Appendix A. Additional figures and tables

Currents and topography drive assemblage distribution on an active hydrothermal edifice

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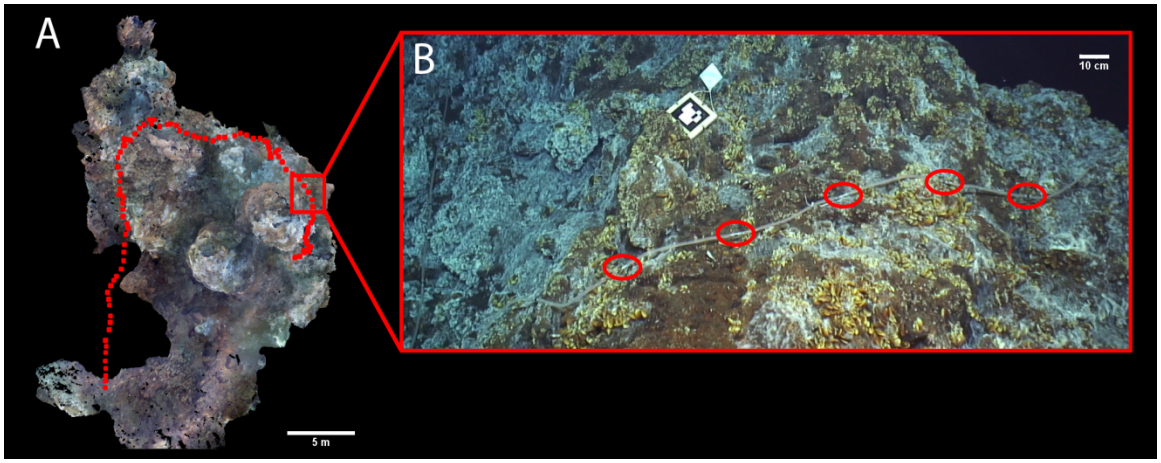

Figure A1. Position of the thermistor chain deployed in 2016 on Eiffel Tower. (A) Thermistor locations represented by red squares on the 2015 3D model. (B) Section of the chain on the north side of the edifice. Thermistors are circled in red.

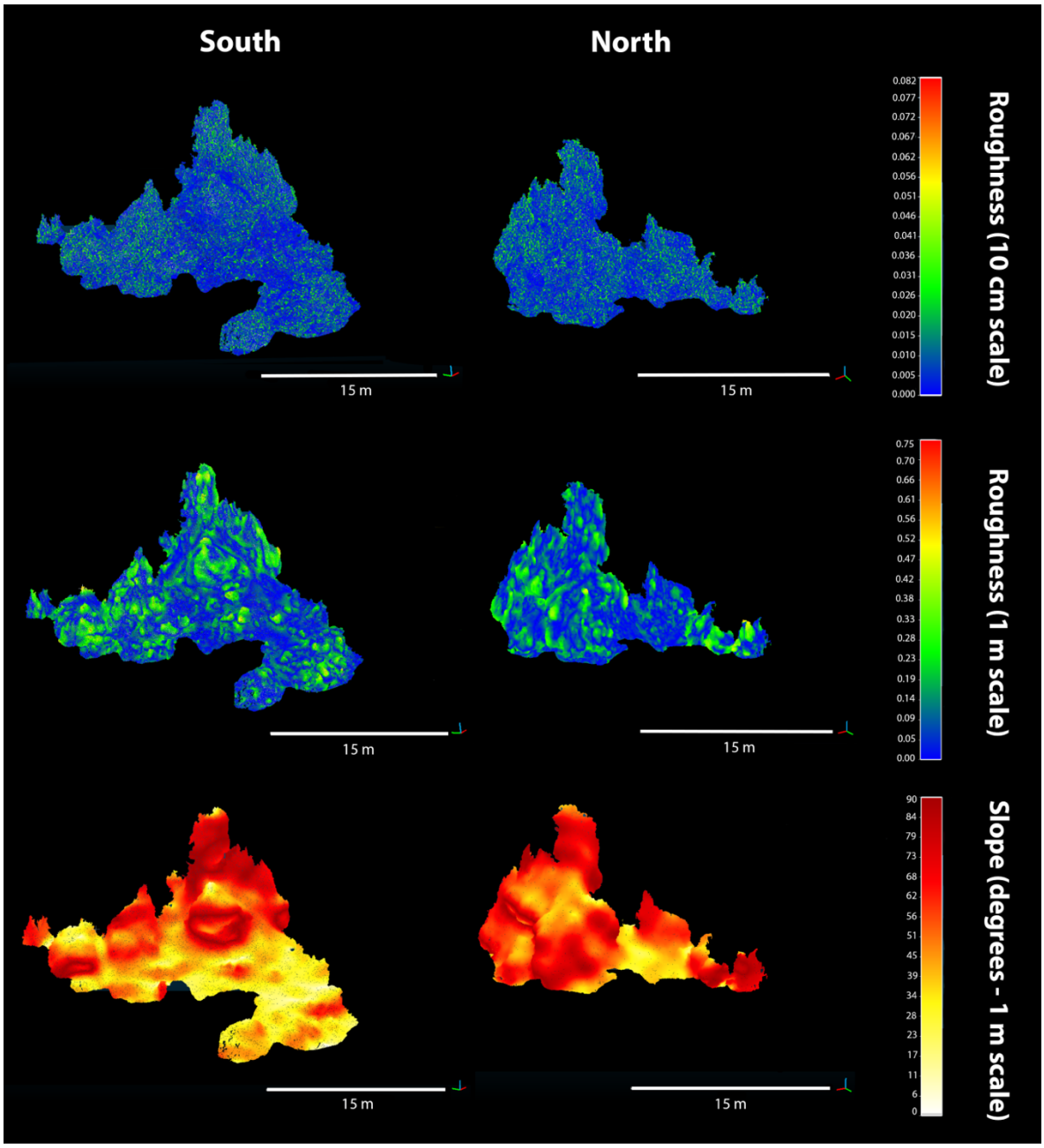

Figure A2. Roughness (on scales of 10 cm and 1 m) and slope (scale of 1 m) profiles for both sides of Eiffel Tower.

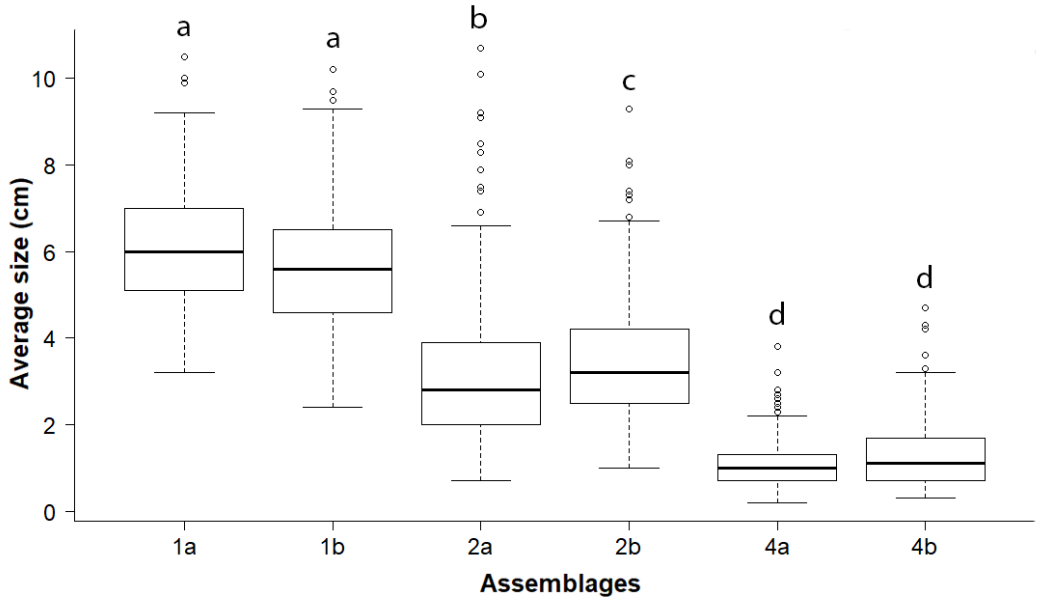

Figure A3. Boxplot representing the size of mussels within each assemblage category (n = 2599). Size differences were tested with Kruskal-Wallis tests followed by post-hoc Dunn's rank tests. Different letters indicate assemblages that were significantly different.

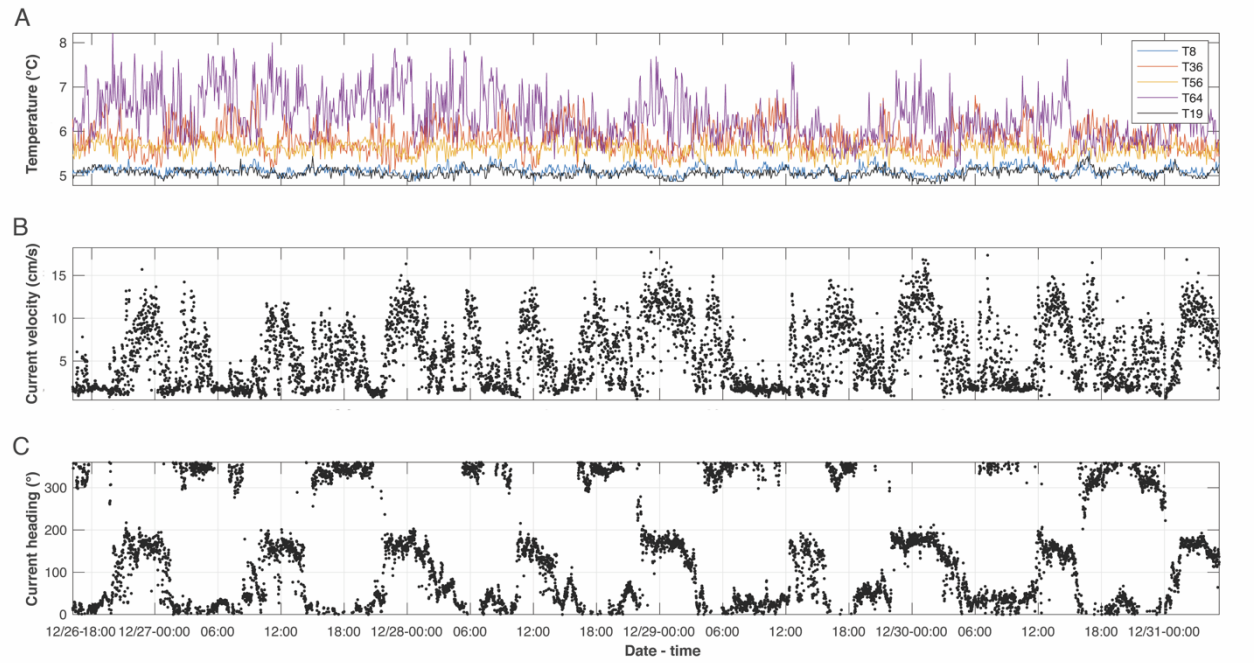

Figure A4. Time series of (A) temperature and current (B) velocity and (C) direction recorded by five selected thermistors and the current meter, respectively. Only data recorded between the 26th and 31st of December 2016 are shown here. The five selected thermistors, represented with different colors, recorded temperature over different faunal assemblages and substrata: T8 - medium-sized mussels; T19 – bare substratum; T36 – large mussels; T56 – substratum covered with microbial mats and T64 – small mussels.

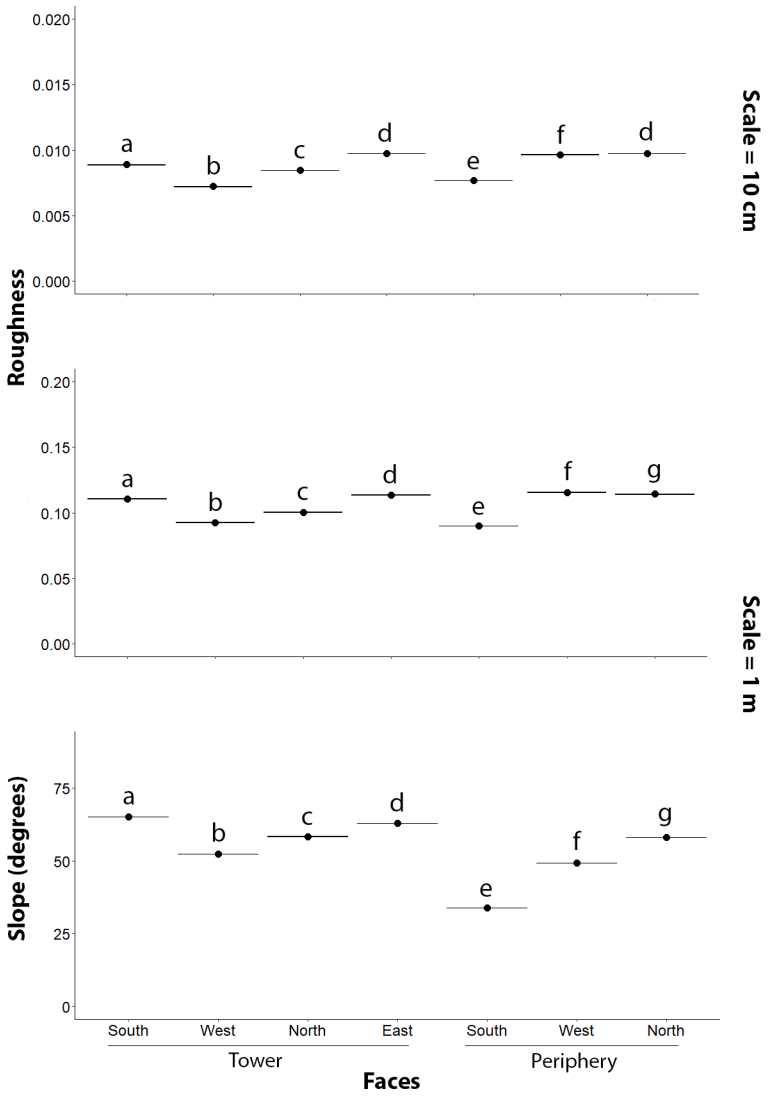

Figure A5. Average roughness and slope measured on the different faces of the edifice. Differences between faces were tested with Kruskal-Wallis tests followed by post-hoc Dunn's rank tests. Different letters indicate faces that were significantly different.

Table A1. Average temperature and average temperature SD (proxy for temperature variability) measured by thermistors in contact with faunal assemblages and substrata. For every assemblage/substratum, the number of thermistors analyzed (n), as well as the mean, standard error (SE), minimum (min) and maximum (max) values are given.

	Assemblage	n	Average temperature (°C)			Average temperature SD (°C)		
			Mean (SE)	Min	Max	Mean (SE)	Min	Max
Mussels	Assemblage 1	3	6.34 (0.575)	5.61	7.48	0.690 (0.380)	0.267	1.45
	Assemblage 2	36	5.93 (0.121)	5.16	9.40	0.413 (0.107)	0.118	4.10
	Assemblage 4	2	5.59 (0.0722)	5.52	5.66	0.232 (0.0783)	0.154	0.311
	Zoanthids	6	5.39 (0.0883)	5.11	5.63	0.276 (0.0518)	0.132	0.275
Substrata	Substratum Sub1a	18	5.37 (0.120)	4.96	6.22	0.205 (0.0367)	0.102	0.477
	Substratum Sub1b	12	5.92 (0.126)	5.17	6.76	0.436 (0.0654)	0.134	1.29
	Substratum Sub2	1	6.49*	NA	NA	0.361*	NA	NA
	Bottom water	1	4.71*	NA	NA	0.0697*	NA	NA

* Average and SD calculated from data collected with a single temperature probe.

Table A2. Coefficients from multinomial logistic regression models testing the effects of distance from smokers (D.s.) and flanges (D.f.), small-scale roughness (10 cm), large-scale roughness (1 m) and slope on faunal assemblage categories. A total of four models were tested, each time with a different assemblage used as a reference for comparisons. Number of polygons included in the analyses: Assemblage 1 = 70; Assemblage 2 = 115; Assemblage 4 = 88; shrimp assemblage = 38; zoanthid assemblage = 38.

			Mussels			
	Reference	Explanatory variable	Assemblage 2	Assemblage 4	Shrimps	Zoanthids
Mussels	Assemblage 1	D.s.	2.06***	1.99***	-0.731	3.21***
		D.f.	0.0855	0.229	-1.312*	1.48***
		Roughness10cm	-0.0796	-0.0892	0.194	0.243
		Roughness1m	-0.142	-0.178	0.295	-0.736
		Slope	-0.177	0.152	-0.207	-2.08***
	Assemblage 2	D.s.		-0.0665	-2.79***	1.15***
		D.f.		0.143	-1.40*	1.40***
		Roughness10cm		-0.0096	0.274	0.323
		Roughness1m		-0.0364	0.437*	-0.593
		Slope		0.328*	-0.0298	-1.91***
	Assemblage 4	D.s.			-2.72***	1.22***
		D.f.			-1.54**	0.26***
		Roughness10cm			0.283	0.332
		Roughness1m			0.473*	-0.557
		Slope			-0.358	-2.24***
	Shrimps	D.s.				3.94***
		D.f.				2.80***
		Roughness10cm				0.0486
		Roughness1m				-1.03*
		Slope				-1.88***

* p-value < 0.05, ** p-value < 0.01, ***p-value < 0.001

Table A3. Results from quadratic discriminant analyses (QDA). The proportions of correct classifications are indicated for each combination of predictors used in the models (D.s: distance from smokers, D.f: distance from flanges, rough10cm: small-scale roughness (10 cm), rough1m: large-scale roughness (1 m) and slope (1 m)). The largest proportions obtained for each assemblage are in bold. Number of polygons included in the analyses: Assemblage 1 = 70; Assemblage 2 = 115; Assemblage 4 = 88; shrimps = 38; zoanthids = 38.

Predictors	Mussels				
	As. 1	As. 2	As. 4	Shrimps	Zoanthids
D.s, D.f	**0.580**	0.278	0.477	0.289	**0.868**
D.s, D.f, rough10cm	0.536	0.530	0.360	0.447	0.789
D.s, D.f, rough1m	0.492	0.348	0.477	0.263	0.789
D.s, D.f, slope	0.478	0.409	**0.547**	0.395	0.842
D.s, D.f, rough10cm, rough1m	0.507	0.487	0.465	0.421	0.763
D.s, D.f, rough10cm, slope	0.507	0.513	0.489	**0.500**	0.816
D.s, D.f, rough1m, slope	0.536	0.435	0.523	0.447	0.816
D.s, D.f, rough10cm, rough1m, slope	0.522	0.487	0.500	0.447	0.737
rough10cm	0.0435	**0.870**	0.280	0.132	0
rough1m	0	0.843	0.151	0.132	0
slope	0	0.652	0.290	0	0.605
rough10cm, rough1m	0.0290	0.835	0.256	0.211	0
rough10cm, slope	0.174	0.652	0.256	0.184	0.395
rough1m, slope	0.130	0.583	0.197	0.263	0.632
rough10cm, rough1m, slope	0.130	0.583	0.198	0.263	0.632