



## Two dimensional mapping of iron release in marine sediments at submillimetre scale

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Titre	Two dimensional mapping of iron release in marine sediments at submillimetre scale
Type de publication	Article de revue
Auteur	Thibault de Chanvalon, Aubin [1], Metzger, Édouard [2], Mouret, Aurélia [3], Knoery, J. [4], Geslin, Emmanuelle [5], Meysman, Filip JR [6]
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Mots-clés	2D-DET [7], Benthic flux [8], Bioturbation [9], Coastal sediment [10]
Résumé en anglais	<p>Coastal and shelf sediments are considered as an important source of dissolved iron to the ocean. Here, we present a new numerical approach to estimate geochemical fluxes and production rates in an estuarine sediment at sub-millimetre resolution. This approach is based on application of Savitsky-Golay filter (SGF) procedure to two-dimensional concentration distributions of dissolved iron. We verified the procedure by applying it to artificial data of known production rates, and analysed the resulting uncertainty on production rates and fluxes across the water-sediment interface. This SGF procedure was applied to data from an intertidal mudflat that is densely inhabited by macrofauna (e.g. 630 ind m<sup>-2</sup> of <i>Hediste diversicolor</i>, I. Métais, pers.com.). Our analysis reveals an apparent recycling rate of <math>3780 \pm 1399 \mu\text{mol m}^{-2} \text{d}^{-1}</math> and a mean residence time of iron in the dissolved phase of 2.3 days. Visual identification of burrows permitted to calculate separately the diffusive flux across the sediment-water interface (<math>104 \pm 20 \mu\text{mol m}^{-2} \text{d}^{-1}</math>) and the bio-irrigational flux (<math>410 \pm 213 \mu\text{mol m}^{-2} \text{d}^{-1}</math>). Reactive iron particles will undergo on average 7.4 cycles of dissolution/precipitation before being released to the water column. These results show that estuarine sediments support intensive iron recycling that has probably a large impact on terrigenous particles before being released into the ocean.</p>
URL de la notice	<a href="http://okina.univ-angers.fr/publications/ua15512">http://okina.univ-angers.fr/publications/ua15512</a> [11]
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## Liens

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- [2] <http://okina.univ-angers.fr/edouard.metzger/publications>
- [3] <http://okina.univ-angers.fr/aurelia.mouret/publications>
- [4] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=24659>
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- [11] <http://okina.univ-angers.fr/publications/ua15512>
- [12] <http://dx.doi.org/10.1016/j.marchem.2016.04.003>
- [13] <http://www.sciencedirect.com/science/article/pii/S0304420316300342>

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