

Food web structure and trophic interactions at the recently discovered deep-sea La Scala hydrothermal vent field (SW Pacific)

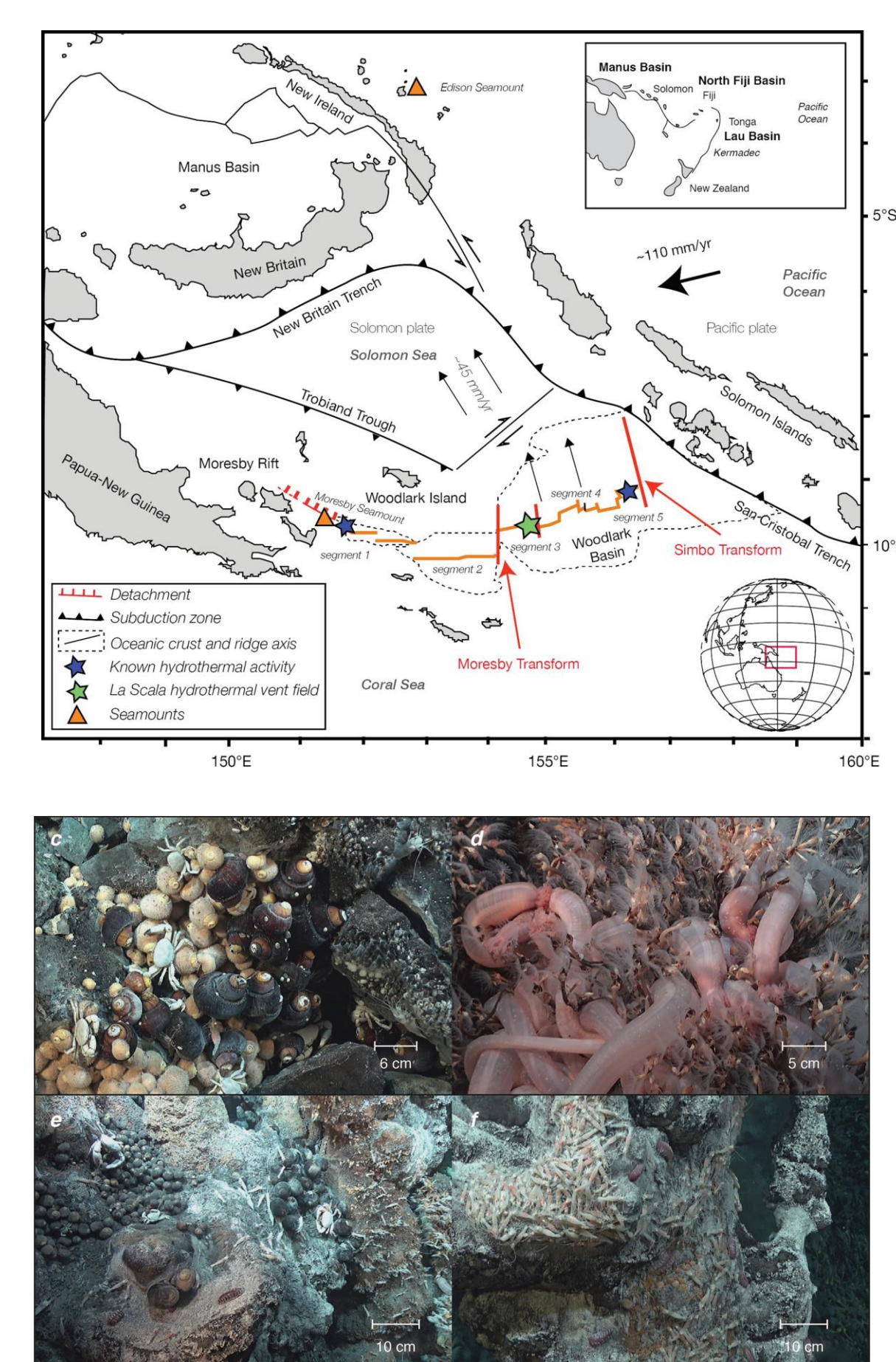
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Context & objectives

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Deep-sea hydrothermal vents form highly productive and specific habitats strongly contrasting with other ecosystems such as abyssal plains

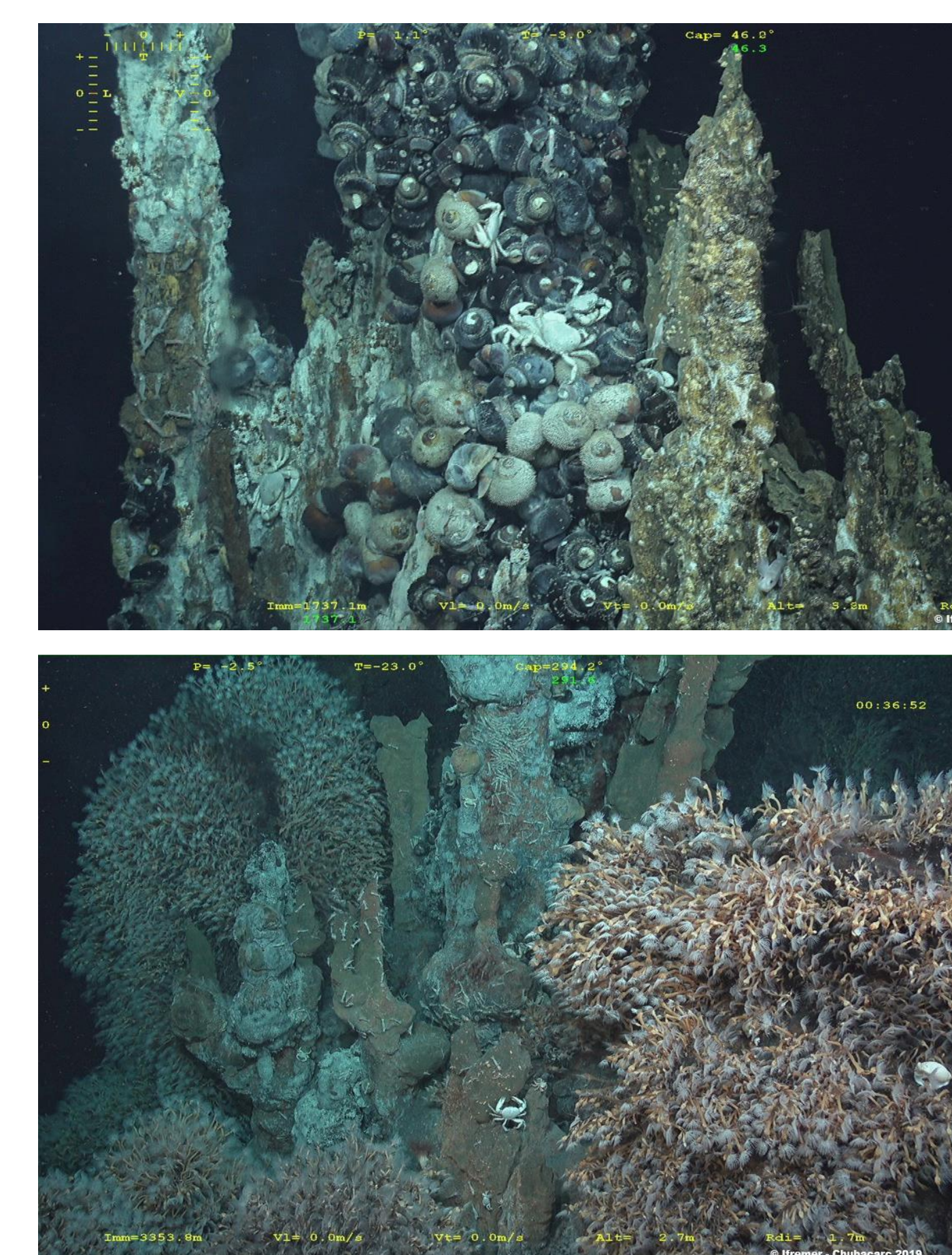
They host abundant fauna relying on chemosynthetic bacteria for their nutrition (through symbiosis or otherwise)

Yet, they are discretely distributed along oceanic ridges, which raises questions of biological connectivity and energy flux towards surrounding ecosystems

In 2019, during the CHUBACARC cruise, discovery of a new vent field, La Scala, in the Woodlark basin (↖).

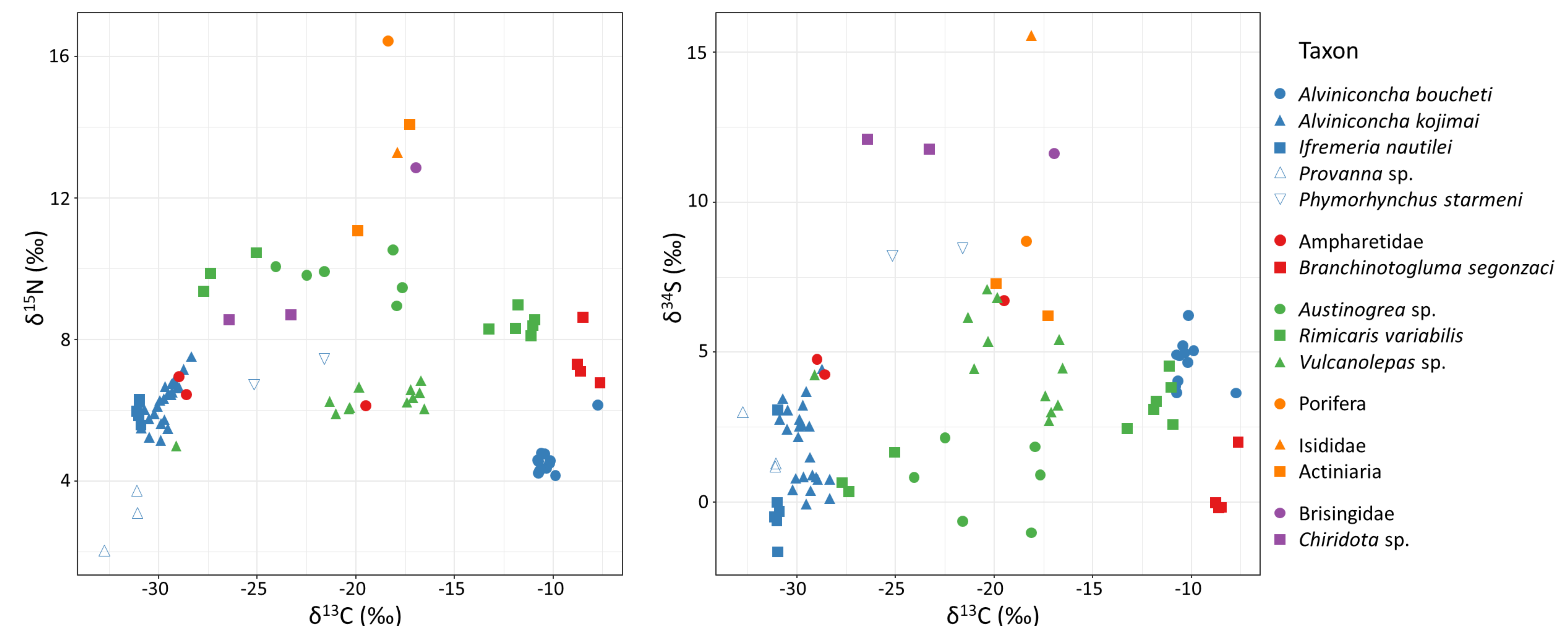
Over 40 taxa (↔), including several new species currently under description.

2 main habitats : large symbiont-bearing gastropods (*Alviniconcha* spp., *Ifremeria nautilei*) on active chimneys (↗), cirripeds (*Vulcanolepas* nov. sp.) on inactive chimneys and peripheral sites (↘).



Objectives: 1) Document functional ecology of this newly discovered system; 2) Identify main production pathways supporting animal populations; and 3) Assess potential energy fluxes between active sites and inactive, peripheral habitats.

Key findings



Community mostly fueled by thiotrophy (sulphide oxydation). No evidence of methanotrophy, photosynthetic inputs limited ($\delta^{34}\text{S} < 10\text{‰}$ in most taxa) in both vent specialists and facultative vent dwellers or species from peripheral habitats.

Continuum of $\delta^{13}\text{C}$ values: co-reliance on Calvin-Benson-Bassham and reverse tricarboxylic acid cycles, with inter- and intraspecific differences in feeding habits.

Take home message

Acknowledgements

Hydrothermal communities from Woodlark Basin mostly depend on endogenous production from sulphide-oxidizing microorganisms for their nutrition.

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Also true for fauna from inactive peripheral zones (target for deep-sea mining). Increasing evidence that vents are not "oases" in the barren deep sea, but are connected to surrounding ecosystems. This needs to be taken into account for conservation.