

Title

Stable carbon and nitrogen isotopes in marine biogeochemistry: insights from OGS (Italy)

Abstract

The stable isotope composition of carbon and nitrogen ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) represents a valuable tracer for investigating biogeochemical cycles, organic matter sources, and food web dynamics in marine ecosystems. This presentation highlights key research activities conducted at the National Institute of Oceanography and Applied Geophysics – OGS (Italy) across two main topics: (1) using primary producers—specifically microalgae in culture experiments and the seagrass *Posidonia oceanica* at the Panarea hydrothermal system (Italy)—to monitor different CO_2 sources; and (2) evaluate land-sea interactions, trace anthropogenic impacts, and model the diet of bivalves in the Northern Adriatic Sea using stable isotopes as tracers of different carbon sources.

These case studies demonstrate the versatility of stable isotope approaches in marine biogeochemistry, from laboratory-scale experiments to field monitoring, providing a valuable tool for environmental assessment and ocean management.

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