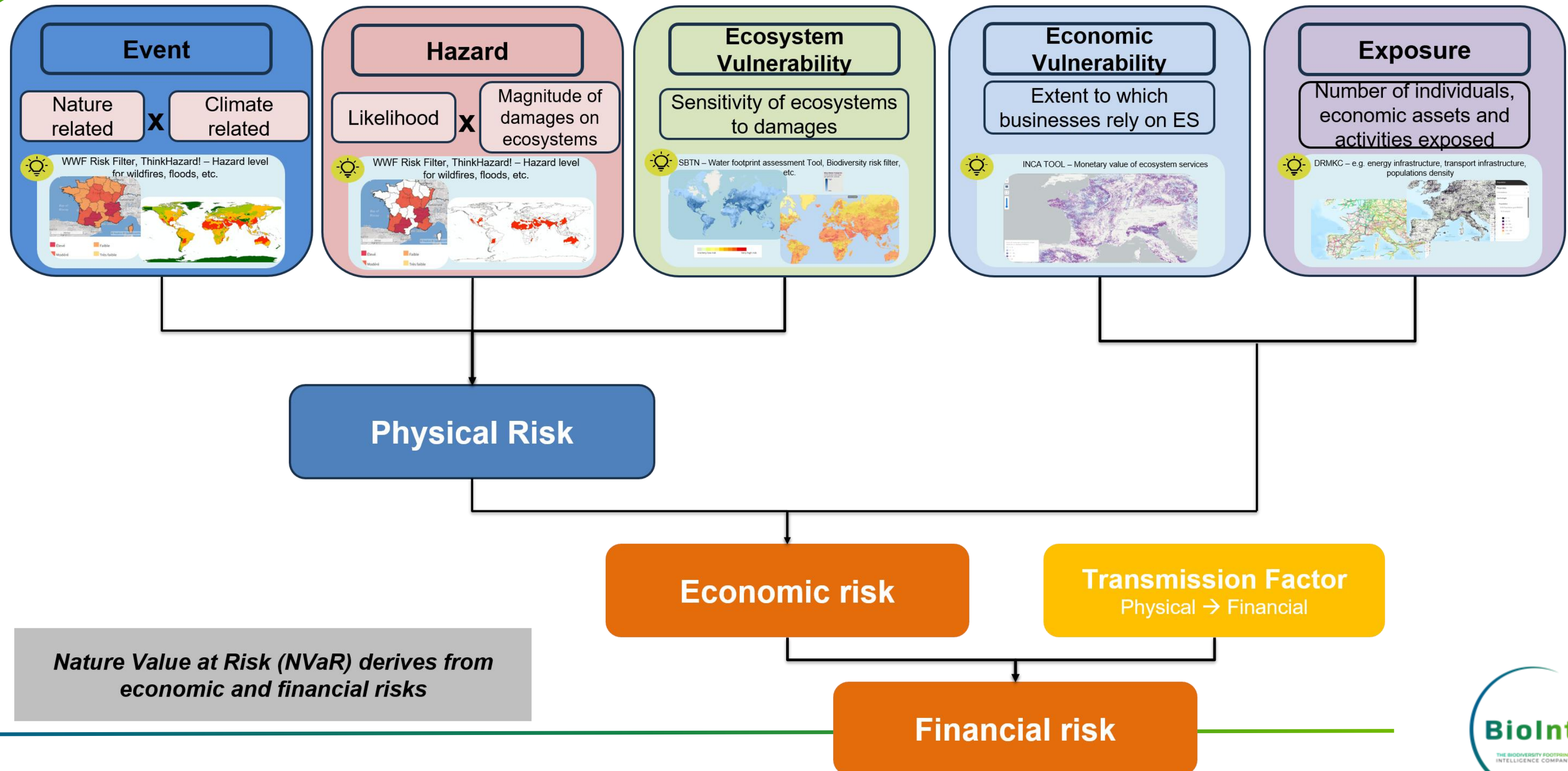


From screening to financial risk assessments: science-based approaches for biodiversity physical risk assessment in the banking sector

Concrete example of physical risk assessment
Joshua Berger, CEO - BioInt

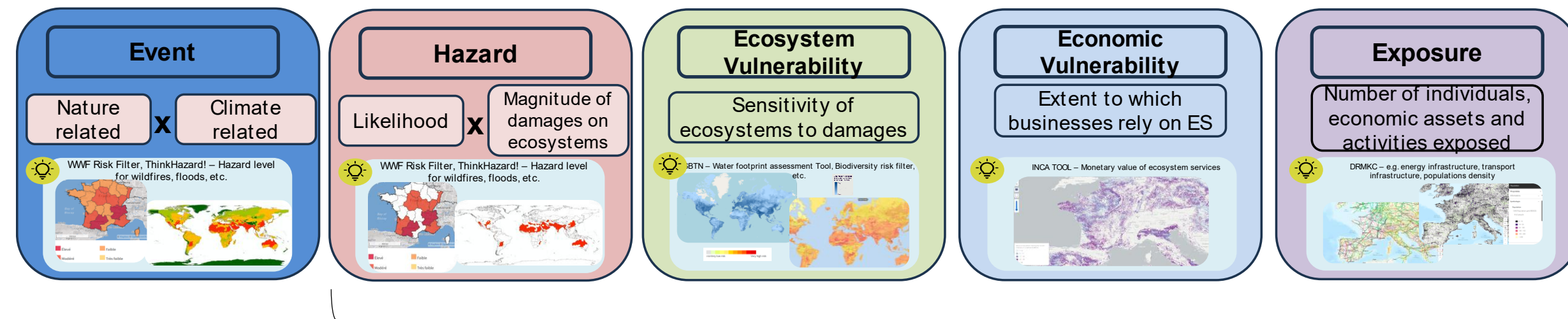


The assessment of biodiversity-related financial risks require a range of spatially-explicit data



To assess those risks in practice, it is necessary to use spatially explicit layers

Main features of the risk layer database compiled by BioInt



- ✿ **92 layers** dedicated to physical risk, spanning the full **Hazard (24) × Ecosystem vulnerability (45) × Economic vulnerability (8) × Exposure (13)** framework
- ✿ Covers both **global** and **European** geographies, with standardised metadata (resolution, format, licence, citation)
- ✿ **Expected licence:** CC-BY-NC ¹
- ✿ **Actively under construction** – target completion: **end of 2026**

¹ <https://creativecommons.org/licenses/by-nc/4.0/deed.en>

Physical risk layers database

What information was gathered about each layer? Examples of information included: resolution, geographic coverage, licence, source and download link

Aa Layer	Description	Risk component	Year	Maximum geographi
 Pluvial Flood (Safer Places)	Physics-based, rainfall-induced (pluvial) flood risk intelligence REST API for the EU	Hazard	Regularly updated	Europe
 Energy Critical Infrastructure (DRMKC)	Mapping of power lines, power plants, river dams, crude oil pipelines, gas pipeline	Exposure	2025	Europe
 Health Critical Infrastructure (DRMKC)	Mapping of hospitals and clinics	Exposure	not provided	Europe
 Public Administration Critical Infrastructur...	Mapping of fire stations, police stations, education buildings	Exposure	not provided	Europe
 Transport Critical Infrastructure (DRMKC)	Mapping of airports and ports	Exposure	not provided	Europe
 Waste Water Critical Infrastructure (DRMKC)	Mapping of urban waste water treatment plants	Exposure	2024	Europe
 GHS Population grid (DRMKC)	Number of people in a cell	Exposure	2023	Europe
 Heritage sites (DRMKC)	Pointers to cultural, mixed and natural sites	Exposure	not provided	Europe
 GHS Built-up residential surface (DRMKC)	Amount of surface built in a cell	Exposure	2023	Europe
 GHS Built-up non-residential surface  OUVRI	Amount of surface built in a cell	Exposure	2023	Europe
 Crop Type Map (DRMKC)	Describes which crop is being cultivated in a cell	Exposure	2022	Europe
 Corine Land Cover (DRMKC)	Provides consistent information on land cover and land cover changes across Eur	Exposure	2018	Europe
 River flood probabilistic layer (DRMKC)	Gives probabilistic layers for river flood depending on flood depth (m)	Hazard	not provided	Europe

To operationalise risk assessment, it is necessary to define materiality thresholds for indicators for each risk component

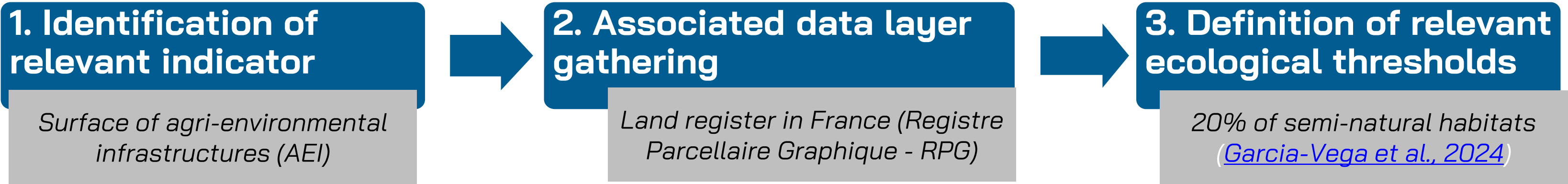
Example of the agricultural sector



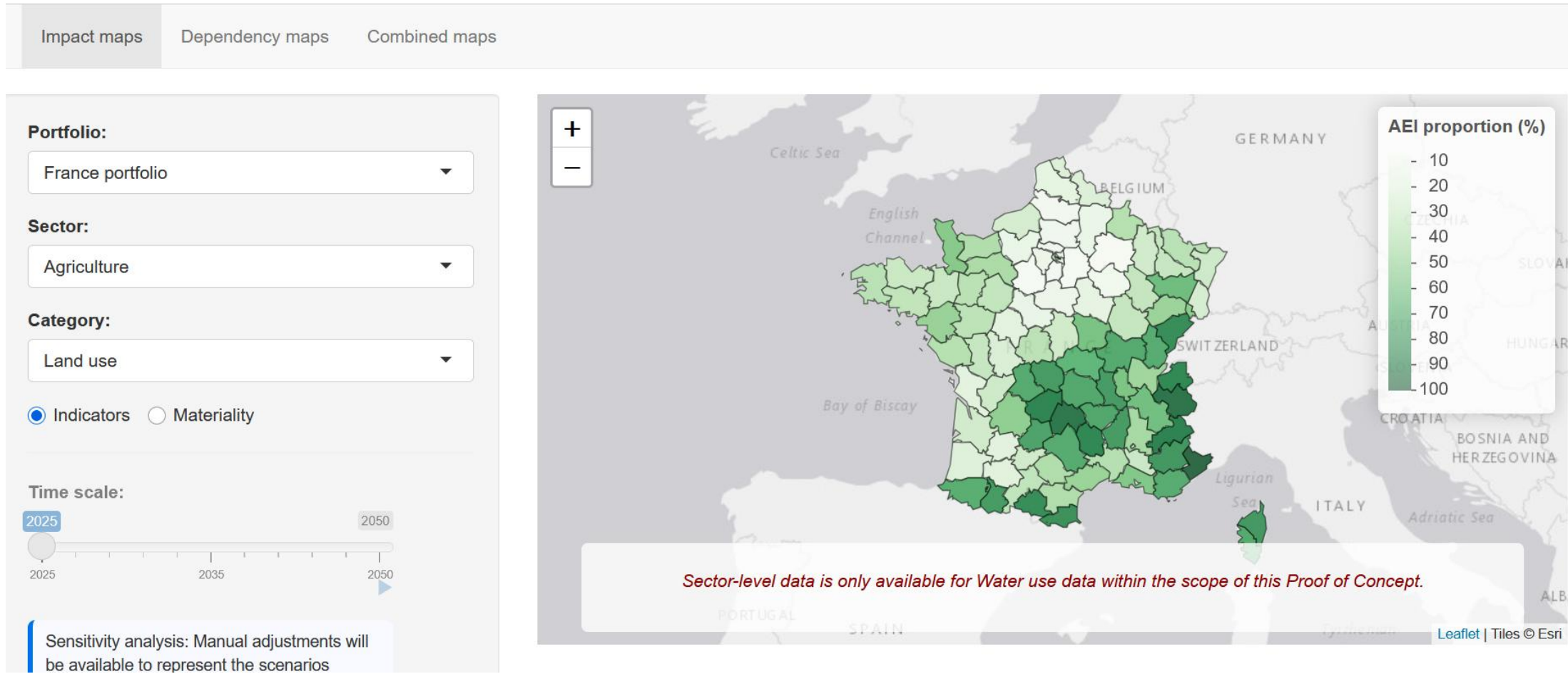
Indicators	Land use		Water use	Pollution		
Risk components	Agri-Environmental Infrastructures (AEI)	Land cover		Nitrate	Phosphorus	Pesticides
Hazard						
Ecosystem vulnerability						
Economic exposure						

Zoom on Ecosystem vulnerability x Land use

Example of the agricultural sector



Indicators	Land use
Risk components	Agri-Environmental Infrastructures (AEI)
Ecosystem vulnerability	Threshold of less than 20% AEI above risk is considered low, between 10% and 20% medium and below 10% high.

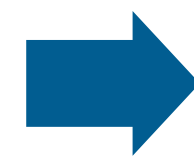


Zoom on Ecosystem vulnerability x Water use

Example of the agricultural sector

1. Identification of relevant indicator

Overshoot of blue water use



2. Associated data layer gathering

Blue Water Reduction Target (SBTN)



3. Definition of relevant ecological thresholds

5%

Indicators	Water use
Risk components	
Ecosystem vulnerability	Thresholds of 5% (high materiality) and 0.1% (medium materiality) of the Blue Water Reduction Target from the Water Footprint Assessment tool

Portfolio: France portfolio

Sector: Agriculture

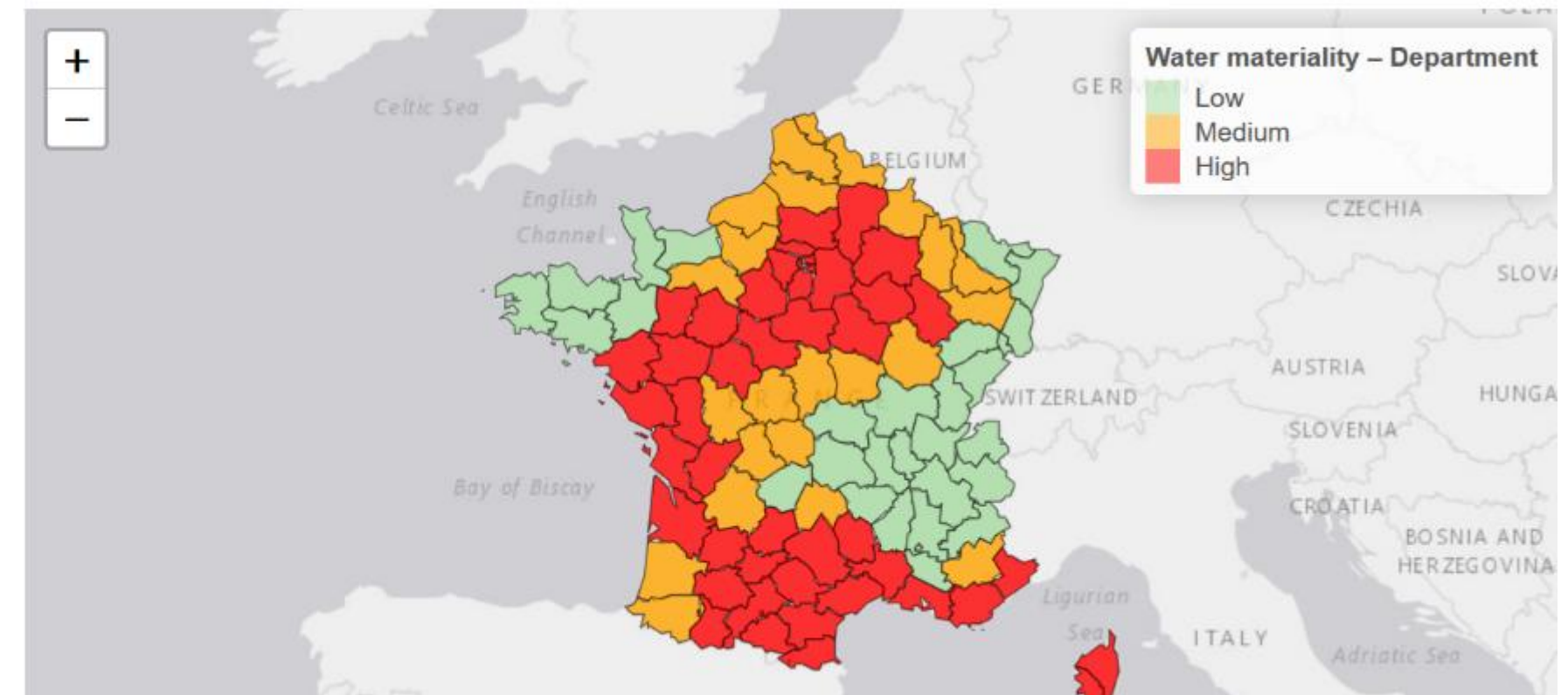
Category: Water use

☐ Indicators ☒ Materiality

Switch department/region

Aggregate materialities (Water + land use)

Non-combined data

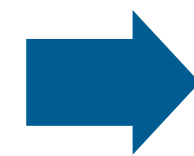


Zoom on Exposure x Water use

Example of the agricultural sector

1. Identification of relevant indicator

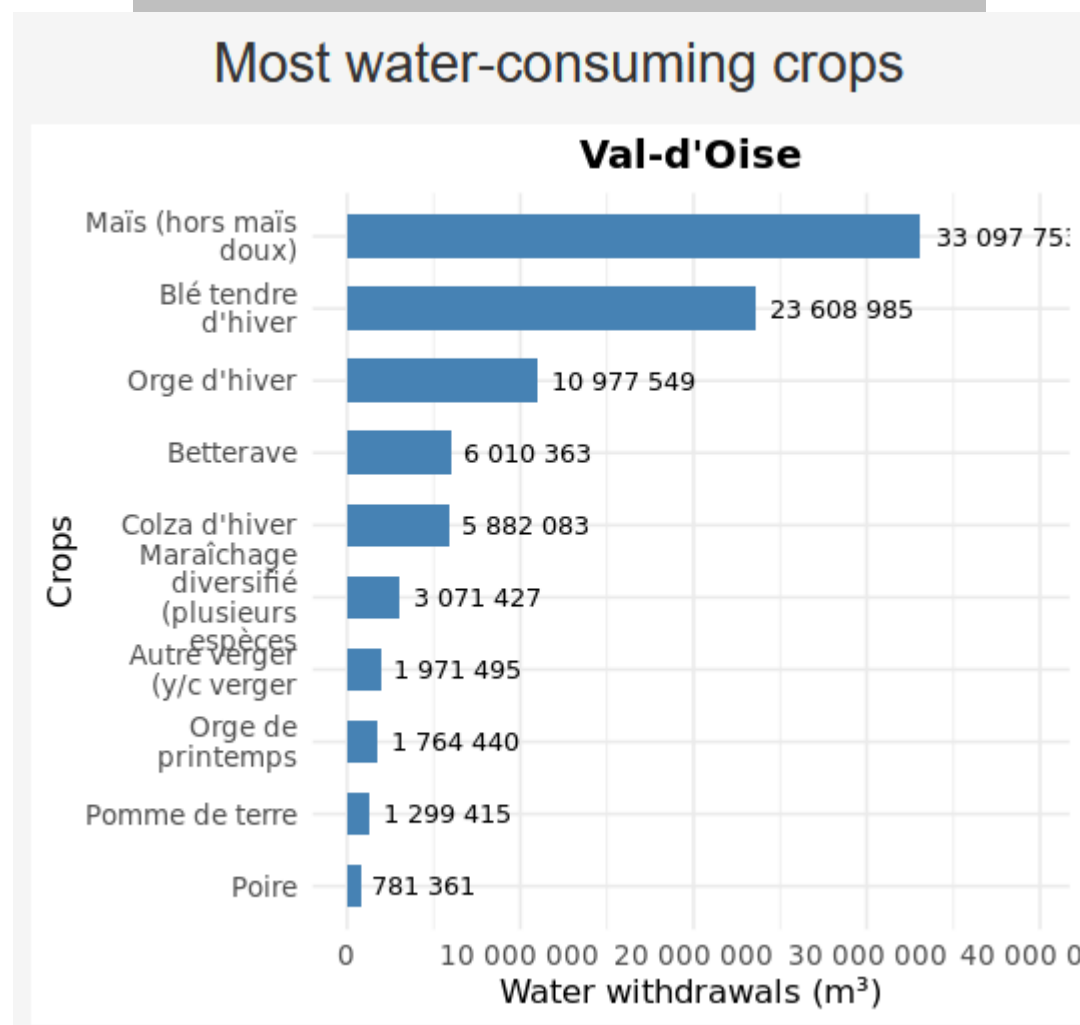
Water withdrawals



2. Associated data layer gathering

Multiple data sources and assumptions

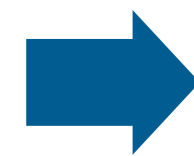
Indicators	Water use
Risk components	
Exposure	Water withdrawal per culture (m ³)



To operationalise risk assessment, it is necessary to define materiality thresholds for indicators for each risk component

Example of the agricultural sector

1. Identification of relevant indicator



2. Associated data layer gathering



3. Definition of relevant ecological thresholds

Indicators	Land use		Water use	Pollution		
Risk components	Agri-Environmental Infrastructures (AEI)	Land cover		Nitrate	Phosphorus	Pesticides
Hazard						
Ecosystem vulnerability	Threshold of less than 20% AEI above risk is considered low, between 10% and 20% medium and below 10% high.	Land use per culture (land cover & rotation) & threshold (yes/no) based on the maintenance of soil cover with a mean rotation of cultures	Thresholds of 5% (high materiality) and 0.1% (medium materiality) of the Blue Water Reduction Target from the Water Footprint Assessment tool	Nitrate concentration, phosphorus concentration in water (mg/L) & thresholds of critical load for the ecosystem: - Nitrates et phosphorus : 2.5 mg / L for N 0.32 mg/L for P for rivers; 0.5mg/L for N 0,024 mg/L for P for stagnant waters (Garcia-Vega et al., 2024)		Pesticides concentration (µg/L) & thresholds: Regulatory thresholds in water
Economic exposure	Surface of agricultural lands	Surface of agricultural lands	Water withdrawal per culture (m ³)			

Finally the materiality of physical risk can be aggregated across indicators and geographies

Example of the agricultural sector

Portfolio:

France portfolio

Sector:

Agriculture

Category:

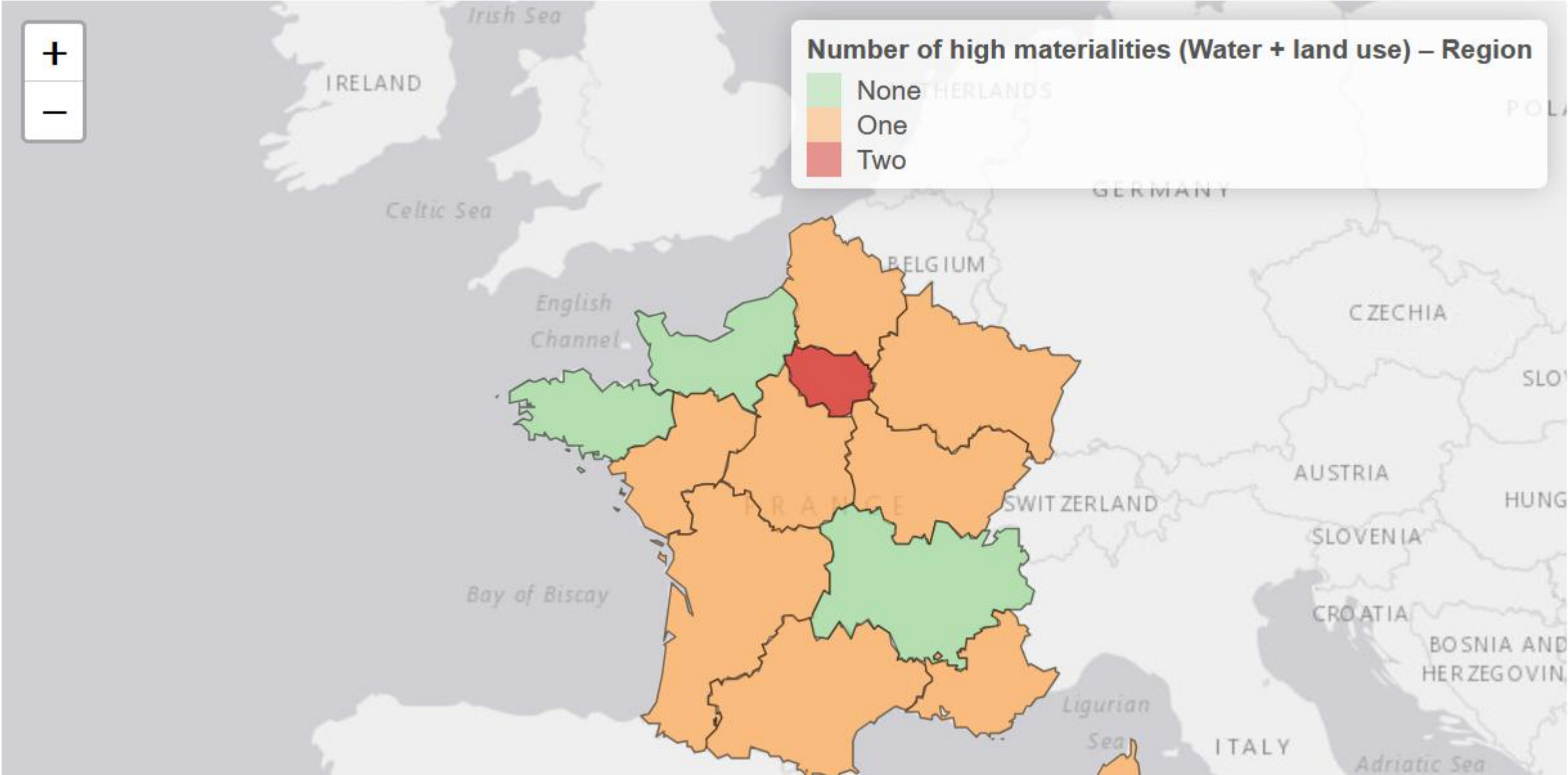
Water use

☐ Indicators ☒ Materiality

↔ Switch department/region

≡ Disaggregate materialities

Combined data





Business @COP17
Groupe WhatsApp



Join the **Business @COP17 WhatsApp group** to get info on business-related side events and promote yours!

If you're working on topics related to Ecosystem condition, join the **Ecosystem condition gathering - Catalysing collaborations around ecosystem condition (drinks)** on 23/10 starting at 19:30 at Bar Phonix near the TNFD Hive (drinks are at each attendee's own expense). More details on the public data, nature credits, physical risks, etc. calendar:



