Corso di Dottorato Nazionale in Biodiversity, Università di Palermo
Ciclo XXXIX

Ecology and Restoration of Chemoautotrophic-based Ecosystems

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Background

Chemoautotrophic-based ecosystems include hydrothermal vents and cold seeps (Fig. 1), which are globally distributed habitats characterized by the presence of seepage from the seafloor. Here, primary production is mainly or exclusively (depending on the depth) operated by microbes specialized in the exploitation of the chemical compounds present in the seepage.

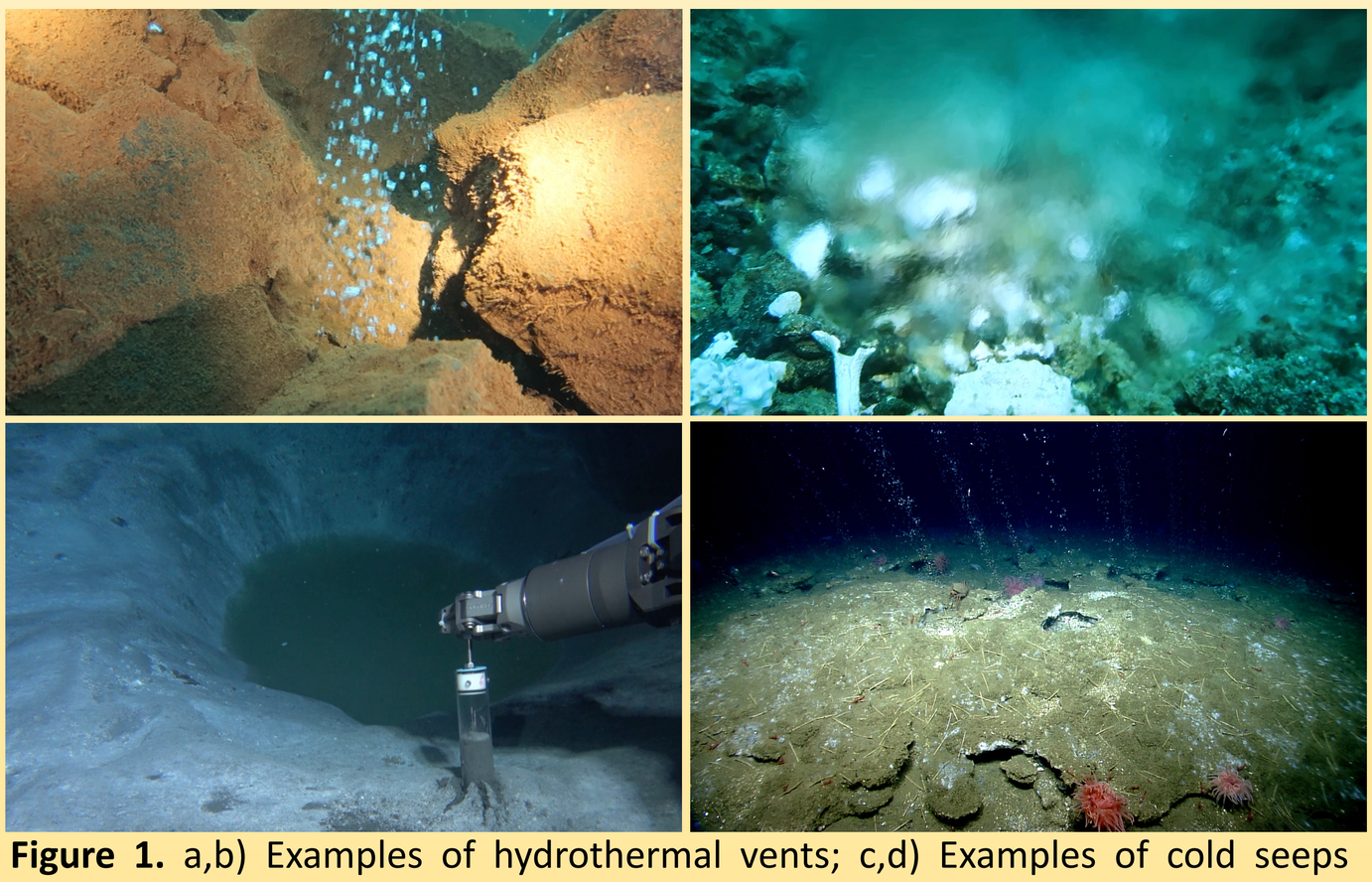


Figure 1. a,b) Examples of hydrothermal vents; c,d) Examples of cold seeps (c)courtesy of Yizhaq Makovsky; d)NOAA gallery).

Aims

- Increasing the current knowledge on the biogeography, distribution, biodiversity, and ecological functions of different typologies of chemoautotrophic-based ecosystems
- Planning restoration actions for chemosynthetic communities

Impacts

Why to Protect and Restore?

Hotspots of <u>biodiversity</u>
Food, substrate, recruitment and nursery

Presence of <u>endemic species</u>
Specifically adapted, symbiotic, long-lived species

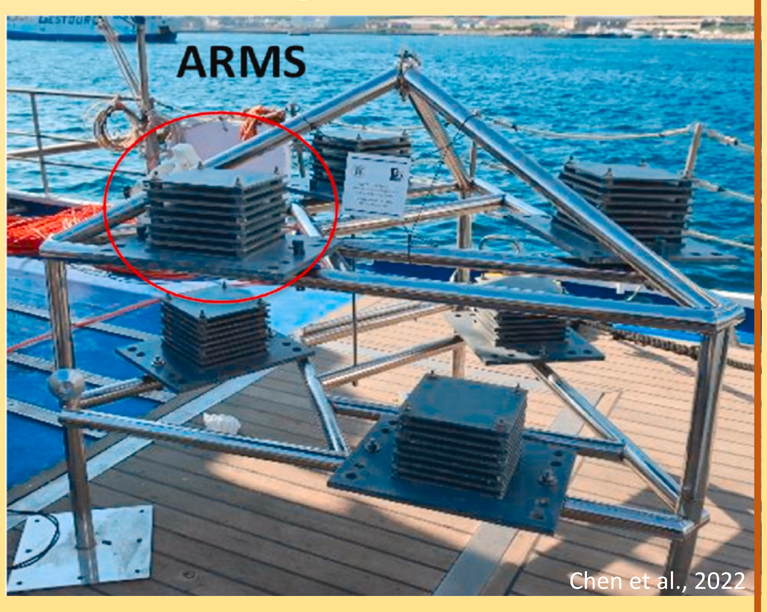
<u>Microbial habitats</u>
Chemosynthetic and extremophiles habitat-forming microbes

<u>Carbon sequestration and cycling</u>
Bio-mineralization of carbonate compounds

Restoration Methods

Autonomous Reef Monitoring Structures (ARMS)

- Deployment
- Recovery
- Analyses of the associated biodiversity



3D-printed Eco-Reefs

- Deployment
- Secondary substrate
- Colonization
- Increasing in biodiversity

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