# Deep-sea Ecosystem Study - Research Unit Ifremer

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Describe and understand the composition, structure and functioning of deep-sea ecosystems

o   Biodiversity patterns (including the microbial compartment)

o   Structuration by the environment

o   Ecosystem functioning (trophic chain, colonisation and life cycle, connectivity, ...)

o   Temporal dynamics

Diversity of beep sea benthic ecosystems
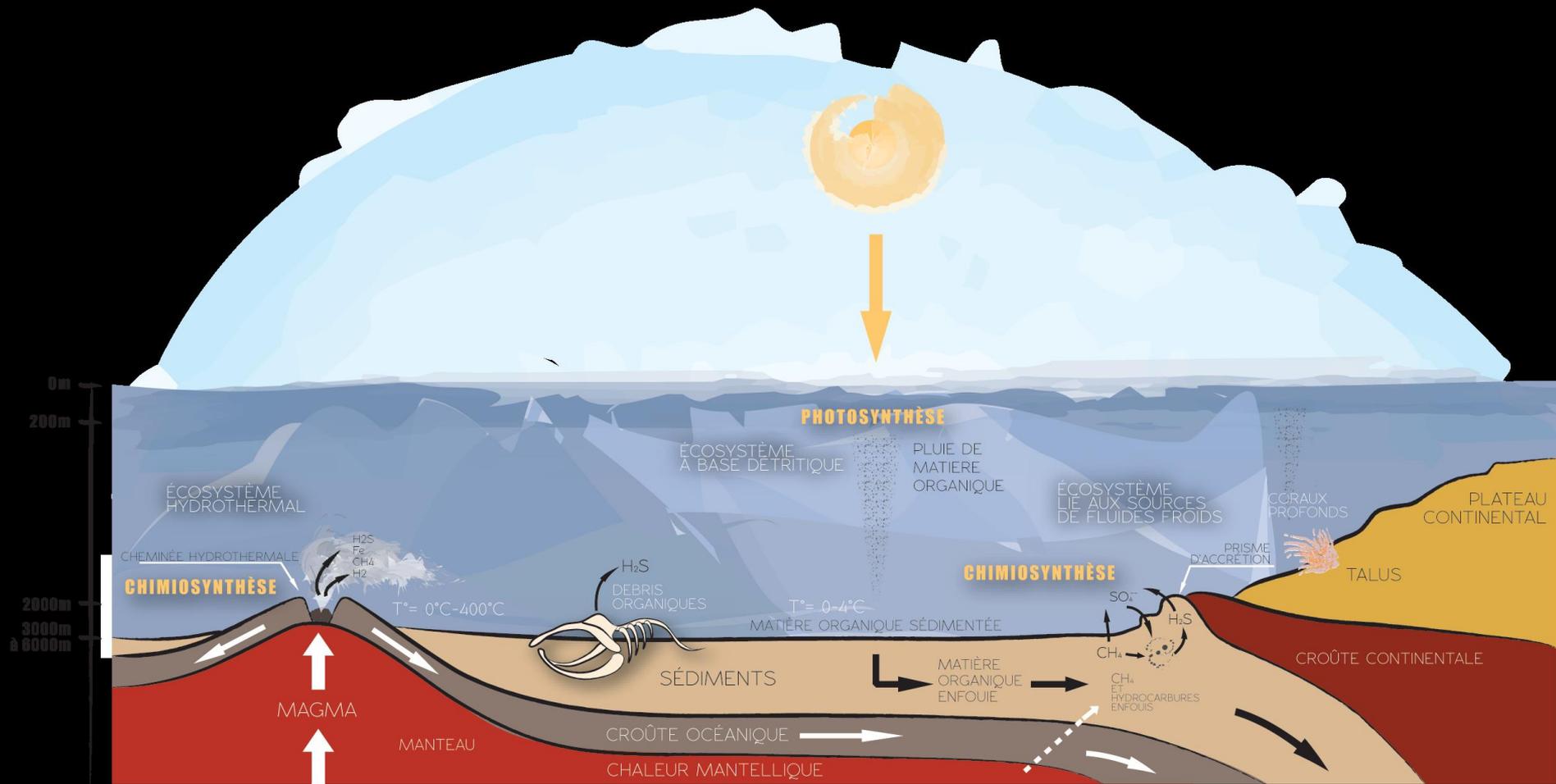
Hydrothermal vents

Abyssal plains
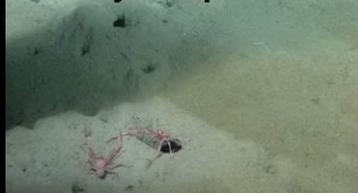
Cold seeps

Deep corals

Microbial compartment
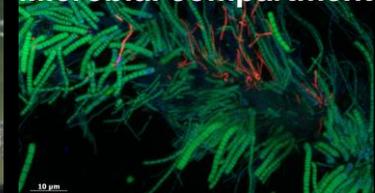
The playing fields
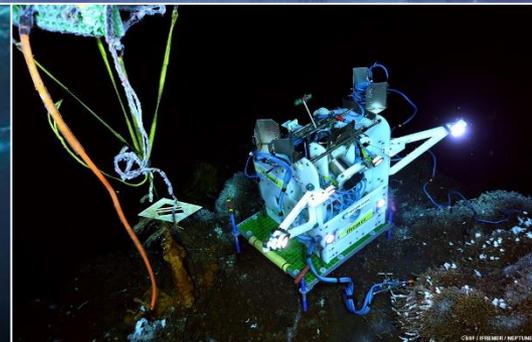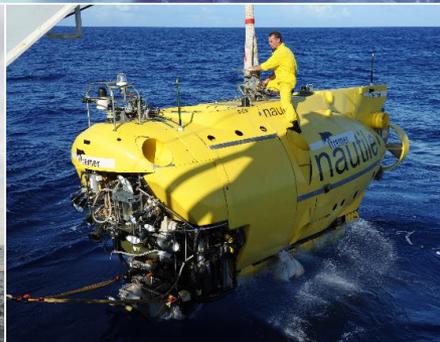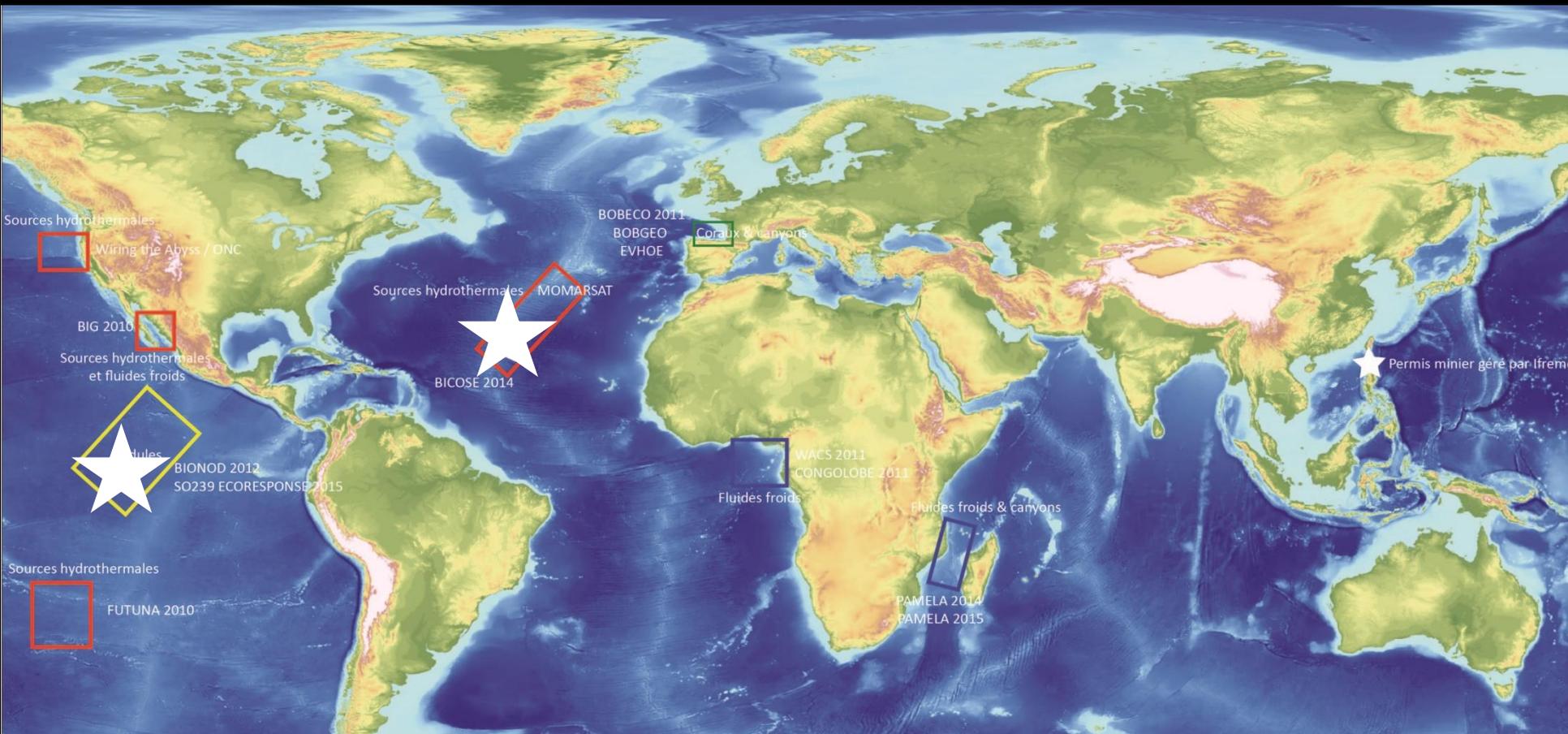
Highlight 1 – Assessing biodiversity
Lucky Strike hydrothermal vent - MPA

Menez Gwen (850 m) Azores
Lucky Strike (1700 m)
Rainbow (2320 m)
Broken Spur (3090 m)
TAG (3650 m)
Snake Pit (3500 m)
Logatchev (3000 m)

Arnaubec, Matabos com.pers.
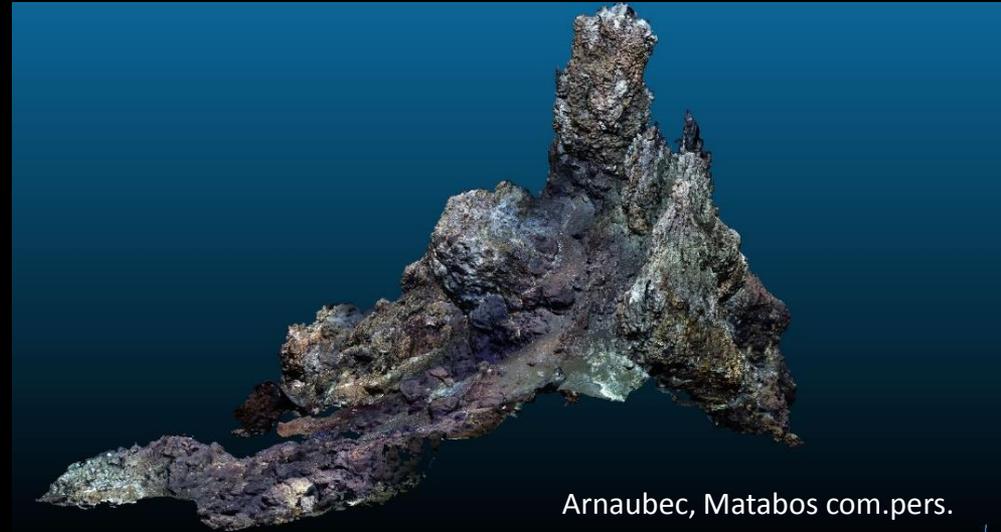
Distribution of macro- and meiofaunal species
70 taxonomic groups identified
        39% of "rare" species
        20 taxa in 2000 (Van dover)
        48 taxa in 2011 (Fabri et al)

Assessing biodiversity is not trivial !

Sarrazin et al. 2015

Highlight 2 – Colonisation processes
# Lucky Strike hydrothermal vent

9 months

24 months

Vent emission
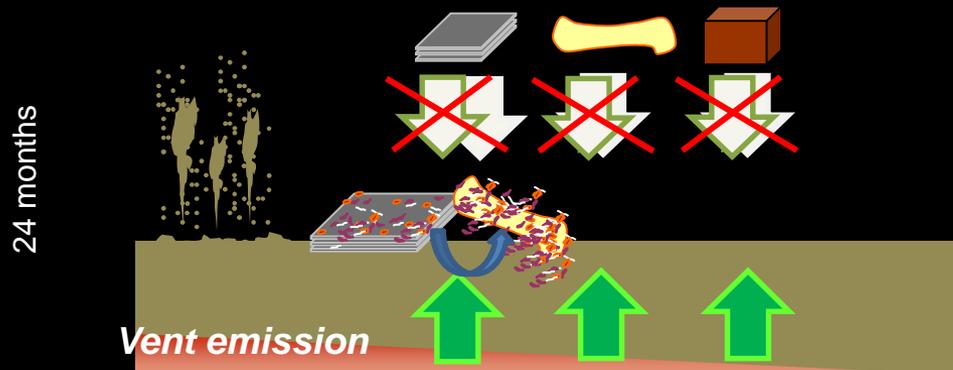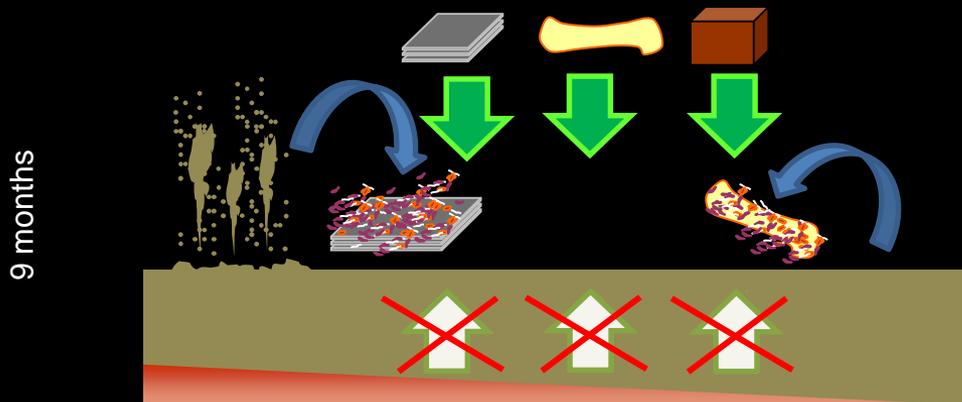
- Substrate to environmental control of the colonization process (faunal composition)

- Resilience of the ecosystem, recolonisation dynamics

Experimental work and site studies

Zeppilli et al. 2015

Key scientific questions

Embryos & larvae

Larval dispersal
(transport, duration, survival)

Colonization/recolonization
(cues, survival)

Juveniles & adults

Pradillon com. Pers.

day : 580

Roullet & Gulla, com. Pers.
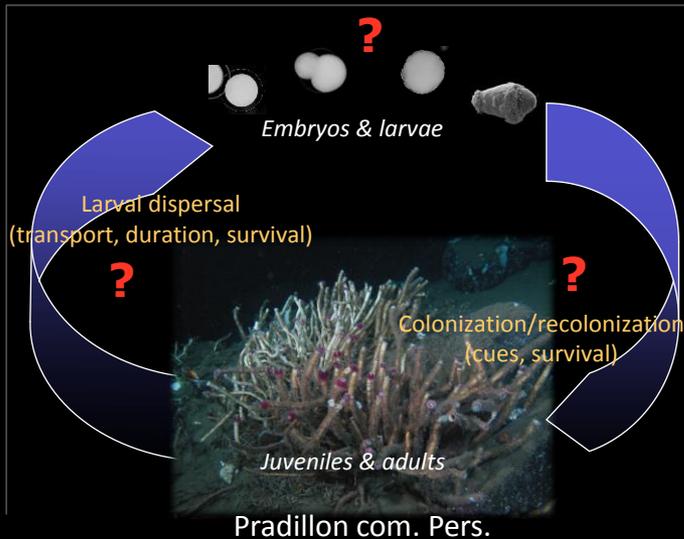
Environmental studies

- Biodiversity patterns in the deep-sea
- Habitat mapping
- Ecosystem functioning – life cycle, colonisation,
- Connectivity
- Role of deep-ocean circulation in transporting material

- New approaches : experimentation and modelisation

- Resilience

- Impact assessment
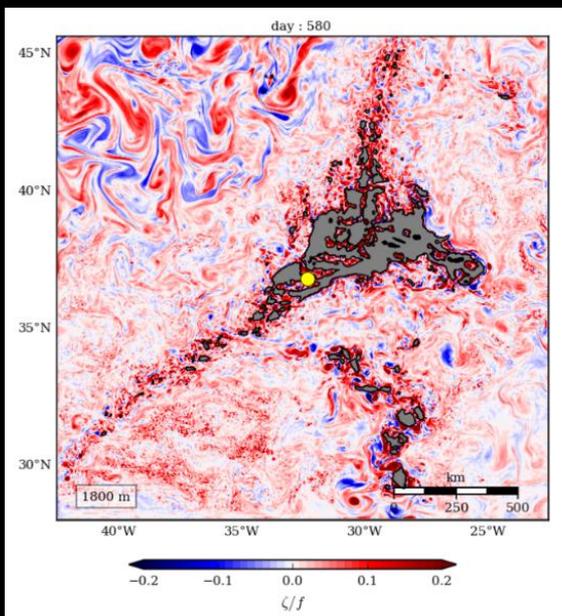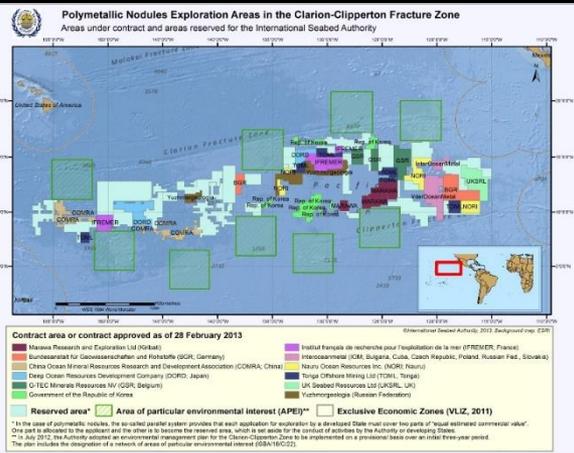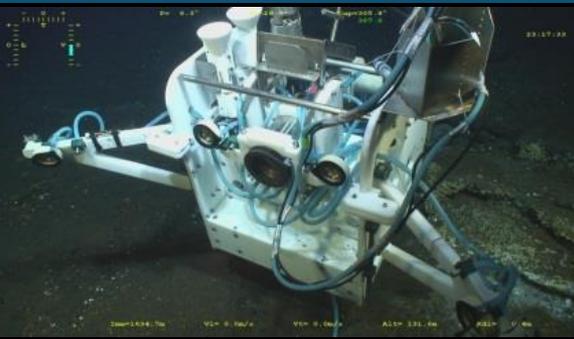
The role of public investment

Support the acquisition of fundamental knowledge

> **Exploration**

> **Deep sea ecosystem functioning, …**

Sharing environmental data

From fundamental knowledge to impact assessment and governance

Connecting the deep-sea with society

Social science, legal and economic research

Thank you !