



Impact of sea-level rise over the last deglacial transition on the strength of the continental shelf CO₂ Pump

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Although shelf seas account for only 7% of the oceanic surface area, recent observations demonstrate that they host significant ocean-atmosphere CO₂ fluxes. A mechanism implicated in driving a significant CO₂ sink in temperate and polar shelf seas is the Continental Shelf Pump. Here we present an analysis of the impact of sea-level rise, and the consequent flooding of continental shelves, on the growth of the continental shelf CO₂ pump over the last deglacial transition. We combine reconstructions of shelf paleogeography, bathymetry and tides, with contemporary shelf-sea - atmosphere CO₂ flux estimates, to demonstrate the potential of the expanding shelf seas to have impacted on the global carbon cycle, over the past 21,000 years, and by inference earlier glacial-interglacial cycles.