Development and use of biological indicators

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Biological conditions: trends

- A trend indicator for biological condition has been developed

- Dynamic dashboards have been developed

- Links to land use and pressures will be explored

- Wider use of WISE-2 data related to biodiversity

- Needs for improvement: Reduce geographic gaps

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Biological condition: trends for river biology

- Sorting the data in 3 groups: high+good (upper), moderate (middle) and poor+bad (lower)
- Calculating mean values for each group per year for water bodies with consistent time series
- Choosing starting year 2015 (due to higher number of consistent time series than earlier)
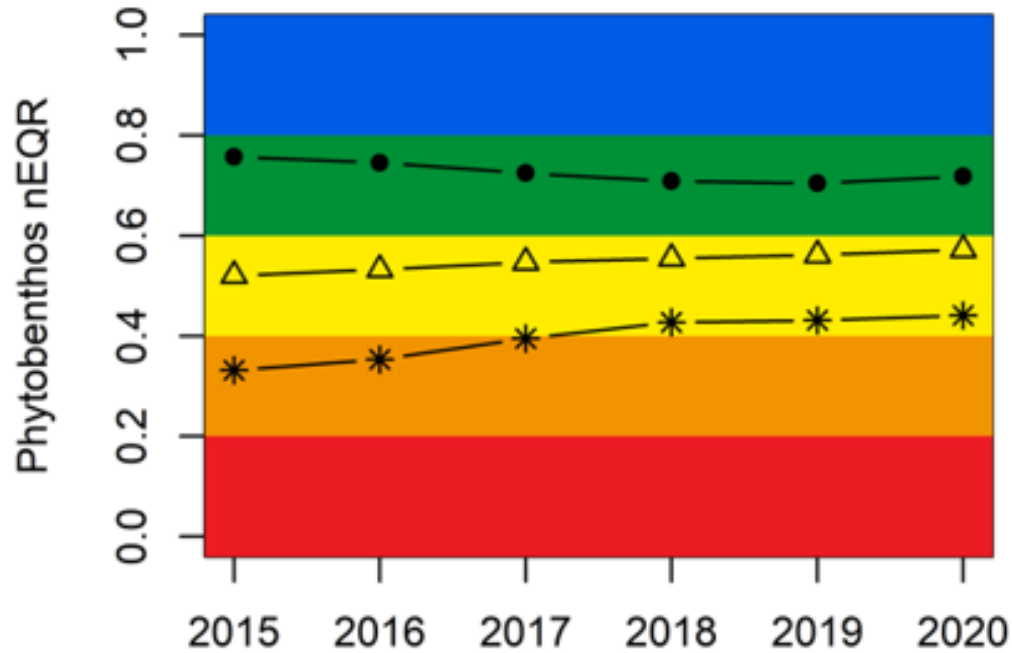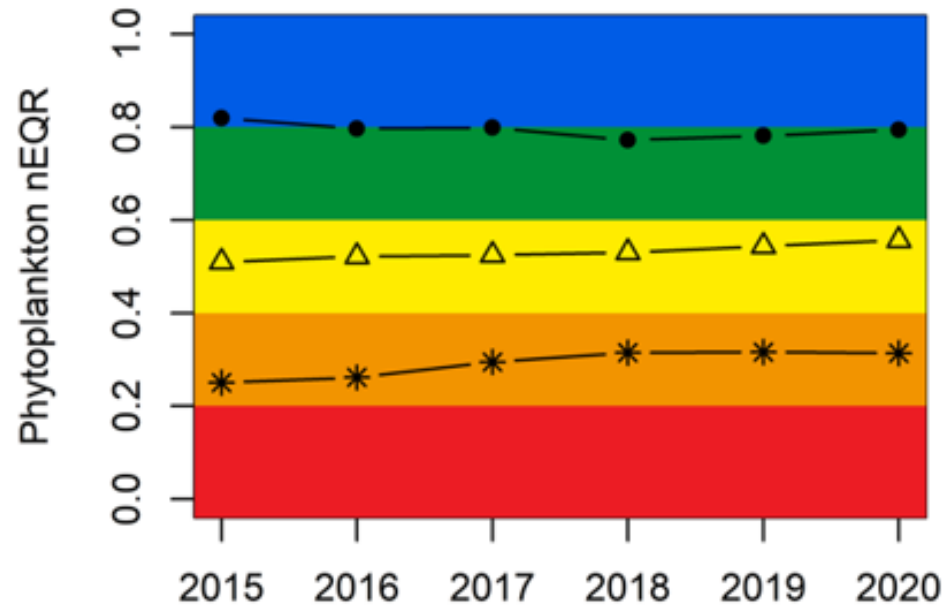

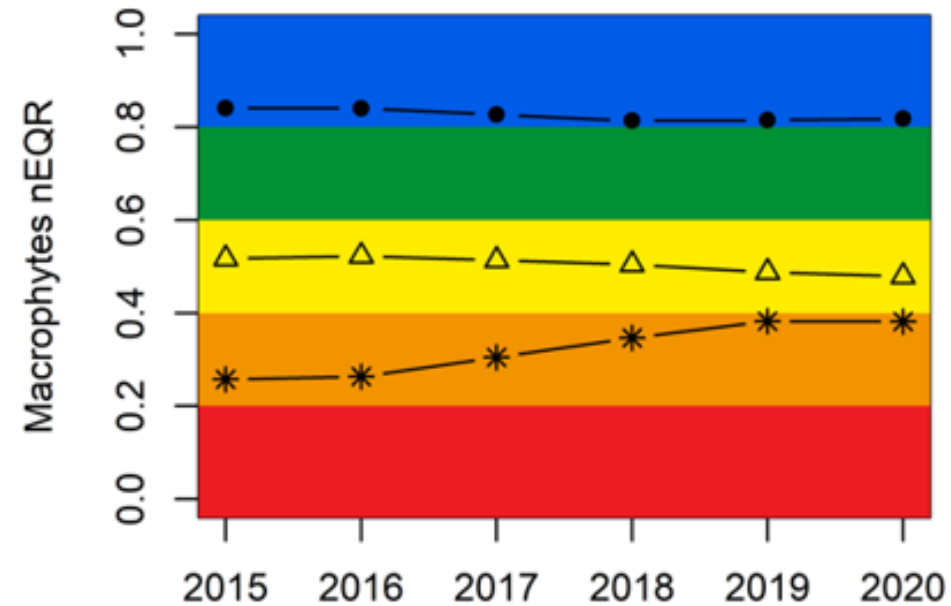EQR data from 14 countries with consistent time series for 897 (H&G)+ 279 (M)+ 85 (P&B) river water bodies
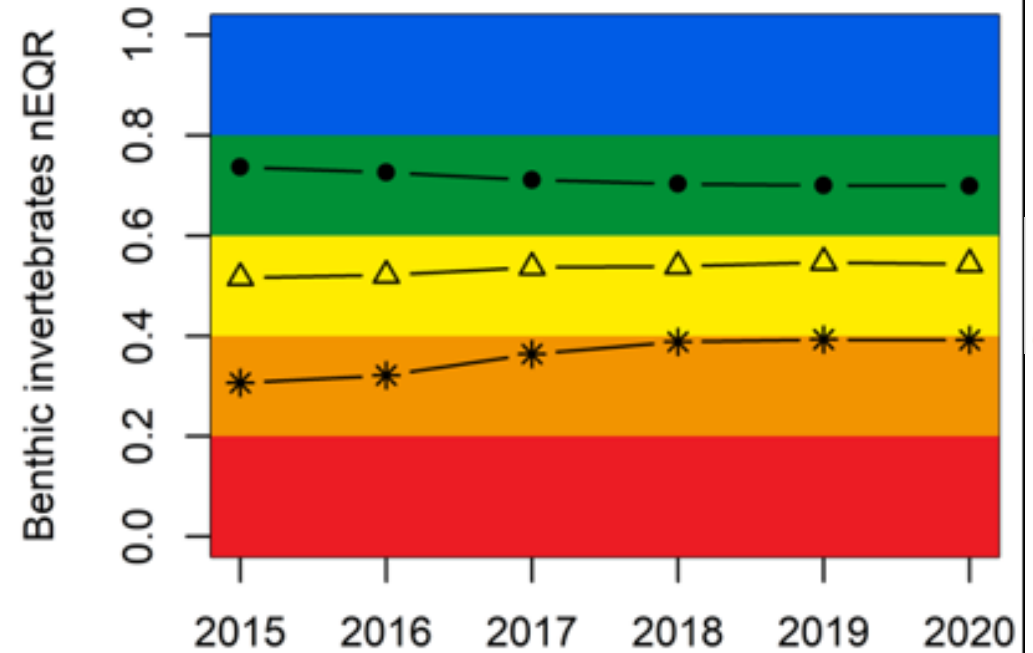
EQR data from 14 countries with consistent time series for 720 (H&G)+ 406 (M)+ 184 (P&B) river WBs

Biological condition: trends for lake biology

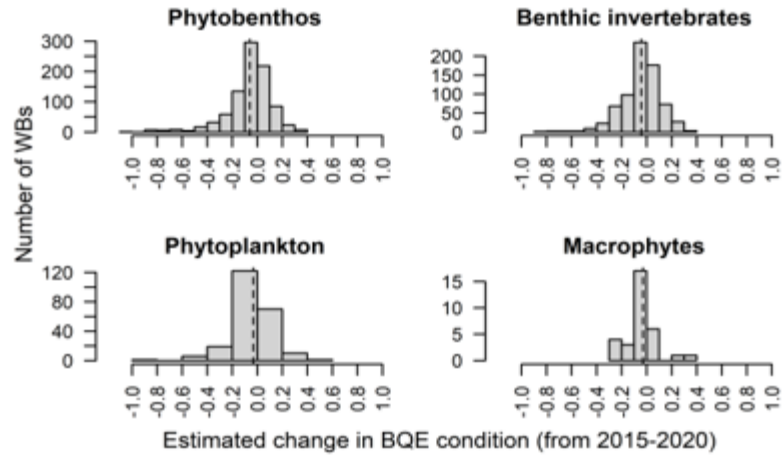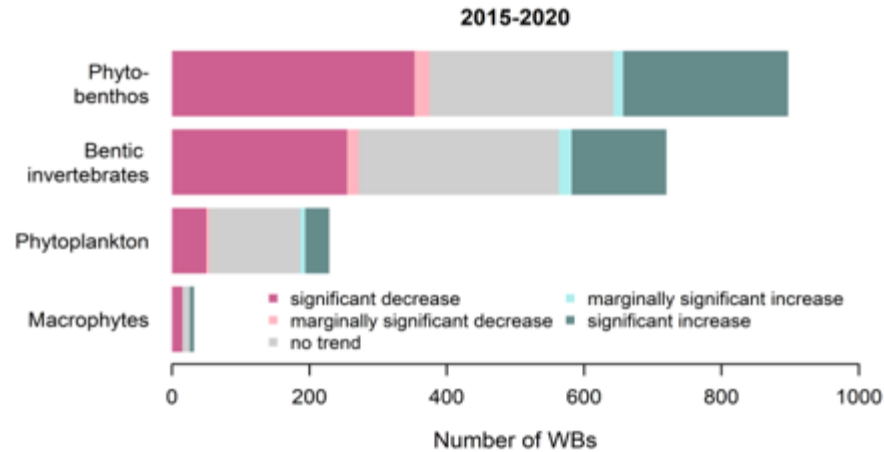EQR data from 9 countries with consistent time series for 229 (H&G)+ 83 (M)+ 59 (P&B) lake WBs

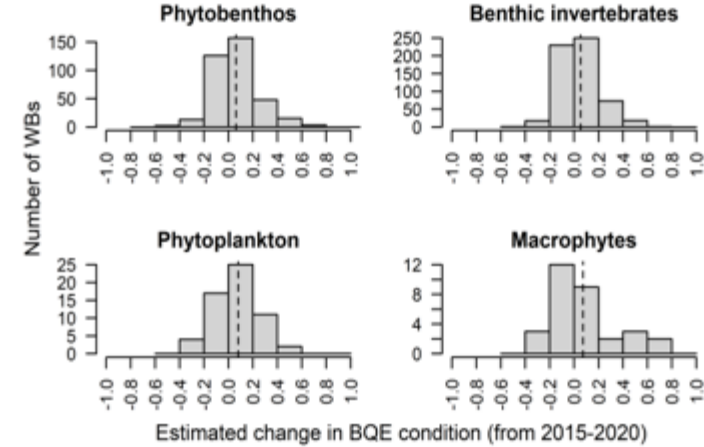EQR data from 6 countries with consistent time series for 32 (H&G)+ 13 (M)+ 18 (P&B) lake WBs

Biological condition: trends summary
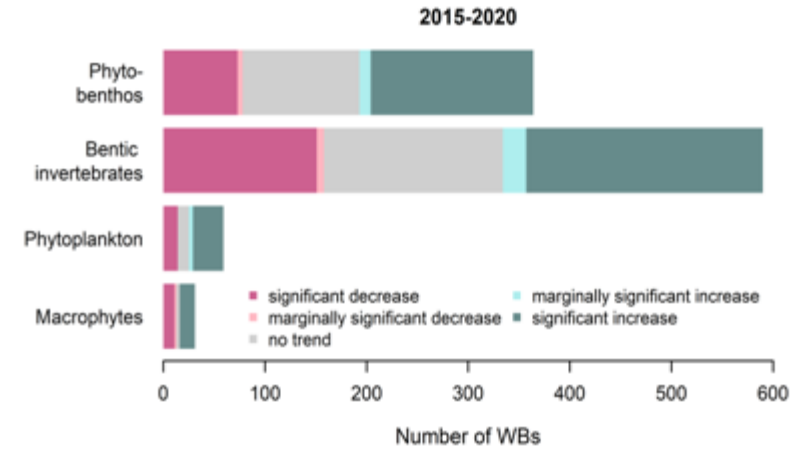
Dynamic dashboards developed: two examples

Class Value by Water Body - Map - 2021 - All in All
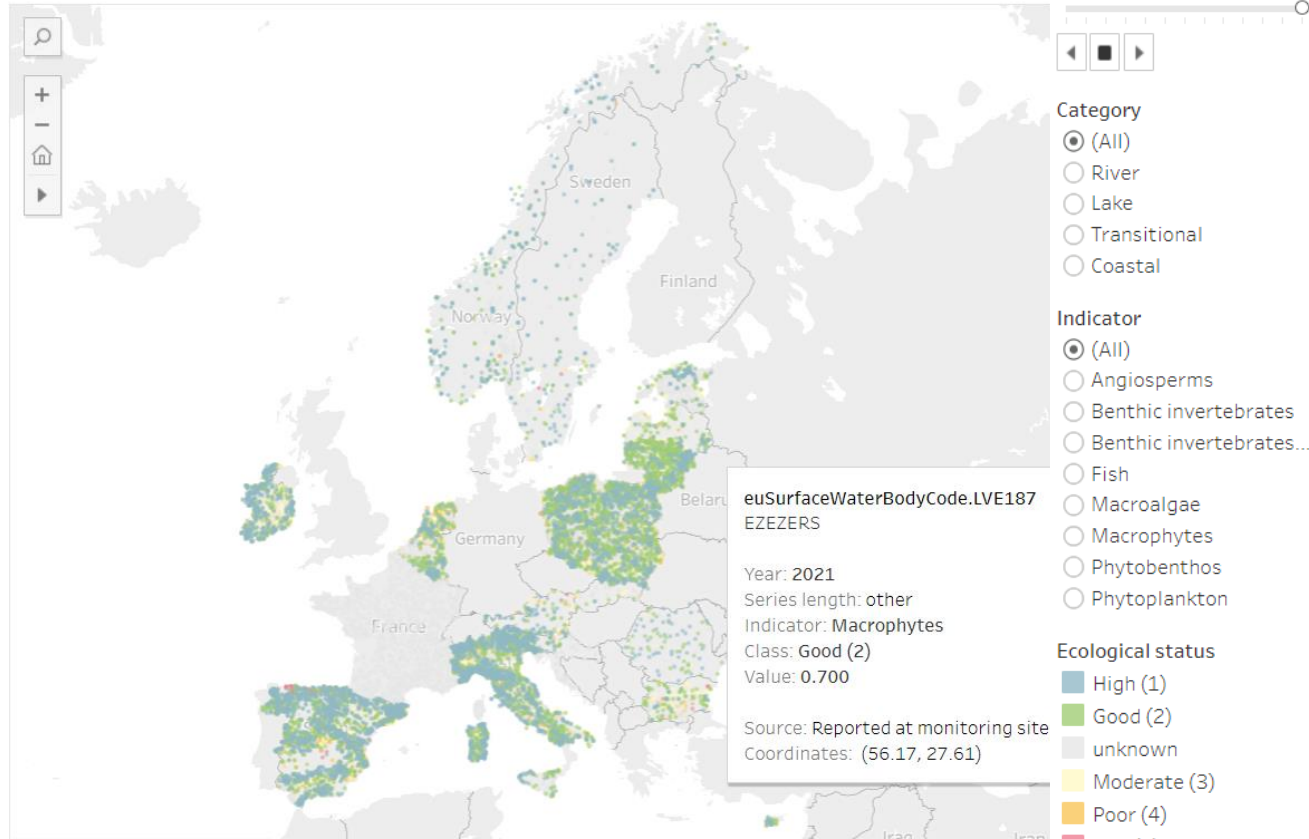
euSurfaceWaterBodyCode.LVE187
EZEZERS

Year: 2021
Series length: other
Indicator: Macrophytes
Class: Good (2)
Value: 0.700

Source: Reported at monitoring site
Coordinates: (56.17, 27.61)

Monitoring Year
2021

Category
- (All)
- River
- Lake
- Transitional
- Coastal

Indicator
- (All)
- Angiosperms
- Benthic invertebrates
- Benthic invertebrates...
- Fish
- Macroalgae
- Macrophytes
- Phytobenthos
- Phytoplankton

Ecological status
- High (1)
- Good (2)
- unknown
- Moderate (3)
- Poor (4)
- Bad (5)

Class Value by Year - Bar Chart - Benthic invertebrates in River

Category
- River
- Lake
- Transitional
- Coastal

Indicator
- Angiosperms
- Benthic invertebrates
- Benthic invertebrates.
- Fish
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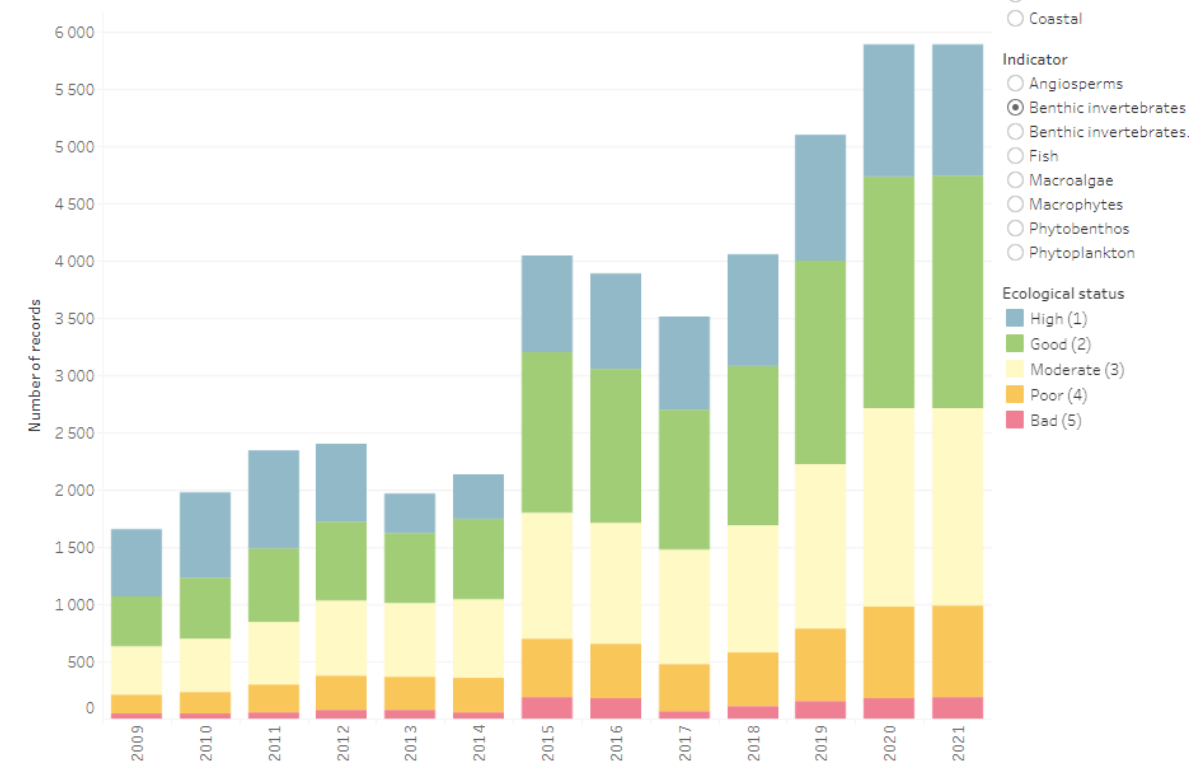
Links to land use and pressures will be explored

Is there a change in land use or climate that can explain the deteriorating trends for most of the high & good water bodies and the improving trends for the poor & bad water bodies?

Ideas (to be further explored in autumn 2023):

- use Corine land cover/land cover change and a map layer showing the location of the deteriorating versus improving water bodies
- use emission data trends and/or WFD pressure data change to explore links to water bodies with improving / deteriorating trends
- use climate data, e.g. summer mean temperature trend and frequency of extreme rain events and minimum flow for the high+good water bodies with deteriorating trends
- Combine nutrient concentrations from WISE-6 with biological data from WISE-2
- Explore regression tree analysis to test the importance of the different explanatory factors underlying the biological trends

Wider use of WISE-2 data related to biodiversity

- The data from WISE-2 can have added value for biodiversity trend monitoring as they explain the deviation from natural communities of freshwater flora and fauna on a harmonized scale from 0-1.

- The outputs from the WISE-2 reporting have therefore been adopted as Essential Biodiversity Variables (EBVs) by the EuropaBON H2020 project, which is developing a harmonized design for biodiversity monitoring across Europe.

  https://github.com/EuropaBON/EBV-Descriptions/wiki/Master-EBV-List

- A deliverable from this project on these EBVs will be drafted in autumn 2023 and published in spring 2024.

Consistent signal across different biological groups:

- Habitats with initial condition high / good: weak **deterioration**

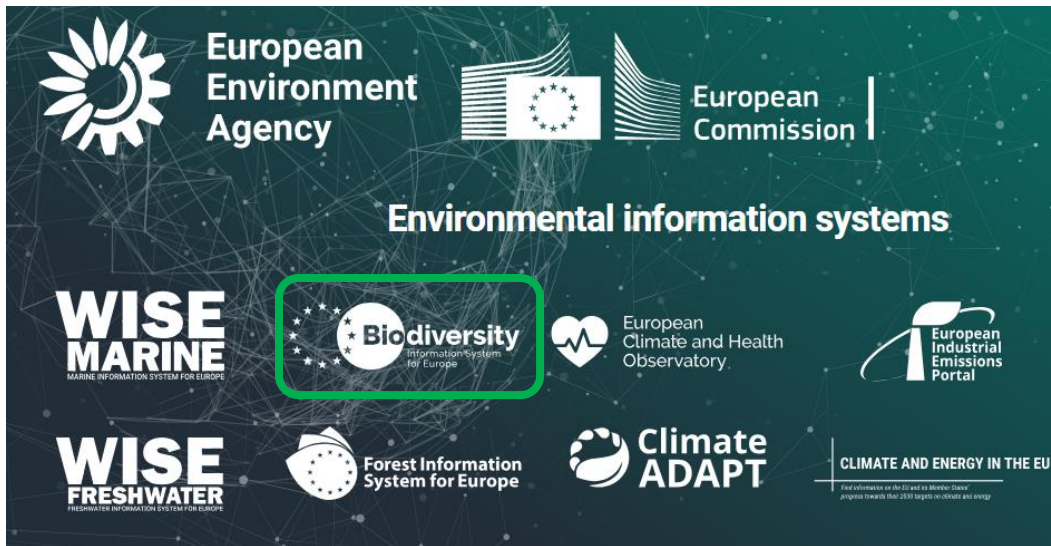- Habitats with initial condition moderate / poor / bad: weak **improvement**

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Wider use of WISE-2 data related to biodiversity

These outputs and regular updates are also relevant to link to EEA-BISE platform:

[Biodiversity data catalogues (europa.eu)](europa.eu)

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Needs for improvement: Reduce geographic gaps
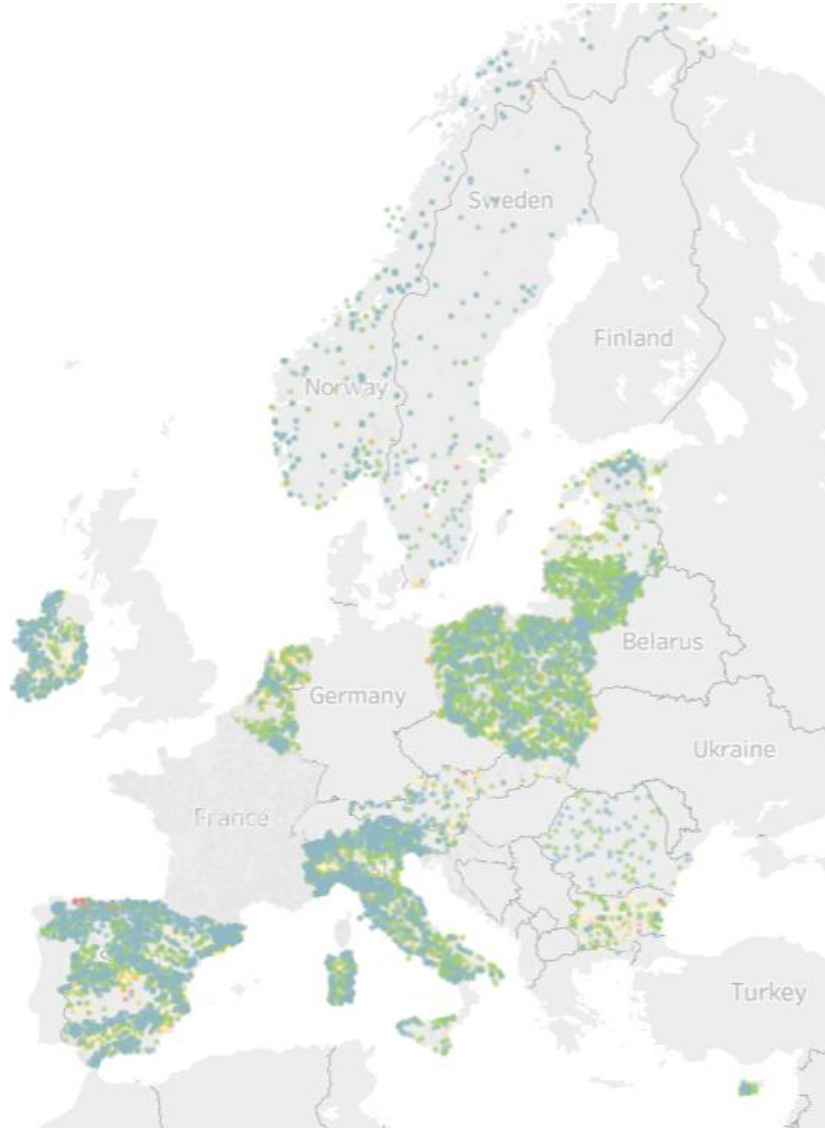
The WISE-2-data represent all the major regions of Europe

The data are highly useful for both aquatic biological condition and for biodiversity and habitat quality.

A better coverage are needed to get a more fully representative dataset at the EU level.

For this purpose we hope for data from more countries: Finland, France, Germany, Portugal, Czech Republic, Hungary, Greece and Croatia.

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