

Table S1. Data used to model the DOC decay in the meso– and bathypelagic ocean.

Values ($\pm$ SE) of the degraded (b_1) and recalcitrant DOC pool (b_2) and the decay constants (k_C) obtained for the meso– and bathypelagic North Atlantic using data from the CLIVAR Repeat Hydrography line A16N. t_0 , apparent age of the youngest waters in each temperature bin; n, number of data used to fit the equation; R^2 , determination coefficient.

Temp. range (°C)	avg. temp. (°C)	age range (year)	t_0 (year)	n	R^2	$b_1(\text{at } t_0)$ ($\mu\text{mol kg}^{-1}$)	k_C (year^{-1})	b_2 ($\mu\text{mol kg}^{-1}$)
Bathypelagic North Atlantic (>1000 m)								
[2.5, 3.5]	3.0	[25, 55]	25	12	0.8		0.054 $\pm$	
				2	0	5.8 $\pm$ 0.2	0.003	40.5 $\pm$ 0.6
[3.5, 4.5]	4.0	[25, 55]	25	11	0.8		0.059 $\pm$	
				7	0	5.6 $\pm$ 0.1	0.004	40.2 $\pm$ 0.5
[4.5, 5.5]	5.0	[20, 55]	20	77	0.8	5.7 $\pm$ 0.5	0.07 $\pm$ 0.01	40.0 $\pm$ 0.5
				6				
[5.5, 6.5]	6.0	[20, 55]	20	59	0.8	5.0 $\pm$ 0.2	0.08 $\pm$ 0.01	40.8 $\pm$ 0.4
				2				
[6.5, 7.5]	7.0	[20, 55]	20	62	0.7	6.0 $\pm$ 0.4	0.09 $\pm$ 0.02	41.7 $\pm$ 0.3
				4				
Mesopelagic North Atlantic (~150–1000 m)								
[7.5, 8.5]	8.0	[5, 50]	5	90	0.8	13.0 $\pm$ 0.6	0.05 $\pm$ 0.01	40.5 $\pm$ 0.8
				7				
[8.5, 9.5]	8.9	[5, 45]	5	90	0.8	11.6 $\pm$ 0.7	0.05 $\pm$ 0.01	41.6 $\pm$ 1.0
				4				
[9.5, 10.5]	10.0	[5, 40]	5	10	0.7	10.0 $\pm$ 0.6	0.06 $\pm$ 0.02	43.1 $\pm$ 0.8
				8				
[10.5, 11.5]	11.0	[5, 35]	5	92	0.6	7.8 $\pm$ 0.9	0.07 $\pm$ 0.03	44.5 $\pm$ 1.5
				3				
[11.5, 12.5]	12.0	[5, 30]	5	63	0.7	6.5 $\pm$ 0.7	0.13 $\pm$ 0.03	46.1 $\pm$ 0.4
				7				
[12.5, 13.5]	13.0	[5, 25]	5	54	0.4	5.5 $\pm$ 0.9	0.16 $\pm$ 0.06	47.0 $\pm$ 0.7
				4				
[13.5, 14.5]	14.0	[5, 20]	5	37	0.7	4.3 $\pm$ 0.6	0.14 $\pm$ 0.05	47.2 $\pm$ 0.4
				4				