

## **Using nitrogen stable isotopes in primary producers to trace groundwater-borne nutrient uptake in coastal lagoons**

ANDRISOA ALADIN<sup>1</sup>, STIEGLITZ THOMAS<sup>1</sup>, RODELLAS VALENTI<sup>1</sup>, RAIMBAULT PATRICK<sup>2</sup>

<sup>1</sup> CEREGE (Aix Marseille Univ, CNRS, IRD, Coll France), Aix en Provence, France (\*correspondance: andrisoa@cerege.fr)

<sup>2</sup> Institut Méditerranéen d'Océanologie, Aix Marseille University, Luminy, 13288 Marseille, France

Coastal lagoons are highly productive ecosystems that support a variety of habitats. Their location at the land-sea interface makes them highly vulnerable to human activities. Elevated nutrient inputs are a major issue in many coastal lagoons, often resulting in eutrophication. Coastal groundwater discharge is increasingly recognized as a transport pathway for nutrients to the coast, but its ecological and biogeochemical roles on lagoonal and coastal ecosystems are still not well understood. In La Palme and Salses-Leucate lagoons (France), groundwater discharge, seawater recirculation through lagoon sediments and sewage effluents are potential nutrient sources. To trace the nutrient sources and to understand the relative contribution of these sources, we investigated the nitrogen isotopic signature ( $\delta^{15}\text{N}$ ) of dissolved inorganic nitrogen in the identified nutrient sources, in lagoon water and in primary producers, i.e. phytoplankton and macrophytes. Primary producers utilize nutrients and thus provide a reliable insight on different sources as they integrate the signature of the source over their lifetime. Preliminary results indicate that the  $\delta^{15}\text{N}$  of nitrate in lagoon waters, particulate organic matter and macrophytes were much closer to  $\delta^{15}\text{N}\text{-NO}_3^-$  of groundwater and  $\delta^{15}\text{N}$  of dissolved inorganic nitrogen of recirculation than to the sewage signature which were significantly higher. This suggests that groundwater and recirculation are important pathways for nutrient supply to the lagoon.