

Figure S1: The operation of the fg-SPI camera in Loch Creran, detailing (a) the distribution of luminophore tracer (orange particles) at the sediment-water interface and the presence of two DGT gel strips (white strips) in the field of view, and (b) a SCUBA diver inserting additional replicate DGT probes in the vicinity. Photographs by Dr M. Sayer, NERC National Facility for Scientific Diving (NFSD).

Figure S2: The gastropod, *Turritella communis*, was particularly abundant in the surficial sediment surrounding the fg-SPI. Photograph by Dr M. Sayer, NERC National Facility for Scientific Diving (NFSD).

Figure S3: Visual representation of the sum of squares (colour shades) between the estimated parameters *activity* and *distance* for deployments (a) 1, (b) 2 and (c) 3 of the fg-SPI following parameterisation of the simulation model using all three parameters. In each case, the surface of the objective function across parameter space reveals a strong correlation between the parameter values *activity* and *distance*, indicating that a wide range of value combinations (ranging from low values for *activity* and high values for *distance*, to high values of *activity* and low values for *distance*) are equally plausible, requiring the parameter *activity* to be fixed at the optimal value and the model re-run with only two parameters.

Figure S4: The sum of squares (measure of fit) of the simulation models over time for each deployment of the fg-SPI (deployment 1, solid line; deployment 2, dotted line, deployment 3, dashed line).