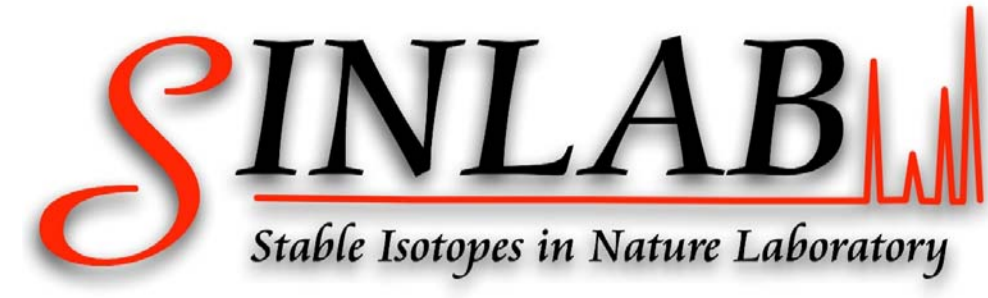


# Towards a global, freely available database of stable isotope ratios in foundation species from deep-sea hydrothermal vents and cold seeps

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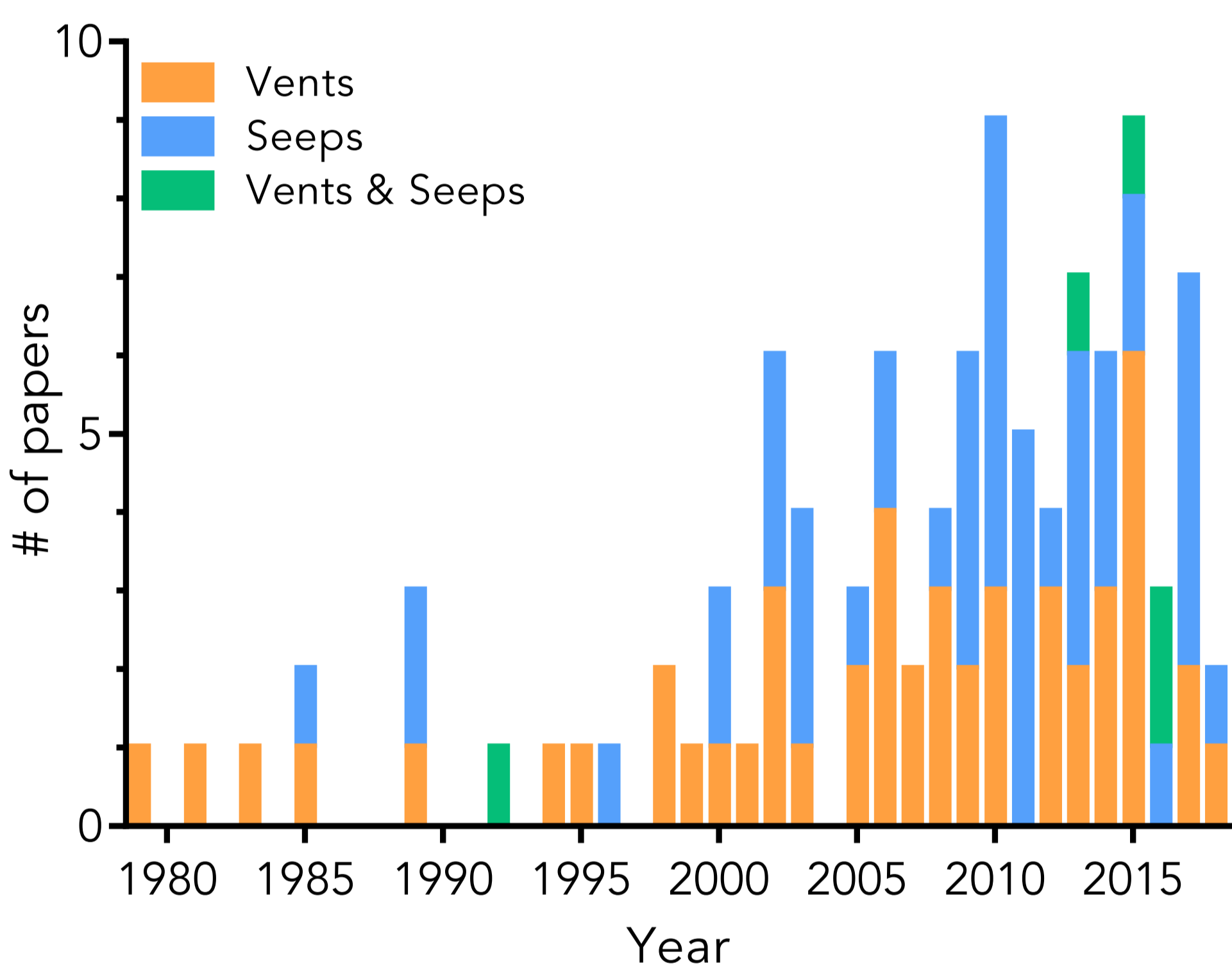
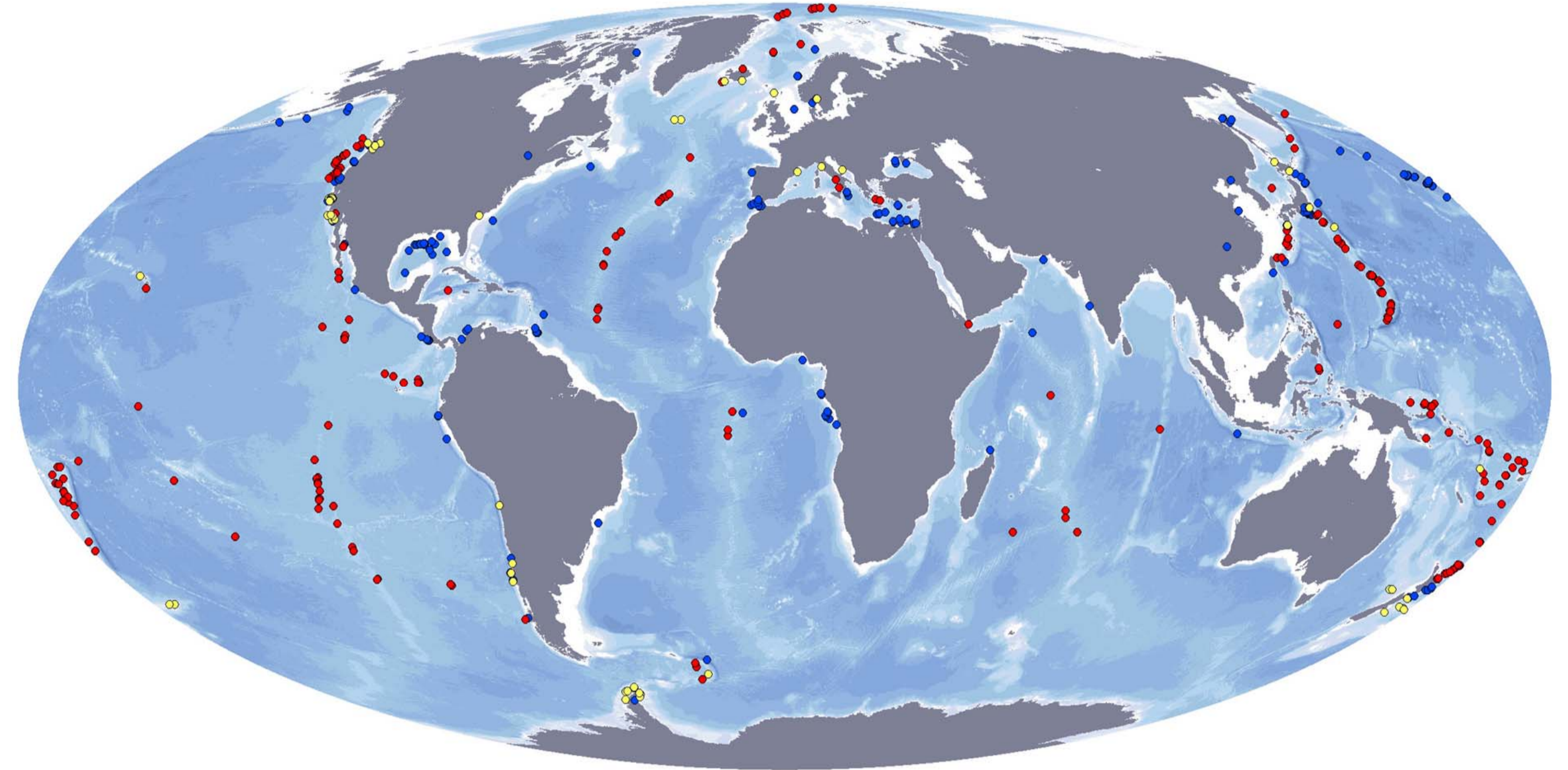


## Why do we need such a database ?

More info about this project ▲

- Ecosystems fuelled by fluid emissions (hydrothermal vents, cold seeps): widespread features of deep sea zones (Fig. 1), affect global biogeochemical cycles
- Associated food webs mostly rely on endogenous chemosynthetic production by micro-organisms
- Foundation species (polychaete, molluscs) typically derive their food from symbiotic associations with chemosynthetic micro-organisms
- Stable isotope ratios: commonly used (Fig. 2) as descriptors of animal ecology in fluid-based ecosystems since discovery of hydrothermal vents

▼ Fig. 1: Map of hydrothermal vents (red) and cold seeps (blue) whose fauna has been studied (from German *et al.* 2011 Plos ONE 6(8): e23259).



▲ Fig. 2: Temporal evolution of the number of published articles using stable isotopes to infer deep-sea food web structure. Curated list obtained through Scopus in May 2018, using the query TITLE-ABS-KEY((hydrothermal OR vent OR seep) AND (stable AND isotop\*) AND (food OR trophic OR ecology)).

- Most of the available literature (Fig. 2) = site-specific studies. Many questions remain open...
  - Are there any global drivers of food web structure in fluid-based ecosystems?
  - Do environmental (depth, fluid nature and emission intensity, geological setting, etc.) and biological factors (species assemblage structure) interactively influence foundation species ecology?
- Large-scale approaches: impaired by difficulty to achieve adequate isotopic characterization of baseline items + presence of spatial & temporal baseline shifts



Deep-sea researchers would greatly benefit from a global, freely available database compiling stable isotope ratios in organisms from hydrothermal vents and cold seeps

## How is the database built ?

Primary focus: symbiont-bearing siboglinid polychaete and bivalve molluscs

Foundation species: ecologically important

Ubiquitous and conspicuous taxa: commonly sampled (maximal coverage)

Good candidates for food web baseline integration

Literature review  
Data extraction

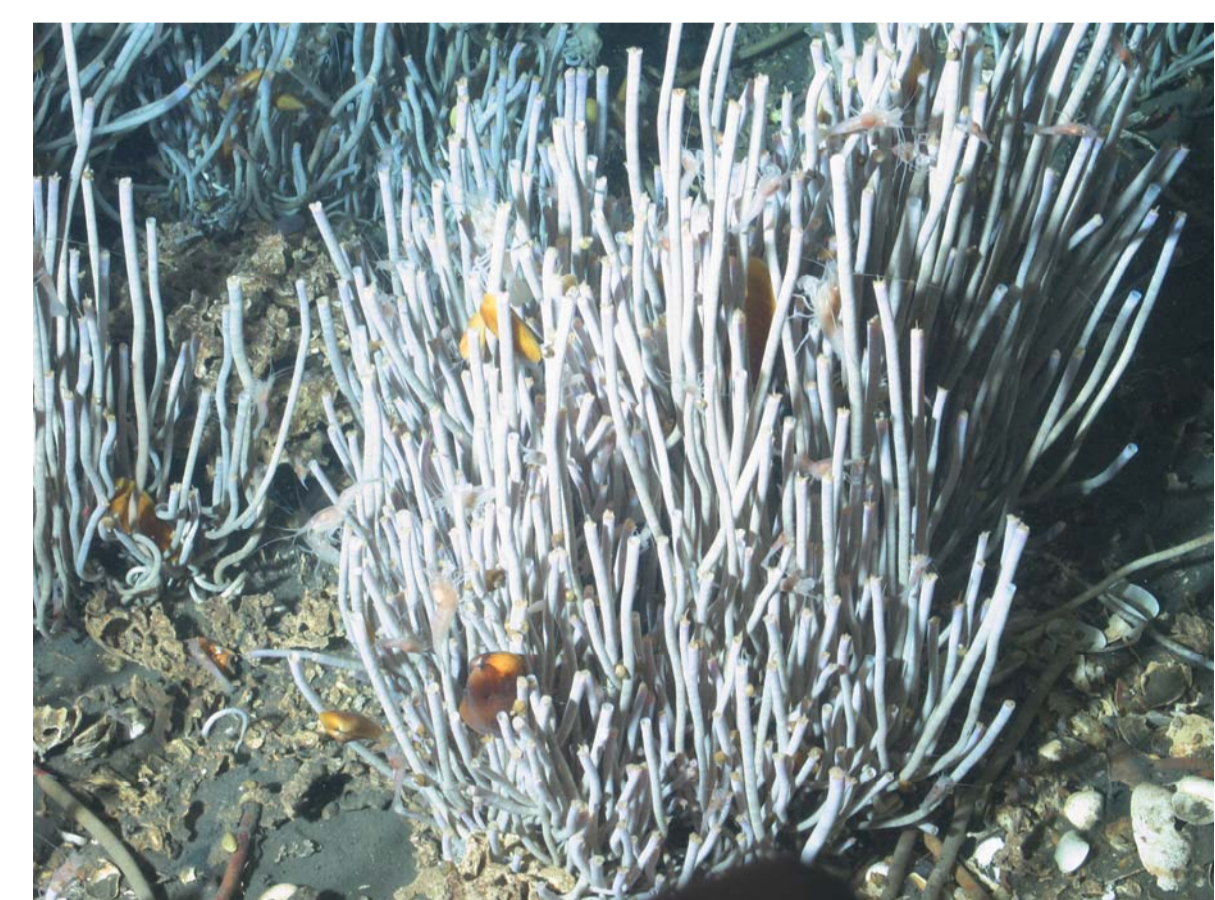


New SI analyses - Valorisation of  
already sampled material

Data centralisation and curation  
Metadata documentation

Data freely available through the IsoBank repository  
[www.isobank.org](http://www.isobank.org)

δ IsoBank



Siboglinid polychaetes (top, *Escarpia southwardae*) and bivalve molluscs (bottom, *Bathymodiolus cf. boomerang*) from cold seeps of the Gulf of Guinea (Pictures: Ifremer)



Siboglinid polychaetes (top, *Riftia pachyptila*) and bivalve molluscs (bottom, *Bathymodiolus azoricus*) from hydrothermal vents of the Mid-Atlantic ridge (Pictures: Ifremer)



## How can you contribute to this initiative ?

Acknowledgements

To expand the scope of the project, we are looking for

- Raw data underlying published articles
- Unpublished / grey literature data
- Suitable samples for analysis

If you are willing to share any of the above, please get in touch!

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