A Showcase for the European Atlas of Marine Life

Plankton gridded products

GHER — GeoHydrodynamics and Environment Research

LIÈGE université

EMODnet — European Marine Observation and Data Network

SeaDataCloud

A work by

Olivier BEAUCHARD (data preparation and processing)

Alexander BARTH (code development and data interpolation)

Peter HERMAN (data preparation and interpretation)

Jean-Marie BECKERS (code development)

Charles TROUPIN (data interpolation and visualisation)

Collect once,

Collect once,
Use many times

Collect once,

Use many times

And create products with DIVA

1. How do we perform interpolation?

Data interpolation

<> Code | Issues **2** | Pull requests **0** | Projects **0** | Wiki | Insights | Settings

DIVAnd performs an n-dimensional variational analysis of arbitrarily located observations

Edit

interpolation | data-analysis | ocean-sciences | julia | toolbox | spatial-data-analysis | oceanography | eosc-hub | Manage topics

| ⊙ **1,302** commits | ⅄ **18** branches | ⬙ **8** releases | ✈ **1** environment | ⬙⬙ **5** contributors | ⚖ GPL-2.0 |

Branch: master ▾ | New pull request | | Create new file | Upload files | Find File | Clone or download ▾

Alexander-Barth enable Compat **@debug** for Vocab | Latest commit 5dd0689 20 days ago

📁 data	fix time series time coordinate variable	7 months ago
📁 docs	update doc	a month ago
📁 examples	migrate b2drop links	5 months ago
📁 src	enable Compat **@debug** for Vocab	20 days ago
📁 templates	Update emodnet-chemistry.mustache	5 months ago
📁 test	subset versions, provide author param given param	a month ago
📄 .codecov.yml	restructure	2 years ago
📄 .gitignore	ipynb checkpoints ignored	a year ago
📄 .travis.yml	update doc deployement	3 months ago
📄 LICENSE	Added function for clever poor man's error	2 years ago
📄 README.md	Update README.md	4 months ago
📄 REQUIRE	remove Tables as an explicit dependency	3 months ago
📄 appveyor.yml	update CI	9 months ago

https://github.com/gher-ulg/DIVAnd.jl/

📖 README.md

✏

DIVAnd

build passing | build passing

coverage 84% | codecov 84%

docs latest

2. Example of products

Benthic macroinvertebrate
living modes
in European seas

Data sources

Available from EMODnet Biology (see list on the web)

3 main living modes

Dataset	EMODnet Biology link
MACROBEL - Long term trends in the macrobenthos of the Belgian Continental Shelf (1976 – 2001)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=145
MAREANO - Base-line mapping of fauna obtained with grab (2006 – 2013)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=4539
NSBS - North Sea Benthos Survey (1986)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=67
MWTL - Dutch long term monitoring of macrobenthos in the Dutch Continental Economical Zone of the North Sea (since 1991 – 2015)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=5759
ODAM - Danish benthic marine monitoring data (1911 – 2013)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=4494
POHJE - Finnish Baltic Sea benthic monitoring (1964 – 2016)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=5725
Polish Monitoring Programme - Monitoring of the Baltic Sea (1987 – 2013)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=2467
Bay of Puck dataset (1996)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=611
REBENT - Benthic Network (2003 – 2015)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=4412
RSMP Baseline Dataset (1976 – 2016)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=5922
SHARK - Marine soft bottom macrozoobenthos monitoring in Sweden (1971 – 2014)	http://www.emodnet-biology.eu/data-catalog?module=dataset&dasid=2454

Resistant

1- strong mobility
2- short life cycle
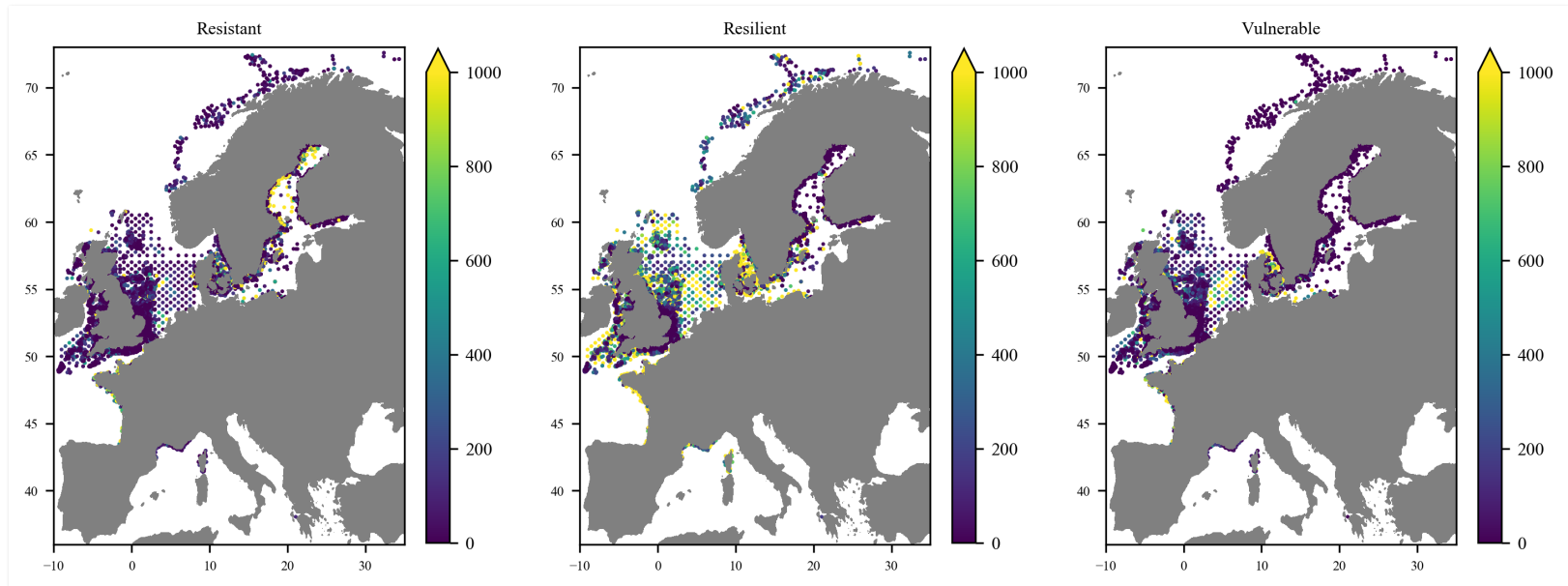3- high offspring survival probability

Opportunistic/resilient

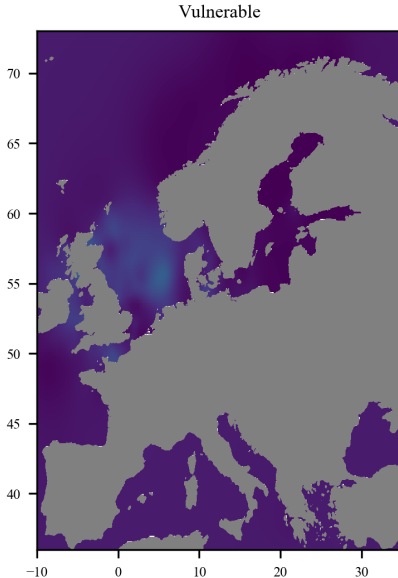1- Relatively short life span
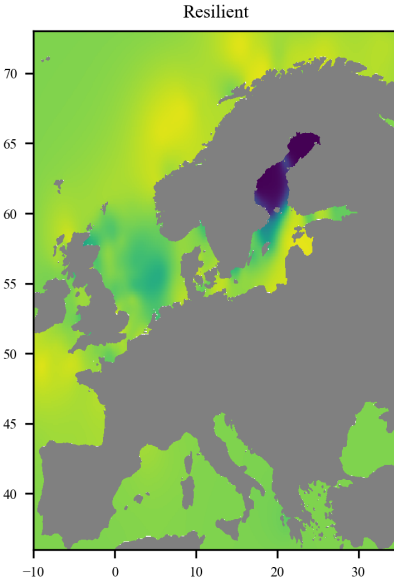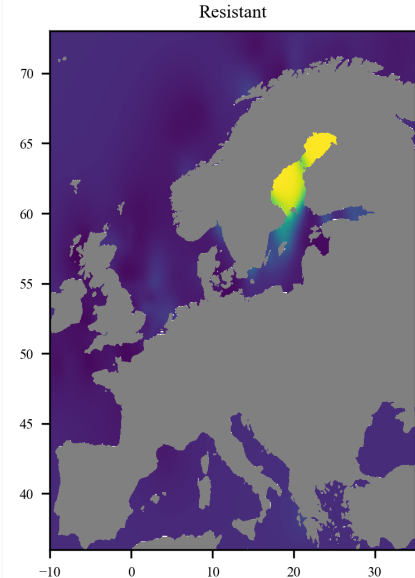2- Not very habitat-specific

Vulnerable

1- Years/decades to achieve a minimum of reproductive success
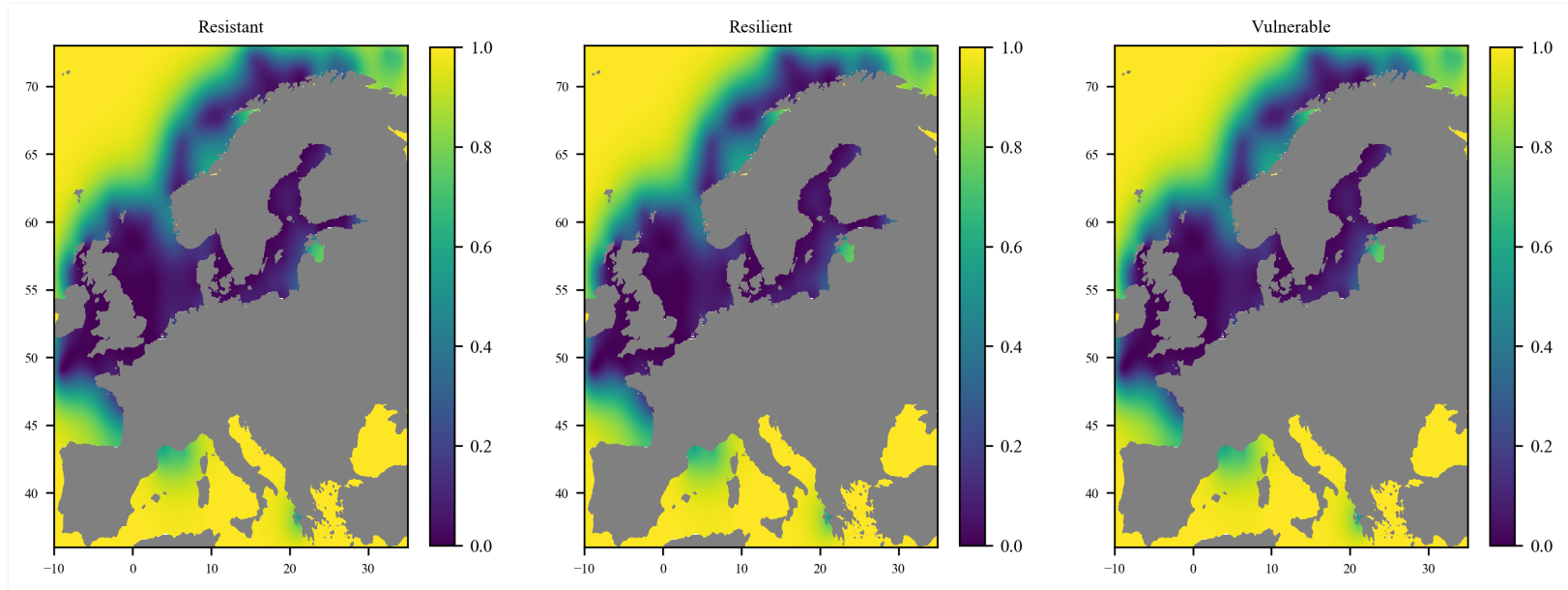2- Negatively affected by bottom trawling

Data location

Interpolated fields (relative)

Error fields

Neural network modelling
of Baltic zooplankton abundances

Method: neural network
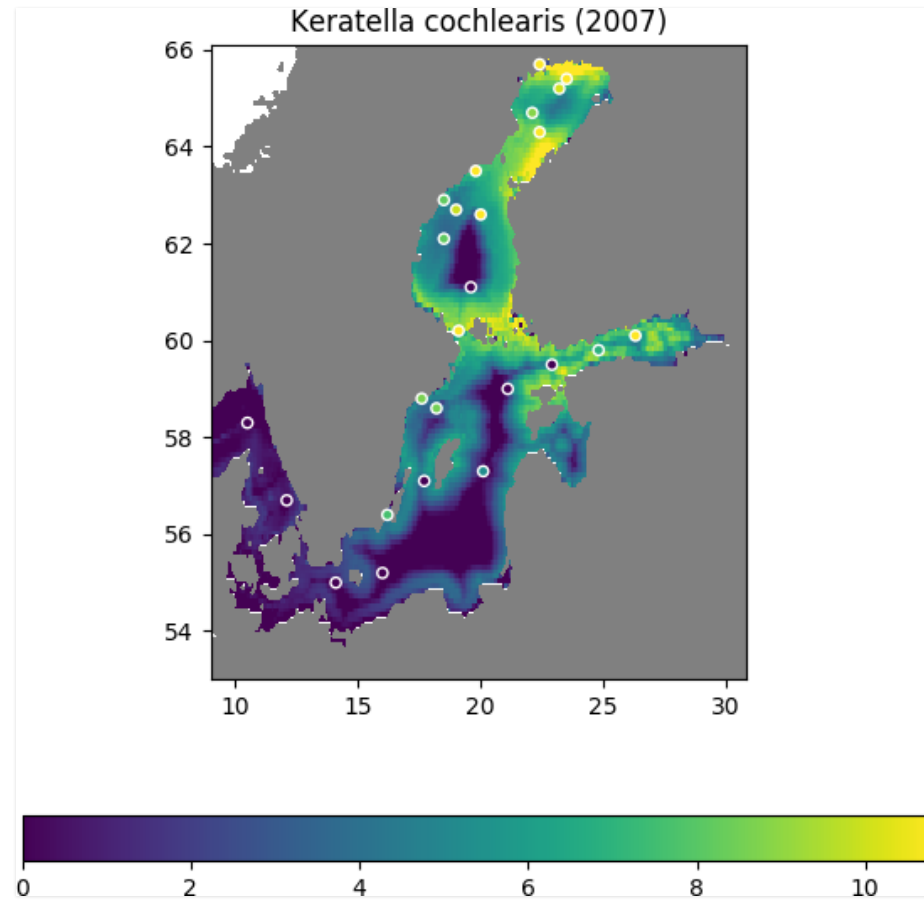
Using *co-variables* to help for the interpolation

Main datasets: Zooplankton observations in the Baltic

      1- the Swedish SHARK database from EMODnet Biology
      2- the Finnish data from the NOAA Copepod database
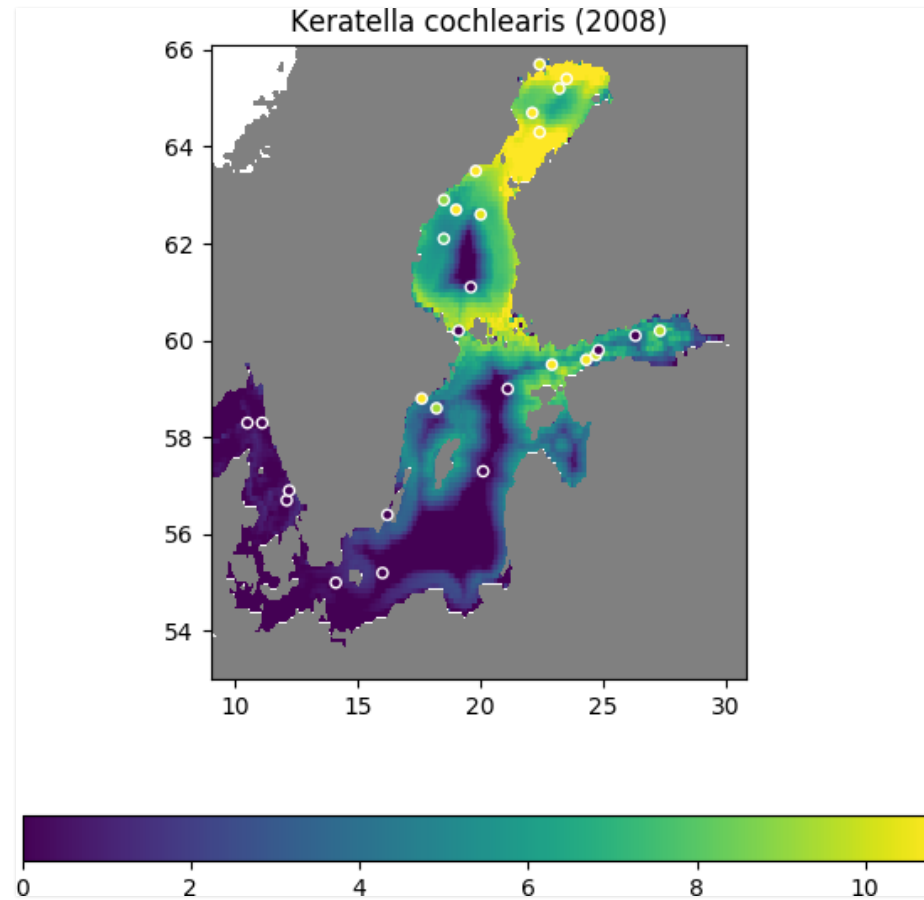   3- the German and Polish from the HELCOM DOME database

Co-variables

1- Dissolved oxygen (from EMODnet Chemistry)
2- Salinity (from SeaDataNet)
3- Temperature (from SeaDataNet)
4- Chlorophyll concentration (MODIS-Aqua from NASA)
5- Bathymetry (from GEBCO)
6- Distance from coast (from GSFC, NASA)

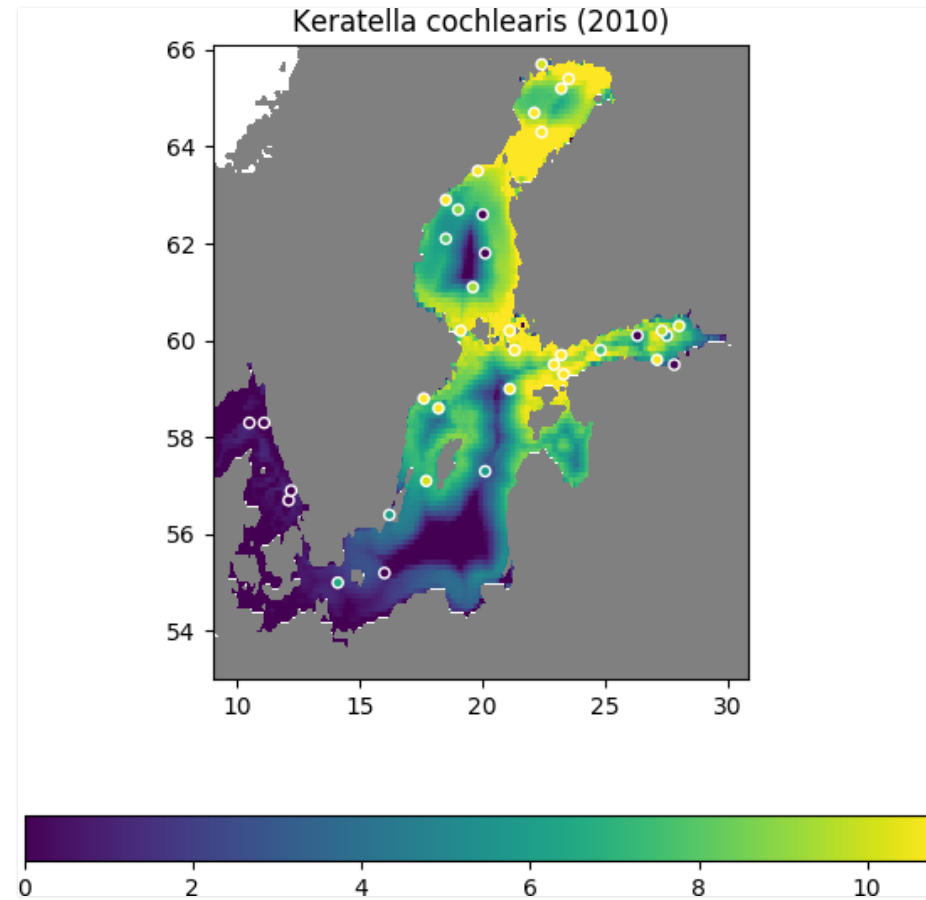# Examples of fields

Keratella cochlearis (2007)

Examples of fields

Keratella cochlearis (2008)

Examples of fields

Keratella cochlearis (2010)

$$\Big(\quad 3. \quad\Big)$$

3.

Findability

3.

Findability

Accessibility

3.

(**F**indability

Accessibility

Interoperability)

3.

$$\left(\begin{array}{l} \textbf{F}\text{indability} \\ \\ \textbf{A}\text{ccessibility} \\ \\ \textbf{I}\text{nteroperability} \\ \\ \textbf{R}\text{eusability} \end{array} \right)$$

Towards reproducibility

✔ Data ➔ EMODnet Biology

✔ Tool ➔ DIVAnd v2.1.1: http://doi.org/10.5281/zenodo.1407912

✔ Code and procedure ➔ Jupyter-notebooks:

✔ Products available for download ➔ netCDF files: https://dox.ulg.ac.be/index.php/s/EvIwSvTwhtJ6Tmu

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Thanks for
your attention