



Ocean data application for biodiversity inclusive Marine Spatial Planning

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Living Data, October 2025



OCEAN BIODIVERSITY INFORMATION SYSTEM



unesco

Intergovernmental Oceanographic Commission

**30% of the ocean
protected by 2030**

**10% strictly
protected**

Marine spatial planning

[...] public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process.

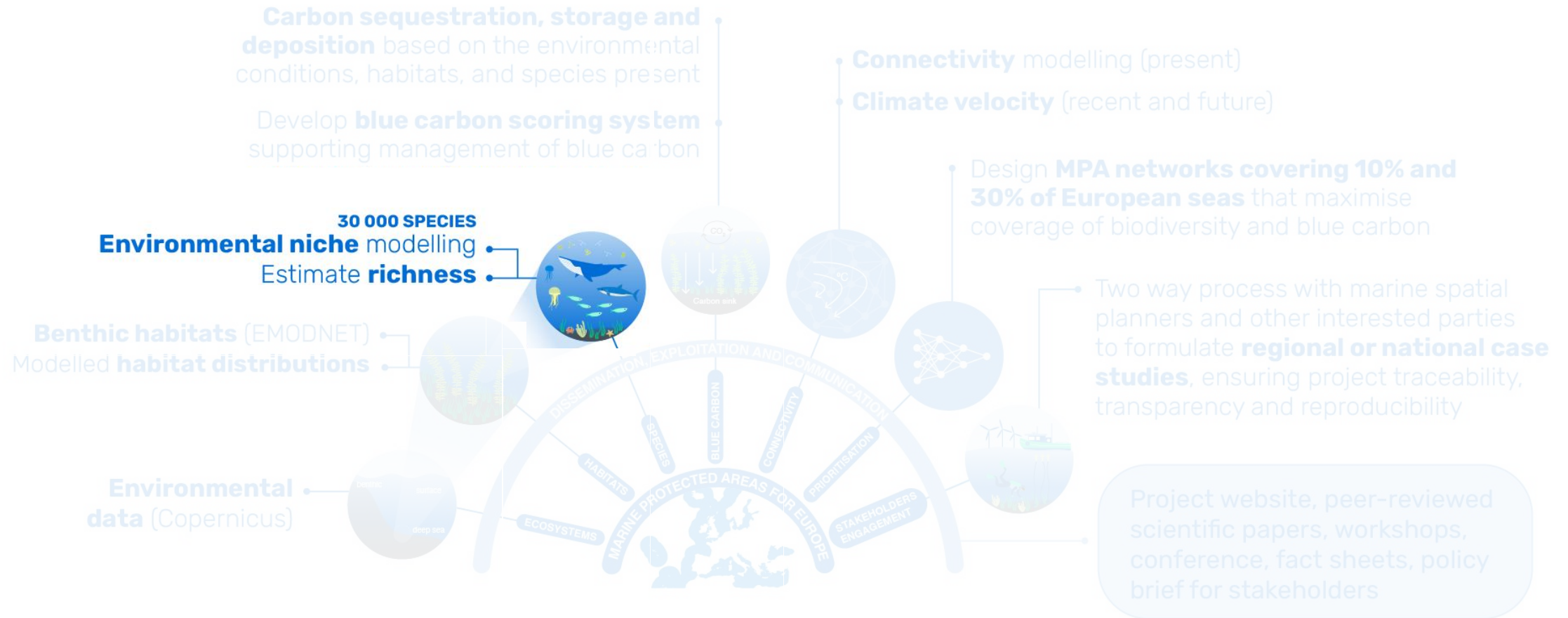
ioc.unesco.org/en/marine-spatial-planning



**MPA EUROPE IS MAPPING
THE OPTIMAL LOCATIONS FOR
MARINE PROTECTED AREAS
IN EUROPEAN SEAS TO SUPPORT
SCIENCE-BASED MARINE
SPATIAL PLANNING**

BIODIVERSITY

BLUE CARBON



Prioritisation



Complete layers



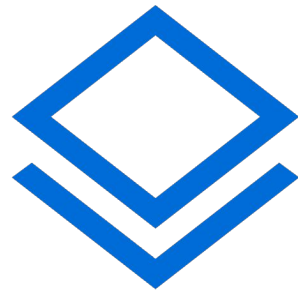
**Species Distribution
Models (SDMs)**

What are species & biogenic habitat distribution models?



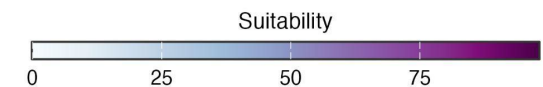
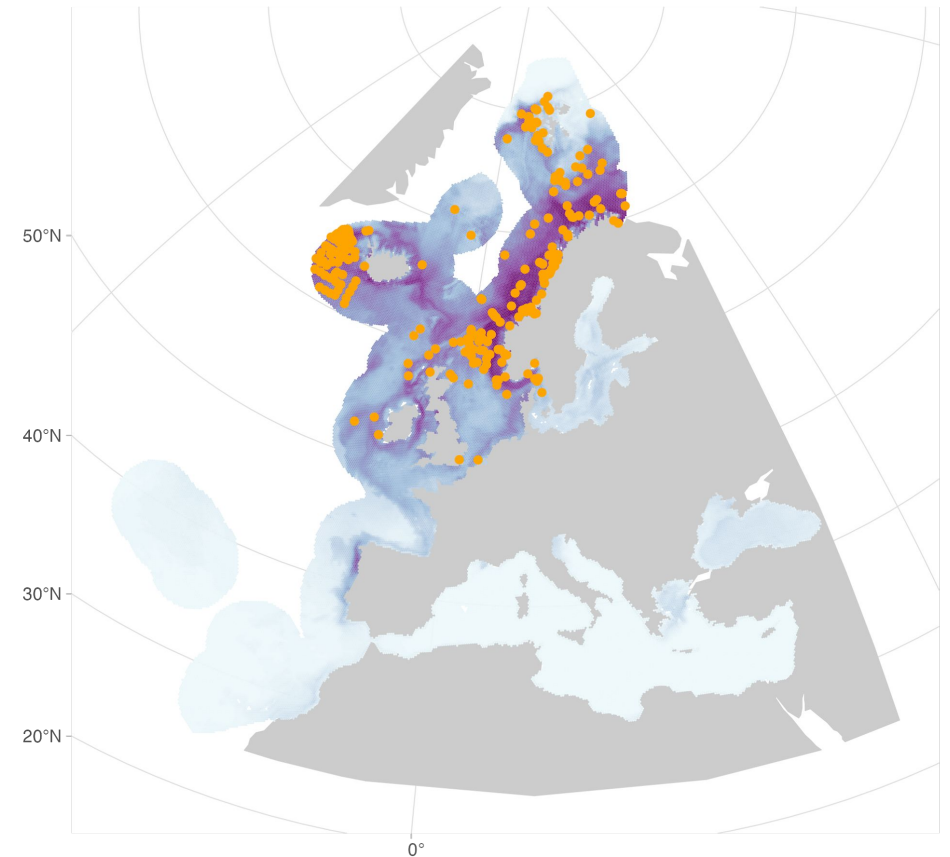
where

+



**on what
conditions**

models



complete range maps
(e.g. *Sebastes norvegicus*)

What are species & biogenic habitat distribution models?



where

+



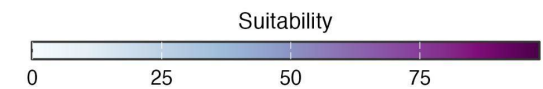
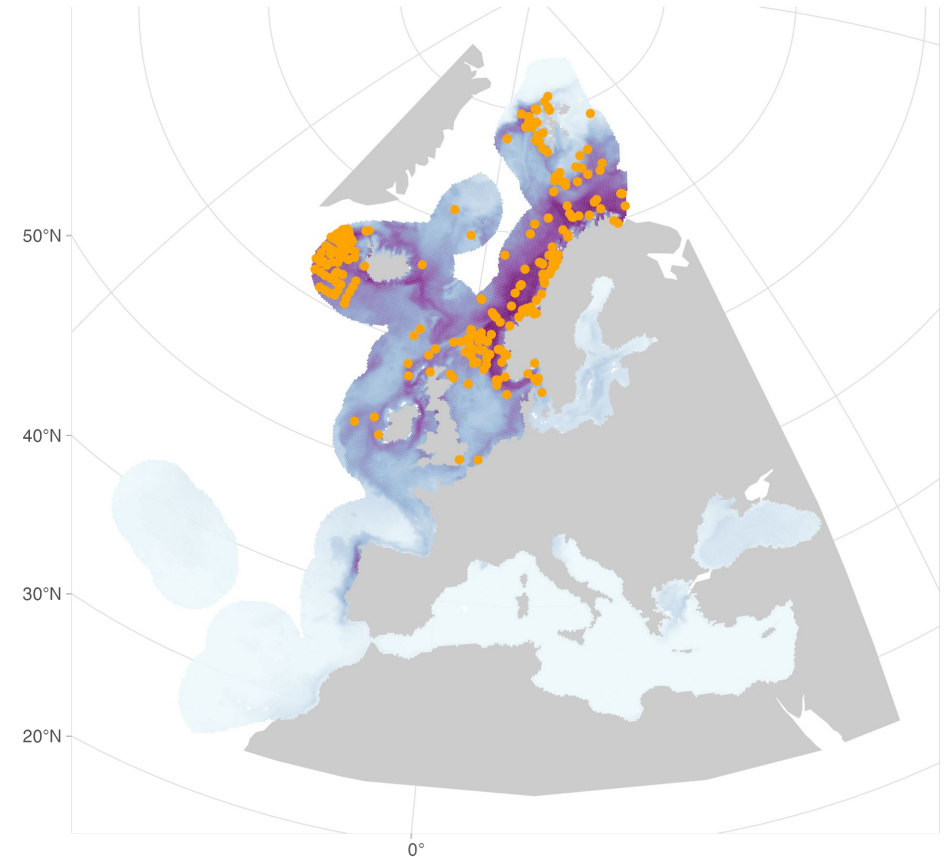
**on what
conditions**

models



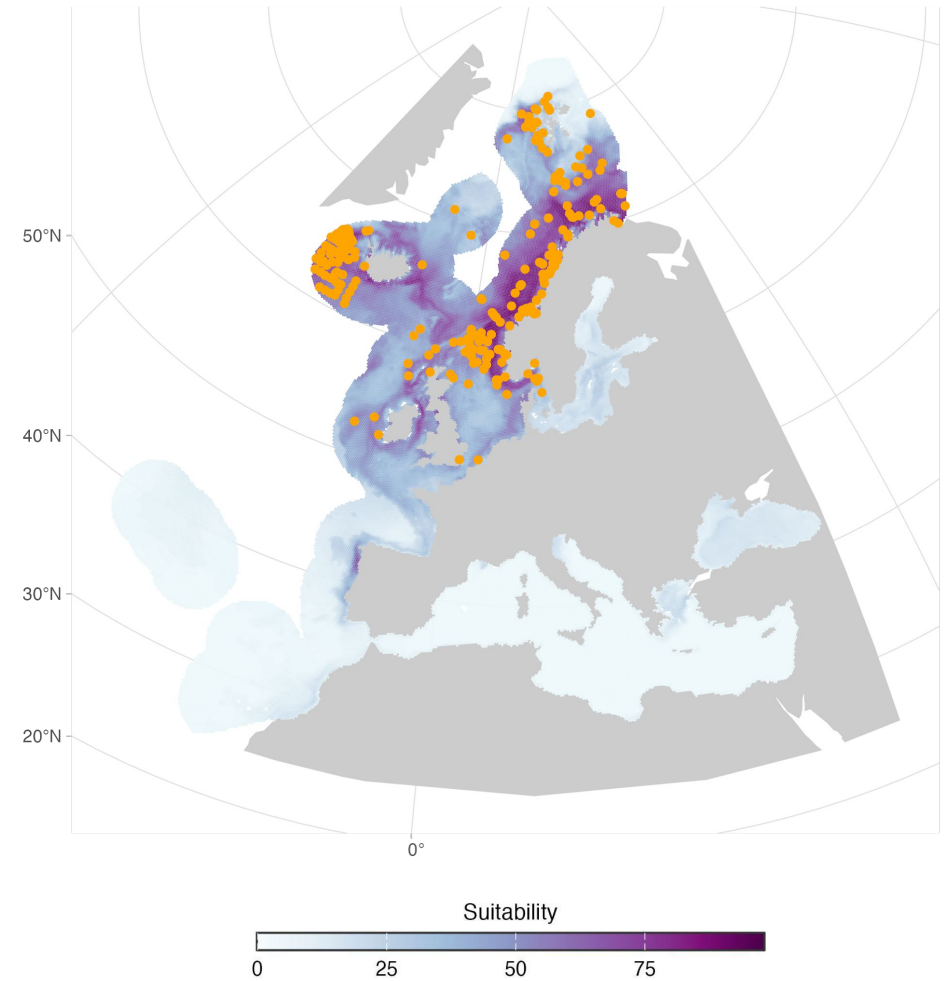
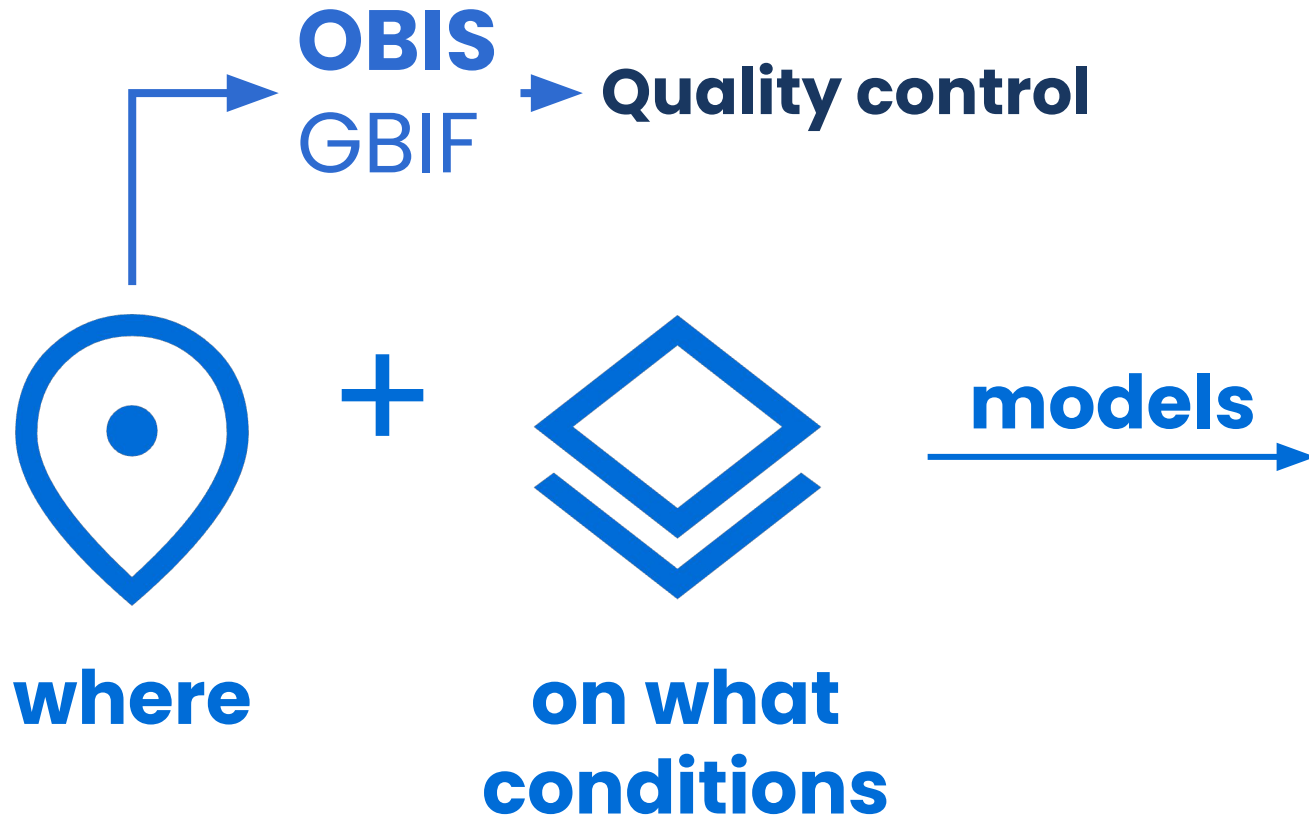
RELATIVE

POTENTIAL



complete range maps
(e.g. *Sebastes norvegicus*)

What are species & biogenic habitat distribution models?



complete range maps
(e.g. *Sebastes norvegicus*)

What are species & biogenic habitat distribution models?



where

+

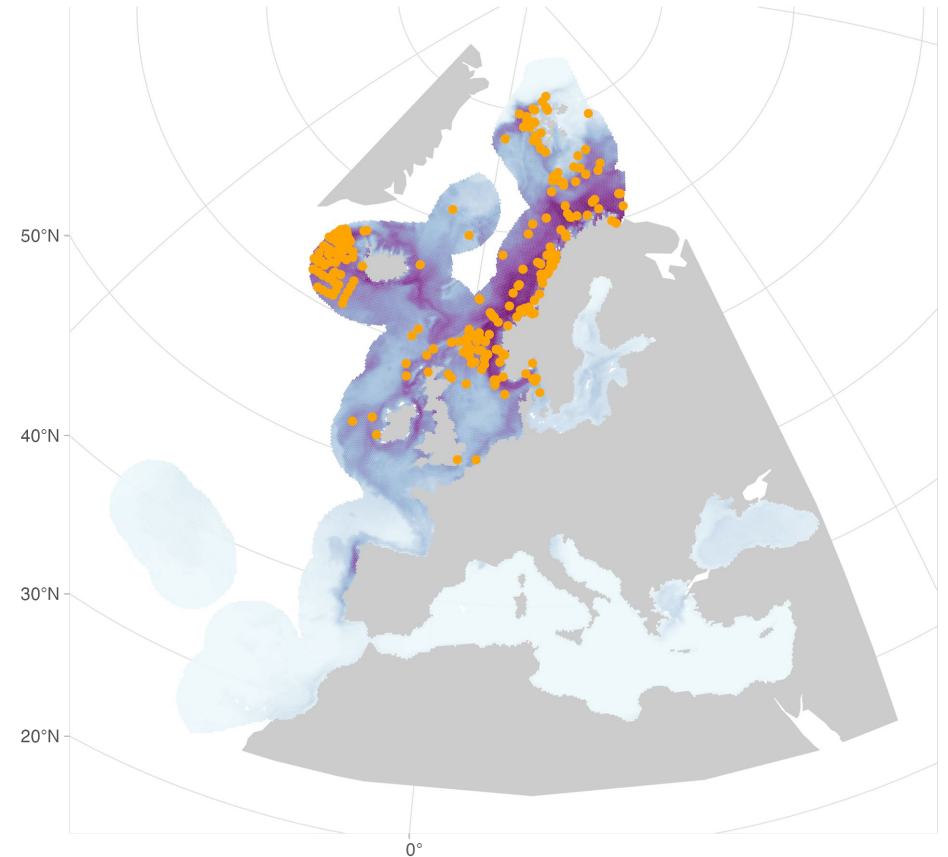


**on what
conditions**

models

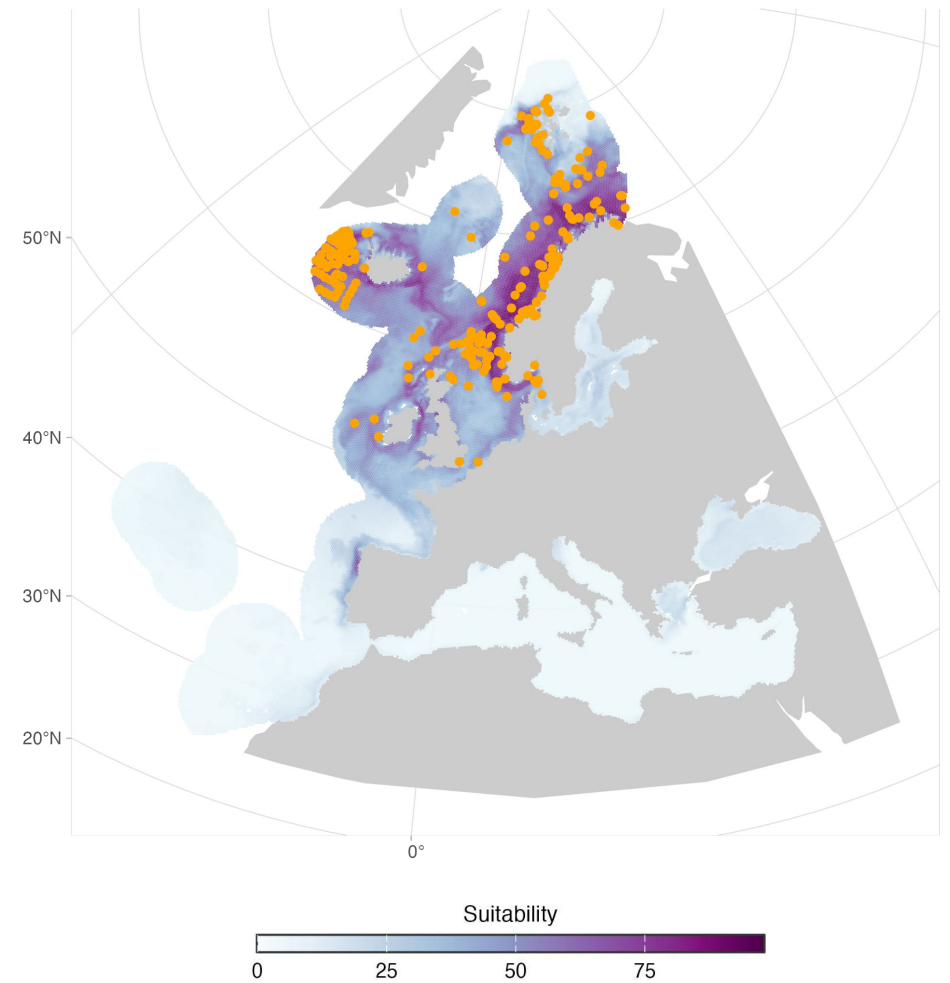
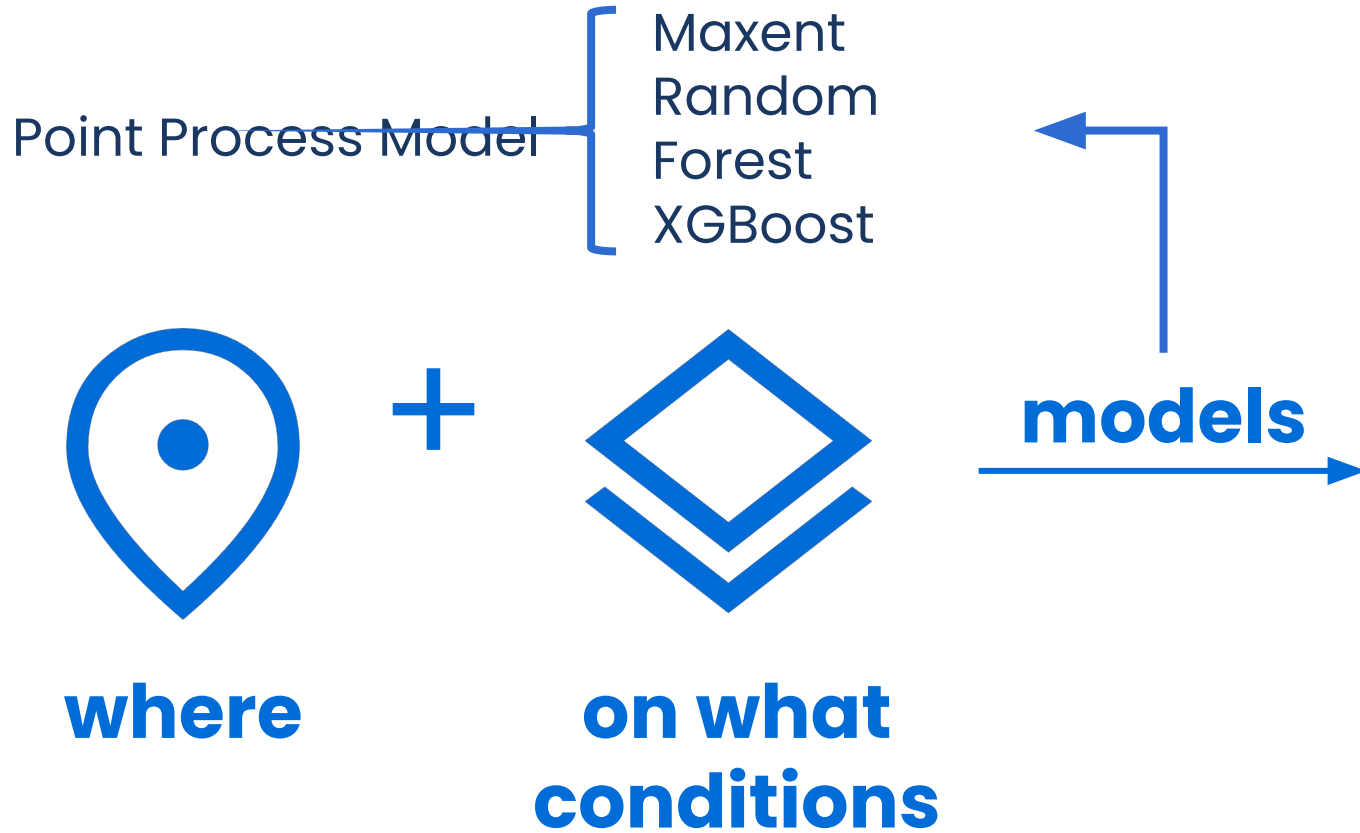


Bio-ORACLE v3.0 → **~5km**



Suitability
0 25 50 75
complete range maps
(e.g. *Sebastes norvegicus*)

What are species & biogenic habitat distribution models?



complete range maps
(e.g. *Sebastes norvegicus*)

Sebastes norvegicus

Current prediction

50°N

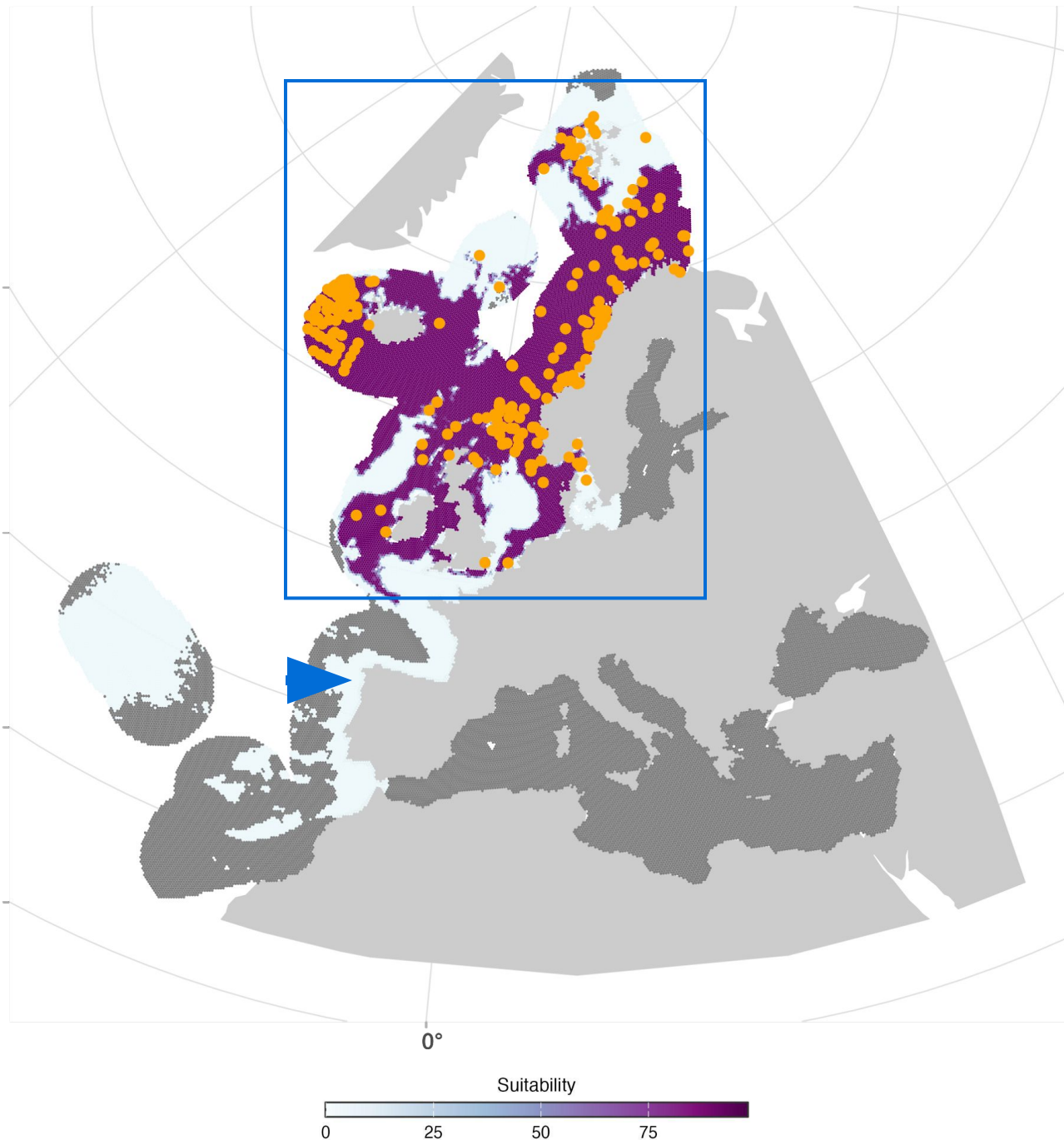
40°N

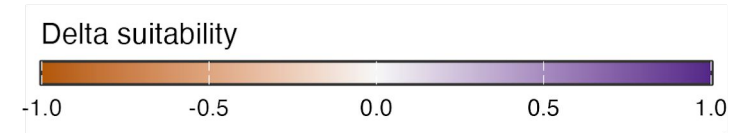
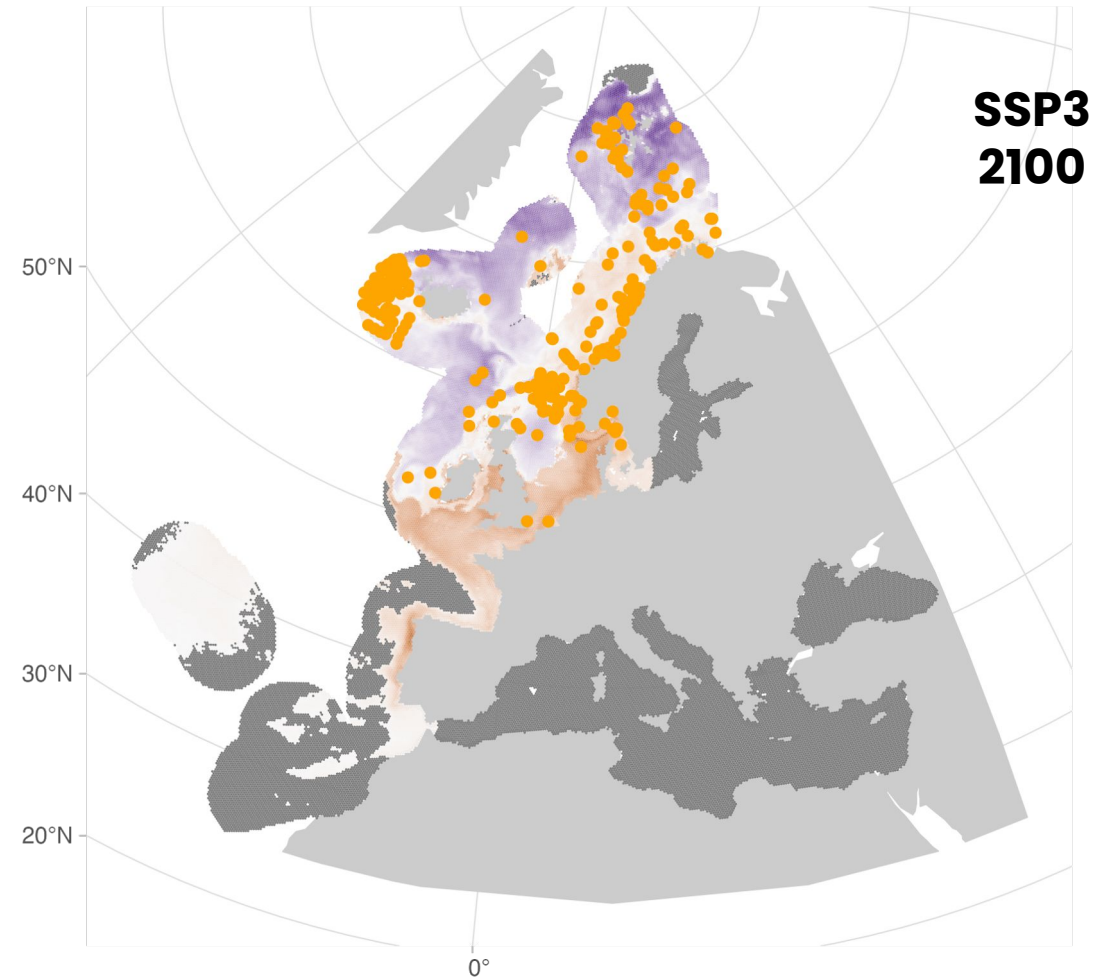
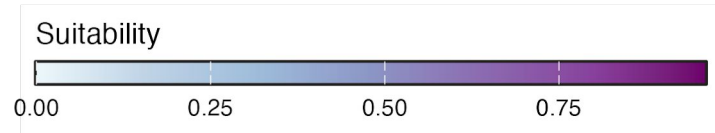
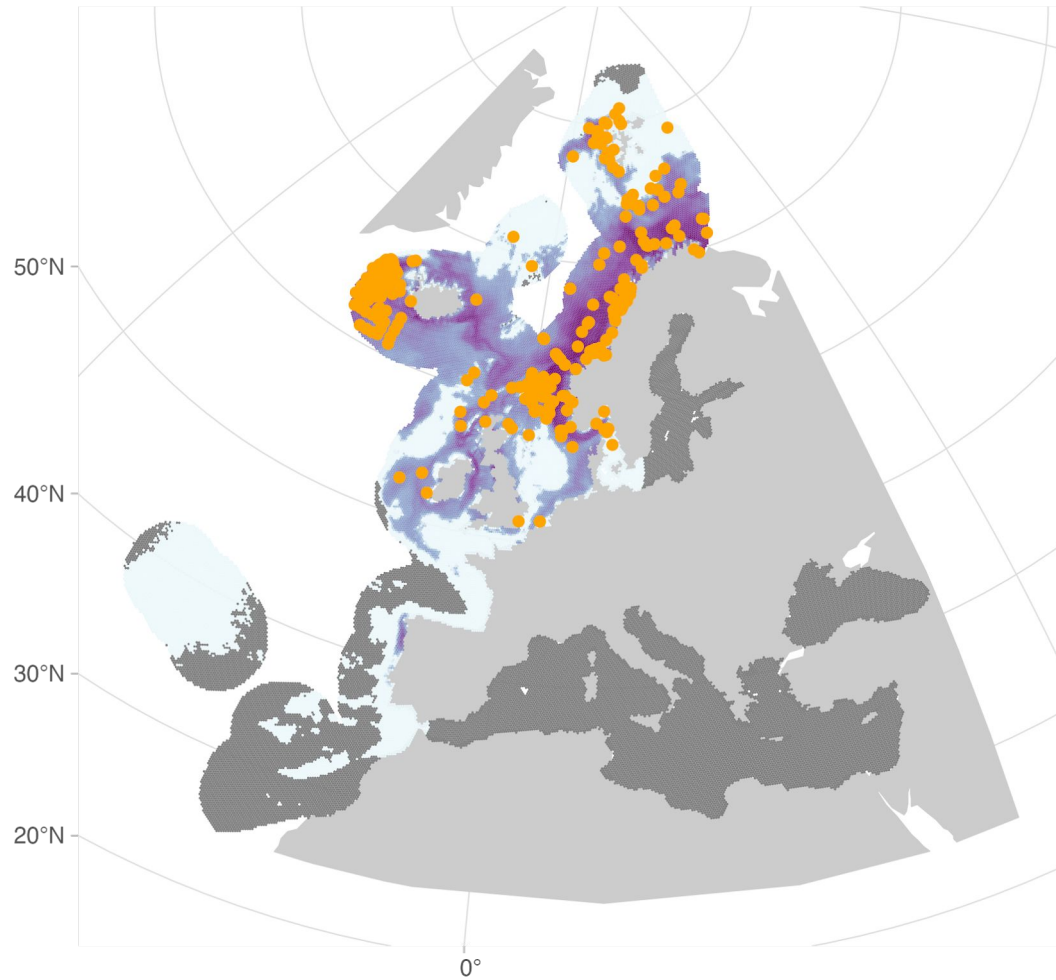
30°N

20°N

0°

**Apply mask and
threshold**





CMIP6 SSP (Shared Socio-Economic Pathways) scenarios □ 2050 and 2100

12,039
species

6
habitats
Stacked
Species
Distribution
Models

All completely open and reproducible

 iobis.github.io/mpaeu_docs :: Documentation

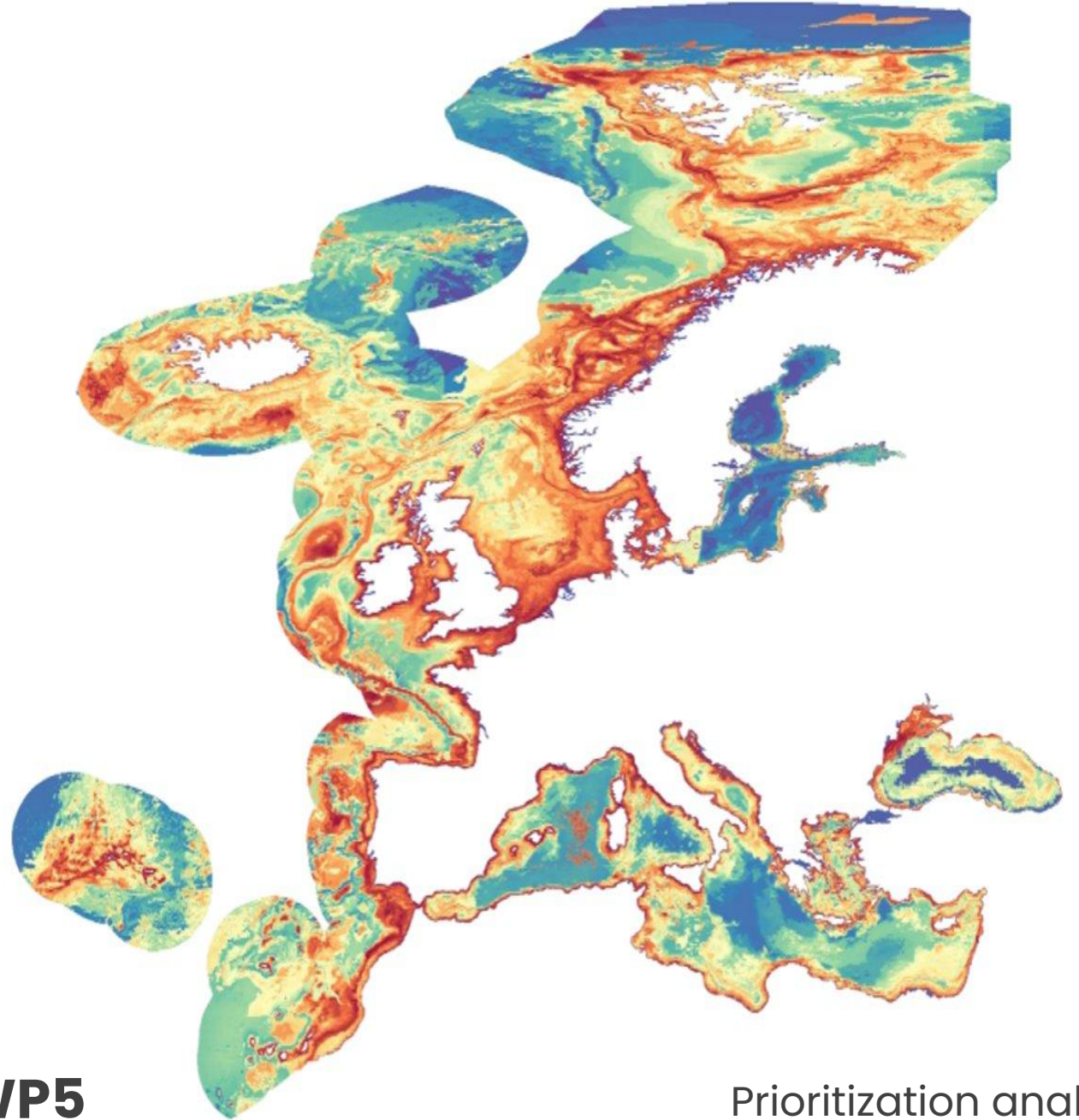
 github.com/iobis/mpaeu_sdm :: Modeling

Supporting MSP

- Species level information: overcoming gaps
- Preparing for potential changes in species distribution
- **Prioritisation of areas according to biodiversity**



Anna Addamo
NORD University – WP5



Prioritization analysis
489 species / V1

shiny.obis.org/distmaps

Model details

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text tree table [view icons]
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  Model details : {
    taxonID : [ 1 item
      0 : [ 1 item
        0 : 100803
      ]
    ]
    scientificName : [ 1 item
      0 : [ 1 item
        0 : Actinia equina
      ]
    ]
    group : [ 1 item
      0 : [ 1 item
        0 : others
      ]
    ]
    hab_depth : [ 1 item
      0 : [ 1 item
        0 : depthmean
      ]
    ]
    model_date : [ 1 item
      0 : [ 1 item
        0 : 2021-11-01
      ]
    ]
  }
}
```

How models were created?

Models were created using a point-process framework. Details on the modelling framework adopted by MPA Europe, including the full documentation are available [in this link](#).

What do we need to advance the use of ocean data in Marine Spatial Planning?

Silas Principe

More data, but well managed and flowing to the global systems
s.principe@unesco.org

Urgent need: available data can already support many applications
mpa-europe.eu

silasprincipe.com
Transparency is key: limitations are also available
github.com/silasprincipe

In this session:

**From Observation to Impact:
Co-created tools emphasize the role of data management in biodiversity observing systems**



Credit: Dimitris Poursanidis / Ocean Image Bank