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Organic carbon sources across salinity gradients in Chilean Fjords: Reloncaví Fjord (∼41ºS) and Southern Patagonian ice fields area (∼48ºS)

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The organic matter preserved in marine sediments contains contributions of allochthonous and autochthonous and variable source inputs. Allochthonous sources are terrestrial erosion (including anthropogenic material) of relatively labile and refractory material, while autochthonous sources including marine phytoplankton. In order to establish the sources of the organic matter (allochthonous/autochthonous) and how organic carbon is distributed along a salinity gradient, on this study we examined of organic Carbon/Nitrogen molar ratios (C:N), isotopic composition (δ13C) and n-alkanes (n-C24 to n-C34) in surface sediments from two continuous systems: river-fjord-ocean in Northern Patagonia (41ºS-43ºS), and glacier-fjord-ocean in central Patagonia (47ºS-50ºS). The continental inner fjord areas are characterized with sediment enriched in allochthonous organic carbon and high C:N (8–12) and low δ13C values (-23‰ to -26‰. Towards the Pacific Ocean, low C:N (6-7) and high δ13C values (-20‰ to -22‰ suggest prevalent autochthonous marine sources. Estuarine waters with salinity between 2 psu and 30 psu were associated with high C:N and low δ13C values together with odd over even long-chain n-alkane predominance (n-C31, n-C29 and n-C27) in surface sediments. All geochemical proxies suggest a great contribution of terrigenous input by glacier origin rivers, mainly from terrestrial plants in both areas. Our study provides a framework to guide future researches on environmental and climate change on these systems.

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