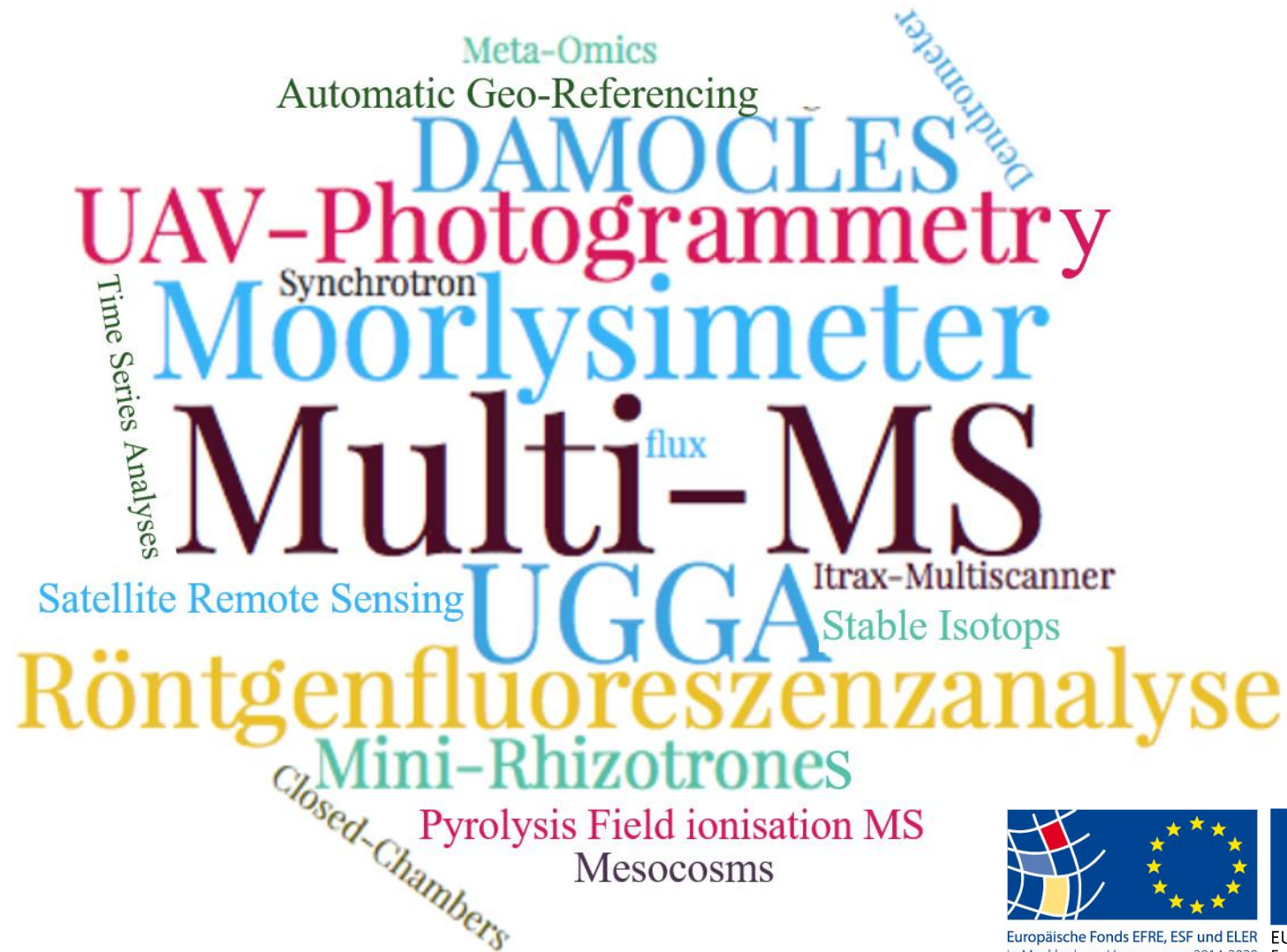
 Experimental Plant Ecology, Greifswald

 German Aerospace Center, Neustrelitz





Profound methodical competence meets broad range of investigations at the landscape scale



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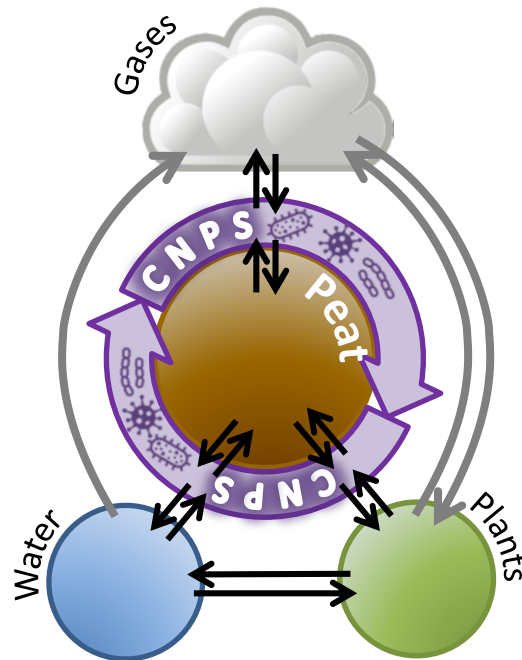


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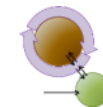
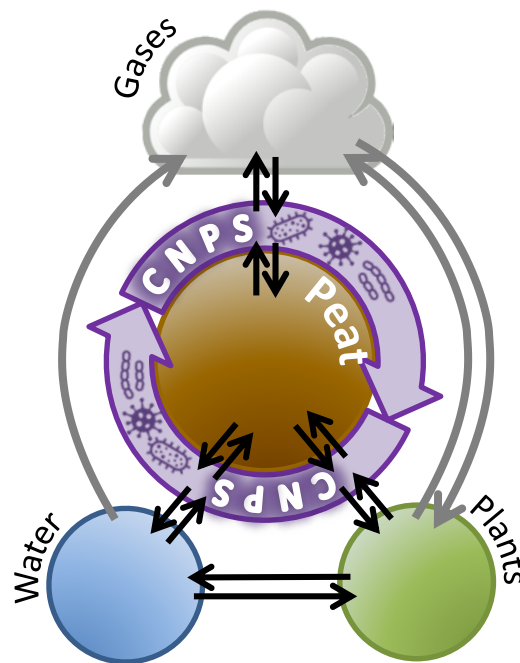




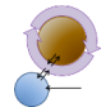
For the first time,  
comprehensive integration of this expertise...



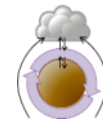
# ... to understand Understanding these systems by interdisciplinary top-level research



Primary production



Substance conversion und transfer



Gas exchange

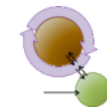
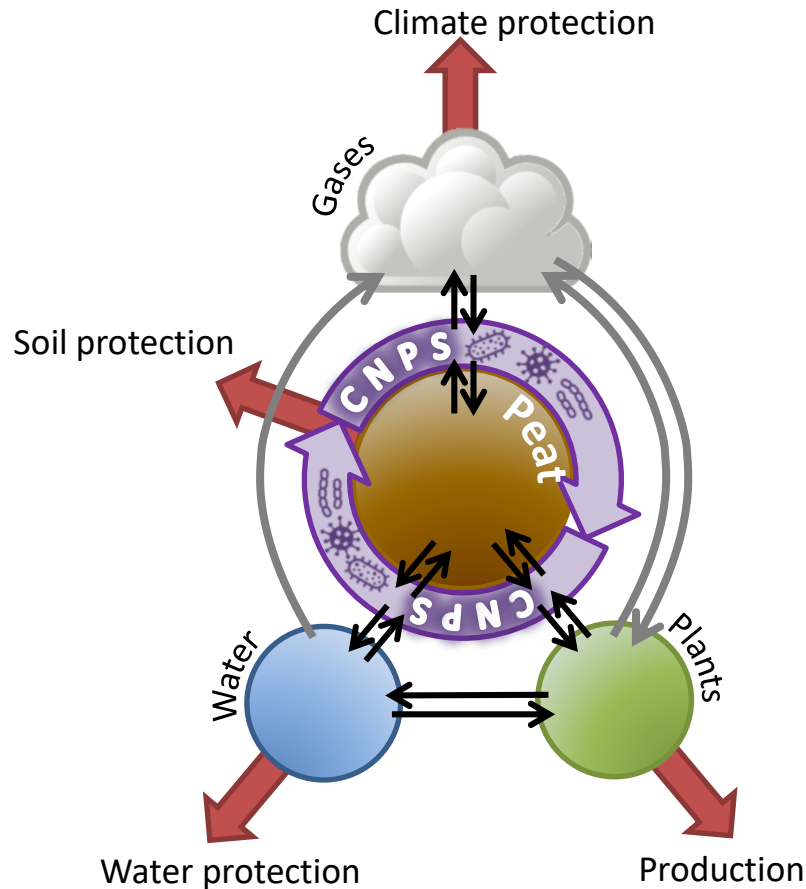


Peat formation

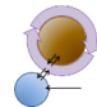




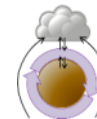
# Integrate the gained knowledge to derive indicators of ecosystem functioning



Primary production



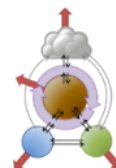
Substance conversion und transfer



Gas exchange



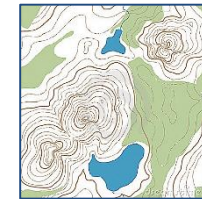
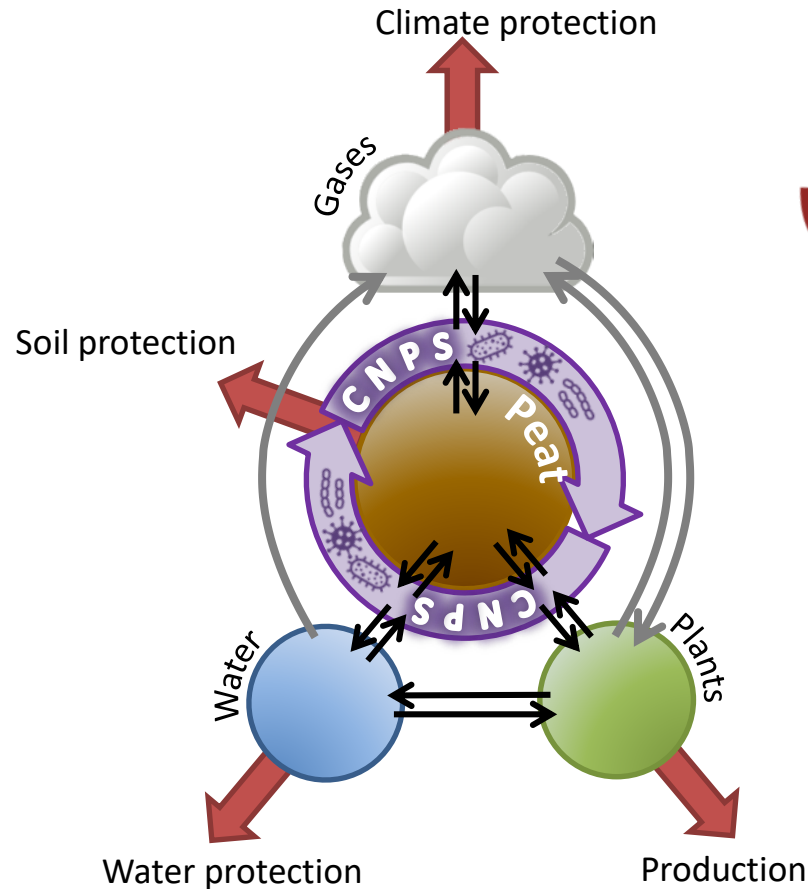
Peat formation



Integration, Ecosystem function



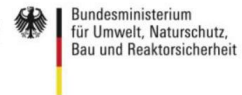
# Upscaling and knowledge transfer to solve societal challenges



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MIRE  
CENTRE

gefördert durch:

MOORDIALOG



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# Foster integration by joint topics as well as by structural measures and staff decisions

- Overarching central research questions
- Joint working on priority topics
- Common investigation sites



# All investigations at the same sites: deep integration of interdisciplinary research

● Common field sites

3 common sites with 2 stages (wet/dry) :

- Alder carr
- Percolation mire
- Coastal flooding mire



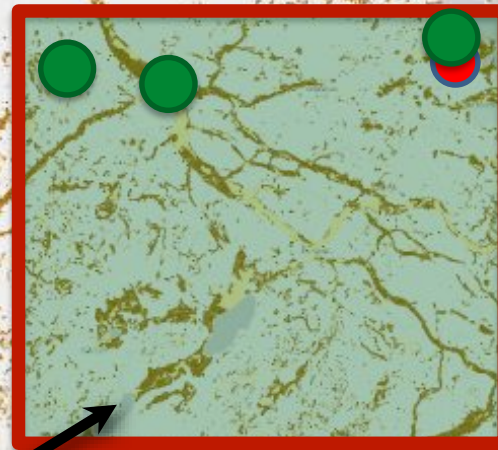
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# Ideal basis for Upscaling: Position of sites in the DEMMIN test field

● Common field sites



DEMMIN-Testfeld:  
Calibration-/ validation  
field for remote sensing



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# Research at further sites: Chronosequence and proof of transferability

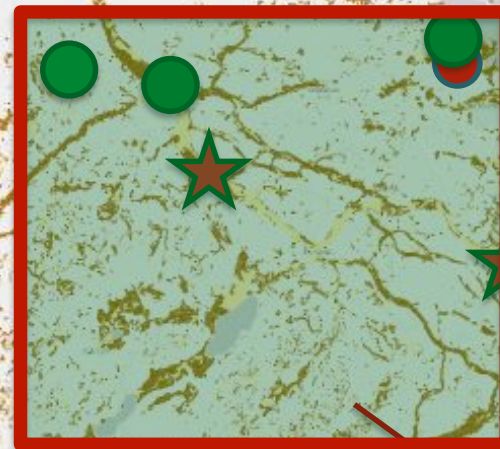
● Common field sites

★ Further sites

● Institutions

■ Peatlands with agriculture

■ Peatlands without agriculture



DEMMIN field



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# Foster integration by joint topics as well as by structural measures and staff decisions

- Overarching central research questions
  - United working on content priorities
- 
- Common investigation sites
  - Common experiments





# Common experiments with mesocosms and unique peatland lysimeter



To come: Hyperspectral **phenotyping** facility  
combined with automated GHG-flux measurements



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# Foster integration by joint topics as well as by structural measures and staff decisions

- Overarching central research questions
  - United working on content priorities
- 
- Common investigation sites
  - Common experiments (mesocosms, moor lysimeter)
  - Common data infrastructure



# Common data infrastructure ensures integration on data level and dissemination of results

- Research to improve efficiency of data storage

**WS WETSCAPES Datenkatalog** | Suchen | WebGIS | Beitragen | Admin Konsole | Hilfe | Kontakt | Impressum | Abmelden | Deutsch

## Beginne

In 38 Datensätzen, Diensten und Karten, ... suchen

Suchen ...

Durchsuchen nach:

Carbon, nitrogen and sulphur concentrations at different depths of WETSCAPES research sites	Concentrations of total elements at different WETSCAPES research sites	Soil pH of WETSCAPES research sites
Inorganic nitrogen concentration of Wetscapes research sites	Coordinates Calculator 0.4 BETA	Shape: Moorkarte_GMC_LUNG
Shape: Standortskarte_Forst	QGIS-Layerstildatei	

Willkommen auf dem Datenportal des WETSCAPES-Projektes.  
 Auf dieser Plattform ist es möglich, wissenschaftliche Grundlagen für eine nachhaltige, schonende Bewirtschaftung der Niedermoore und feuchten Küstenstandorte, hochzuladen.

Quellen durchsuchen  
 Datenbestand 28

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## Foster integration by joint topics as well as by structural measures and staff decisions

- Overarching central research questions
- United working on content priorities

- Common investigation sites
- Common experiments (mesocosms, moor lysimeter)
- Common data infrastructure
- Regular WETSCAPES colloquia with all partners and associated scientists and experts

- Integrators at each university: identification of interfaces and initiation of cooperations



# Embedded in strong research network



# WETSCAPES knowledge contributes to societal acceptance of wise use of mires and peatlands

- measure to gain a process-based understanding
- link processes to ecosystem services (GHG, water quality, biodiversity, productivity)
- develop proxies & remote sensing solutions to monitor these ES
- identify opportunities to improve services to society: mitigating conflicts between agriculture – conservation – tourism – energy economy



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Gefördert durch:



Bundesministerium  
für Umwelt, Naturschutz,  
Bau und Reaktorsicherheit



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→ Knowledge transfer by Greifswald Mire Centre



# WETSCAPES heads for the future: Northeastern knowledge centre ,peatlands and coastal wetlands‘



- Fostering further collaboration among the partners
- Developing new joint projects (with partners)



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# WETSCAPES invites interested researchers and institutions to collaborate!



- Fostering further collaboration among the partners
- Developing new joint projects (with partners)



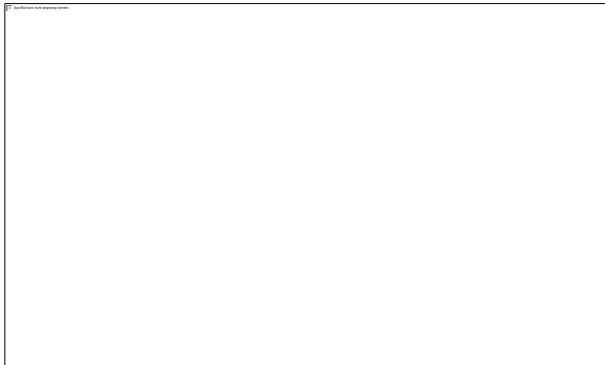
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# WETSCAPES organizes a 2-day workshop „Peatlands under water“ in spring 2018

- Rewetting of drained peatlands leads to novel ecosystems, often inundated (shallow lakes, „polytrophic swamps“<sup>1</sup>)
- What did we learn so far, where are the knowledge gaps?



- Details follow soon
- 1) Term coined by Prof. Michael Succow



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# WETSCAPES CONFERENCE

Understanding the ecology of restored fen peatlands for  
protection and sustainable use

- 📅 September, 10<sup>th</sup> to 13<sup>th</sup>, 2019
- 📍 Rostock, Germany
- 🌐 [www.wetscapes.de/conference](http://www.wetscapes.de/conference)



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# Join the (growing) WETSCAPES team!



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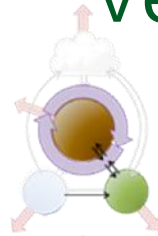


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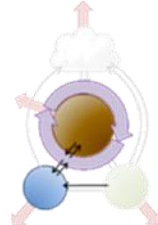


# Deshalb Forschungsschwerpunkte und starke Vernetzung

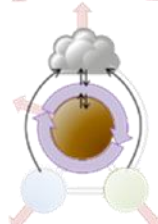
Primärproduktion



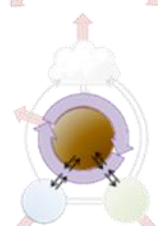
Stoffumsatz/  
verlagerung



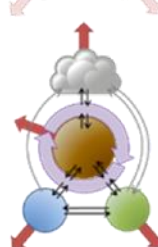
Gasaustausch



Torfbildung/  
zehrung



Integration



Biomasse

Mikrobiologie

Paläoökologie

Wasserhaushalt

Stoffkreisläufe

Stofftransport

Kohlenstoffaustausch

Stickstoffaustausch

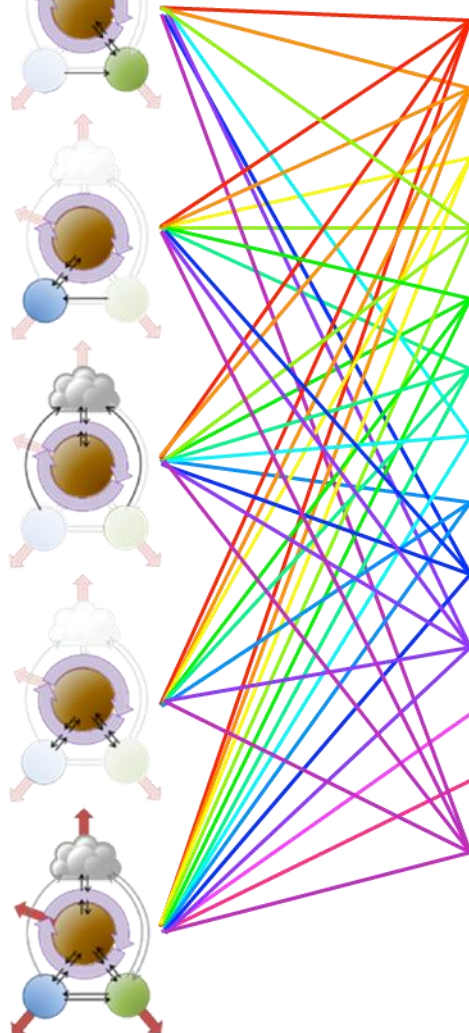
Treibhausgase

Forschungsdateninfrastruktur

Fernerkundung

Landnutzungswandel

Integration



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