

## **Constraining the U-236 input function from nuclear reprocessing using sea shells**

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Anthropogenic radionuclides discharged from Sellafield (SF) and La Hague (LH) nuclear reprocessing plants into western European Seas allow identifying water mass transport pathways and estimating transit times to, and within, the Arctic and N. Atlantic Oceans. Recent work proposed using <sup>236</sup>U, alone or in combination with <sup>129</sup>I, to better identify key circulation patterns [1]. So far, the <sup>236</sup>U tracer cannot be fully exploited because of a substantial gap of knowledge on the release history from SF, and to lesser extent also from LH. Here, we present the first observational-based reconstruction of past <sup>236</sup>U (and <sup>14</sup>C, <sup>129</sup>I) releases from the two nuclear facilities using bivalve shells of known collection date and lifespan. First, the suitability of *C. edule* bivalve as a recorder of sea water <sup>236</sup>U/<sup>238</sup>U levels was confirmed by comparing the shell-based reconstruction to documented U releases from LH. Then, the so far unknown input function of <sup>236</sup>U from SF was reconstructed. We found that the shell-based <sup>236</sup>U input function from SF is significantly different from the model-based reconstruction [1].

[1] Christl et al. (2015) J. Geophys. Res. Oceans, 120.