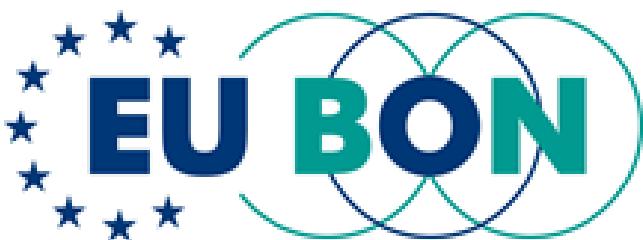




# The European Biodiversity Observation Network

## - Key Achievements -

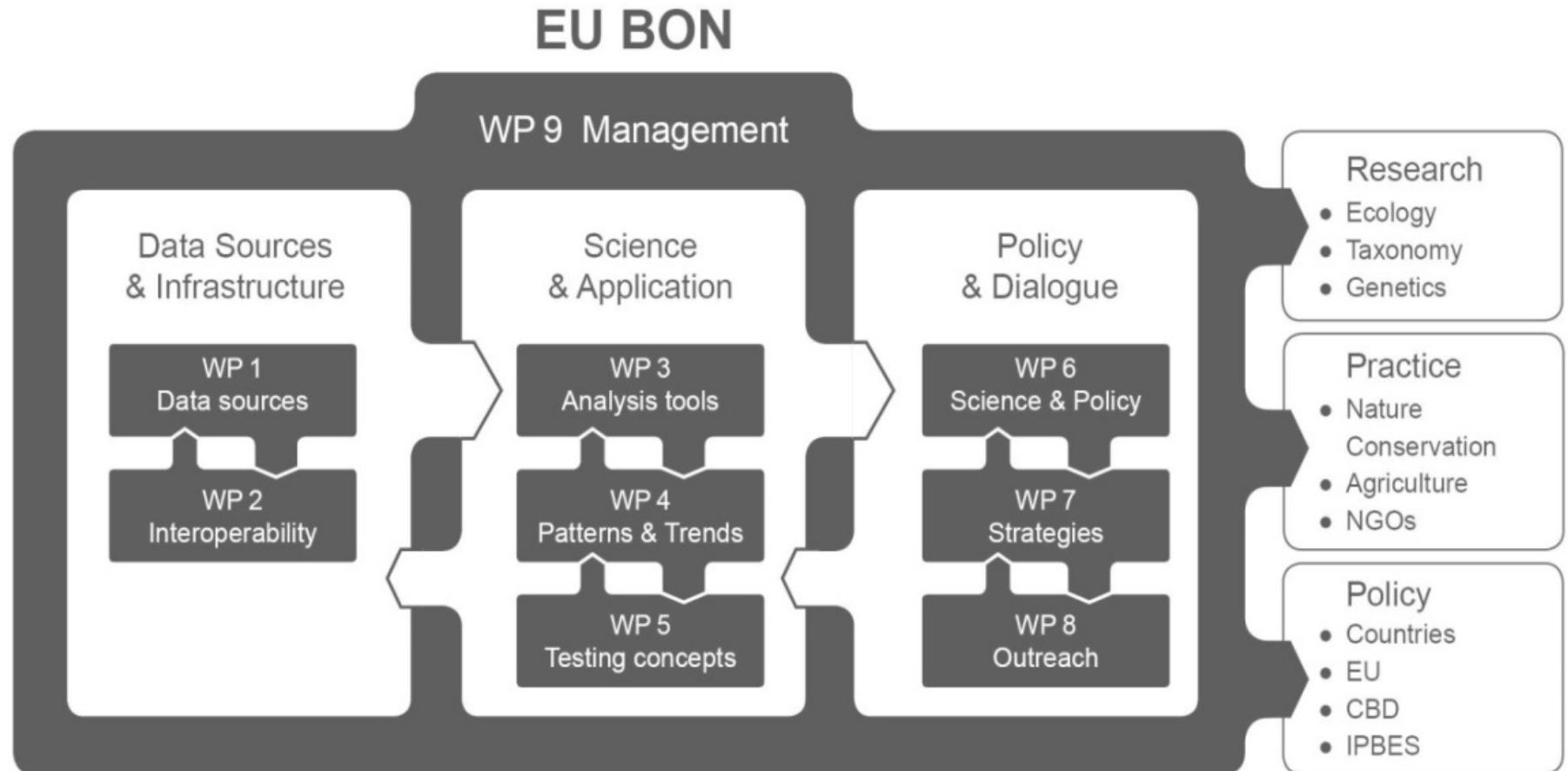


***Christoph L- Häuser***

*Museum für Naturkunde Berlin - Leibniz Institute for Evolution and  
Biodiversity Science*



# EU BON workflow and organization





# Data Integration



**Historical data**  
MfN research vessel Valdivia 1898, picture credits: MfN



**Monitoring data** (picture credits: Zeynel Cebeci CC-BY)



**Satellite data,**  
e.g. Sentinel-2 satellite  
picture: ESA



# Work programme & key outputs

**Strategies for targeted data mobilization *in / for Europe***

**Software tools & improved models**

*for better biodiversity data recording / mapping and analysis / visualization of patterns & trends*

**Recommendations for integrated national / regional biodiversity recording/monitoring schemes and information infrastructures**

**European Biodiversity Portal**  
*with new functionalities*

**Results & lessons learnt from EU BON (& other) sites**

*for regional/global network of long term recording/monitoring sites (LTER / ILTER)*

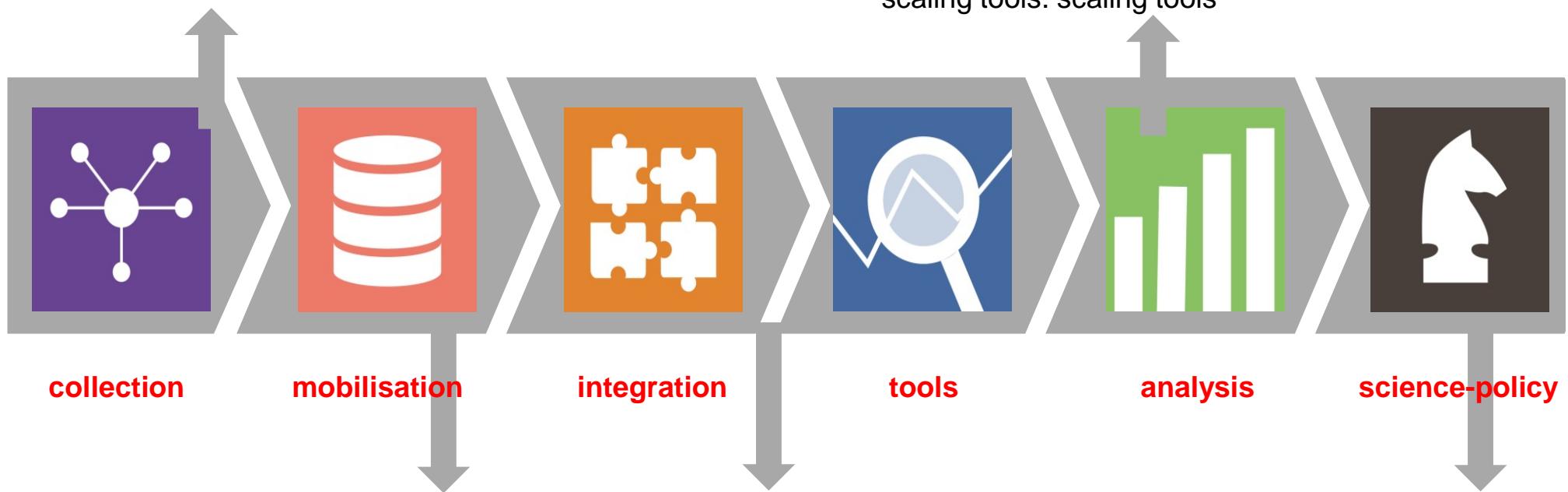
**Blueprint for a global biodiversity monitoring scheme / infrastructure (GEO BON)**



# EU BON - data tools & models

## Monitoring / collection

- Darwin Core, Taxonomic backbone, EuMon, ....



## Mobilisation / management

- **Citizen science module PlutoF**
- DINA web system
- Abundance data GBIF IPT
- Taxonomic Information Service

## Integration / standardisation

- **European Biodiversity Portal**
- Golden Gate Imagine
- Biodiversity Data Journal
- ARPHA publishing platform
- ...

## Visualisation / decision support

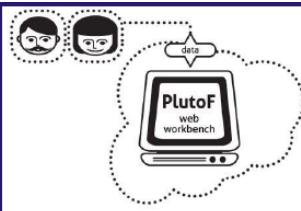
- AquaMaps
- GeoCAT
- ...



# Some examples of EU BON products for research and policy needs...

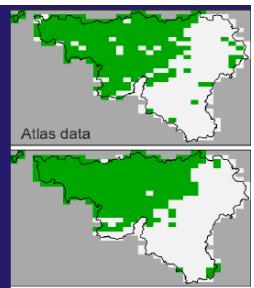
Data mobilisation and curation  
with PlutoF (<https://plutof.ut.ee/>)

DATA MANAGEMENT



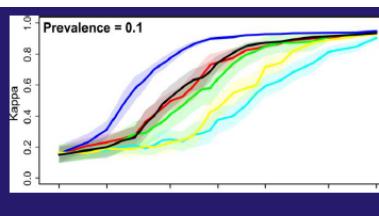
Hybrid SDMs - Accounting for  
both environmental and spatial  
aspects in species distribution  
models

DATA ANALYSIS



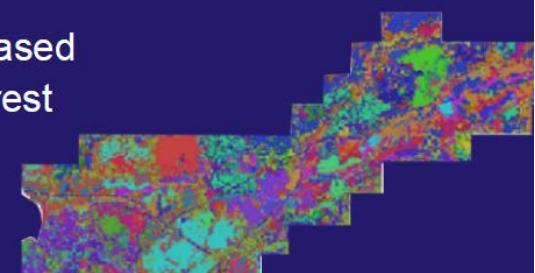
SDM profiling - a spatially  
explicit species distribution  
model evaluation tool

DATA ANALYSIS



Habitat classification tool based  
on hierarchical RandomForest

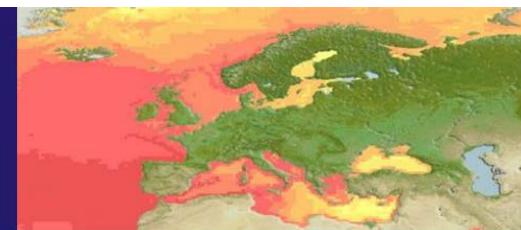
DATA ANALYSIS



EU BON Capacity Building for  
Biodiversity Data Managers

DATA MANAGEMENT

AquaMaps for  
EU BON  
DECISION-SUPPORT  
TOOL



# BiMAT

The EuMon integrated Biodiversity Monitoring & Assessment Tool



4<sup>th</sup> EU BON Roundtable Museum für Naturkunde  
17. November 2016, Berlin

museum für  
naturkunde  
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Leibniz-Gemeinschaft



# EU BON european biodiversity portal

- offers EU BON derived products, tools and knowledge
- communication interface between biodiversity researchers, data repositories, interested communities and policy makers.
- make biodiversity data and information discoverable, accessible and digestible



[www.biodiversity.eubon.eu](http://www.biodiversity.eubon.eu)





# Analysis Tools (examples)

Home

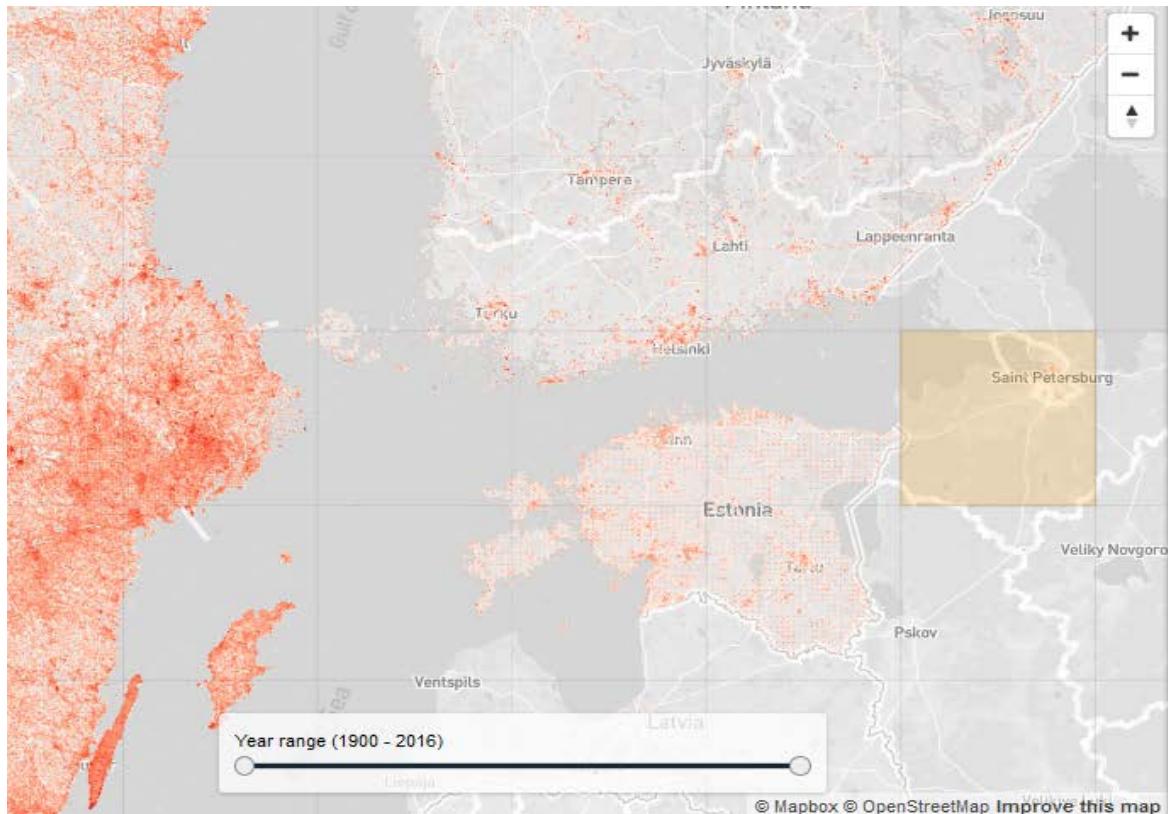
Data ▾

Analysis ▾

Services ▾

Products

Citizen Science



×



62 datasets in this area

With data from 1900-2016

- Amphibian specimens
- Ascomycetes of Russian Fennoscandia
- Australia's Virtual Herbarium
- Australian National Herbarium (CANB)
- Botanical Museum, Copenhagen, the Phycology Herbarium
- Botany (UPS)
- Bryophyte herbarium, Trondheim (TRH)
- CAS Ichthyology (ICH)
- Collection Ornithologie - SNSD
- Entomological Collections (NHRS), Swedish Museum of Natural History (NRM)
- EOD - eBird Observation Dataset
- Estonian University of Life Sciences
- Fungus Collections at Staatliches Museum für

## Spatial Dataset Browser

helps to identify and access datasets of interest when generating Essential Biodiversity Variables (EBVs) for species distribution.

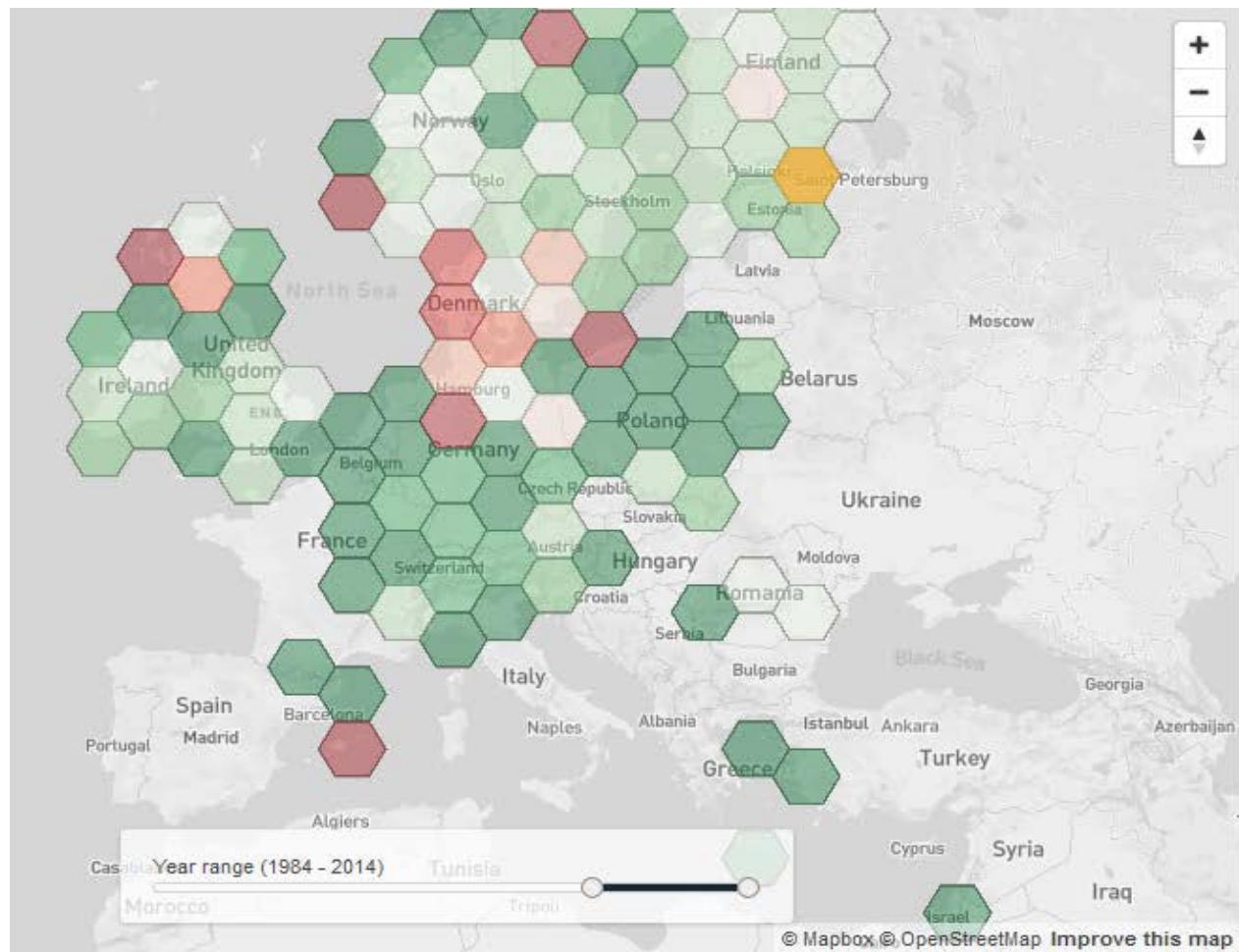


4<sup>th</sup> EU BON Roundtable Museum für Naturkunde  
17. November 2016, Berlin

museum für  
naturkunde  
berlin

Leibniz  
Gemeinschaft

# Analysis Tools (examples)

[Home](#)
[Data](#)
[Analysis](#)
[Services](#)
[Products](#)
[Citizen Science](#)


## Species populations trends

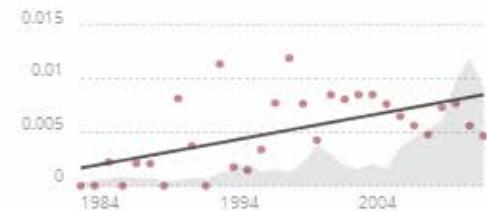
A pilot to explore if GBIF data supports inference of population trends. [Read full explanation](#)

- 1 Select a species

- 2 Select binning  size

- 3 Select the minimum number of years of data required per location to be included:

- 4 Select area by clicking on the map or shift-dragging a bounding box.



## Species Population Trend Browser

helps to analyse species trends in GBIF mediated data. **Example:** the butterfly species 'Red Admiral' *Vanessa atalanta*, **green:** increasing populations, **red:** declining.

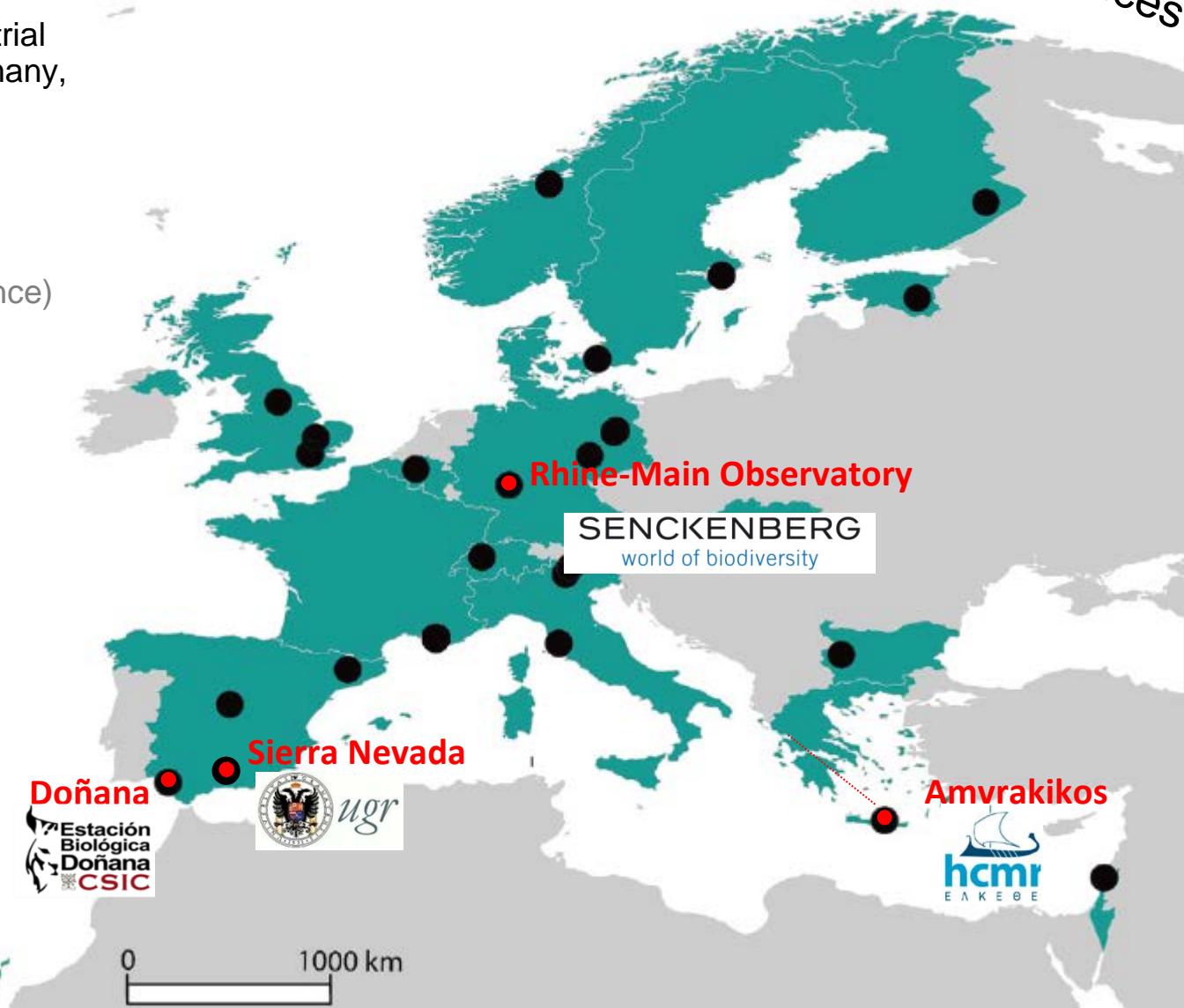


## EU BON test sites

1. Sierra Nevada (Spain, LTER) - terrestrial
2. Doñana (Spain, LTER) - terrestrial
3. Rhine-Main Observatory (Germany, LTER) - freshwater
4. Amvrakikos (Greece) - marine

### Additional sites

- INPA-Brasil (Amazonia)
- Mercantour National Park (France)
- Alpi Marittime Park (Italy)
- HaMAARAG (Israel's National Assessment Program)



# Factsheets, infographics and policy briefs

for scientists

## AquaMaps Create-Your-Own-Map (CYOM) Tool

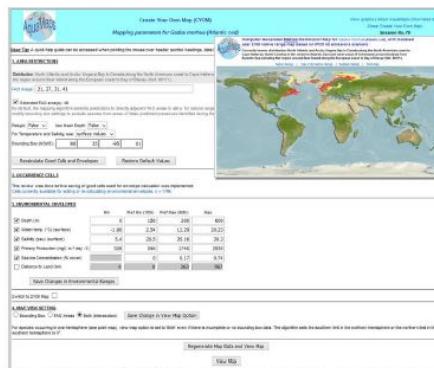
### DATA ANALYSIS

Rainer Froese ([r.froese@peumar.de](mailto:r.froese@peumar.de))

#### Overview

AquaMaps is a species distribution modelling approach that combines ecological information, occurrence data and environmental layers to derive a species' environmental tolerances, and predict its natural distribution based on habitat suitability. These predictions are illustrated through color-coded species range maps in half-degree latitude and longitude cell resolution. While this approach enables the generation of a large number of species distribution maps, a map may sometimes be incorrect due to sampling biases, outdated input data, or data encoding errors. In such cases, map predictions can be improved if reviewed by an expert.

The Create-Your-Own-Map (CYOM) tool is a web-interface tool linked to an AquaMaps species distribution map that allows species experts to edit an erroneous map, and regenerate and publish an improved version. The interface allows an expert to edit a map in four areas: (1) area restrictions that define the known native range of a species; (2) point data used in deriving environmental tolerance of a species; (3) species tolerance threshold estimates (environmental envelopes) for different environmental parameters and which set of parameters to use to predict the distribution of a given species; and (4) the map display settings (see Fig. 1). Actions/edits that can be performed using the CYOM are outlined in Table 1.



**Figure 1.** Create-Your-Own-Map (CYOM) interface. Shown are four sections of mapping parameters used in modelling the distribution range of Atlantic cod (*Gadus morhua*). The interface is interactive and allows a species expert or map reviewer to change the map settings and regenerate an edited species map. Corresponding native distribution map in inset.



for decision  
makers

### CHANGE & BIODIVERSITY

#### What may happen to bony fishes in the North Sea?

Climate change is predicted to change the distribution, number and composition of species of bony fishes around the world during the upcoming century. In the North Sea, these changes have been projected to 2100 based on modelled environmental conditions under the Intergovernmental Panel on Climate Change's A2 emissions scenarios. This is of relevance to Aichi Biodiversity Target 10 (Convention on Biological Diversity), showing potential climatic impacts on community composition in ecosystems.



The EU BON project seeks to build a European Biodiversity Observation Network that facilitates access to biodiversity information of relevance to policy.  
[www.eubon.eu](http://www.eubon.eu)

### ECONOMIC VALUE

**€620.5 MILLION**

Annual total value of landings for 2006, comprising over of total fisheries landings revenue in the North Sea.



### REFERENCES

- \* Time frame based on data obtained from Kaschner et al. (2013).
- \*\* All species counts based on modelled environmental conditions.
- 1 Obtained from the Sea Around Us project ([www.searoundus.org/](http://www.searoundus.org/)) at the University of British Columbia, Canada.
- 2 Atlantic mackerel graphic produced by Koenig, K., & Rius-Barba, S. (2013). Aquatmaps: Predicted range maps for aquatic species collection for use and occupancy maps. [www.aquatmaps.org](http://www.aquatmaps.org). Version 08/2013.
- 3 Aboriginal Mapping Networks icon Collection for Use and Occupancy Maps (version 1.1, March 2012). [www.amn.ca](http://www.amn.ca). Version 07/2013.
- 4 Infographic produced by Lauren Wachter (EUMAP-MC).



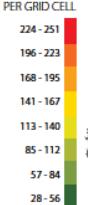
**Bony fishes** include a broad range of fishes with bony skeletons. In the North Sea, these include commercially important species such as Atlantic salmon, Atlantic herring, European anchovies, Atlantic cod, haddock, and Atlantic mackerel. Bony fishes form an important part of the North Sea food web and contribute to local economies and international food security through fisheries.



2

### SPECIES DIVERSITY

NUMBER OF SPECIES PER GRID CELL



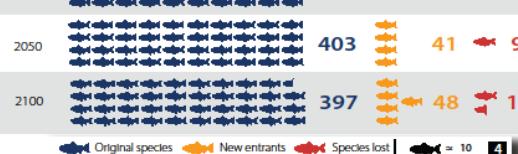
### SPECIES COMPOSITION

Current\*

2050

2100

Original species



Contact Details

Museum für Naturkunde Berlin, Germany and EU BON Project Coordination:  
Dr. Christoph Hauser ([christoph.hauser@mfn.berlin.de](mailto:christoph.hauser@mfn.berlin.de))

4



POLICY BRIEF X

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[www.eubon.eu](http://www.eubon.eu)

**EU BON POLICY BRIEF ON OPEN DATA**

**EU BON AND OPEN ACCESS**

With the "Joint Declaration on Open Science for Europe" the EU has committed to making scientific information produced in Europe as defined by the European Commission.

**Intellectual property rights on biodiversity data!**

The inappropriate application of intellectual property rights (copyright) impedes access to scientific data, which is often the result of public funding and requires a creative form of presentation. It does not cover ideas, our content, scientific knowledge and standardised methods. It does not apply to data that are freely available because, traditionally, few data are released, they are often backed up in traditional scientific literature, or are not of concern over intellectual property rights.

These limitations concern us. Alternative approaches are available. Major data repositories, such as GBIF for observational data and IOC/IHSS for modelling data, and Google Scholar for publications are not subject to their owners' intellectual property rights. For example, evolutionary research.

Copyright protection of scientific data under new circumstances, but more appropriate, can be achieved with agreed standards that a data collection is, the less likely copyright considerations will apply.



POLICY BRIEF A

The Group on Earth Observations' Biodiversity Observation Network, of which EU BON is a part, has developed a set of principles for open access to biodiversity data.

**Optimizing long-term monitoring schemes for biodiversity mapping**

**Biodiversity is undergoing important decline worldwide, due to a range of human activities. Monitoring data can be used to track these changes in time and space, and to evaluate the effectiveness of political measures to halt this loss. Understanding and reporting on biodiversity changes is required for tracking the progress of biodiversity conservation, and for setting and evaluating decision-making of possible positive or negative side effects of other policy decisions.**

**Biodiversity data requirements for conservation decision-making**

Long-term biodiversity monitoring schemes are required across different spatial scales and administration to reflect temporal trends in biodiversity. In such schemes, field data are often rapidly recorded in a network of sites according to established procedures. Monitoring data can then be used to generate indicators to monitor the changes in biodiversity over time. They require a clear definition of what is to be monitored (e.g. under Article 19 of the EU Biodiversity Strategy Directive). Mapping the distribution of species and documenting how such distributions change over time is key to effective conservation planning. Large-scale biodiversity atlas projects, such as the European Biodiversity Observation Network, provide a good deal of geographical information on biodiversity, which can then be used effectively for decision-making.



POLICY BRIEF A

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***Thank you very much for your attention!***

