

# **Recent advances in aquatic eddy covariance as a sensing approach for validating marine carbon dioxide removal**

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Several marine carbon dioxide removal (mCDR) approaches promise to enhance large-scale carbon fluxes to the deep ocean to achieve gigaton-scale CO<sub>2</sub> sequestration. However, to verify major changes in carbon export to depth requires sensing approaches able to quantify carbon fluxes volumetrically in the water column and over large areas of the seafloor. This contribution will focus on the strengths of aquatic eddy covariance (AEC) as a sensing method able to quantify organic carbon metabolism linked to export and to establish baseline understanding of the ocean carbon cycle. Examples will highlight new insights gained from AEC measurements of underwater oxygen fluxes in ocean shelf regions experiencing hypoxia. Instrumentation designs and advances that promise to lead to sustained measurements from fixed and mobile platforms will also be introduced.