

Foraminiferal indicators of high OC content in marine sediments; a question of OC source?

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West Shetland voes (sea inlets), on Scotland northern maritime periphery, represent a range of environmental and depositional settings in an area of coastal ocean which is characterised by a generally high organic carbon content in marine sediments. Possible sources of organic carbon are fish farms, as this region is experiencing a large expansion in marine aquaculture, and/or erosion of peatland. Twenty-one sites in six voes were sampled in August 2015 following an organic carbon gradient. The aims of this study are: 1) to establish the modern biogeography of benthic foraminifera in west Shetland voes, 2) to explore the use of these organisms as bio-indicators of high organic carbon content in marine sediments, and 3) to trace the source of organic carbon and its transportation between different habitats and pools (e.g.: terrestrial to marine; marine aquaculture to sediments). To achieve this, we paired together spatial variations in the composition of benthic foraminiferal assemblages (species abundance and diversity) with changes in the physical properties of marine sediments determined by carbon stable isotope measurements and loss on ignition analysis. Preliminary results show a positive relationship between high abundance of the agglutinated benthic foraminifera *Eggerelloides scaber*, high organic carbon content in the sediments and proximity to fish farms. Although aquaculture farming in these areas may be a contributing factor, radiocarbon dates demonstrate that organic enrichment in the sediments pre-dates the introduction of aquaculture, while carbon stable isotope measurements point to peat erosion as a more likely source of organic carbon in west Shetland voes. Therefore, peatland erosion is a significant source of organic carbon in marine sediments and may be an important contributor to the store of blue carbon in west Shetland voes and, more in general, in the coastal ocean.