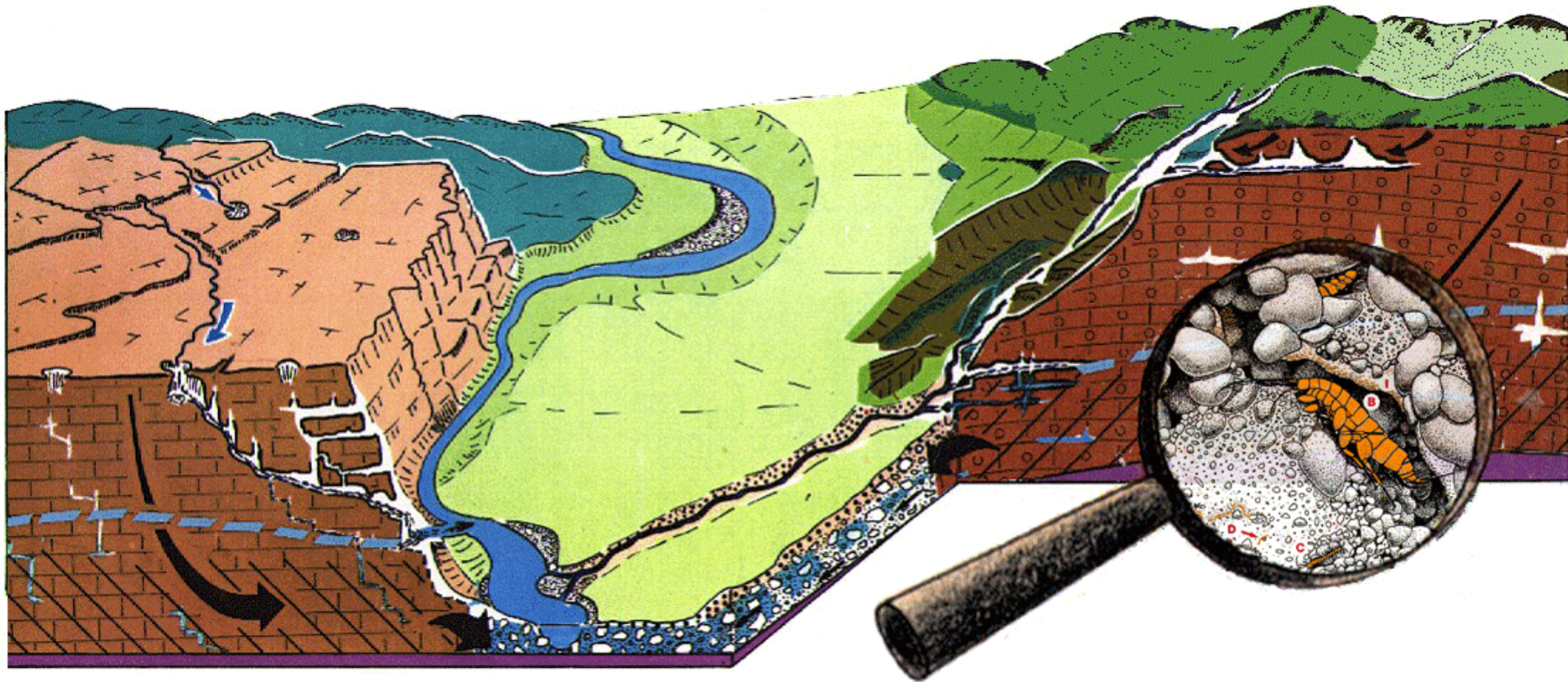


European maps of habitats, bioregions, and species in groundwater



Florian Malard, *France* (speaker); Jean-françois Cornu, *France*; David Eme, *France*; Fabio Stoch, *Italy*; Cene Fiser, *Slovenia*; Diana Galassi, *Italy*; Pierre Marmonier, *France*; Maja Zagmajster, *Slovenia*

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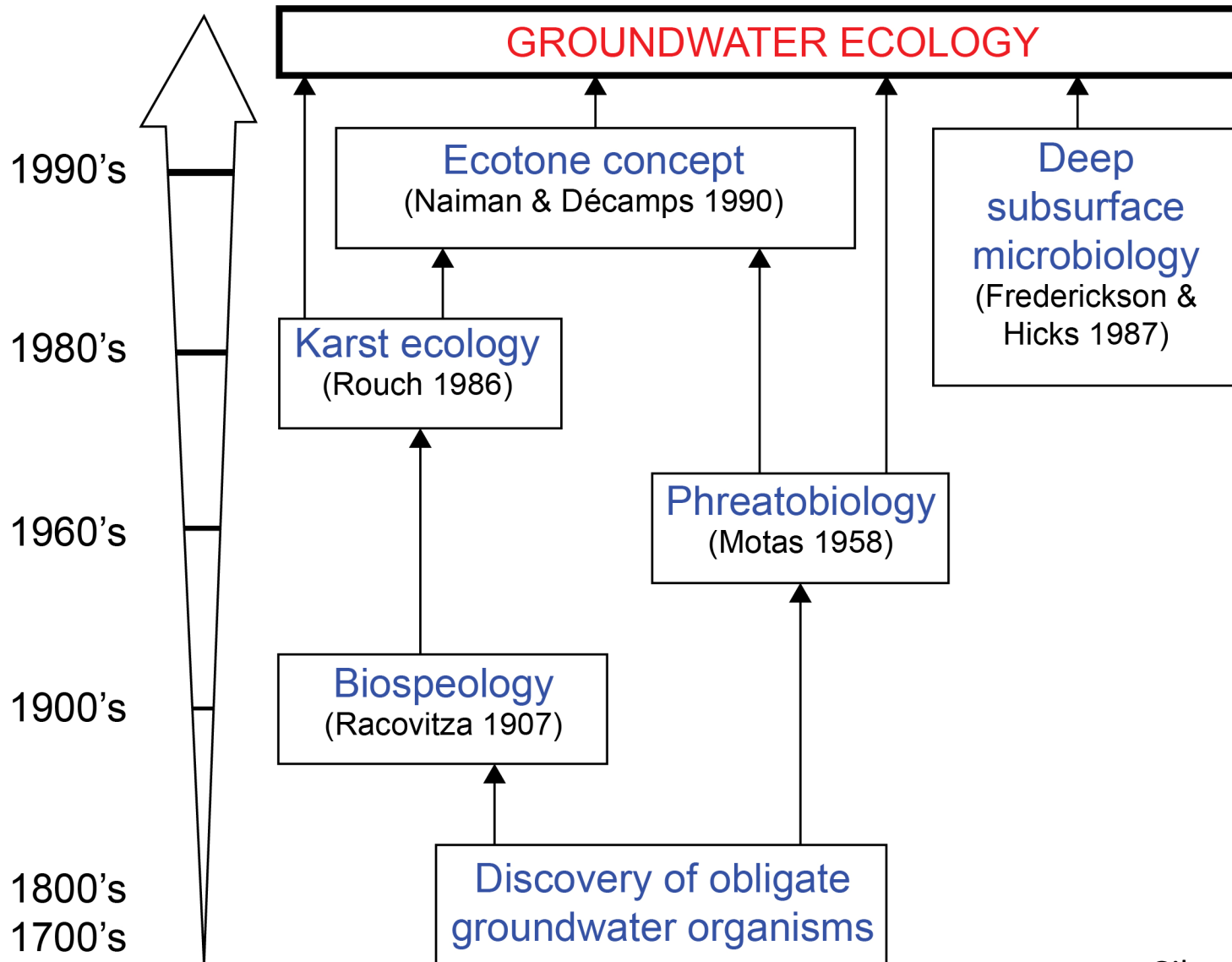
Montpellier, France
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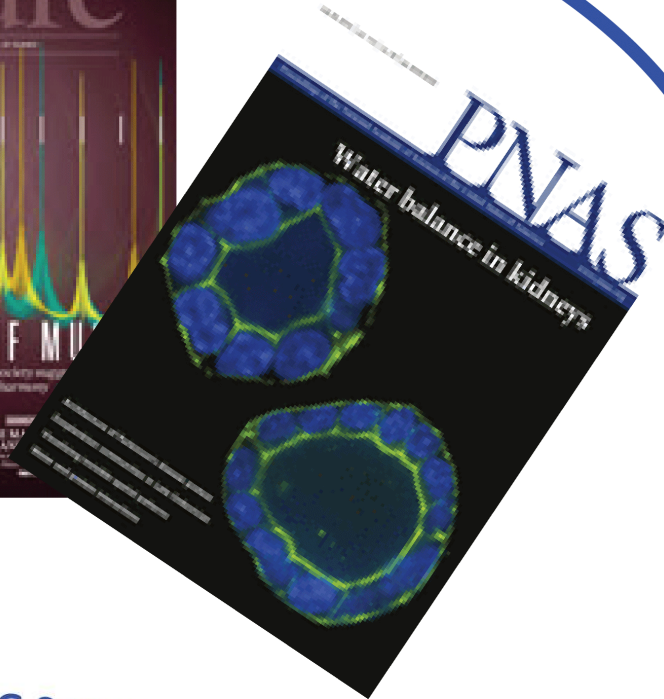
Groundwater ecology as a mature research field

Distribution, evolution and functional role of biodiversity



Implementing scientific knowledge in groundwater ecology

MAKING SCIENCE



IMPLEMENTING SCIENCE



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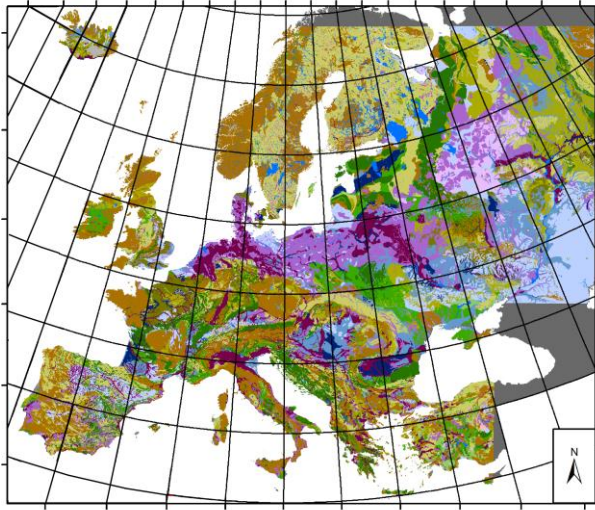
Montpellier, France
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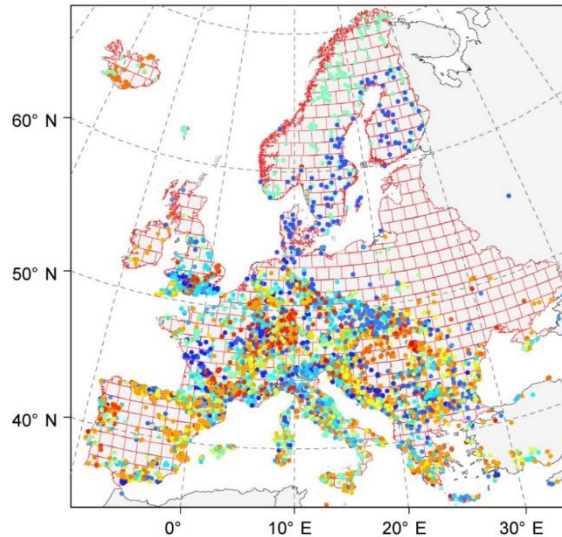
Meeting the needs of policy makers at national to continental scale

The groundwater habitat map of Europe (**GHME**)



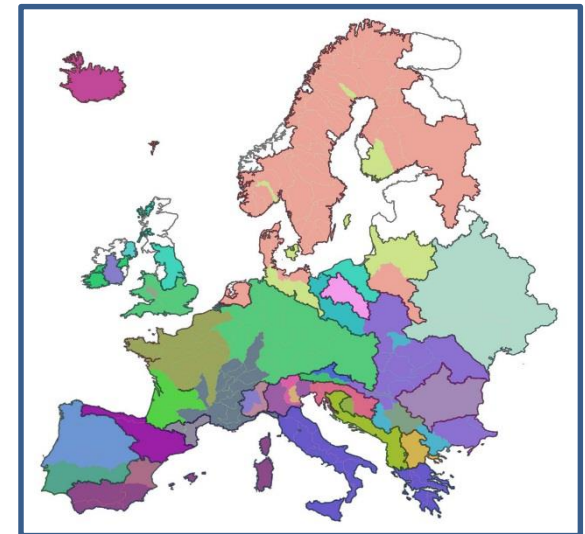
2013

The European groundwater crustacean dataset (**EGCD**)



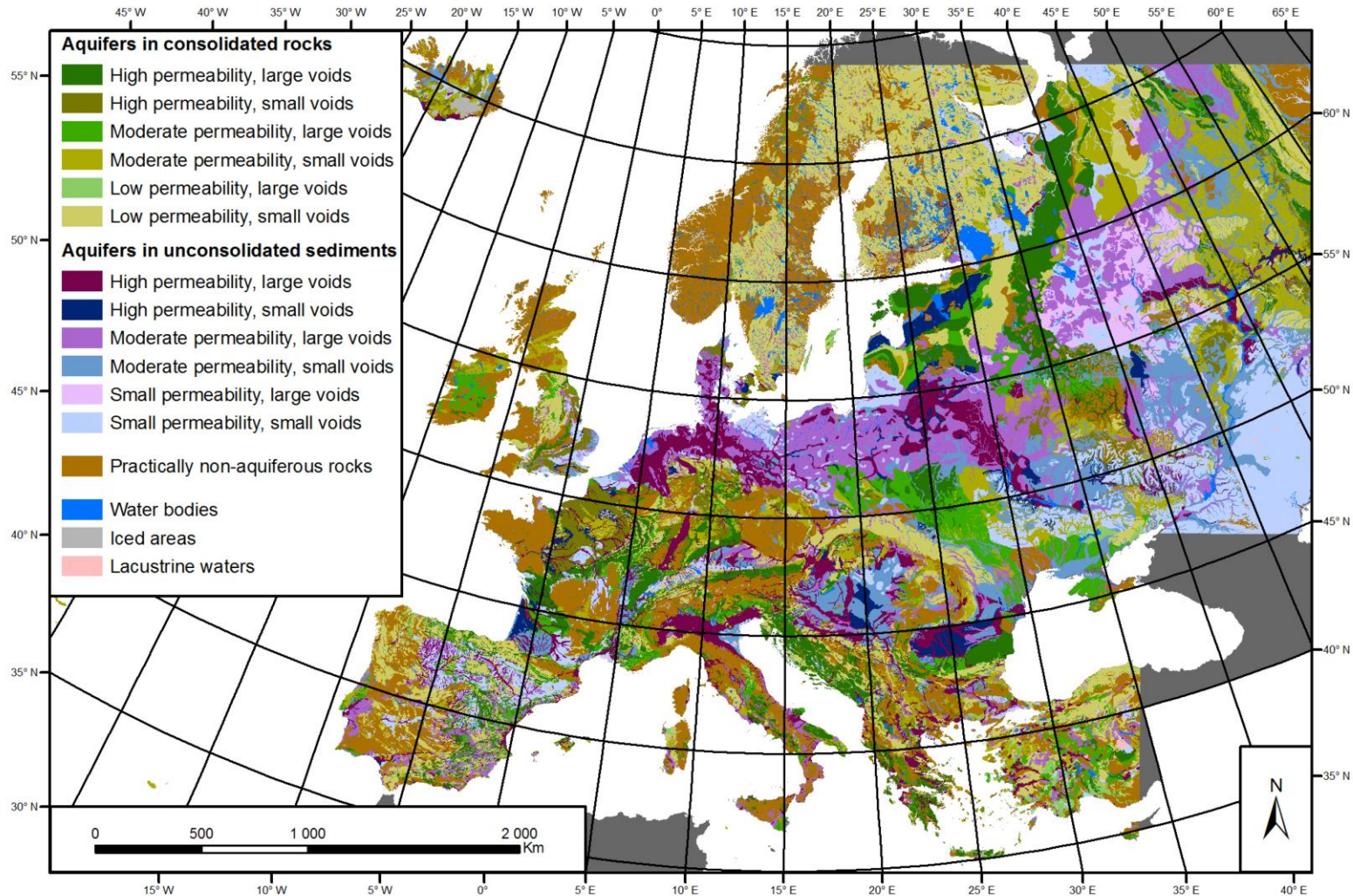
2014-2015

The groundwater bioregional map of Europe (**GBME**)



2015-2016

The groundwater habitat map of Europe (GHME)



Hydrogeology Journal (Cornu et al. 2013).

2013 Editors' choice

Available on the Global Freshwater Biodiversity Atlas



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September 2016

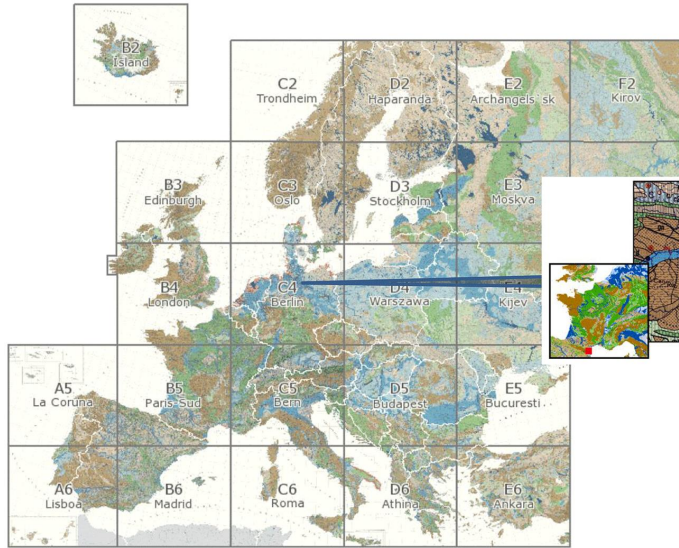
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The groundwater habitat map of Europe (GHME)

Georeferenced IHME

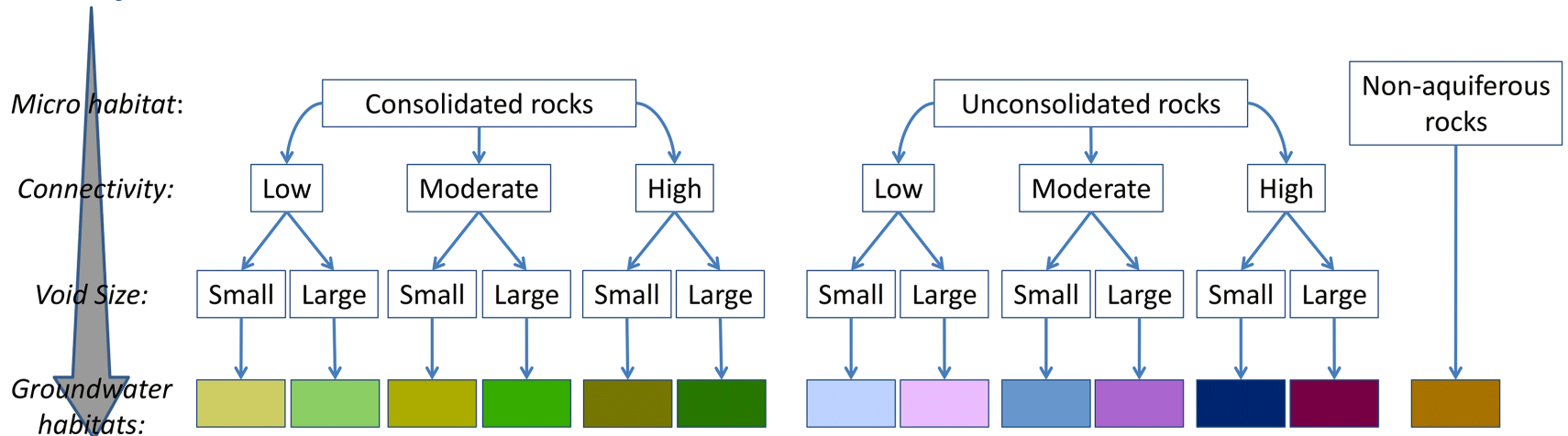


61,275 polygons
1,105 unique legends

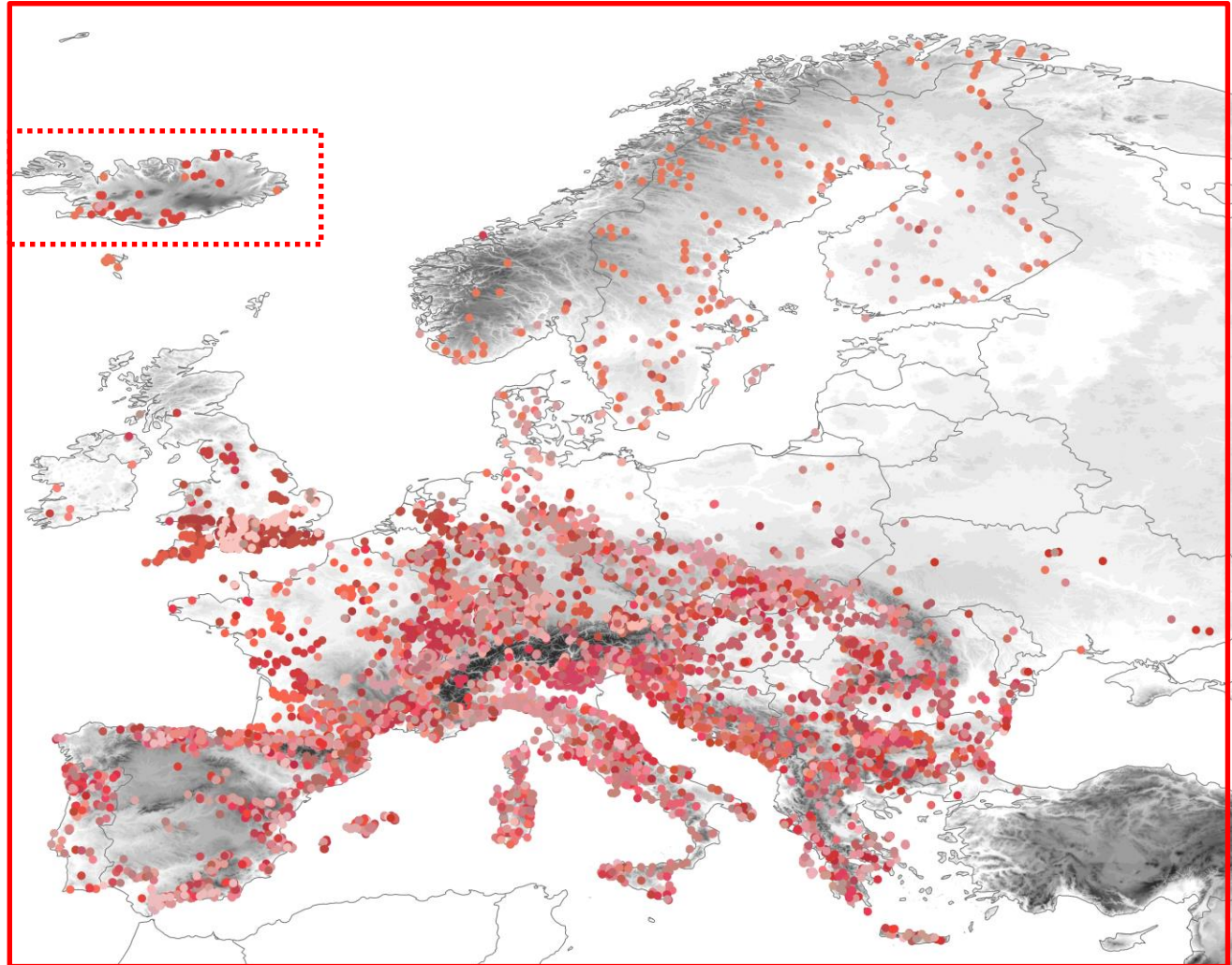
Vector version of IHME



From aquifers to habitats



The European groundwater crustacean data set (EGCD)



21,700 records, 12 orders, 46 families, 165 genera
and 1570 species of groundwater Crustacea

Patterns and drivers of groundwater biodiversity in Europe

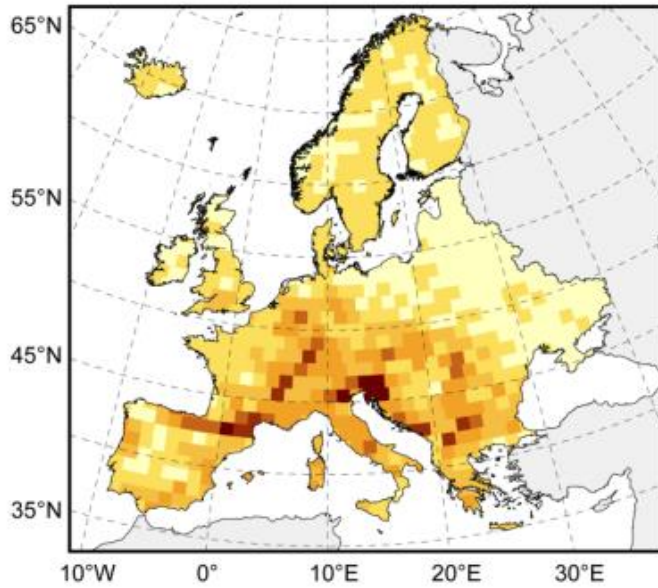
RESEARCH
PAPER



GLOBAL ECOLOGY AND
BIOGEOGRAPHY (2014)

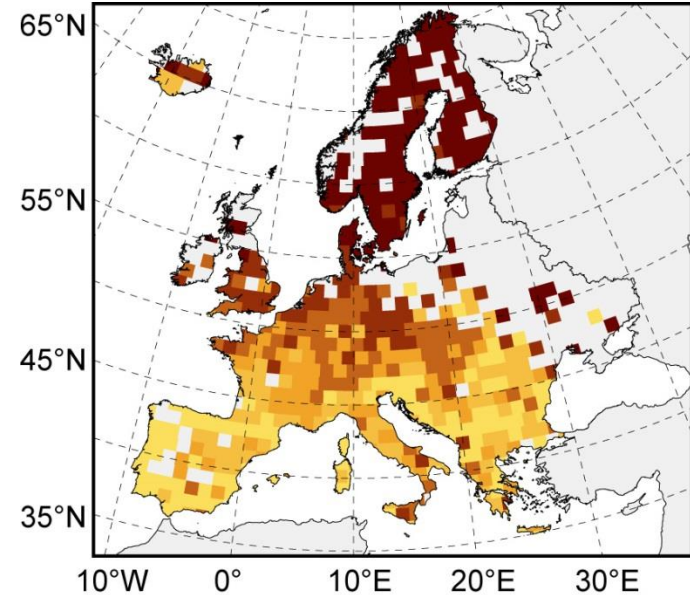


ECOGRAPHY (2015)



Species richness per cell

0 1-5 6-13 14-26 27-39 40-64 65-127



Median range size per cell (100 km)

< 2.6 2.6-6 6-10 10-15 15-24 > 24



Available on the Global Freshwater
Biodiversity Atlas



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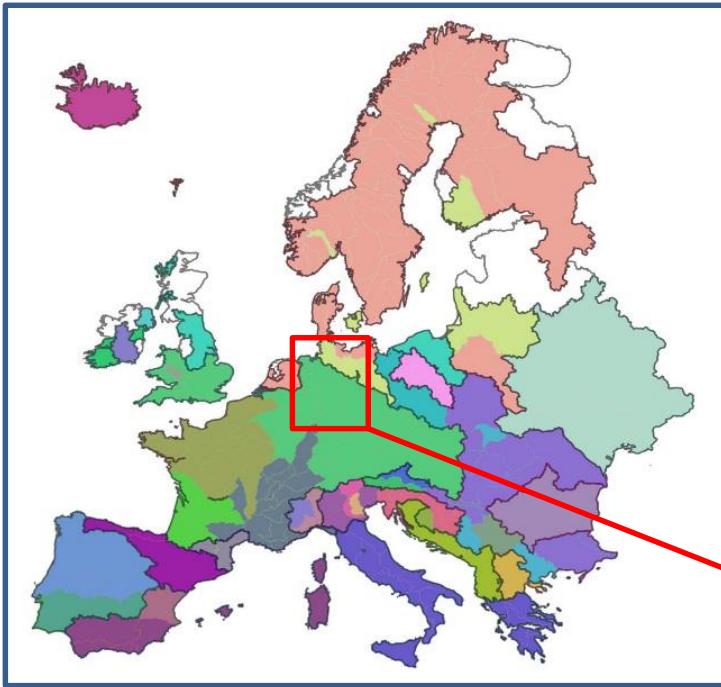
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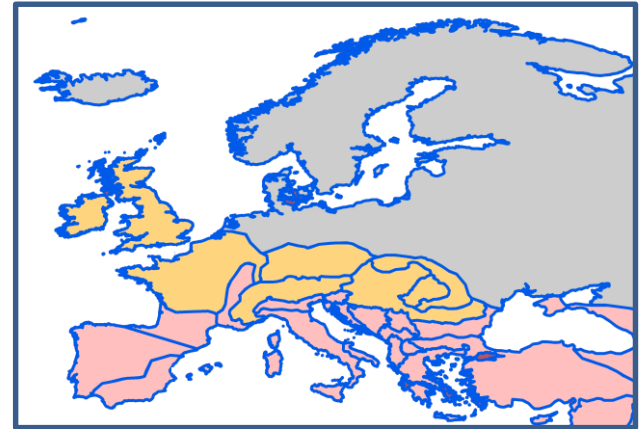
The groundwater bioregional map of Europe (GBME)

Fuzzy statistics applied to EGCD*



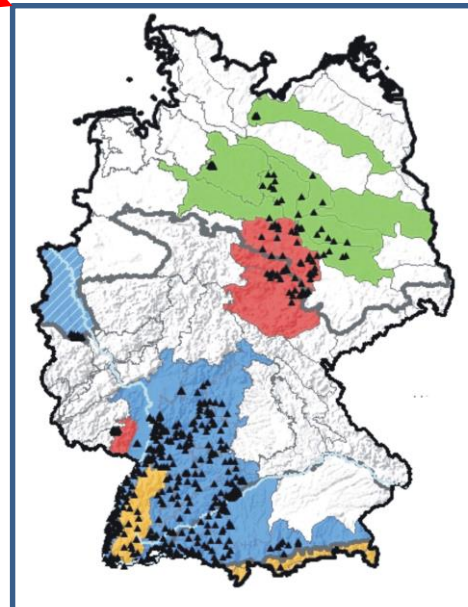
Stoch *et al.* (in progress)

Expert knowledge



Stygofauna Mundi
(Botosaneanu, 1986)

MDS



SCIENTIFIC
REPORTS

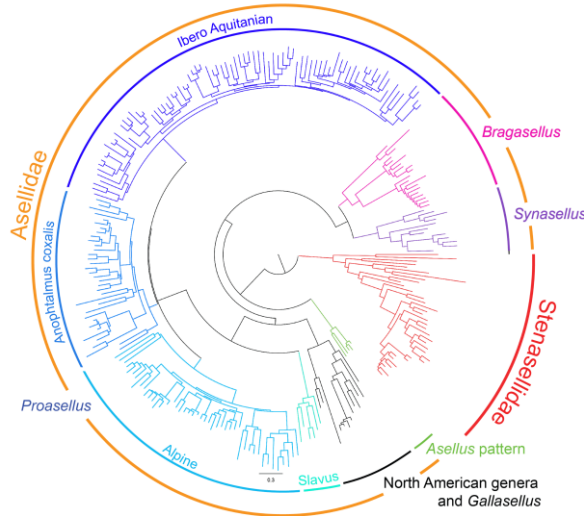
Stein *et al.* (2012)

* Olivero *et al.* (2013) Syst. Biol.

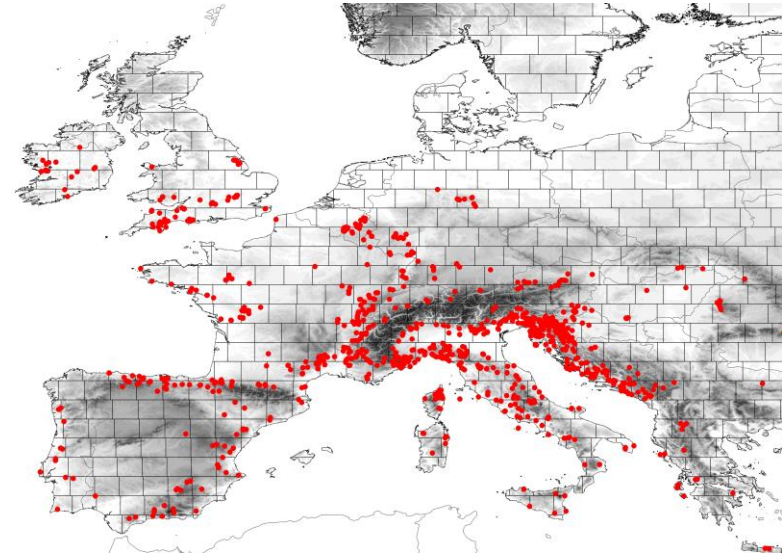
The next generation of biodiversity data bases and maps



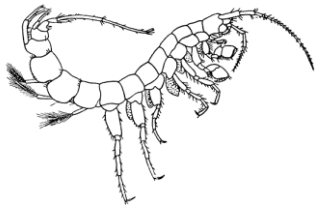
Large molecular phylogenies



DNA sequences from > 1000 sites



Morphology-based approaches



Species richness



Phylogenetic diversity

Beta diversity



Phylobetadiversity

Sampling of species



Environmental DNA

DNA-based approaches



Take home messages

- Mature research field of limnology



« We know so few »



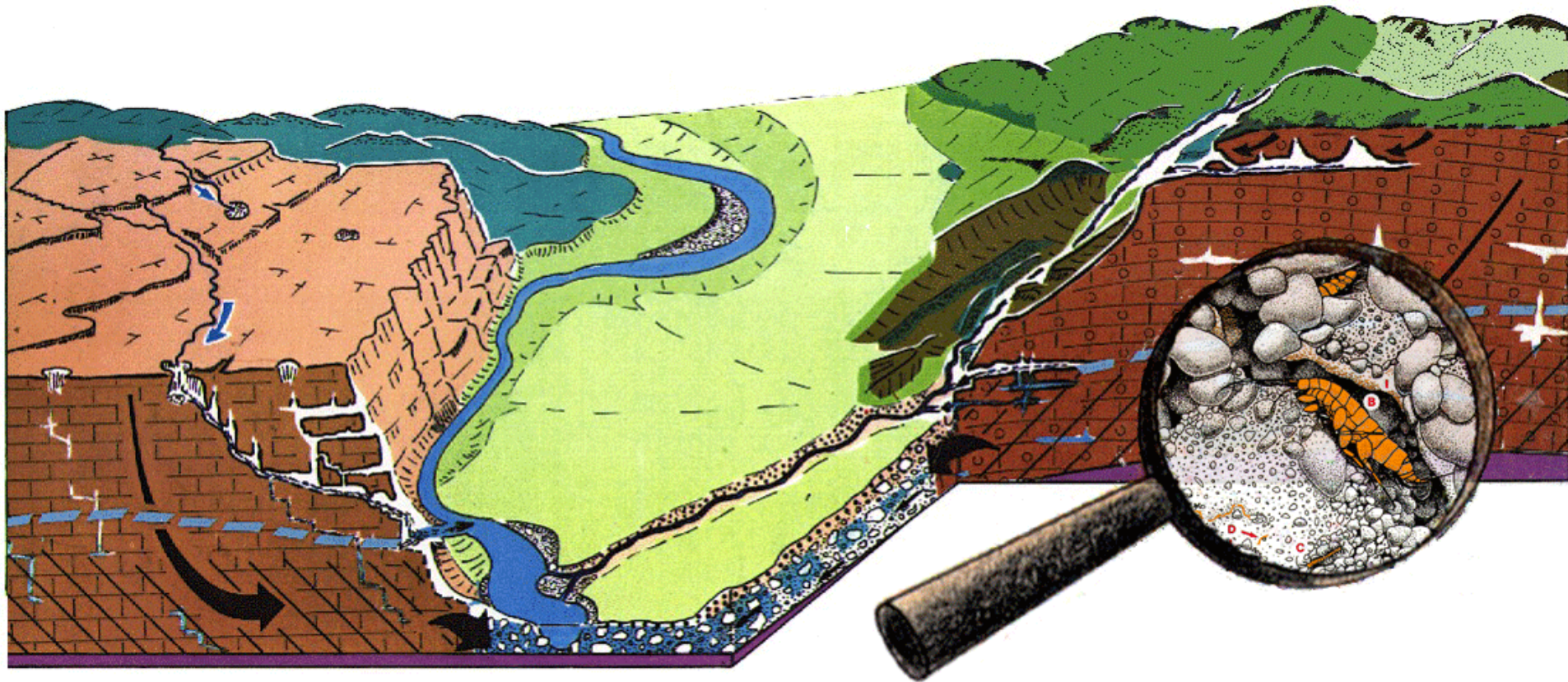
« Data are not available in a ready-to-use format »

Global Freshwater Biodiversity Atlas
The gateway to freshwater biodiversity maps

Member of the
**Freshwater
Information
Platform**

- Little constraints for integrating groundwater ecology into national and EU policies

European maps of habitats, bioregions, and species in groundwater



Florian Malard, *France* (speaker); Jean-françois Cornu, *France*; David Eme, *France*; Fabio Stoch, *Italy*; Cene Fiser, *Slovenia*; Diana Galassi, *Italy*; Pierre Marmonier, *France*; Maja Zagmajster, *Slovenia*

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