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Where's the Carbon: Exploring the Spatial Heterogeneity of Sedimentary Carbon in Mid-Latitude Fjords.

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Fjords are recognised as globally significant hotspots for the burial and long-term storage of marine and terrestrially derived carbon (C), providing climate mitigation potential through their ecosystem services. Currently our understanding of the spatial distribution of C within the surficial sediments of fjords is limited and this potentially implies an overestimation in the global estimates of C buried in fjords. Using the mid-latitude fjords of Scotland and Ireland as a natural laboratory, we have developed a methodological approach utilising a spectrum of data ranging from freely available chart data to the latest multi-beam geophysics to determine and map the seabed sediment type. A targeted sampling of fjord sediments establishes a calibration of sediment type against C content and we show that fjords sediments are highly heterogenous in C content. This tiered approach makes it ideally suited to global application where data availability may differ significantly. Improved spatial mapping of seabed C will provide policy makers with a new tool for the targeted management and protection of these globally important C stores.