#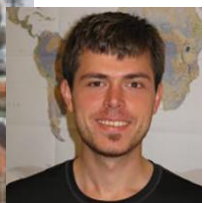 *Hydrogeological processes and Geological settings over Europe controlling dissolved geogenic and anthropogenic elements in groundwater of relevance to human health and the status of dependent ecosystems*

Laurence Gourcy (BRGM) – Project coordinator

Klaus Hinsby (GEUS) WP2 and WP6

Daniel Elster (GBA) WP3

Jens Aamand (GEUS) WP4

Matthew Ascott (BGS) WP5

Stefan Broda (BGR) WP7

Benjamin Lopez (BRGM) WP8

HOVER

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GeoERA
GROUNDWATER

Challenges

- Heterogeneity of knowledge and GW quality data over Europe

- Developing products of interest at different scales combining precise local data (even with depth related variability) to scarce, one shot, incomplete dataset, long-term regular monitoring

- Having the 29 EGS learning from each other, sharing their vision on hydrogeology and having different working methods

HOVER – a diversified project

- In numbers of countries involved (from 2 to 17) in WP

- In the way to upscale point information – from statistics, country side, based on lithological classes, simplified transfer models, GW bodies….

- In the tools used for presenting the results; 1 D maps, time scale maps, interactive maps, pilot sites description, scientific and technical reports, guidelines….

- In targets and topics considered: health, ecology, diffuse pollution, urban and agriculture pressure, global change
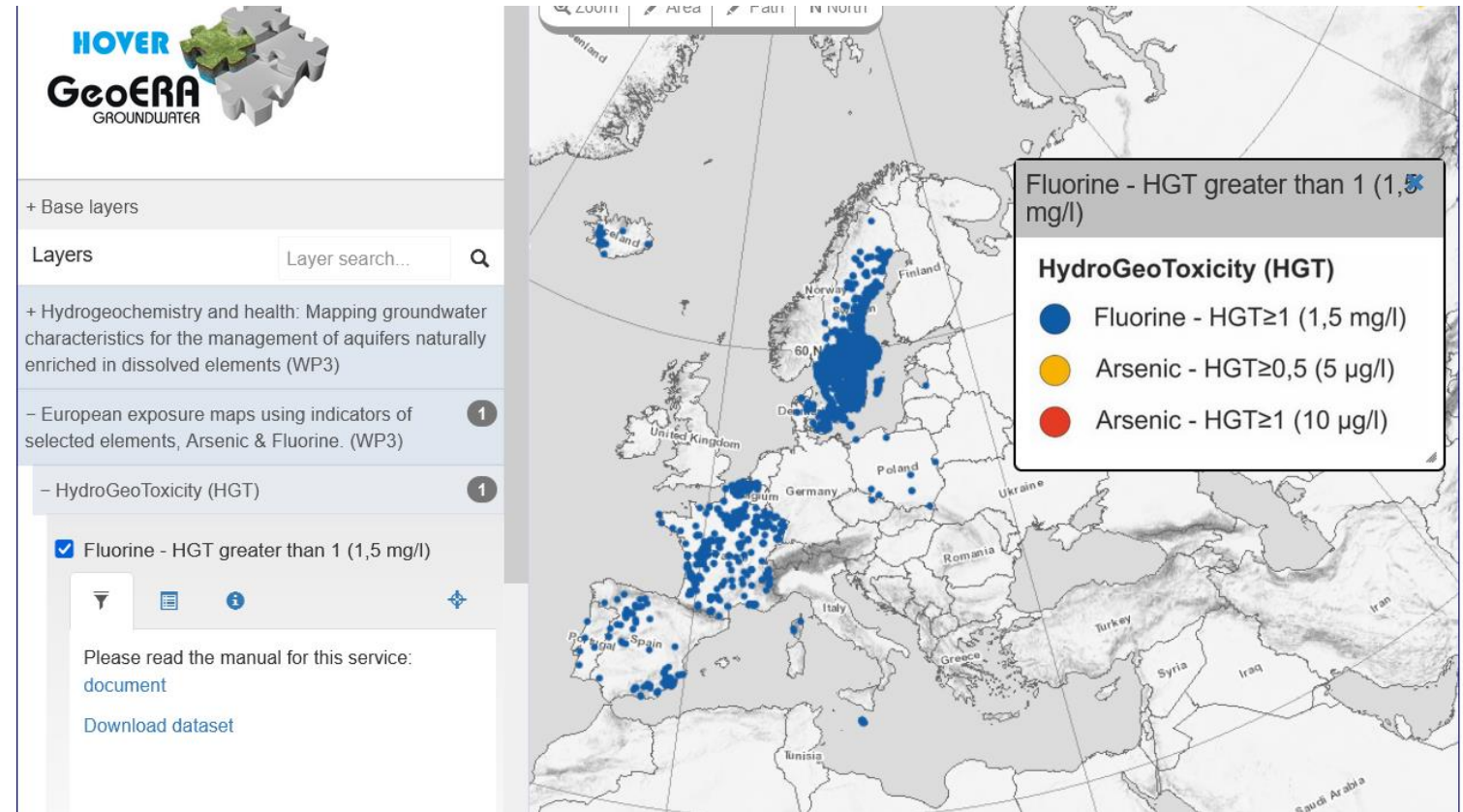
WP3 – elements of natural origin

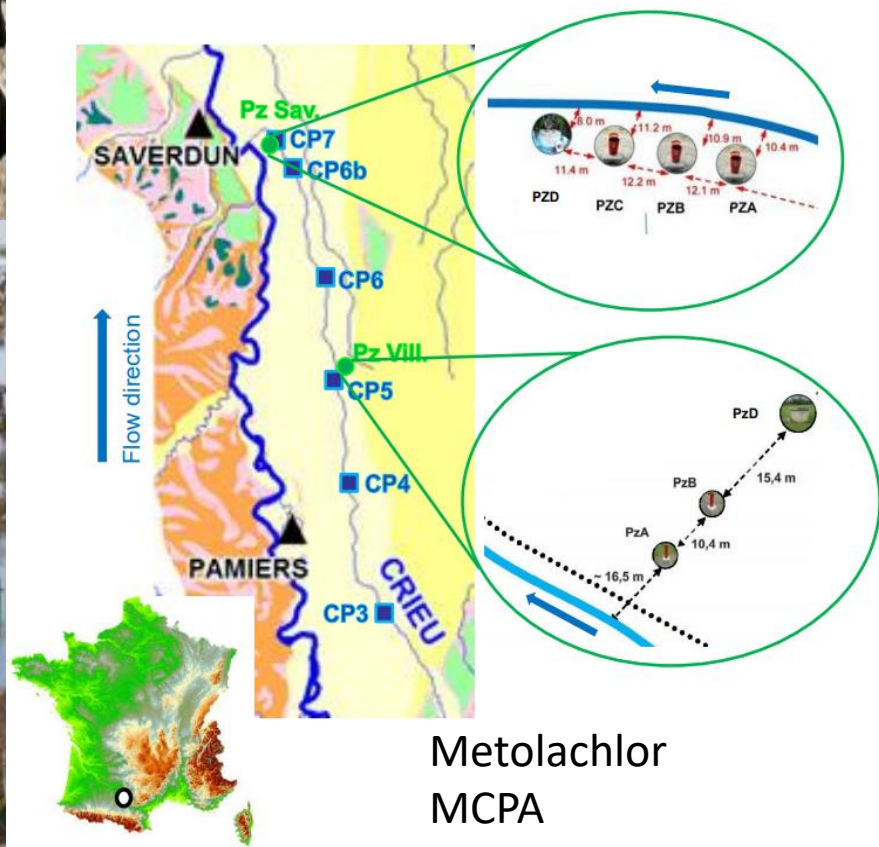Service of thermal and natural mineral waters in Europe

WP3 – elements of natural origin
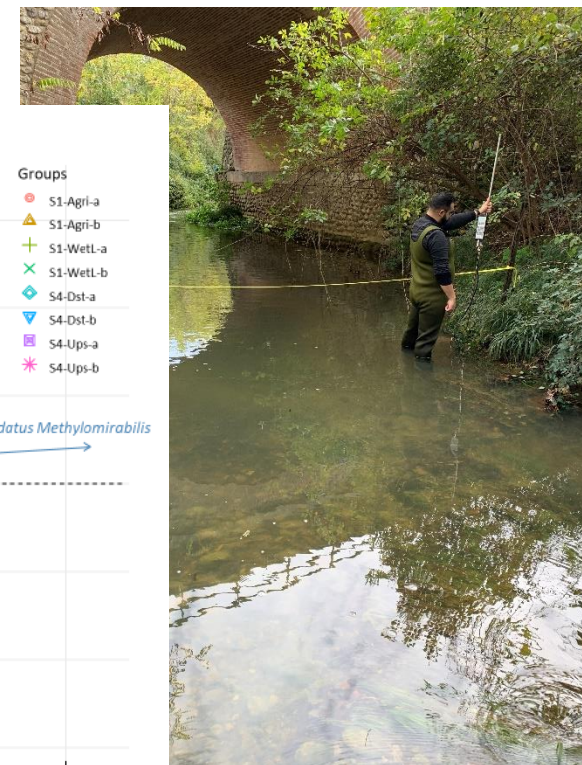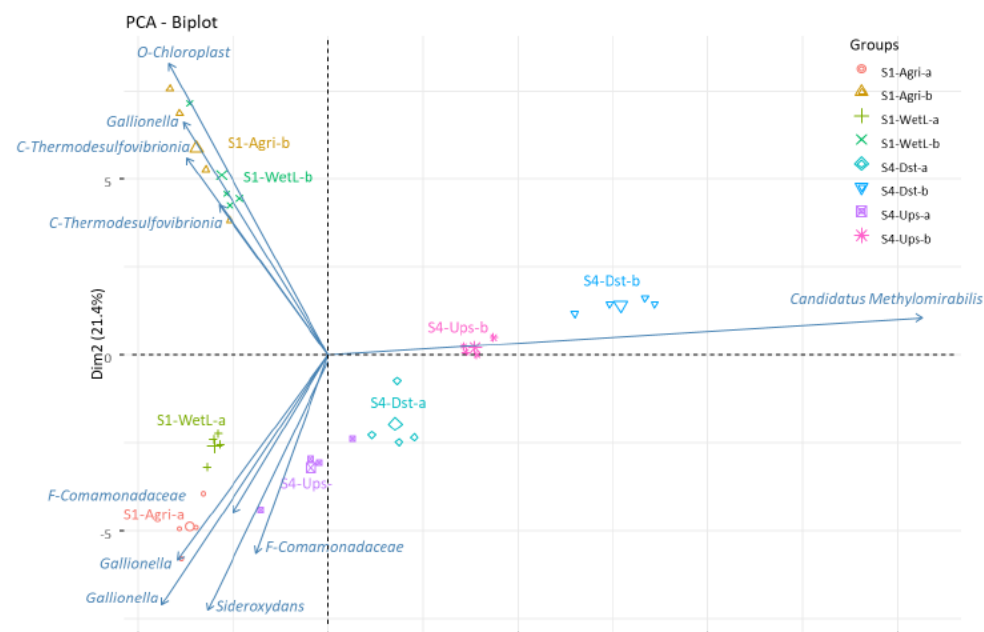
Hydrogeotoxicity for As
 and F

Natural backgroud level – improving the BRIDGE method

WP4 – Biodegradation of contaminant in the hyporheic zone
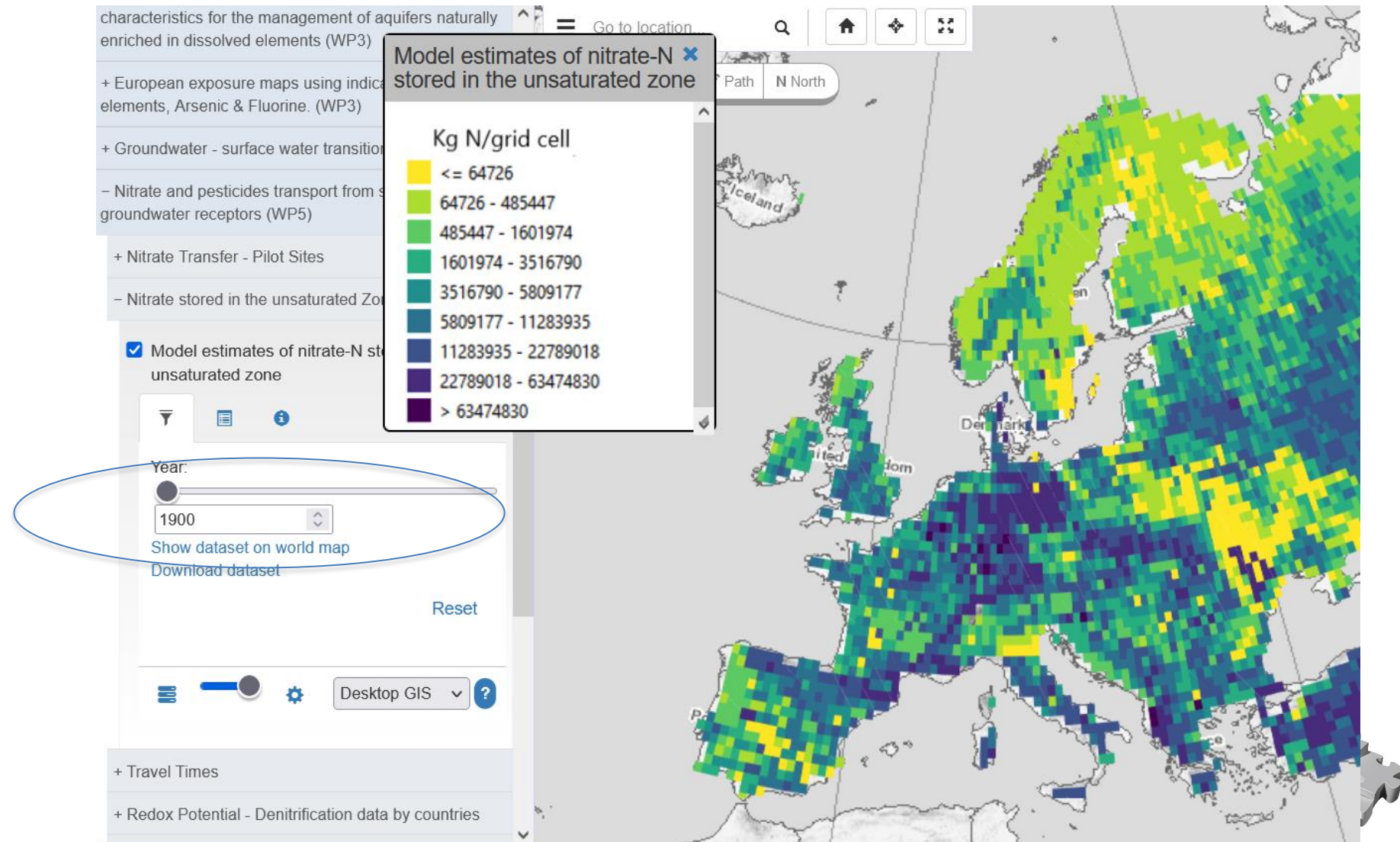

Metolachlor
MCPA
Propiconazole
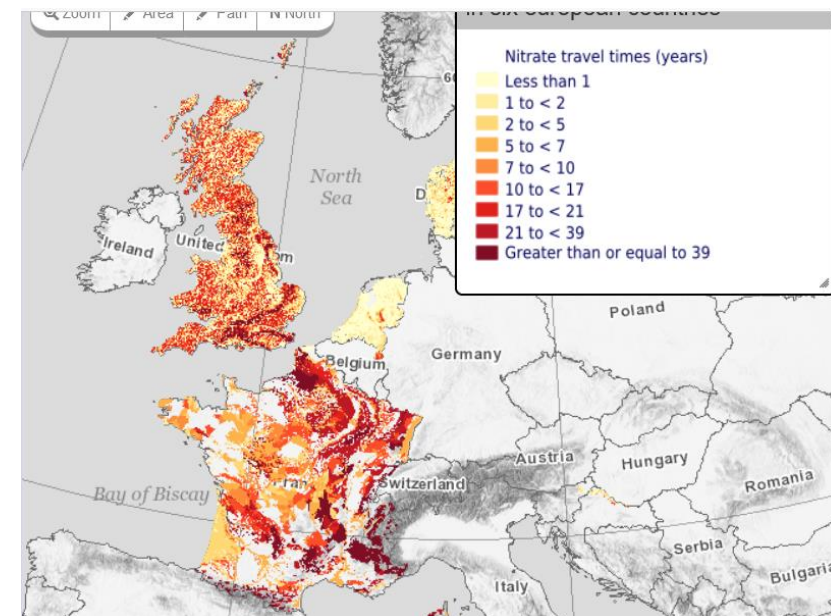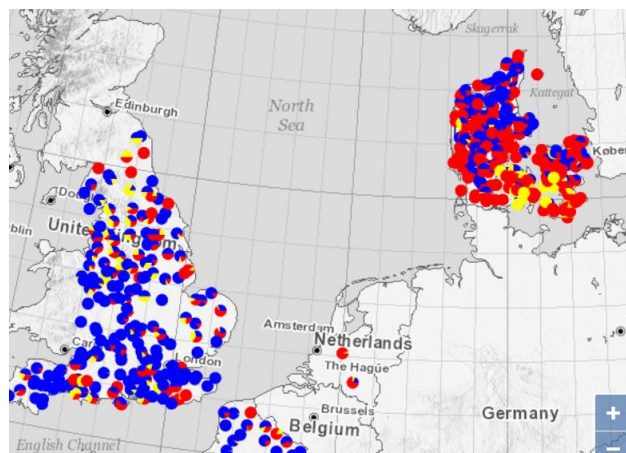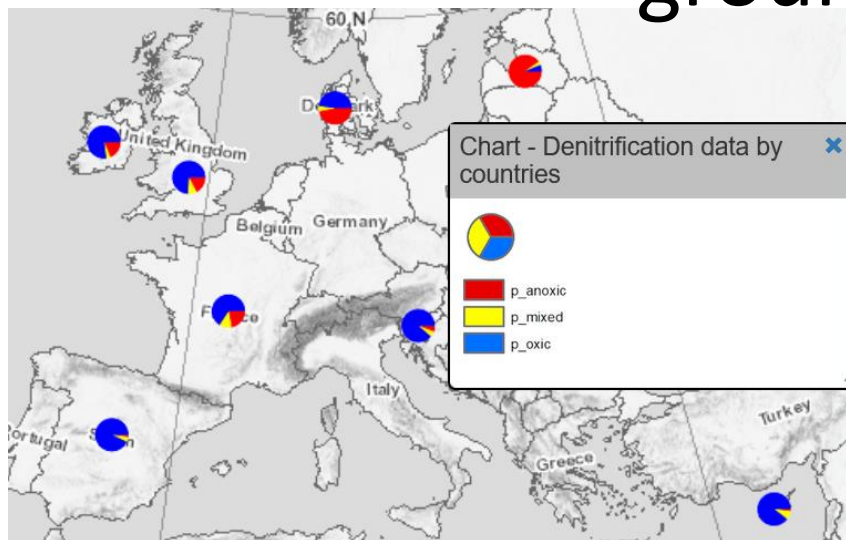Sulfadiazine
Sulfamethoxazole

WP5 – Nitrate and pesticides transport from soil to GW

Year can be changed (up to 2000)

# WP5 – Nitrate and pesticides transport from soil to groundwater

WP6 – Groundwater age range at pilot sites

Colour	Tracer concentration:	Comment
Red	3H >= 1 TU	High fraction of young (< 70 yr) potentially contaminated groundwater that infiltrated later
Orange	3H< 1 TU	Small fraction of young potentially contaminated groundwater
Green	3H < 0.1 and/ or 1 > 39Ar < 100 pmAr and/or 14C > 10 pmc	Groundwater in the age range 70 - 10.000 yr
Blue	14C < 10 pmc (paleowater)	Paleowater (> 10.000 yr)
Purple	81Kr < 75 (pmKr)	> 100.000 yr

Database construction
Guidelines on the best
practices of the tools, and
correct way to use the
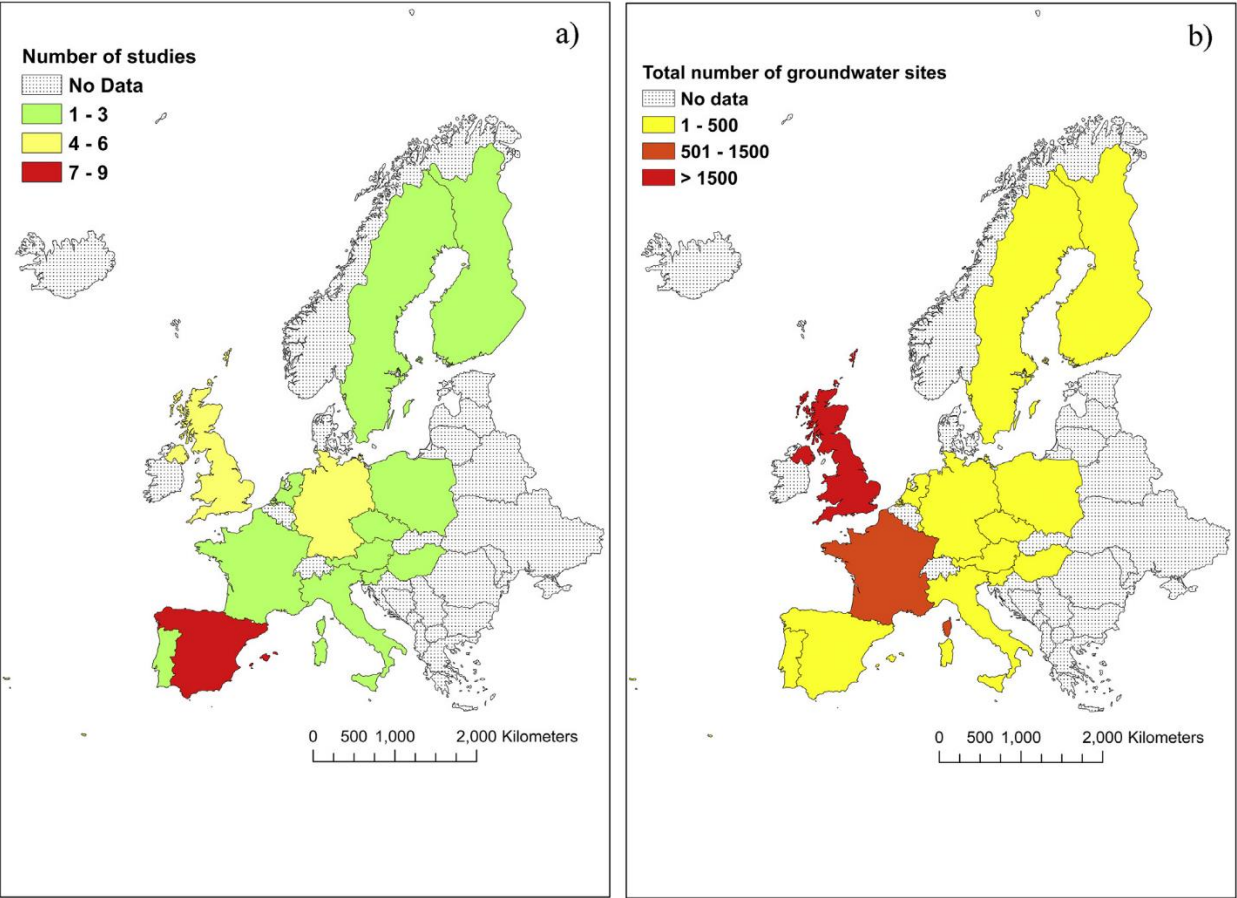« age » information

More than 20 pilote sites
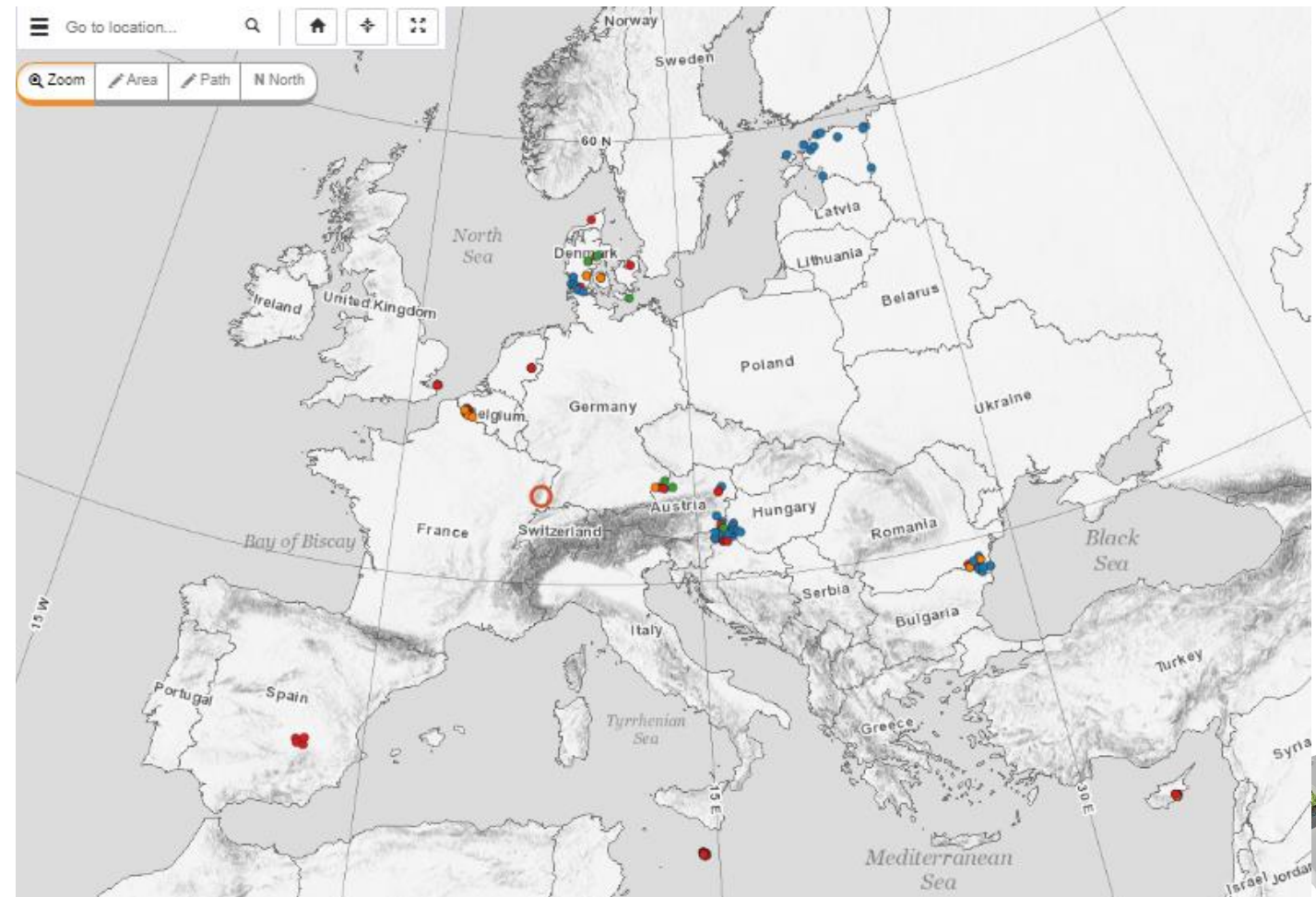
# WP7 – Vulnerability to pollution mapping
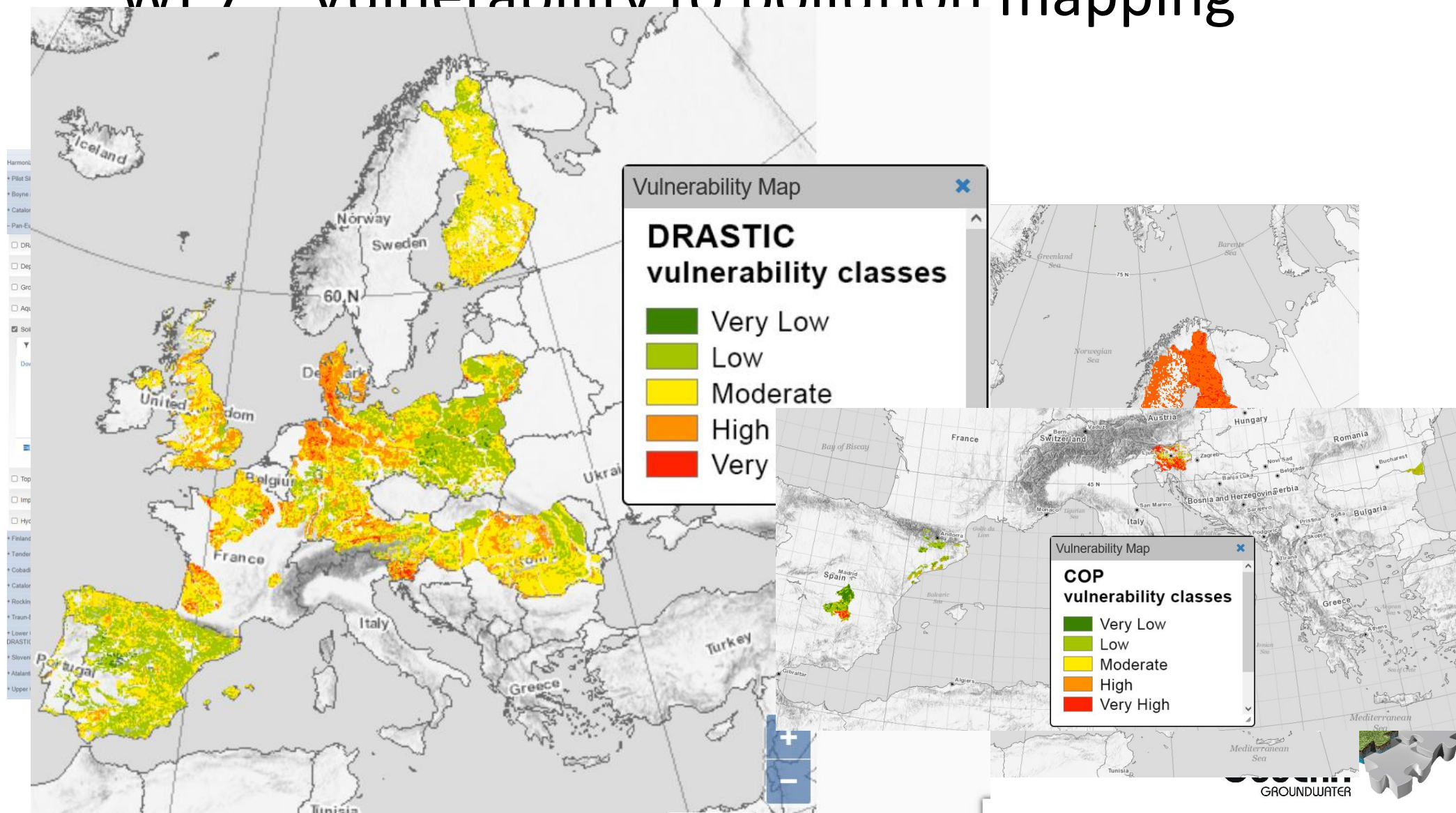
WP8 – Organic contaminant of emerging interest

| CAS number	Compound	Number of studies reporting detection
298465	**_Carbamazepine_**	22
52082	Caffeine	15
723466	**_Sulfamethoxazole_**	13
80057	Bisphenol A	13
15687271	**_Ibuprofen_**	12
103902	Acetaminophen	9
134623	N,N-diethyl-m-toluamide	8
15307865	Diclofenac	8
108907	Chlorobenzene	8
41859670	Bezafibrate	7

Sampling and analytical comparison exercise
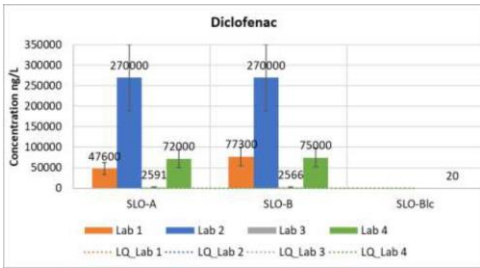
EOC results for groundwater studies in Europe: (a): number of studies used in this review from each country. (b) total number of groundwater sites from the selected review studies

HOVER products on EGDI
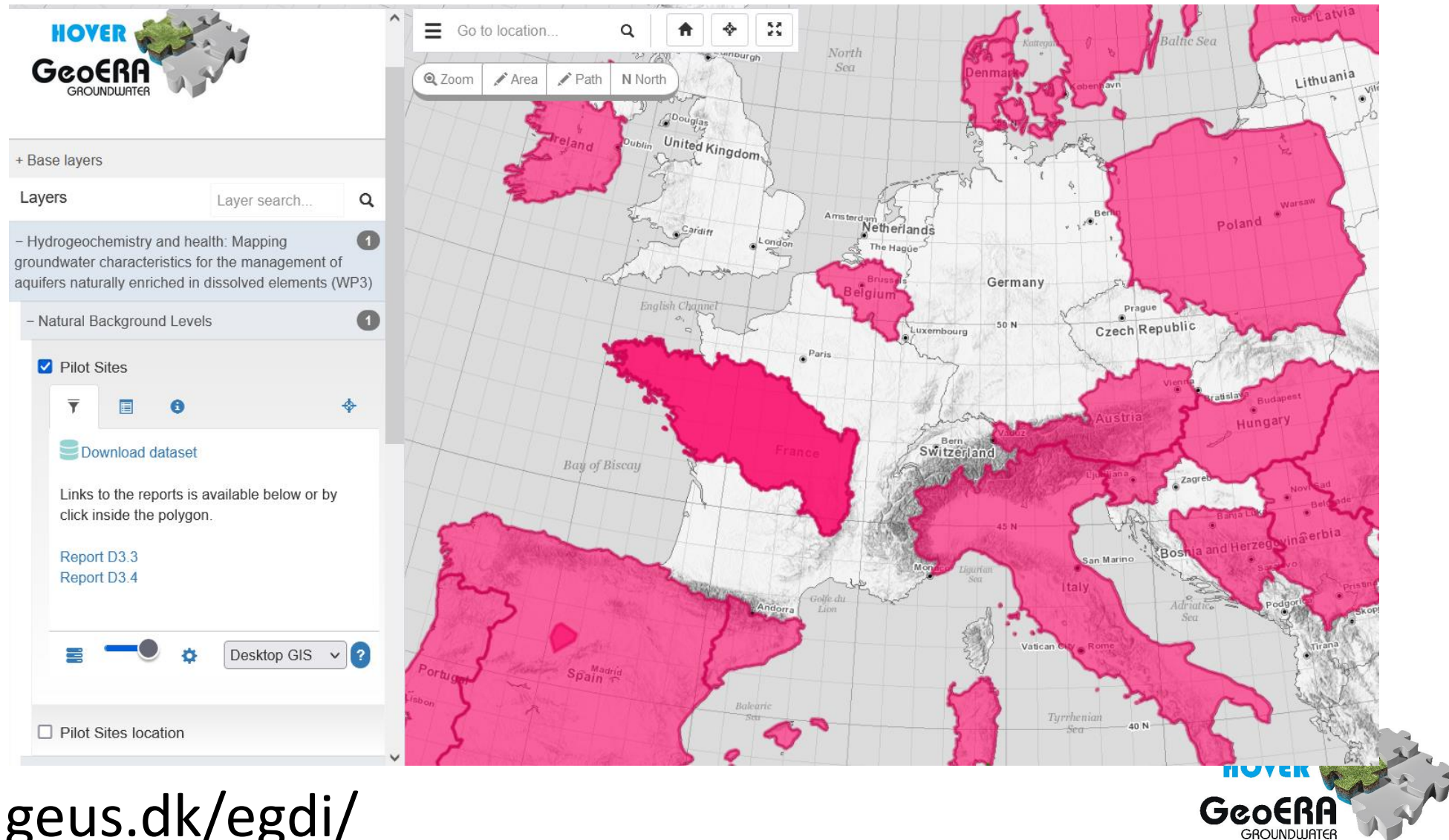
Data.geus.dk/egdi/

HOVER is also

- Publications – 7 in international journals (5 in preparation)
- Conferences – 9 majors scientific events (EGU, IAEA, AIH, LuQW), 5 policy conferences, webinars
- Newsletters
- Interactions with other organisms - USGS, IAEA, JRC, EEA, CIS/WGGW
- General public communication– Facebook blogs, LinkedIn post, WordPress blog, twitter post, webpage