DeepIso

A global open database of stable isotope ratios and elemental contents for deep-sea ecosystems

Loïc N. Michel, James B. Bell, Stanislas F. Dubois, Gilles Lepoint, Karine Olu, William D. K. Reid, Jozée Sarrazin, Gauthier Schaal & Brian Hayden

IsoEcol Virtual Meeting, 19-21/05/2021. Contact: loicnmichel@gmail.com

DeepIso: context

- The use of stable isotopes as ecological tracers in deep-sea ecosystems dates back several decades, and they have been instrumental to many key discoveries about ecosystem functioning

NATURE VOL. 306 3 NOVEMBER 1983 LETTERS

Sulphur isotopic compositions of deep-sea hydrothermal vent animals

Brian Fry, Howard Gest & J. M. Hayes

484 Nature Vol. 289 5 February 1981

Low $^{15}N/^{14}N$ in hydrothermal vent animals: ecological implications

Greg H. Rau

616 Nature Vol. 293 22 October 1981

Bacterial symbionts and low $^{13}C/^{12}C$ ratios in tissues of Pogonophora indicate unusual nutrition and metabolism

A. J. Southward*, Eve C. Southward*, P. R. Dando*, G. H. Rau†, H. Felbeck‡ & H. Flügel§

DeepIso: context

- The use of stable isotopes as ecological tracers in deep-sea ecosystems dates back several decades, and they have been instrumental to many key discoveries about ecosystem functioning

- However, constraining sampling logistics commonly limit the temporal, spatial, or taxonomic scope of deep-sea studies

- Much is left to discover about factors globally influencing food web structure and ecological interactions in deep-sea ecosystems

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- The use of stable isotopes as ecological tracers in deep-sea ecosystems dates back several decades, and they have been instrumental to many key discoveries about ecosystem functioning
- However, constraining sampling logistics commonly limit the temporal, spatial, or taxonomic scope of deep-sea studies
- Much is left to discover about factors globally influencing food web structure and ecological interactions in deep-sea ecosystems
- Goal: produce a global, easily discoverable, available and reusable compilation of stable isotope ratios and elemental contents in organisms from deep-sea ecosystems
- Provide the deep-sea community with an open data analysis tool that can be used in the context of future ecological research, and to help deep-sea researchers to use stable isotope markers at their full efficiency.

People: core working group

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UBO (FR)

Brian Hayden
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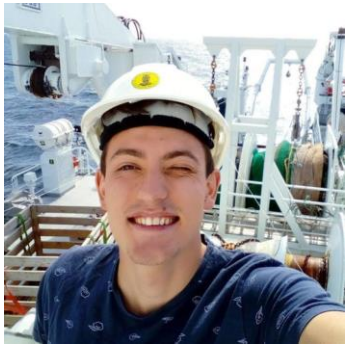
People: data contributors



DeepIso v1 (10/2020)

SEANOE Sea scientific open data edition SEANOE

DeepIso - a global open database of stable isotope ratios and elemental contents for deep-sea ecosystems

Date	2020-10-22
Temporal extent	1989 -2018
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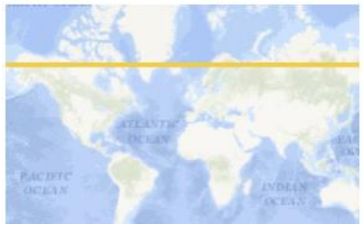
Click to download the data

DATA

Example of targeted taxa: tubeworms Escarpia southwardae and mussels Bathymodiolus aff. boomerang from cold seeps. Picture: Ifremer, WACS cruise, 2011 (depth: 3160 m).



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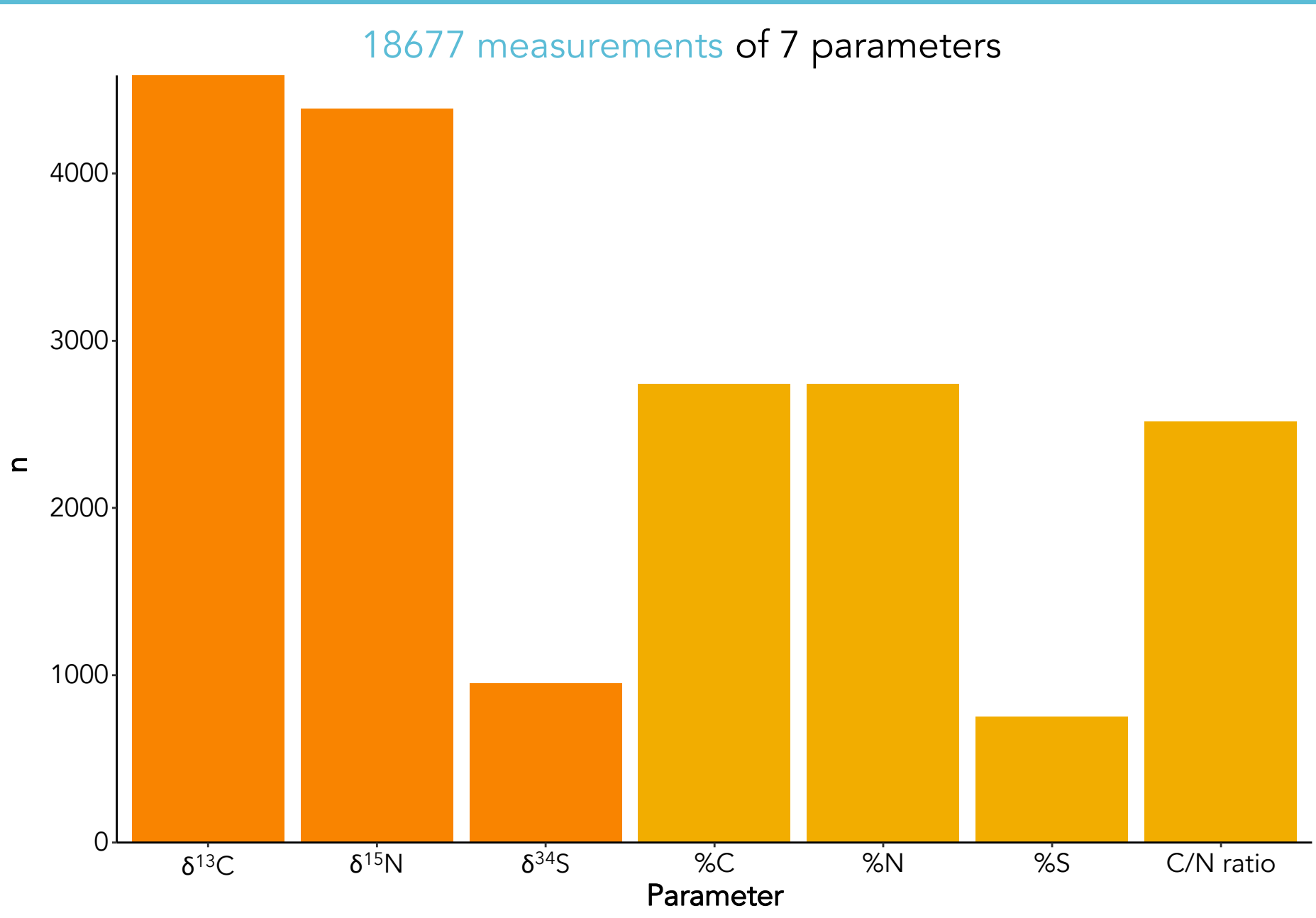
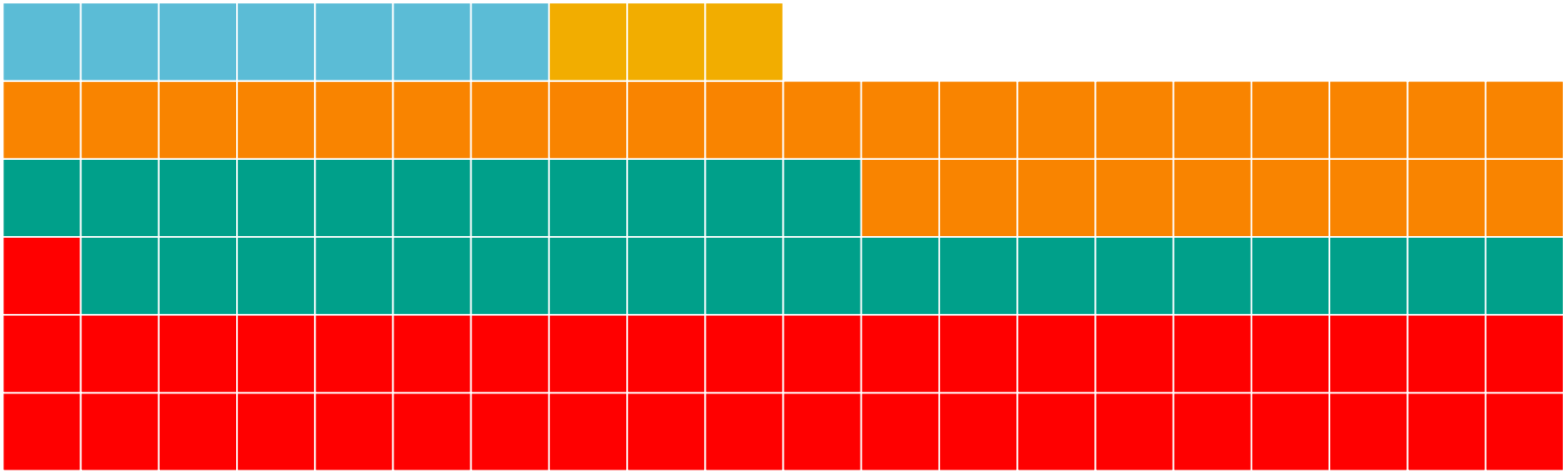
Deeplso v1


18677 measurements of 7 parameters
n
4000
3000
2000
1000
0
δ13C
δ15N
δ34S
%C
%N
%S
C/N ratio
Parameter

DeepIso v1

4378 distinct samples



Hydrothermal vent

Benthic deep-sea

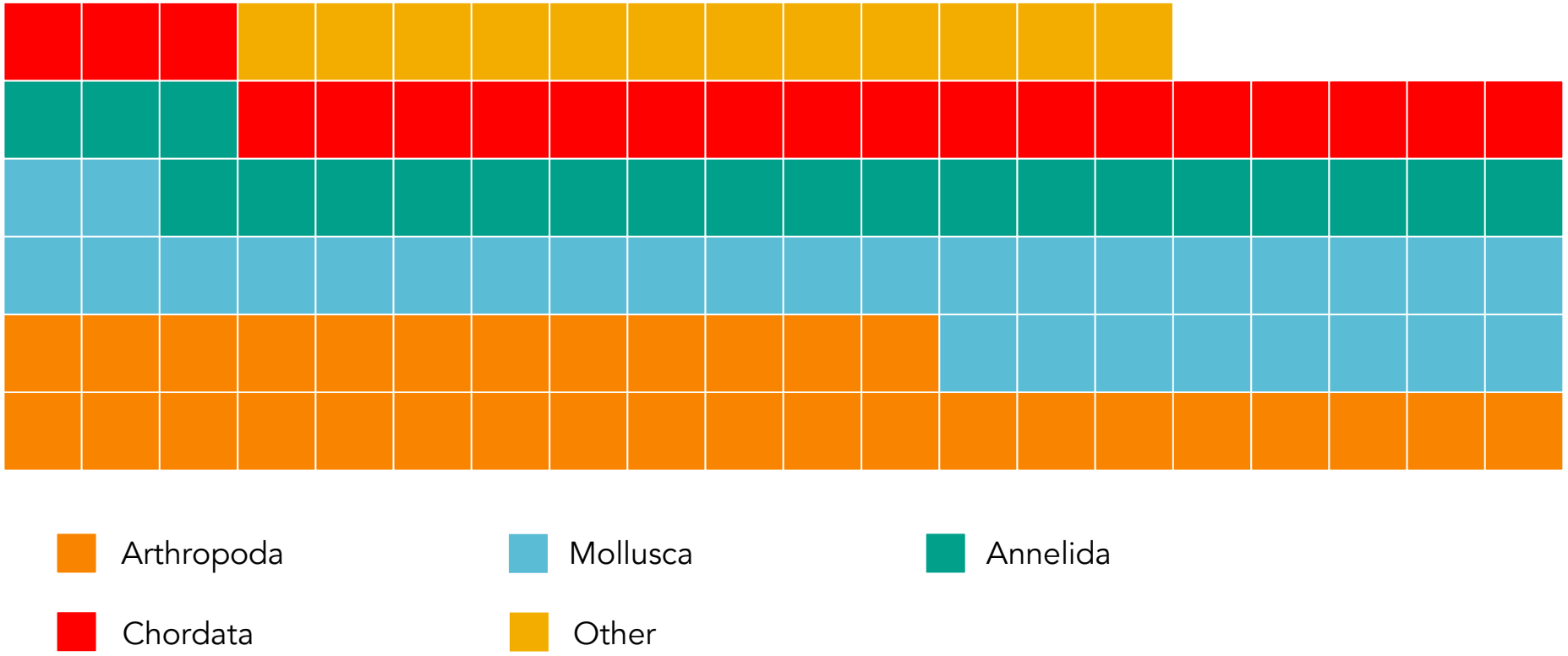
Cold seep

Pelagic deep-sea

Cold water coral reef

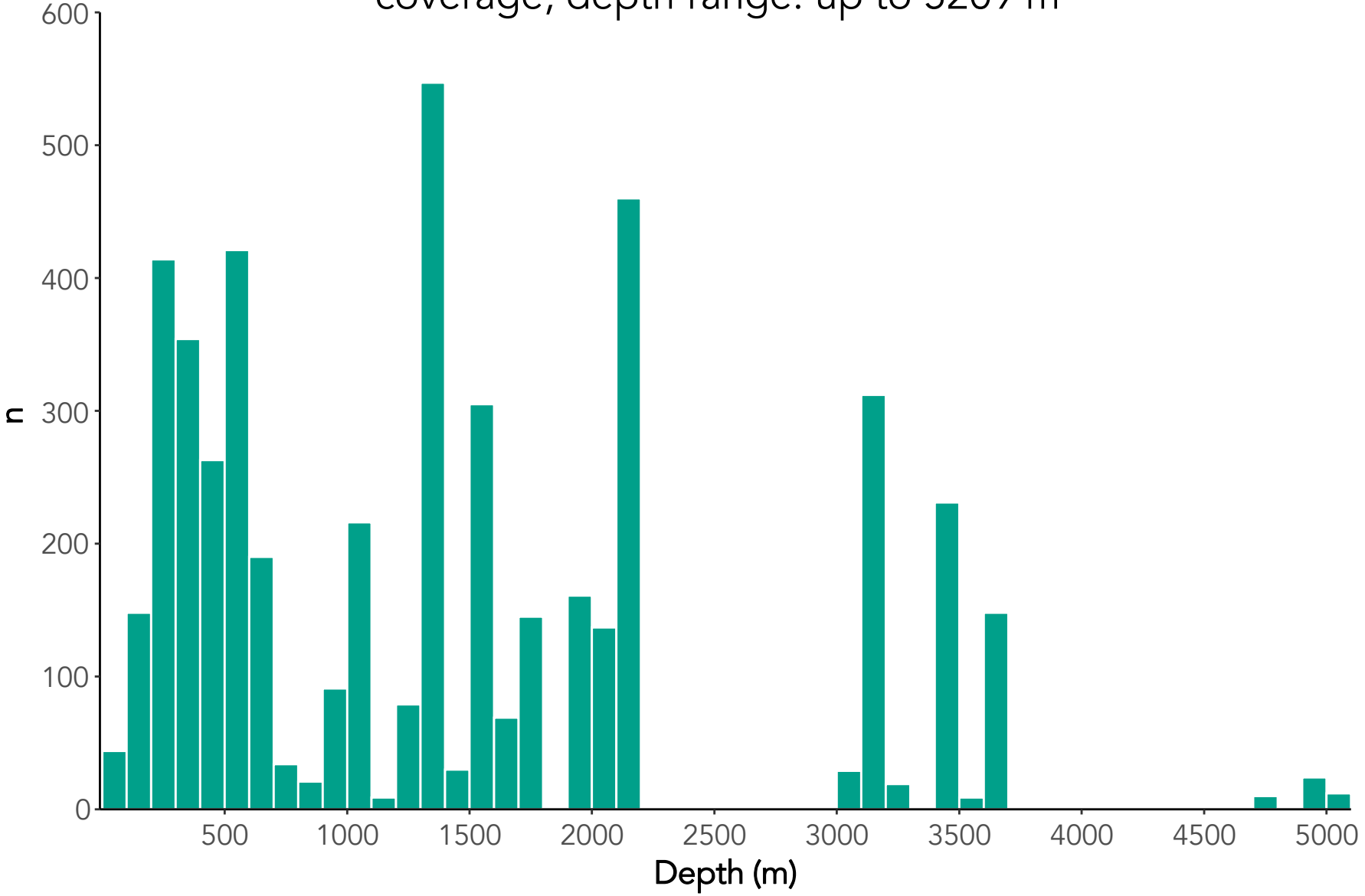
DeepIso v1

4378 samples belonging to 493 taxa (+ sediments, suspended particulate organic matter, detritus)



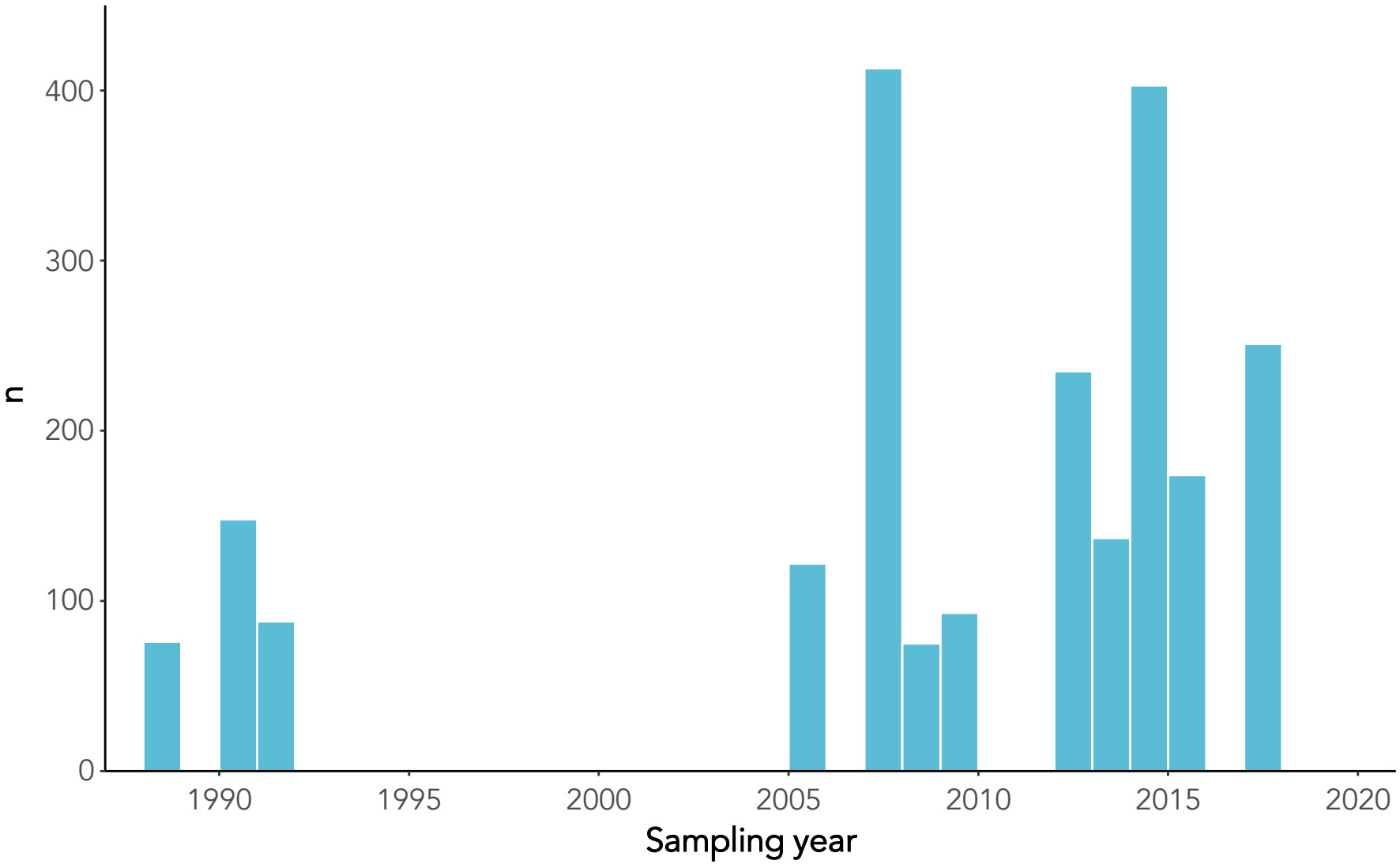
DeepIso v1

Spatial scope: almost global latitude (-62 to 67°) and longitude (-177 to 152°) coverage, depth range: up to 5209 m



DeepIso v1

Temporal scope: 1989 to 2018



DeepIso: what's next?

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Feeling like contributing? Questions? Feedback?
Get in touch at loicnmichel@gmail.com