

MASTS Coastal Processes & Dynamics Forum Award CPDSG4: Optically Stimulated Luminescence (OSL) dating of saltmarsh sediments in Nigg Bay, Cromarty Firth.

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The small grant application funding was requested to cover the costs of fieldwork and preliminary laboratory analysis using Optically-Stimulated Luminescence (OSL) techniques in order to establish a saltmarsh sedimentation chronology and thus sedimentation rate for a pair of sites in Nigg Bay, Cromarty Firth (Scotland) comprising a managed realigned saltmarsh adjacent to a natural saltmarsh .

A main thrust of the application was focussed on establishing whether the OSL technique was sensitive enough to provide accurate ages from buried saltmarsh sediments and so to allow sedimentation rates to be calculated and compared with more recent surface sedimentation rates. This will ultimately improve our understanding of the sedimentation, erosion and accretion dynamics of managed saltmarsh systems as oppose to natural systems. Not only will this work will directly inform the biogeomorphic dynamics and properties of saltmarsh systems but it will also improve the understanding of the sedimentation changes that underpin the biodiversity, function and ecosystem services of saltmarshes.

The funding Award was fully transferred to –the Scottish Universities Environmental Research Centre (SUERC) where the OSL analyses were conducted under the full collaboration, support and expertise of Prof. David Sanderson & Dr. Tim Kinnaird. In all 8 (< 1m) sediment cores were collected and investigated to assess the potential of OSL techniques in saltmarsh environments. The preliminary results and analyses of the cores led to a successful poster presentation (*“Luminescence in Scottish saltmarshes: Testing contemporary sediment bleaching at Nigg Bay, Cromarty Firth”* Francoz, C., Sanderson, D. C. W., Kinnaird, T. C., Carmichael, L.A., Hansom, J.D.) which won the first prize at the UK Luminescence and ESR Meeting 2016 held at the University of Liverpool (11-13 July 2016). A further poster presentation update of this work is planned for the MASTS ASM in October 2016.

Building on the MASTS-funded analyses and collaborative work with SUERC, the Nigg Bay saltmarsh sediment luminescence signals and sensitivity are now being appraised on the remaining cores. Further work has been initiated to collect contemporary intertidal suspended sediments on a spring-tide cycle in order to establish the degree of signal resetting and assess in-situ bleaching. This unique dataset will allow us to improve our understanding of the luminescence properties of sediments and accuracy of OSL age dating in saltmarsh settings globally.