

Supplementary Material

Does nitrate enrichment accelerate organic matter turnover in subterranean estuaries?

J. Severino P. IBÁNHEZ^{1,2*}, Xosé Antón ÁLVAREZ-SALGADO², Carlos ROCHA¹

¹ Biogeochemistry Research Group, School of Natural Sciences, Trinity College, Dublin 2, Ireland

² Instituto de Investigacións Mariñas, Consejo Superior de Investigaciones Científicas (IIM-CSIC), Eduardo Cabello 6, 36208 Vigo, Spain

* **Correspondence:** J.S.P. IBÁNHEZ

e-mail: pinoibaj@tcd.ie

1 Supplementary Figures and Tables

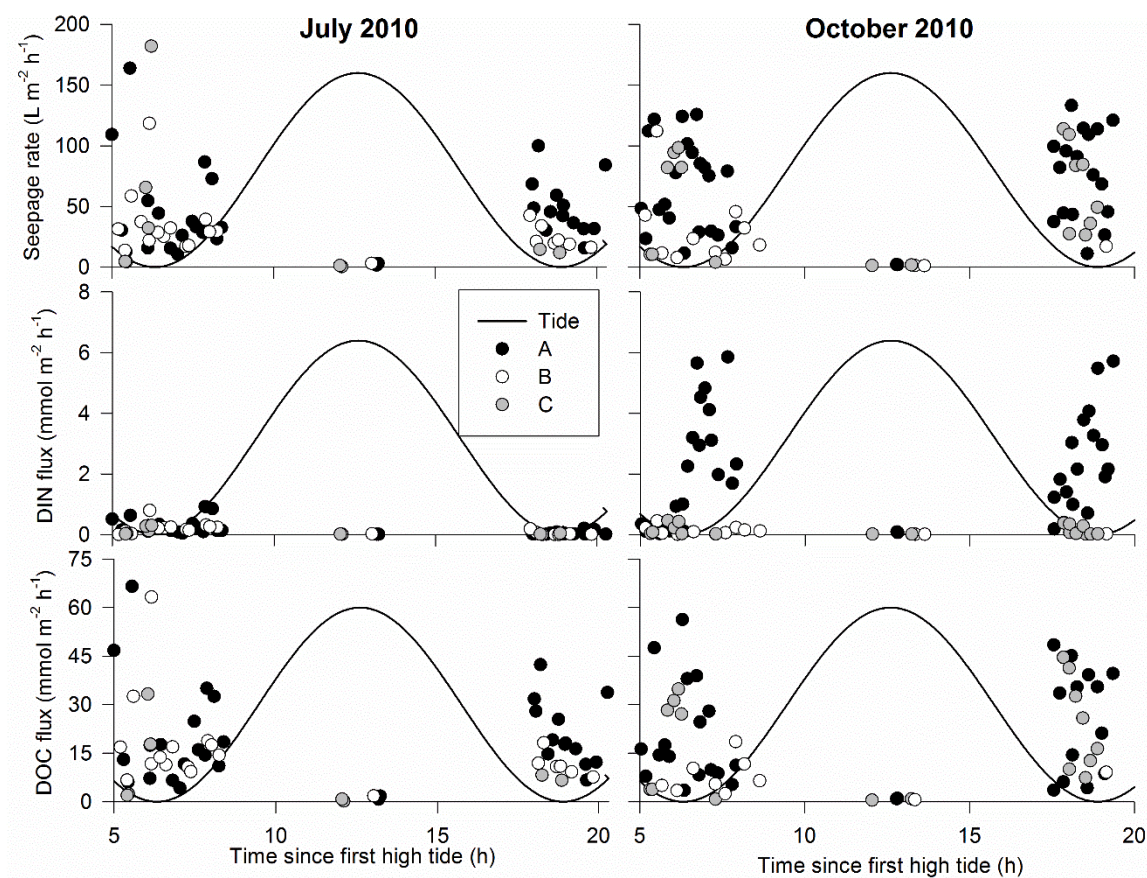
1.1 Supplementary Tables

Supplementary Table 1. Median (range) salinity, nitrate, ammonium and DOC concentrations as measured in the samples taken from the seepage meters for each sampled month. The median intensity (and range) of the five fluorophores identified through PARAFAC modeling of the entire FDOM data set is also shown.

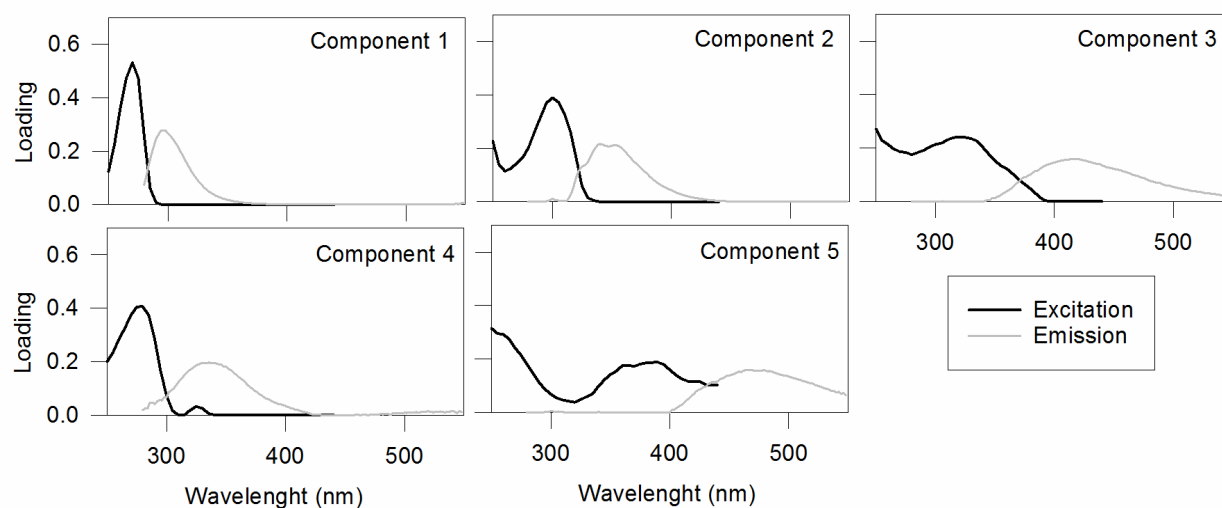
	Salinity	NO ₃ ⁻ + NO ₂ ⁻	NH ₄ ⁺	DOC	FDOM (R.U.)					n
		μM	μM	μM	C1	C2	C3	C4	C5	
December	36.0 (35.3-36.4)	6.4 (0.2-10.9)	2.3 (1.7-10.6)	310 (194-693)	0.26 (0.00-6.20)	0.03 (0.01-0.14)	0.07 (0.05-0.41)	0.08 (0.00-0.21)	0.04 (0.01-0.06)	57
April	35.9 (32.8-36.7)	3.7 (0-24.9)	0.5 (0-5.5)	540 (366-976)	0.86 (0.00-8.22)	0.04 (0.02-0.08)	0.14 (0.12-0.19)	0.10 (0.03-0.24)	0.07 (0.05-0.08)	46
July	37.2 (36.7-37.6)	3.3 (0-10.6)	0.2 (0-5.5)	484 (318-666)	1.18 (0.06-4.92)	0.32 (0.06-3.64)	0.17 (0.14-0.24)	0.10 (0.00-0.77)	0.09 (0.06-0.15)	63
October	36.0 (35.1-36.3)	5.6 (0-108)	0.4 (0.2-4.9)	354 (95-562)	0.03 (0.00-1.51)	0.05 (0.02-0.12)	0.14 (0.05-0.21)	0.12 (0.05-0.40)	0.08 (0.03-0.13)	71
January	36.2 (35.2-36.7)	3.5 (0-9.2)	0.2 (0-0.9)	334 (291-424)	0.30 (0.01-3.44)	0.03 (0.02-0.07)	0.10 (0.08-0.17)	0.09 (0.04-0.23)	0.06 (0.04-0.09)	28

1.2 Supplementary Figures

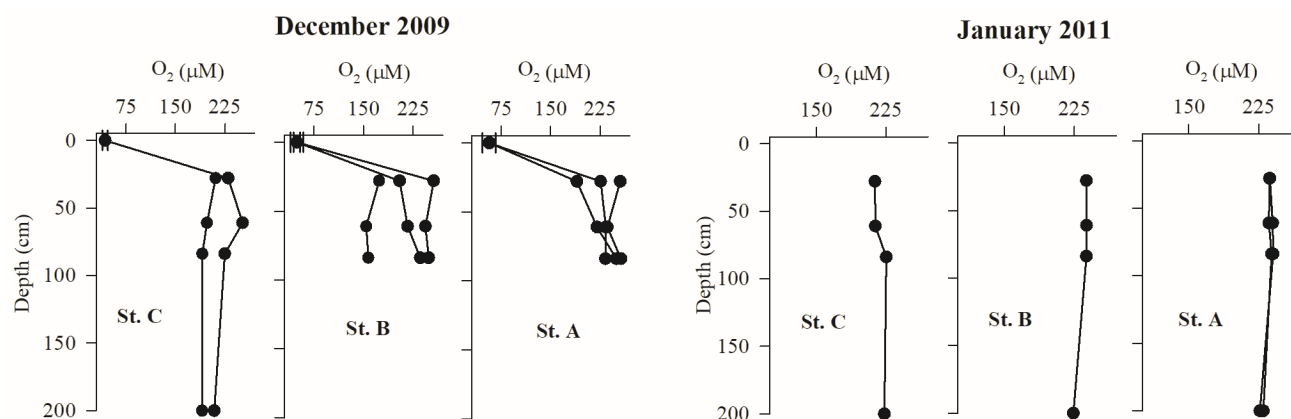
Supplementary Figure 1. Seepage rates and associated DIN and DOC fluxes to the lagoon measured with Lee-type seepage meters at the three sampling stations during two consecutive tidal cycles in July and October 2010. The schematic tidal level at the site is shown for reference.



Supplementary Figure 2. Excitation (grey lines) and emission (black lines) loadings of the five FDOM components identified through PARAFAC modeling of the data set presented here (701 samples).



Supplementary figure 3. Vertical porewater profiles of O_2 measured in sampling stations A, B and C during the period of sediment exposure (i.e. active seepage) during December 2009 and January 2011. O_2 concentration in the sediment surface presented in December 2009 was calculated from that measured in the seepage meters integrated for half an hour around the time the porewater samples were obtained. Error bars represent the standard error of the estimate. Data obtained from Ibánhez, J. S. P., and Rocha, C. (2016). Oxygen transport and reactivity within a sandy seepage face in a mesotidal lagoon (Ria Formosa, Southwestern Iberia). *Limnol. Oceanogr.* 61, 61–77. doi:10.1002/lno.10199.



Supplementary figure 4. High-resolution vertical porewater profiles of salinity during the peak of discharge in stations A and B (not sampled in January 2011) throughout the five seasonal surveys performed. Porewater profiles correspond to the average of those obtained during two consecutive tidal cycles with piezometers and porewater profilers.

