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Comparing ^{1}H NMR spectra of solid-phase extracted and whole DOM across a salinity gradient

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Marine dissolved organic matter (DOM) represents one of the largest pools of reduced carbon on the Earth's surface. Despite decades of research, little is known about the role of marine DOM in the oceanic carbon cycle due to limited understanding of its molecular composition. Nuclear magnetic resonance (NMR) spectroscopy is a powerful tool for investigating complex organic samples and has been widely used to characterize marine DOM. However, the vast majority of NMR spectra in the literature are of solid-phase extracted DOM (SPE-DOM), which represents only ~60% or less of the total DOC pool. To address this gap in the knowledge base, we collected DOM samples in San Francisco Bay, California, USA, to understand how molecular composition in SPE-DOM and whole DOM in estuarine water varies along a salinity gradient. SPE-DOM was extracted via PPL, a styrene divinyl benzene polymer type sorbent known for its high extraction efficiency. Whole and SPE-DOM samples from 11 stations were analyzed by ^{1}H NMR spectroscopy to determine which compound classes are represented differently in extracted DOM relative to whole DOM. We repeated this comparison using pore water samples collected from intertidal sediments in San Francisco Bay. In addition to assessing the effects of solid-phase extraction on DOM composition, this study helps us evaluate how marine DOM composition varies across sample type (water column versus sediment porewater) and salinity (marine versus terrestrial). The outcomes of these analyses will be presented and discussed.