Supplement

TABLE S1. Mean leucine aminopeptidase activity (in units nmol l^{-1} hr^{-1}) per salinity bin.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	15	0	0	29	-	2.1	0.28	7.3	13	10	-	-
10	-	-	-	109	103	139	102	95	168	-	-	-	-	-	-
11	-	-	-	-	-	165	113	123	-	-	-	-	-	-	-
12	-	-	-	-	-	121	196	207	199	-	-	381	-	-	-
13	-	-	-	-	-	-	-	149	182	118	124	149	80	80	-
14	-	-	-	-	-	-	-	-	-	-	-	-	41	50	68
15	-	-	-	-	-	65	45	115	160	53	99	125	-	-	-
16	78	11	65	-	90	-	-	-	-	-	-	-	-	-	-
17	151	86	65	88	118	84	101	190	156	118	60	92	92	68	162
18	-	-	-	-	-	-	137	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	88	117	130	218	-	-	-	-
20	140	63	42	-	-	-	-	79	102	103	155	231	-	-	-

TABLE S2. Chlorophyll fluorescence (in chlorophyll fluorescence units) per salinity bin.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	0	0	0	0	-	482	283	187	189	135	-	-
10	-	-	-	332	299	172	90	223	182	-	-	-	-	-	-
11	-	-	-	-	-	349	288	0	-	-	-	-	-	-	-
12	-	-	-	-	-	491	508	114	758	-	-	525	-	-	-
13	-	-	-	-	-	-	-	0.002	0.02	541	423	130	98	125	-
14	-	-	-	-	-	-	-	-	-	-	-	-	111	99	81
15	-	-	-	-	-	1483	1395	1110	911	1106	604	181	-	-	-
16	645	1179	1135	-	1285	-	-	-	-	-	-	-	-	-	-
17	447	585	591	688	663	705	627	522	347	338	236	150	114	98	97
18	-	-	-	-	-	-	465	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	183	145	151	166	-	-	-	-
20	953	947	576	-	-	-	-	337	429	178	171	148	-	-	-

TABLE S3. Nitrate concentration per salinity bin (in units of μM).

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	-	-	14.4	-	-	8.8	3.5	2.0	1.5	0.86	-	-
10	-	-	-	-	-	8.6	10.5	7.9	6.1	4.9	4.0	0.87	1.6	1.5	-
11	-	-	-	-	10.8	9.1	6.2	5.6	5.0	2.2	1.7	-	-	-	-
12	-	-	-	-	-	9.5	5.1	3.7	3.0	2.1	1.4	-	1.1	-	-
13	-	-	-	-	-	-	4.7	3.0	1.6	0.85	1.0	1.1	1.0	1.0	0.96
14	-	-	13.4	11.2	9.4	6.7	4.1	3.1	2.2	2.2	1.2	2.0	0.94	1.2	-
15	-	-	-	-	-	-	-	3.3	1.6	1.3	0.70	1.4	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	12.3	8.4	9.0	9.3	8.0	6.2	6.5	8.4	6.9	5.0	4.4	-	-	-	-
18	-	-	-	7.8	5.8	3.2	3.4	3.0	3.0	2.4	3.4	5	-	-	-
19	-	-	-	-	-	1.7	1.8	1.8	1.5	1.5	1.6	1.2	1.6	-	-
20	-	-	-	-	-	1.4	-	1.7	1.5	1.4	1.3	1.1	1.2	-	-

TABLE S4. Coefficient of variation (CV) for salinity per salinity bin as a proportion.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	-	0.01	0.01	-	-	0.01	0.01	0.01	<0.01	0.01	-	-
10	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
11	-	-	-	-	0	0.01	0.01	0.01	0.01	0.02	<0.01	-	-	-	-
12	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	-
13	-	-	-	-	-	-	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01
14	-	-	0.02	0.02	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
15	-	-	-	-	-	0.01	-	0.02	0.01	0.01	0.01	0.02	-	-	-
16	0.01	-	0.02	-	<0.01	-	-	-	-	-	-	-	-	-	-
17	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	<0.01
18	-	-	-	-	0.02	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	-
19	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-
20	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	-	-

TABLE S5. Coefficient of variation (CV) for leucine aminopeptidase activity per salinity bin as a proportion. Bold values exceed 1.0.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	-	-	-	-	-	-	-	**1.41**	-	0.87	-	-
10	-	-	-	-	0.62	0.11	**1.03**	0.87	0.04	-	-	-	-	-	-
11	-	-	-	-	-	0.22	0.68	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	0.29	0.27	0.29	-	-	-	-	-	-
13	-	-	-	-	-	-	-	0.44	0.30	0.25	0.48	0.59	0.99	0.01	-
14	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.24	0.36
15	-	-	-	-	-	0.19	-	0.36	0.54	-	-	-	-	-	-
16	0.86	-	0.48	-	**1.23**	-	-	-	-	-	-	-	-	-	-
17	0.47	0.49	-	0.59	0.51	0.62	0.52	0.36	0.14	0.45	-	0.67	0.54	0.83	0.46
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	0.35	0.09	0.43	0.63	-	-	-	-
20	-	-	-	-	-	-	-	0.39	0.06	0.19	0.65	**1.16**	-	-	-

TABLE S6. Coefficient of variation (CV) for chlorophyll fluorescence per salinity bin as a proportion. Bold values exceed 1.0.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	-	-	-	-	-	-	-	0.31	-	0.19	-	-
10	-	-	-	-	0.88	**1.24**	**1.81**	0.89	**1.15**	-	-	-	-	-	-
11	-	-	-	-	-	**1.11**	**1.26**	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	0.49	**2.36**	0.25	-	-	-	-	-	-
13	-	-	-	-	-	-	-	**3.16**	**2.23**	0.60	0.77	**1.17**	0.61	0.02	-
14	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.19	0.07
15	-	-	-	-	-	0.03	-	0.08	0.24	-	-	-	-	-	-
16	0.25	-	0.11	-	0.11	-	-	--	-	-	-	-	-	-	-
17	0.07	0.05	-	0.38	0.30	0.41	0.40	0.37	0.14	0.22	-	0.19	0.20	0.09	0.08
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	0.35	0.34	0.30	0.17	-	-	-	-
20	-	-	-	-	-	-	-	0.32	0.36	0.14	0.23	0.22	-	-	-

TABLE S7. Coefficient of variation (CV) for nitrate concentration per salinity bin as a proportion. Bold values exceed 1.0.

Day	Salinity bin														
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
9	-	-	-	-	-	0.09	-	-	-	**1.37**	0.81	0.54	0.06	-	-
10	-	-	-	-	-	0.13	0.21	0.30	0.57	0.38	0.95	0.41	**1.29**	0.63	-
11	-	-	-	-	0.02	0.14	0.32	0.47	0.72	0.31	0.83	-	-	-	-
12	-	-	-	-	-	0.23	0.47	0.51	0.48	0.46	0.15	-	-	-	-
13	-	-	-	-	-	-	0.02	0.47	0.37	0.64	0.18	0.34	0.28	0.10	0.19
14	-	-	0.19	0.04	0.54	0.22	0.18	0.18	0.92	1.09	0.32	**1.07**	0.16	0.05	-
15	-	-	-	-	-	-	-	0.59	0.14	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	0.21	-	0.04	-	0.31	0.16	0.31	0.50	0.37	0.78	0.15	-	-	-	-
18	-	-	-	-	0.44	0.44	0.44	0.44	0.72	0.40	0.57	-	-	-	-
19	-	-	-	-	-	0.27	0.30	0.36	0.32	0.25	0.13	0.34	0.21	-	-
20	-	-	-	-	-	-	-	0.34	0.39	0.32	0.24	0.39	0.37	-	-

Table S8. Spearman correlation coefficients for the coefficient of variation (CV) among environmental parameters. The CVs were calculated for each day/salinity bin combination. LAP: leucine aminopeptidase.

	Salinity	**LAP activity**	**Chlorophyll fluorescence**	**Nitrate concentration**
Salinity	1.0	-0.05	0.14	-0.14
LAP activity	-0.05	1.0	0.07	-0.05
Chlorophyll fluorescence	0.14	0.07	1.0	0.21
Nitrate concentration	-0.14	-0.05	0.21	1.0

Table S9. Semi-variogram results for leucine aminopeptidase (LAP) activity. The numeric values are the semi-variance at zero lag (nugget), equal to the y-intercept of the regression of semi-variance with distance between samples. The letters in parentheses are the type of model fit: C = constant, W = wave, G = Gaussian, S = spherical, L = linear. I.D. = Insufficient data to calculate a semi-variogram.

	Region			
Day	*River-affected*	*Bulge*	*Coastal current*	*Offshore*
April 9	0 (C)	I.D.	I.D.	0.1 (G)
April 10	2035 (C)	6384 (C)	I.D.	0 (G)
April 11	I.D.	0 (W)	I.D.	4916 (C)
April 12	I.D.	3045 (C)	I.D.	2536 (C)
April 13	I.D.	558 (G)	896 (C)	1089 (S)
April 14	I.D.	I.D.	I.D.	189 (L)
April 15	145 (C)	I.D.	I.D.	3162 (C)
April 16	3845 (C)	I.D.	I.D.	I.D.
April 17	512 (C)	337 (G)	I.D.	1327 (S)
April 18	I.D.	I.D.	I.D.	I.D.
April 19	I.D.	288 (C)	387 (C)	13652 (C)
April 20	2637 (C)	56 (C)	3956 (C)	4486 (S)

TABLE S10. Coefficients of variation of leucine aminopeptidase (LAP) activities in different environments from the literature.

Variability measured	Coefficient of variation	Source	Comments
Spatial	0-0.42 free living; 30% attached	Unanue et al. (1998)	Laboratory flume with particles; CV based on standard error
Temporal	0.01-10 0.70-1.53 annual means	Caruso et al. (2005)	Small ponds
Spatial	0.11	Misic & Fabino (2006)	Marine oligotrophic
Temporal	0.12	Allison et al. (2012)	Pier sampling in the morning; size fractionated
Temporal	0.14	Taylor et al. (2003)	River; CV based on standard error
Temporal	0.18-0.84	Karner & Rassoulzadegan (1995)	Pier sampling; Free and total LAP activity; Activity varied by factor of 2-3 in a given day
Spatial	0.20	Misic et al. (2006)	Marine eutrophic to heterotrophic gradient; CV = 19% nitrate; CV=10% chlorophyll
Spatial	0.53-0.97	Piontek et al. (2014)	Marine water masses
Temporal	1.0	Sinsabaugh & Foreman (2001)	River
Spatial	1.0-3.5 total 0.70-1.0 cell-specific	Zaccone et al. (2010)	Epipelagic layer
Temporal	No value given	Martinez et al. (1996)	Pier sampling; 3-fold changes, primarily in first 24 hours

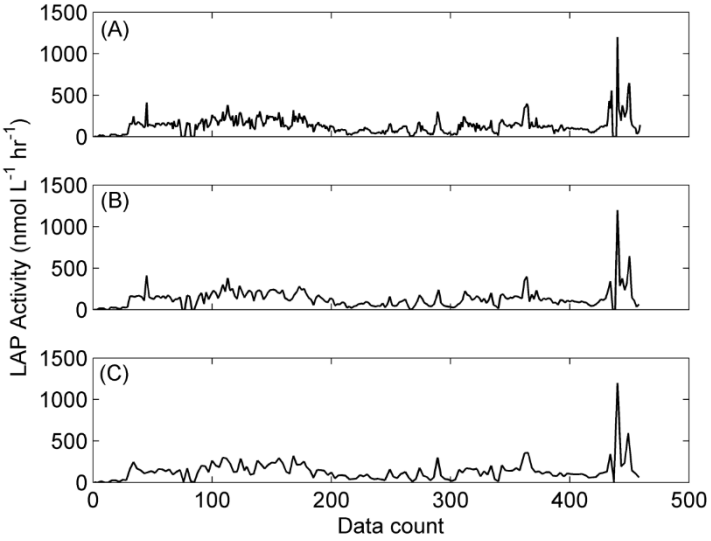

FIGURE S1. Original and downsampled (every second or second and third sample removed) time-series of leucine aminopeptidase (LAP) activity from the cruise track of the R/V Oceanus on April 17. Data spacing of the original time-series was approximately every 14 minutes. (A) = full dataset. (B) = data downsampled at half the original frequency (every 28 minutes), thus excluding half of the data (every other data point). (C) data downsampled at one-third of the original frequency (every 42 minutes), excluding two-thirds of the original data (second and third of every three data points).

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