Unlocking the Power of Wetland Mapping for Restoration

Online Training for policy-makers and practitioners

Trainers: Alexandra Barthelmes and Cosima Tegetmeyer, Landscape Ecologists and Geodata Experts

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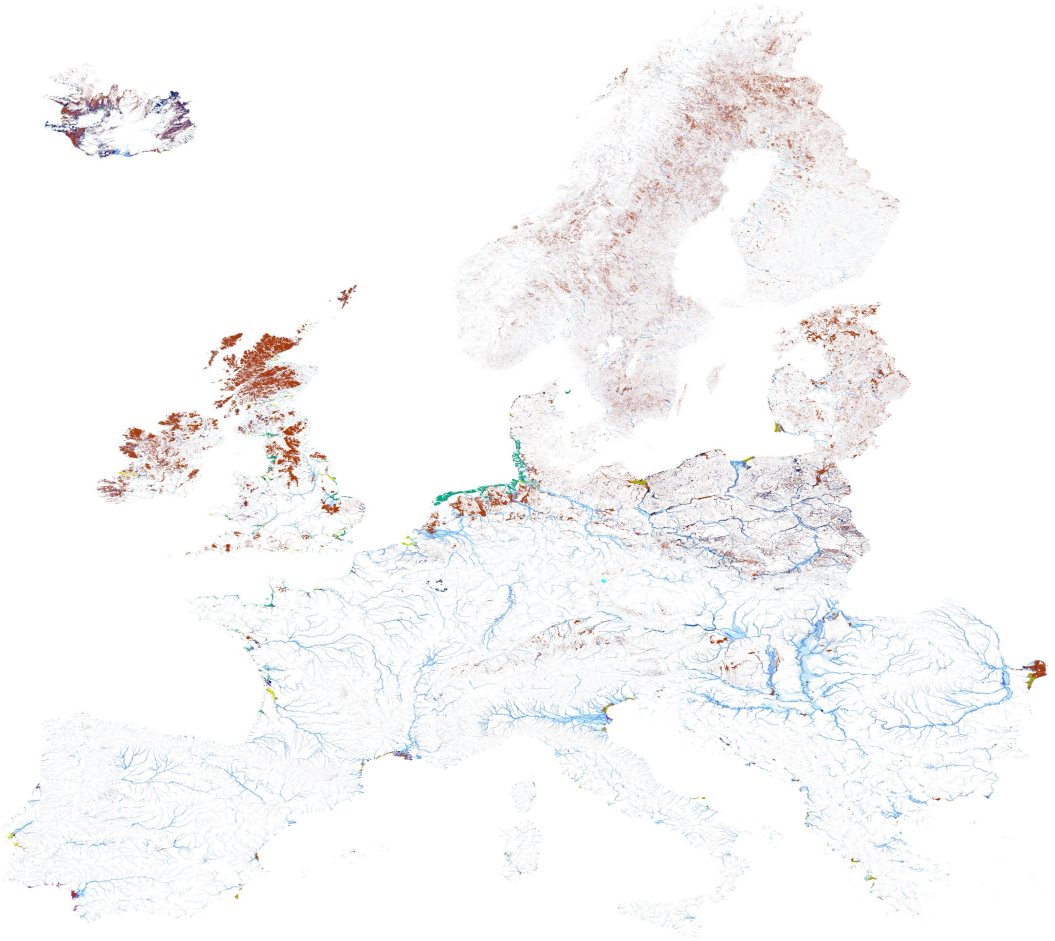
The European Wetland Map ('EWM') - a game changer

https://zenodo.org/records/15302184



Alexandra Barthelmes
Senior Scientist (Greifswald Mire Center)
alex.barthelmes@greifswaldmoor.de

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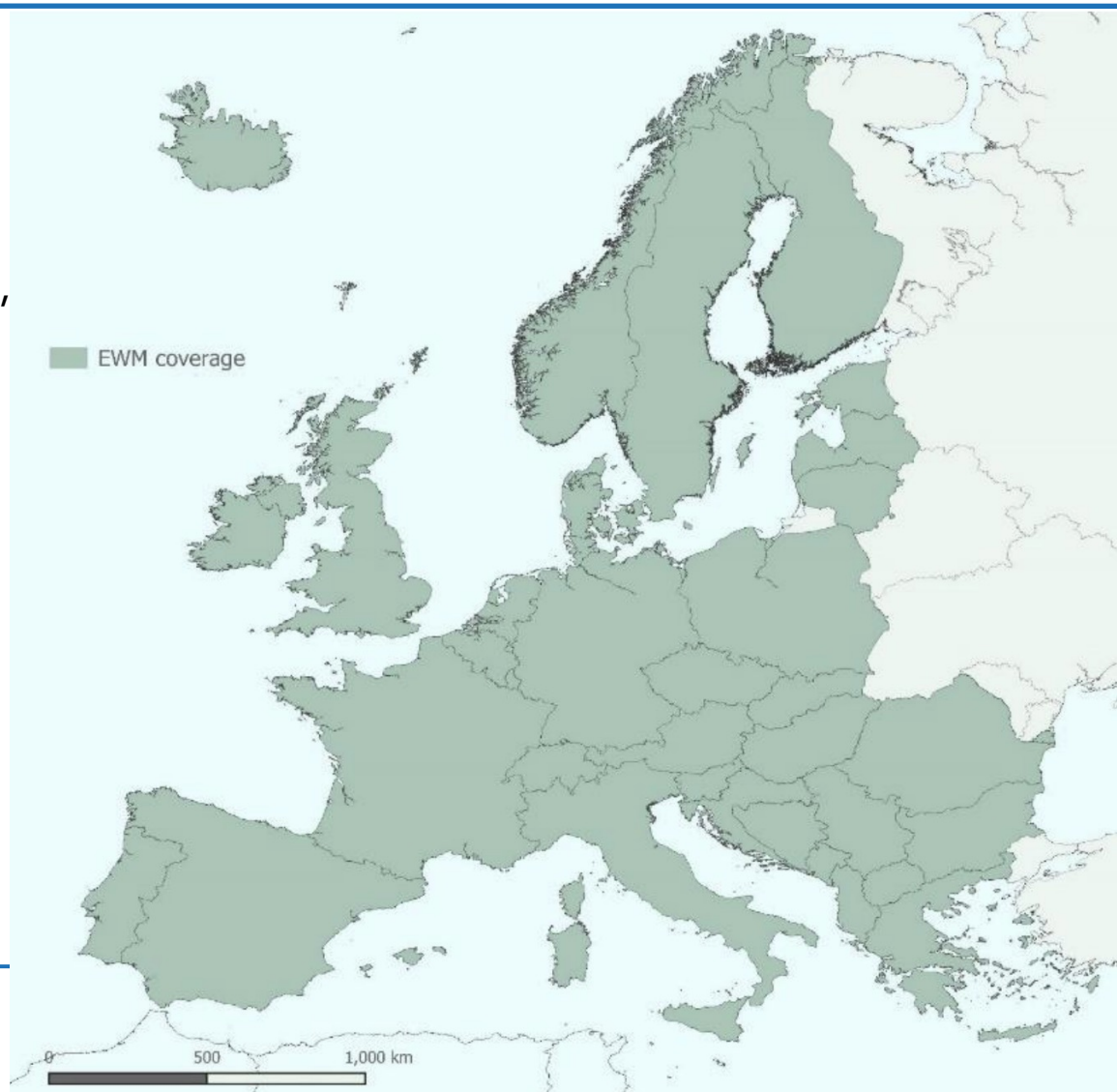
Definitions and coverage

- **European Wetland Map** covers most European countries (‘EU+’)
- not included: Moldavia, Malta, Monaco, San Marino, Vatican, Cyprus, Belarus, Ukraine and the Russian Federation



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Definitions and coverage

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Peatland data:

- very divers data between countries
- no fixed thresholds for peat thickness to accommodate for national/regional specifics (mostly 20-50 cm)
- including all data >12%SOC = “organic soils”
- rarely 6-12% = “peaty soils”
- also include proxy data (e.g. typical habitats, mire vegetation)



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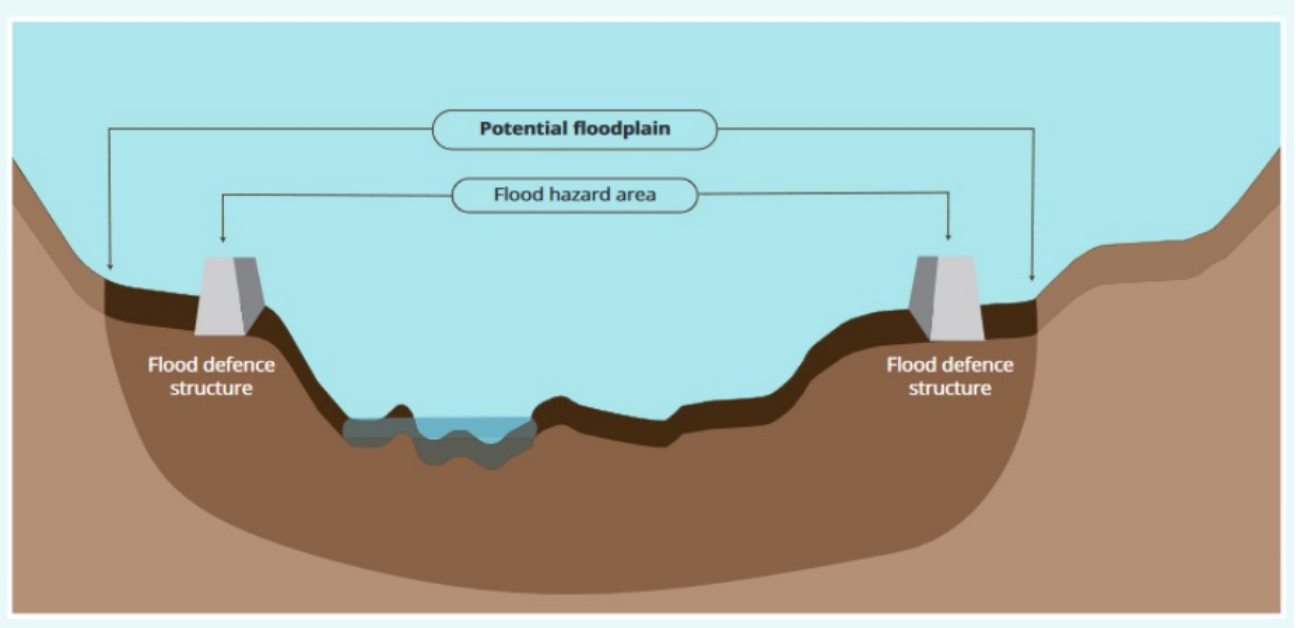
Floodplain data:

- Copernicus Riparian Zone product as baseline (Copernicus 2019; cf. EEA Report No 24/2019)
- 100 m flood hazard map (JRC, 2016)
- national data for refining, if useful



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https://land.copernicus.eu/local/riparian-zones/riparian-zones-delineation

Definitions and coverage

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Coastal Zones Monitoring:

We adopted the Coastal Zones (2018) from Copernicus and extracted data from:

- 7.2. Coastal wetlands: (inter-)tidal flats, salt marshes, salines, and
- 8.3. Transitional waters: lagoons, estuaries.

We added data for coastal wetlands from a global wetland product (Zhang et al. 2023) on:

- tidal flats, estuaries and lagoons.



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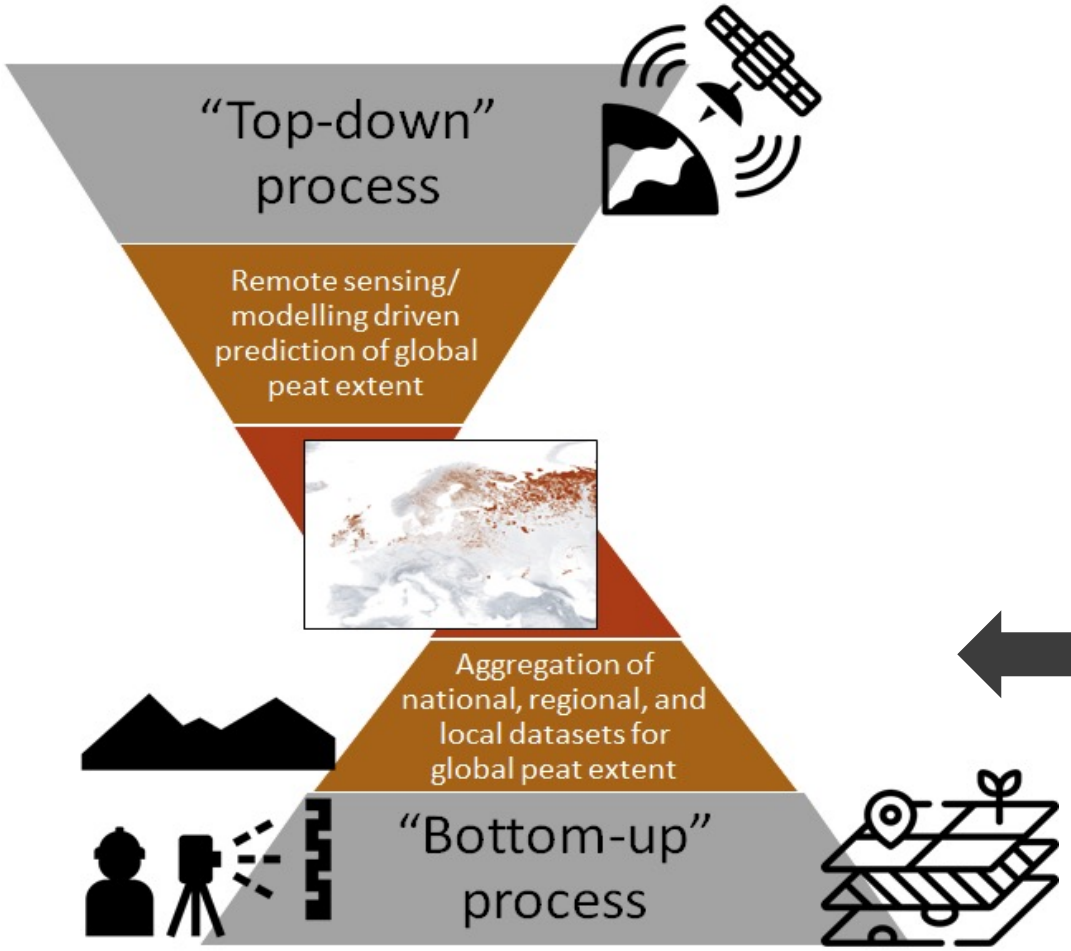
https://land.copernicus.eu/local/coastal-zones/coastal-zones-2018

Methods



- Two conceptual different (peatland) mapping approaches
- Multiple methodologies have been employed to date, basically follow eighter a **Top-down approach** or a **Bottom-up approach**.
  - We collated and assessed >400 GIS datasets on peatlands, floodplains and coastal wetlands - and used about half of them for the EWM.
  - The national peatland data is a mosaic layer.

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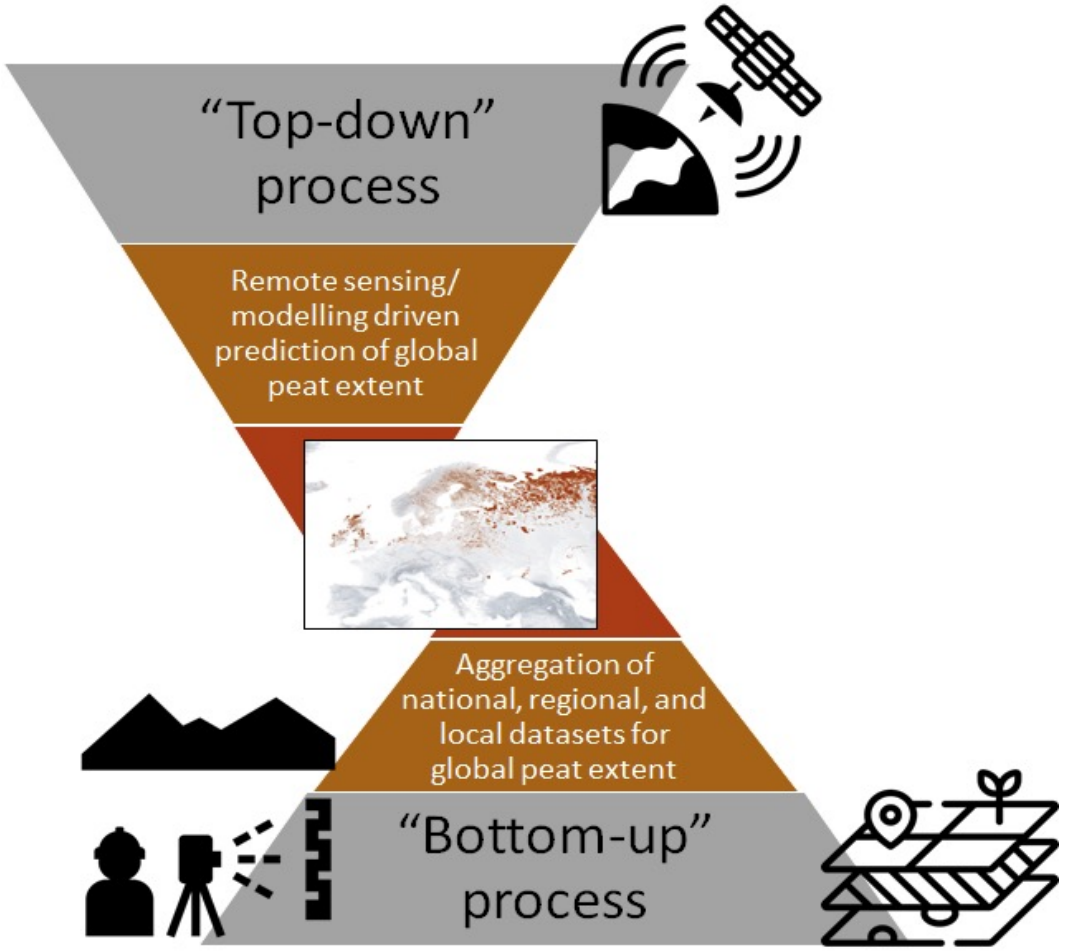
Methods



- obtained GIS data has undergone a procedure for evaluating its accuracy and comprehensiveness.
- checked against proxy data (e.g., Digital Elevation Models - DEM), satellite imagery, and ancillary data while using landscape and peatland ecological expert knowledge ('plausibility check').
- dataset with sufficient quality integrated
- low quality datasets were excluded

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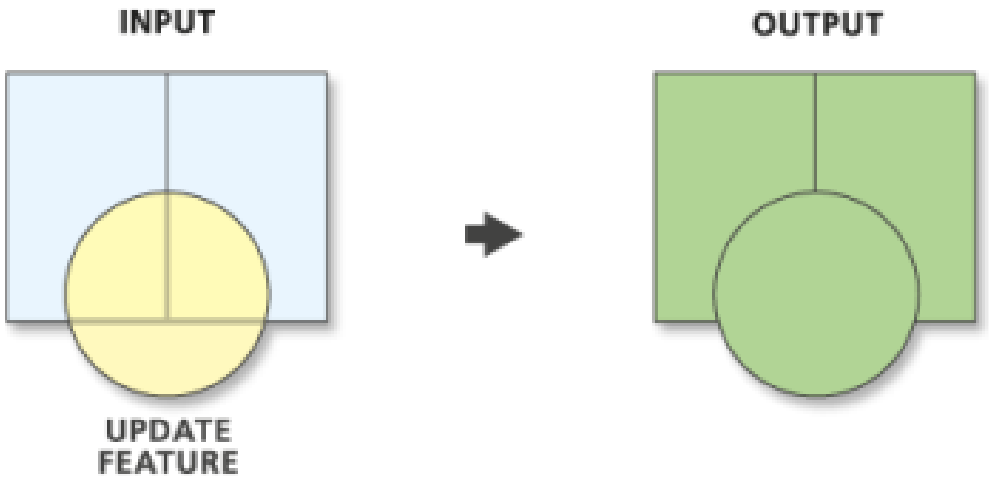
Methods – Data amalgamation



To intersect the selected and prepared layers, the ArcGIS Analysis-tool ‘update’ was used.

→ surfaces of the layers to be intersected are added and the attribute table is overwritten with the information of the overlaying layer.

→ we started with the coarsest data and progressively updated it with more detailed/relevant information. Peatland data is on top as the ‘most important’.

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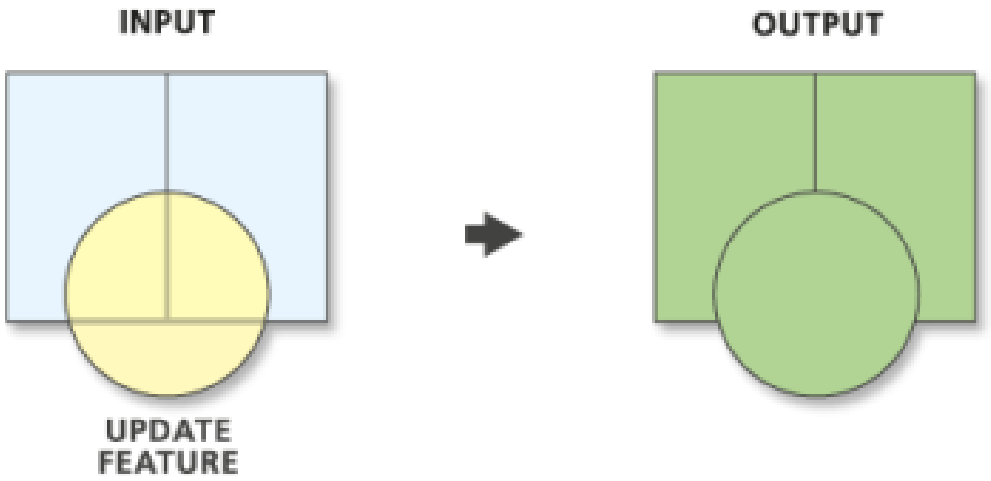

	Overlay layer
7	national peatlands
6	(some) national wetlands
5	Coastal wetlands (Copernicus)
4	Coastal wetlands (Zhang et al 2023)
3	actual floodplain
2	potential floodplain
1	100-year flood risk

„hierarchy“ in final datasets

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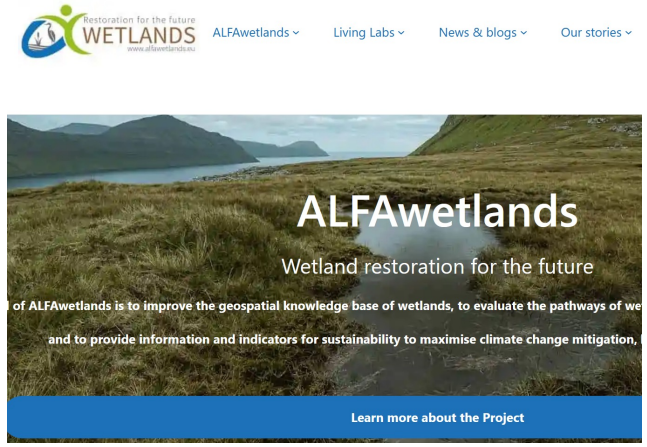
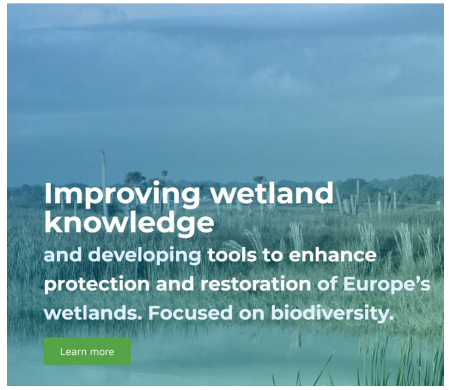
The European Wetland Map

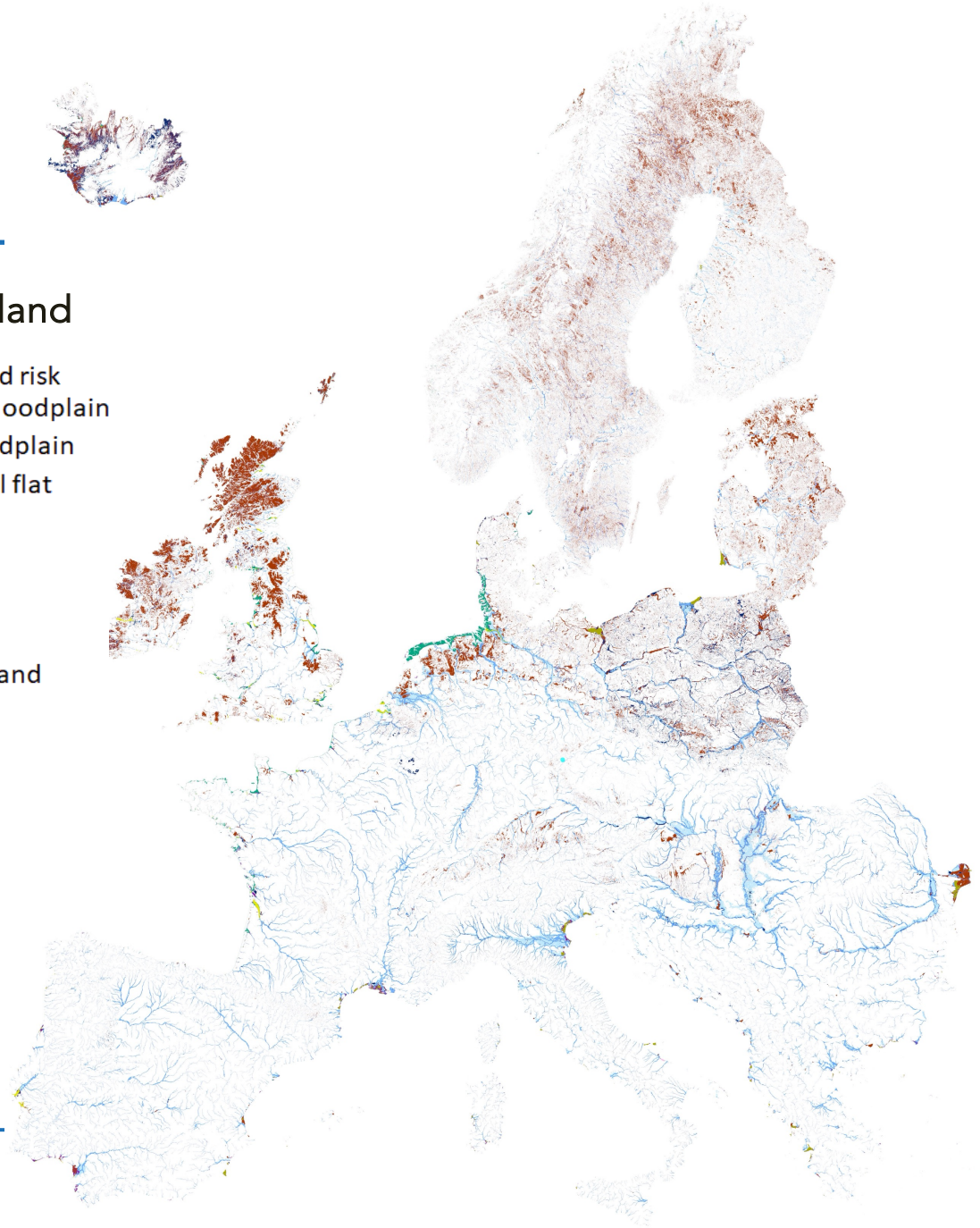


WET HORIZONS



Europäische
Klimaschutzinitiative
EUKI

"Building the European Peatlands Initiative: a strong alliance for peatland climate protection in Europe"



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The European Wetland Map

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Wetlands occur where the availability of water shapes ecological conditions and allows flora and fauna adapted to this conditions to thrive.

European wetlands are found in all climate zones and from the coast to high altitudes.

Suitable conditions are mainly found in areas:

- with frequent and excessive rainfall (maritime climates, e.g., western Europe);
- with high rainfall and/or restricted evapotranspiration (arctic/boreal and montane/alpine environments);
- where large catchments guarantee regular water inflow and retention (terrain depressions and floodplains); and
- along coastlines.

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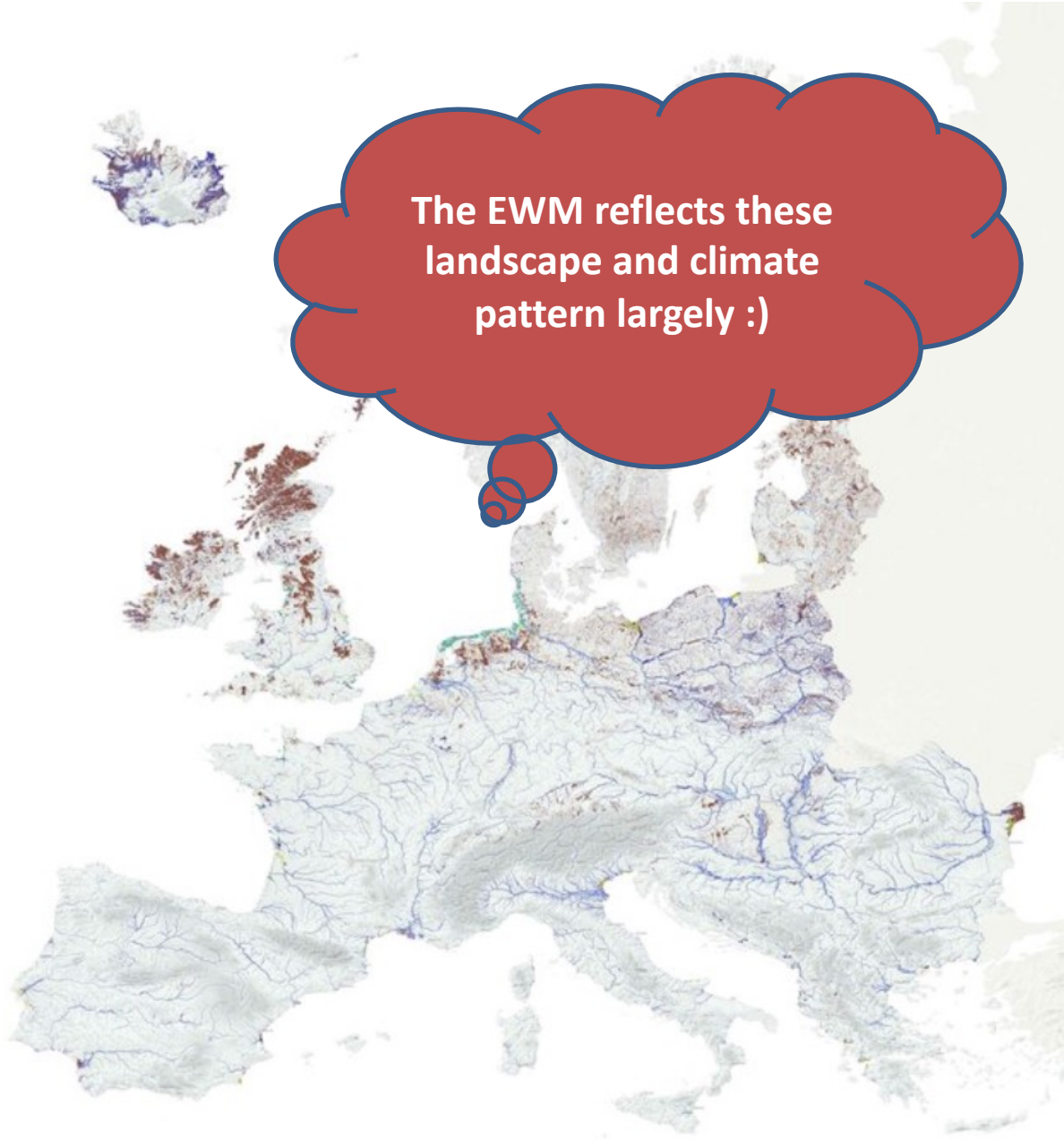
The European Wetland Map

This means that the occurrence of wetlands follows landscape patterns that are the result of, e.g.:

- climate conditions (amounts of rainfall & temperatures)
- geologic processes (mountain rise and sinking coasts)
- ice ages (‚young' landscapes with plenty of depressions and lakes)
- topography (depressions, lowlands)
- gravity driven landscape drainage (river courses and floodplain extent)



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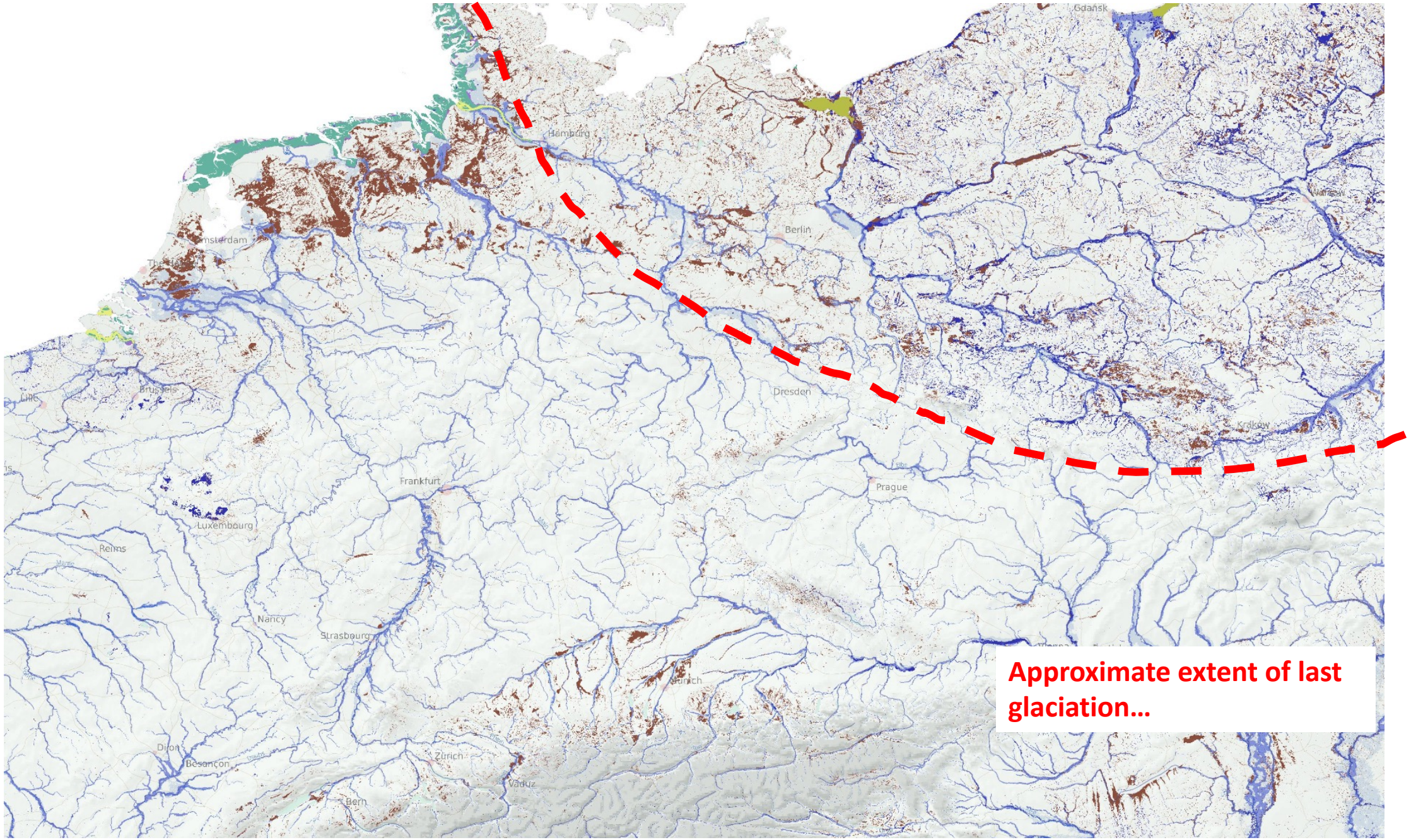
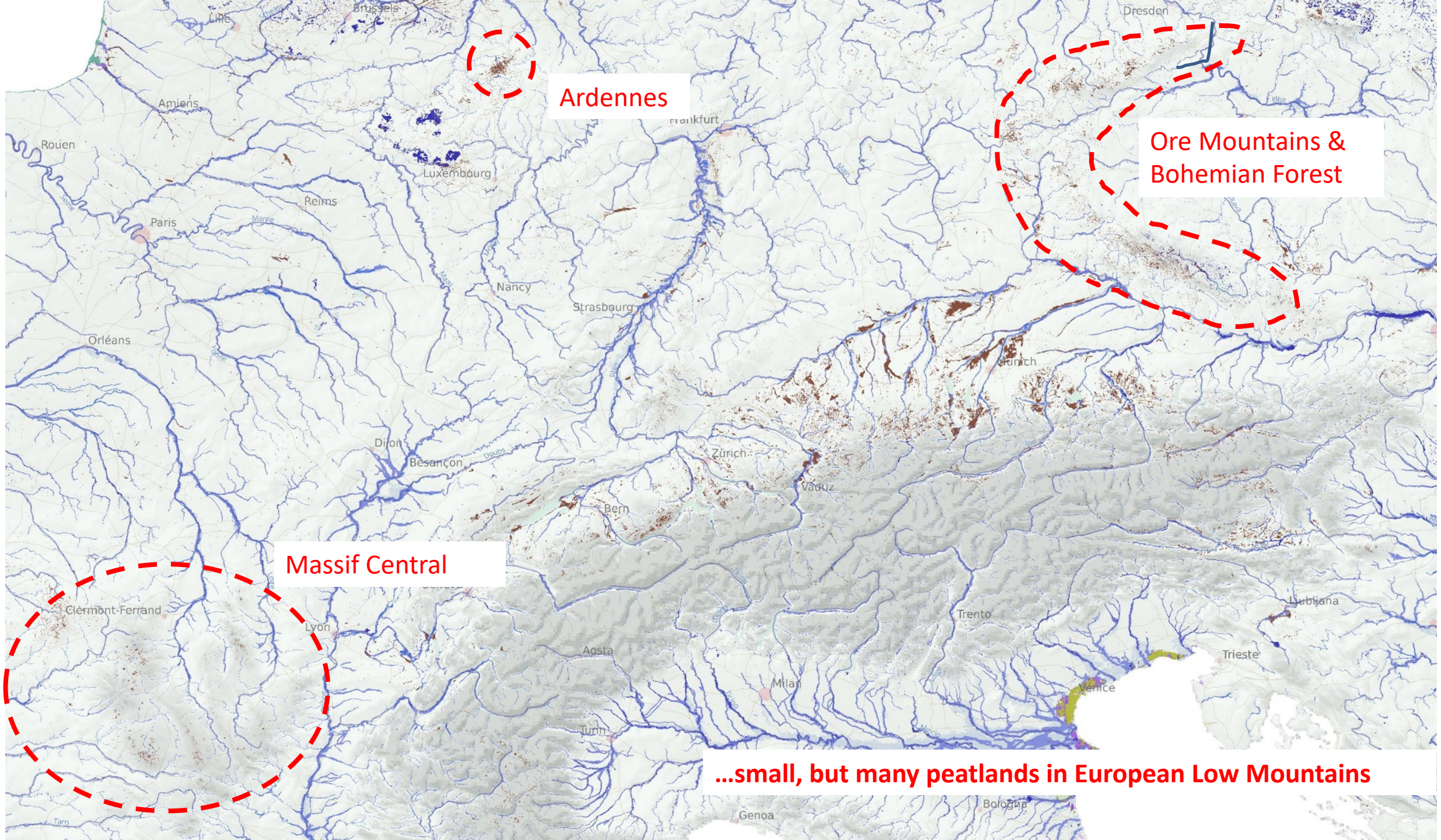
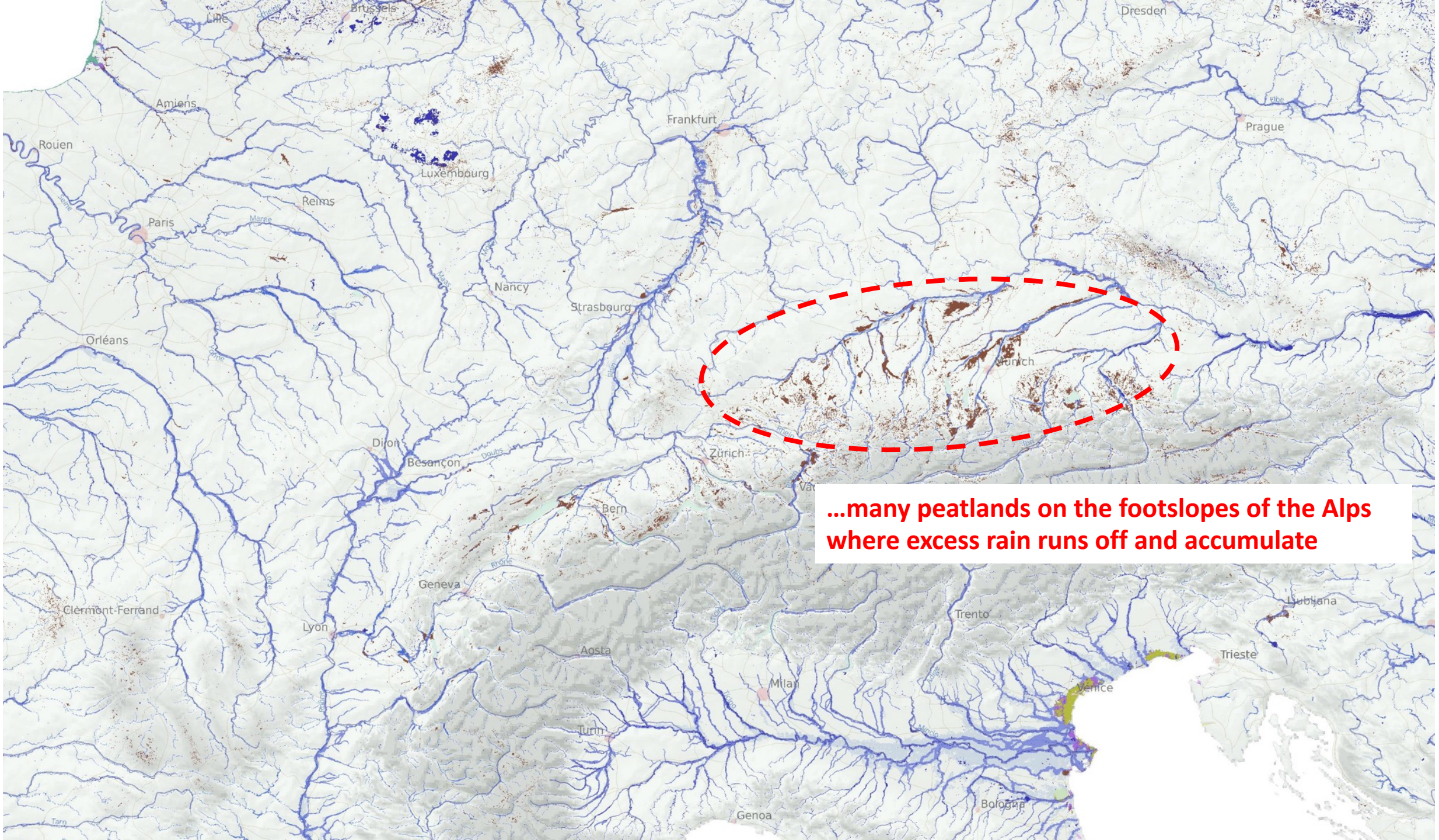

Gdańsk
Hamburg
Berlin
Amsterdam
Brussels
Lille
Dresden
Kraków
Frankfurt
Prague
Luxembourg
Reims
Nancy
Strasbourg
Zürich
Dijon
Besançon
Vaduz
Bern
Approximate extent of last glaciation…


Ardennes
Ore Mountains &
Bohemian Forest
Massif Central
…small, but many peatlands in European Low Mountains
Lille
Brussels
Amiens
Rouen
Luxembourg
Reims
Paris
Frankfurt
Dresden
Nancy
Strasbourg
Orléans
Dijon
Besançon
Zürich
Vaduz
Bern
Clermont-Ferrand
Lyon
Aosta
Milan
Turin
Trento
Ljubljana
Trieste
Venice
Genoa
Bologna


Lille
Brussels
Dresden
Amiens
Frankfurt
Prague
Rouen
Luxembourg
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Nancy
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Munich
Dijon
Besançon
Zürich
Bern
Geneva
Clermont-Ferrand
Lyon
Ljubljana
Trento
Aosta
Trieste
Milan
Venice
Turin
Bologna
Genoa
…many peatlands on the footslopes of the Alps where excess rain runs off and accumulate

The European Wetland Map

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Why a 'game changer'?

- is the most comprehensive European Wetland Map to date (coverage);
- wetland distribution largely follows landscape patterns across Europe;
- provides free access to high resolution spatial data for peatlands;
- provides additional information, e.g., on peatland types and drainage (!The latter is currently being improved!)
- shows the interconnection of floodplains, coastal wetlands and peatlands across Europe



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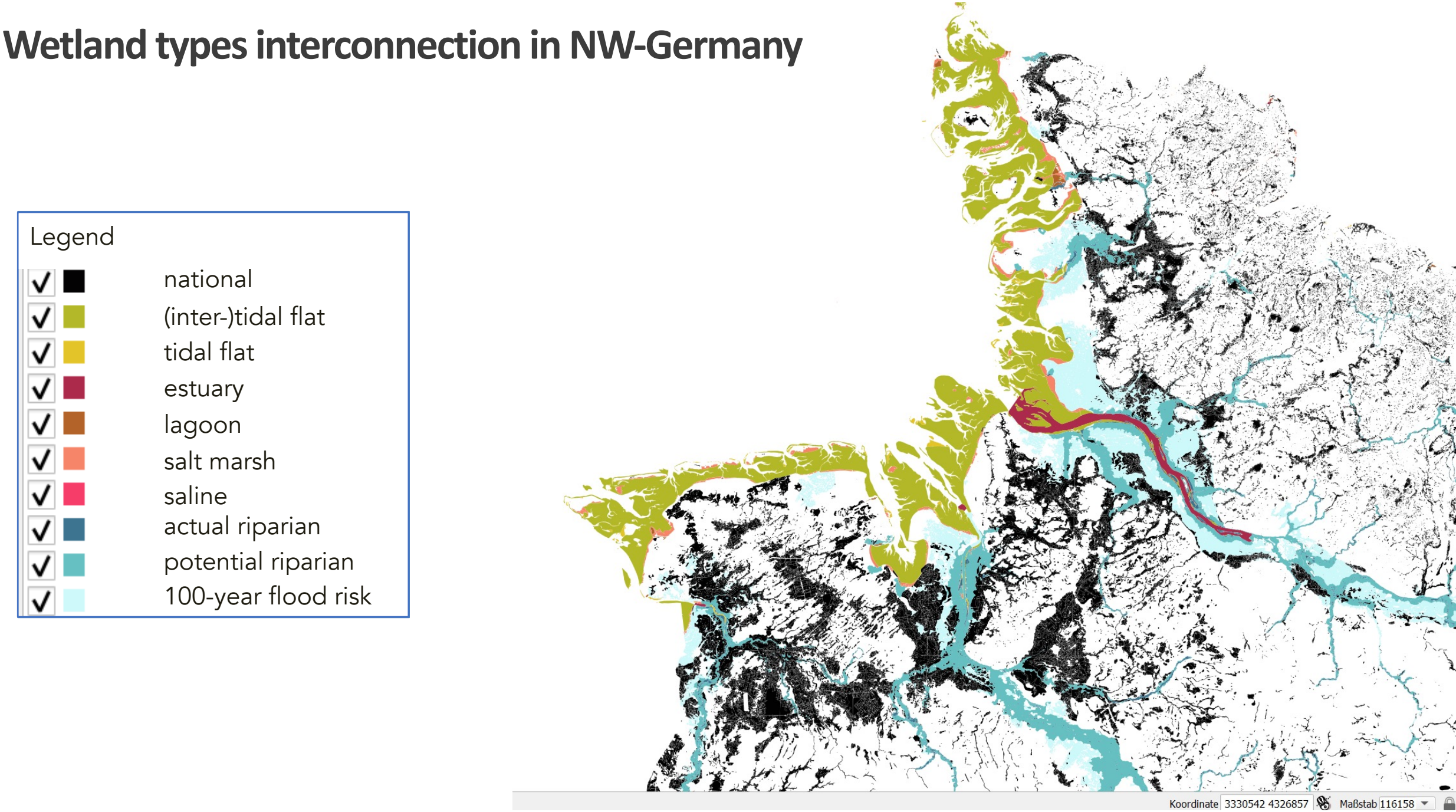
Wetland types interconnection in NW-Germany



The European Wetland Map – game changer

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The map comes in different data formats to allow wide range of applications:

- **use the high-resolution image** (*jpg*) **to learn about wetland occurrence on regional to European scale;**
- **use the high resolution, country-wise** *geodatabase* **on all scales for wetland indication and modelling** (*contains additional information* and thus, *demands high computing capacity*!);
- **the country-wise raster data** (*geo-tiffs in 1 arc second res., lower demand for computing capacity, suitable for modelling too*) **can be overlaid with administrative data to identify, e.g.,:**

  → national to European distribution of wetland

  → endangered infrastructure (100-year flood hazard /potential floodplains) and current land use on wetlands;

  → compare the wetland map with e.g., protected area extent (national and regional scale).

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Thank you & looking forward for collaboration on European Peatlands!

Alexandra Barthelmes & Cosima Tegetmeyer
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