



Showcasing EU BON's digital products

Communicating products clearly to users and decision-makers

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... and all of our EU BON colleagues!



UNEP



WCMC



How do we get from science to policy?



Digital science and decision-support tools

Possible climate change impact on bony fish diversity in Large Marine Ecosystems

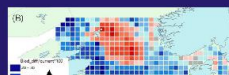
DECISION-SUPPORT TOOL

Overview

AquaMaps is an approach to generating maps of possible future climate change impacts on bony fish diversity. The modelling approach uses estimates of species tolerances with respect to temperature, salinity and distance to land, as probabilities of species occurrence, are generated under local environmental conditions to determine probabilities are illustrated through color-coded maps of resolution. And now, with future climate change on global distribution of marine species A2 emissions scenario for the years 2050 and 2100, this tool shows predictive species richness in Europe for the current period, 2050 and 2100 change in species richness in by the years 2050 and 2100.



Figure 1. Tool on possible climate change impact on bony fishes in the North Sea. Shown are the richness predictions for the years 2050 and 2100, considering species with >50% probability of occurring naturally.



Alpha adjusted SDMs - Accounting for biotic interaction in species distribution models
DATA ANALYSIS

Overview

Species distribution models (SDMs) predict the potential distribution of species under characteristic fine-resolution environmental conditions in which the species occurs. However, the potential effects of biotic interaction on species distribution are often ignored. The **Probability of Occurrence (PoO)** for a focal species is not a site's suitability (alpha diversity) and by the suitability of the sites to other species. To account for these biotic interactions, the **alpha-adjusted PoO** of all species in all sites based on the relative PoO of the different species. Thus, the alpha-adjusted PoO is high relative to other species' PoOs. The alpha-adjusted SDMs are simultaneously.

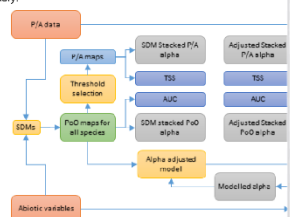
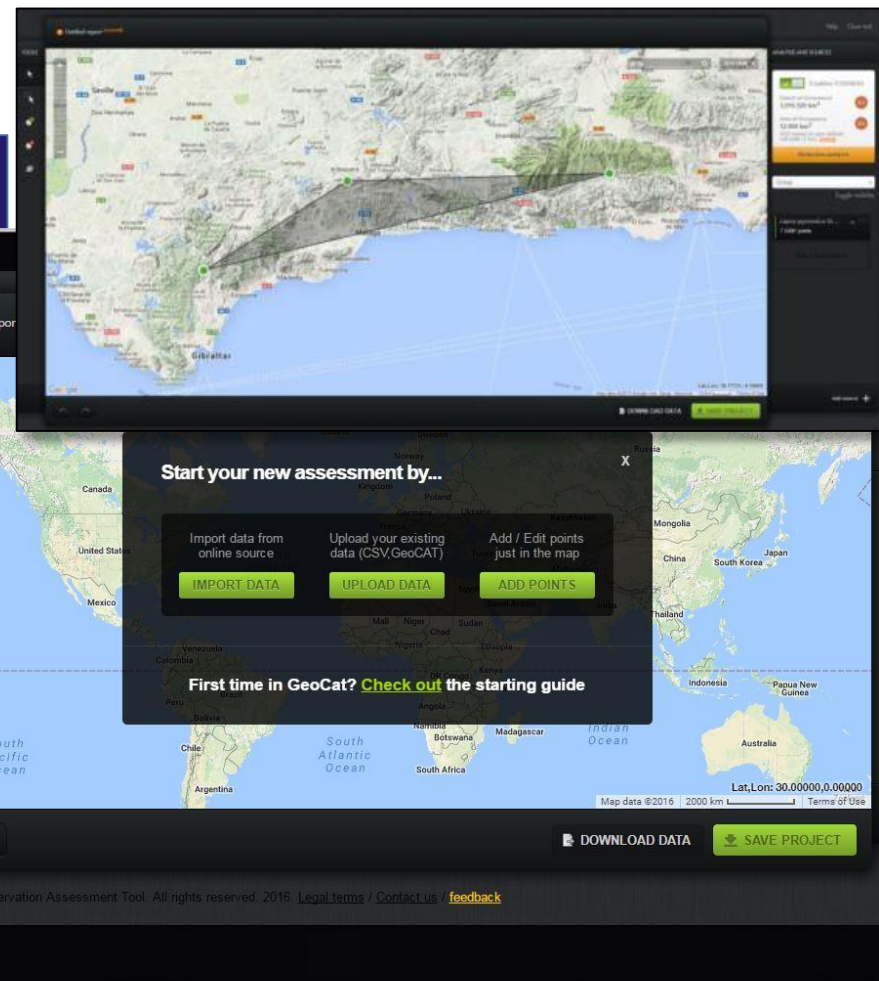


Figure 1. Main workflow for SDMs and alpha-adjusted SDMs. Present in multiple sites alongside abiotic variables are used to train an SDM occurrence (PoO) maps. The P/A data are also used to estimate a site alpha diversity model. The SDMs' PoO and the predicted alpha diversity are then used to produce the adjusted PoO of each species in each site. The adjusted PoO can then be used to assess performance at the site after applying a threshold to produce binary P/A maps (e.g., TSS). The P/A maps over all species in a given site predicts the site's alpha diversity.

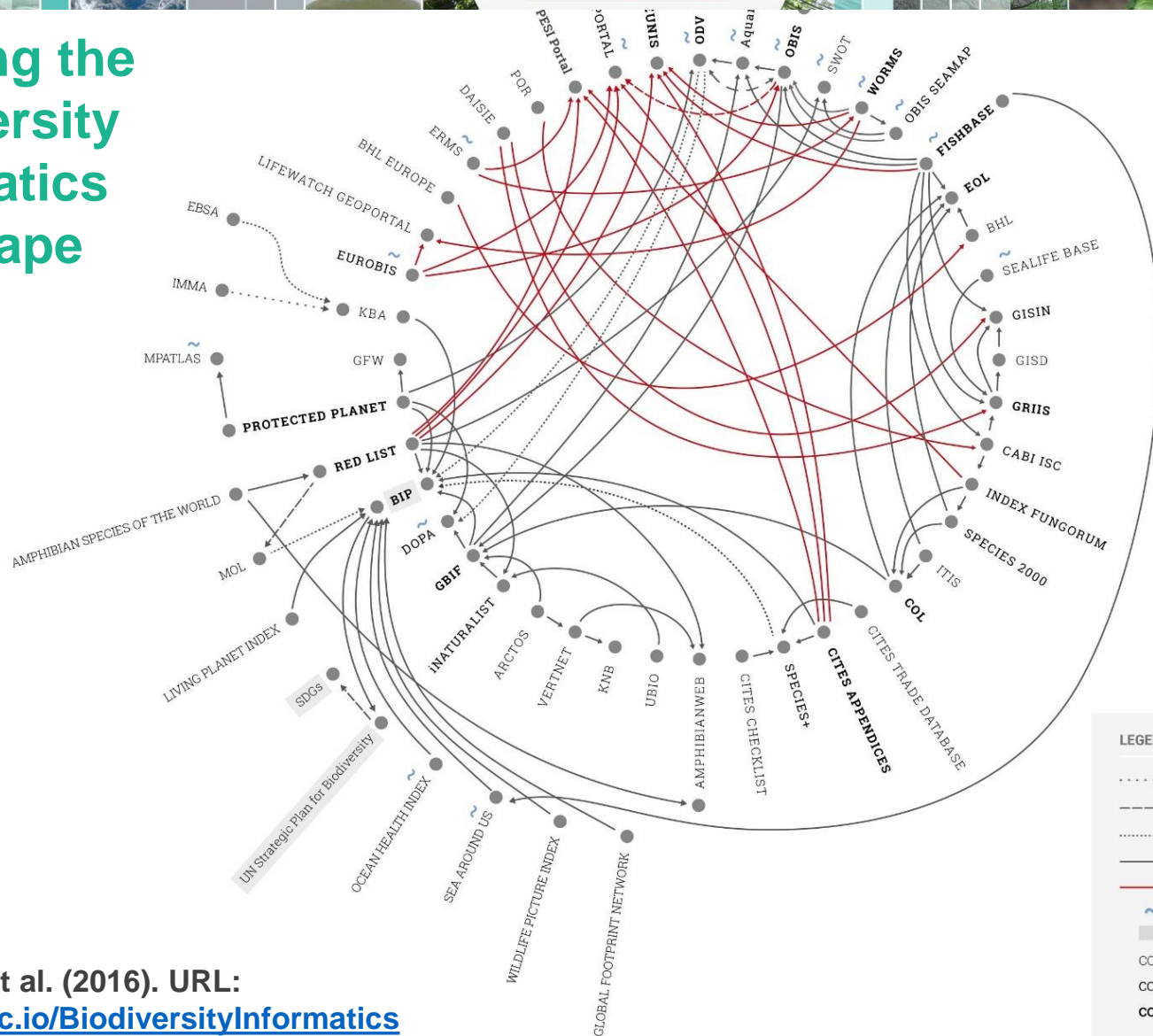
Expected advantages

- Increased accuracy:** some species will not occur in suitable conditions due to biotic interactions. On the other hand, some sites that are currently occupied since the species is more suited to the site's conditions. The alpha-adjusted model accounts for these issues.
- Predicted alpha diversity:** the model predicts the expected number of species at each site.



GeoCAT (geocat.kew.org)

Mapping the biodiversity informatics landscape



Bingham et al. (2016). URL:
<http://wcmc.io/BiodiversityInformatics>

Infographics explaining product's links with policy

CLIMATE 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.



ECONOMIC VALUE

€620.5 MILLION

Annual total value of landings for 2006, comprising over 67% of total fisheries landings revenue in the North Sea.

€238.2 million
Cod, haddock, etc.

€167.4 million
Flatfishes

€91.3 million
Herring, mackerel, etc.

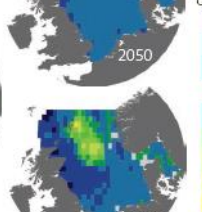
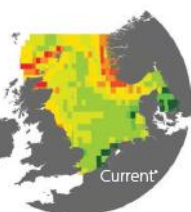
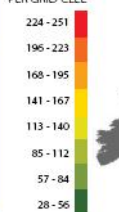
Bony fishes include a broad range of fishes with bony skeletons. In the North Sea, these include commercially important species such as Atlantic salmon, Atlantic herring, European anchovies, Atlantic cod, haddock, and Atlantic mackerel. Bony fishes form an important part of the North Sea food web and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



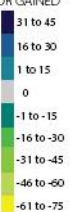
Atlantic mackerel (Scomber scombrus)

SPECIES DIVERSITY

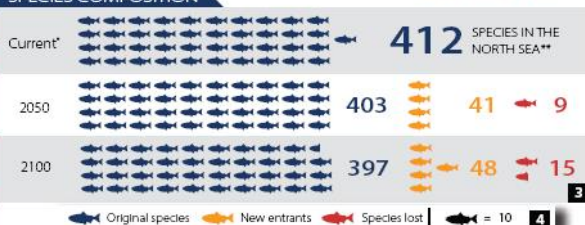
NUMBER OF SPECIES PER GRID CELL



NUMBER LOST OR GAINED



SPECIES COMPOSITION



REFERENCES

- * Time frame based on data obtained from Kachner et al. (2013).
- ** All species counts based on modelled predictions.
- 1. Kachner, K., J. Blus-Benli, K. Kachner-Hayes, C. Garlits, S.O. Kullander, T. Rees, and R. Probst. 2013. AquaMaps: Predicted range maps for aquatic species. World wide web electronic publication. www.aquamaps.org. Version 08/2013.
- 2. Atlantic mackerel graphic produced by Lauren Weatherdon at UNEP-WCMC.
- 3. Kachner, K., J. Blus-Benli, K. Kachner-Hayes, C. Garlits, S.O. Kullander, T. Rees, and R. Probst. 2013. AquaMaps: Predicted range maps for aquatic species. World wide web electronic publication. www.aquamaps.org. Version 08/2013.
- 4. Aborigin Mapping Networks icon collection for Use and Occupancy Maps (version 1.1, March 2012). www.mfnwmaps.org. CC BY 3.0.

Infographic produced by Lauren Weatherdon (UNEP-WCMC).



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EXCLUSIVE

KAR

Weatherdon et al. (2015). URL:
<http://wcmc.io/North-Sea>

EU environment chief stresses nature's key role in nurturing economic growth

EU BON's contributions to policy instruments

EU BON's contributions towards meeting Aichi Biodiversity Target 19



The EU BON project seeks to build a European Biodiversity Observation Network that facilitates access to policy-relevant biodiversity information.

www.eubon.eu

Summary

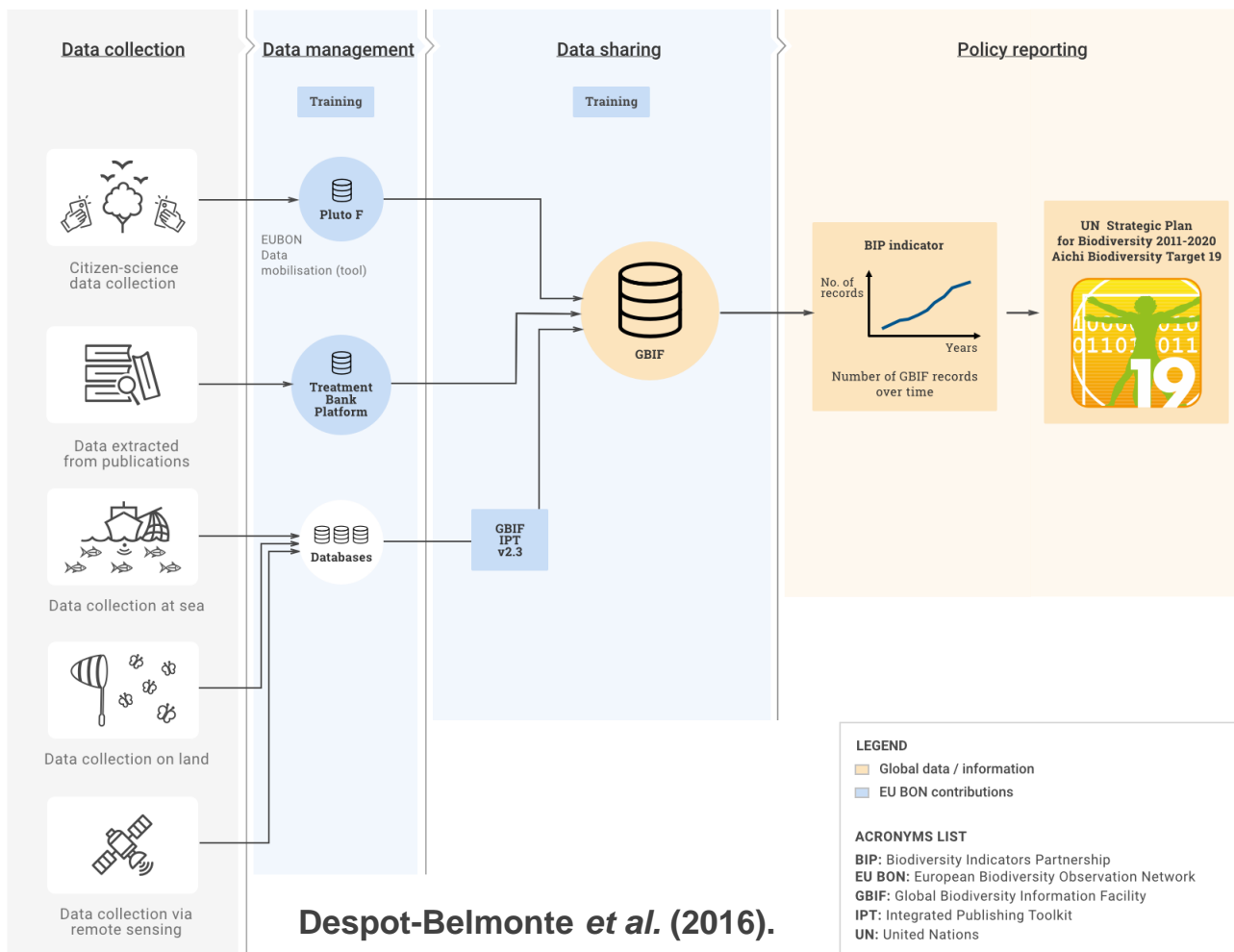
EU BON has developed and refined pre-existing tools for the integration of biodiversity data. This work contributes towards the achievement of global conservation targets of the Convention on Biological Diversity (CBD); for example Aichi Biodiversity Target 19 "By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied" (UN Strategic Plan for Biodiversity 2011-2020).

Citation

Despot-Belmonte K, Doudin M, Martin CS, Groom Q, Wetzell F, Agosti D, Jacobsen K, Smirnova L, Weatherdon LV, Robertson T, Hoffmann A, Mac Sharry B, Shennan-Farpón Y (2016). EU BON's contributions towards meeting Aichi Biodiversity Target 19.



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Despot-Belmonte *et al.* (2016).



WCMC Team



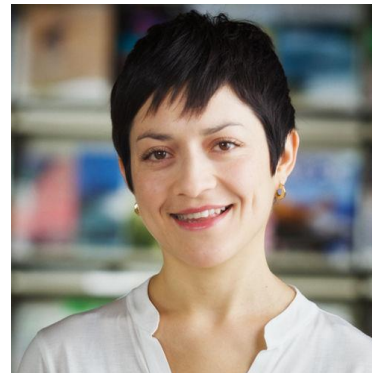
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