Supplementary information for

The temporal dynamics of bacterial and fungal colonization on plastic debris in the North Sea

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Materials and Methods (extended)

16S and ITS2 amplicon sequencing

The bacterial V3-V4 fragment of the 16S rRNA gene was selected for amplicon sequencing. Amplification of the fragment was done using primers S-D-Bact-0341-b-S-17 and S-D-Bact-0785-a-A-21, described by Klindworth and co-workers (2013), extended with Illumina specific adaptors. Following PCR conditions were used: initial denaturation at 95 °C for 3 min, followed by 25 cycles of denaturation (95 °C for 30 s), annealing (55 °C for 30 s) and extension (72 °C for 30 s) and a final extension step at 72 °C for 5 min. To amplify the fungal rDNA-ITS2 region, the forward primer of fITS7bis from Ihrmark et al. (2012) was adapted (GTGAATCATCRAATYTTTG) and the ITS4NGSr reverse primer (Tedersoo et al. 2014) were used. Both primers were extended with Illumina specific adaptors. The ITS2-PCR conditions were as above, but now using 30 cycles with an annealing time of 1 min. A second PCR was done to attach dual indices and sequencing adaptors to the V3-V4 and ITS2 fragments, using the Nextera XT index kit (Illumina, San Diego, CA, USA). The same PCR conditions were used as in the first PCR but now with 8 cycles. Mastermixes for all PCRs were prepared using the Kapa HiFi Hotstart ReadyMix (Kapa Biosystems, Wilmington, MA, USA) according to the manufacturer's instructions in a total volume of 25 µl (amplification of the bacterial and fungal fragments) or 50 µl (dual indices and sequencing adaptor attachment). Each PCR product was cleaned up using the Highprep PCR reagent kit (MAGBIO, Gaithersburg, MD). Final libraries were quality controlled using the Qiaxcel Advanced, with the Qiaxcel DNA High Resolution kit (QIAGEN, Germantown, MD, USA) and concentrations were measured using the Quantus double-stranded DNA assay (Promega, Madison, WI, USA). The final barcoded libraries of each sample were diluted to 10 nM and pooled in a 2:1 ratio for bacteria and fungi respectively. Resulting libraries were sequenced using Illumina MiSeq v3 technology (2 x 300 bp, paired-end) by Macrogen, South-Korea with 30% PhiX.

Sequence Reads Processing

Demultiplexing of the amplicon dataset was done by the sequencing provider. Trimmomatic v0.32 was used for removing the primers (Bolger et al., 2014). Raw Illumina forward and reverse reads were merged using the program PEAR (Zhang et al., 2014). Length of the merged sequences was set between 400 and 450 bp for the 16S V3-V4 sequences and between 200 and 480 bp for the ITS2 sequences. A minimal overlap size of 120 bp and quality score threshold of 30 were used for all sequences. Amplification of the ITS2 region of fungi using the aforementioned primers includes parts of the neighboring, highly conserved, ribosomal genes. To extract the ITS2 sequences from the complete amplicon sequence, the ITSx program was used (Bengtsson-Palme et al. 2013). In the following steps, different programs of the Usearch software v7.0.1090 were used (Edgar, 2014). Merged sequences were quality filtered with a maximum expected error of 3 with the "fastq_filter" option. Next, sequences of all samples that needed to be compared to each other were merged, dereplicated and sorted by size. Clustering the reads into Operational Taxonomic Units (OTUs) was done using Uparse, with an identity level of 97% for bacterial sequences and 98.5% for fungal sequences (Edgar, 2014). Chimeras were removed from the V3-V4 fragments using Uchime with the RDP Gold database as a reference (Edgar et al., 2011). Finally, sequences of individual samples were mapped back to the representative OTUs using the "usearch_global" algorithm at 97% identity, and then converted into an OTU table (McDonald et al., 2012).

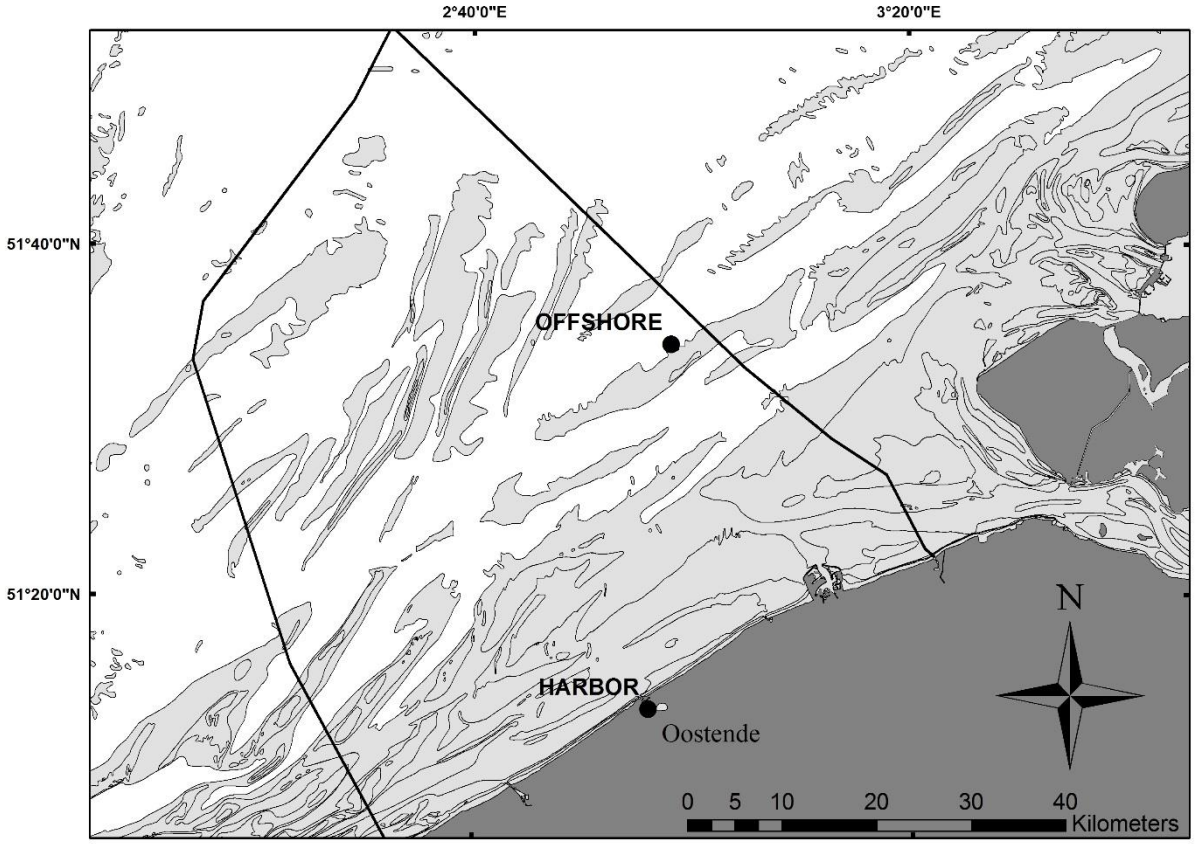

Figure S1. Map of the Belgian coastline and the Belgian part of the North Sea. The two experimental sites Harbor and Offshore are located at the harbor of Ostend and the Thornton windmill park. (Figure constructed using ArcGis)

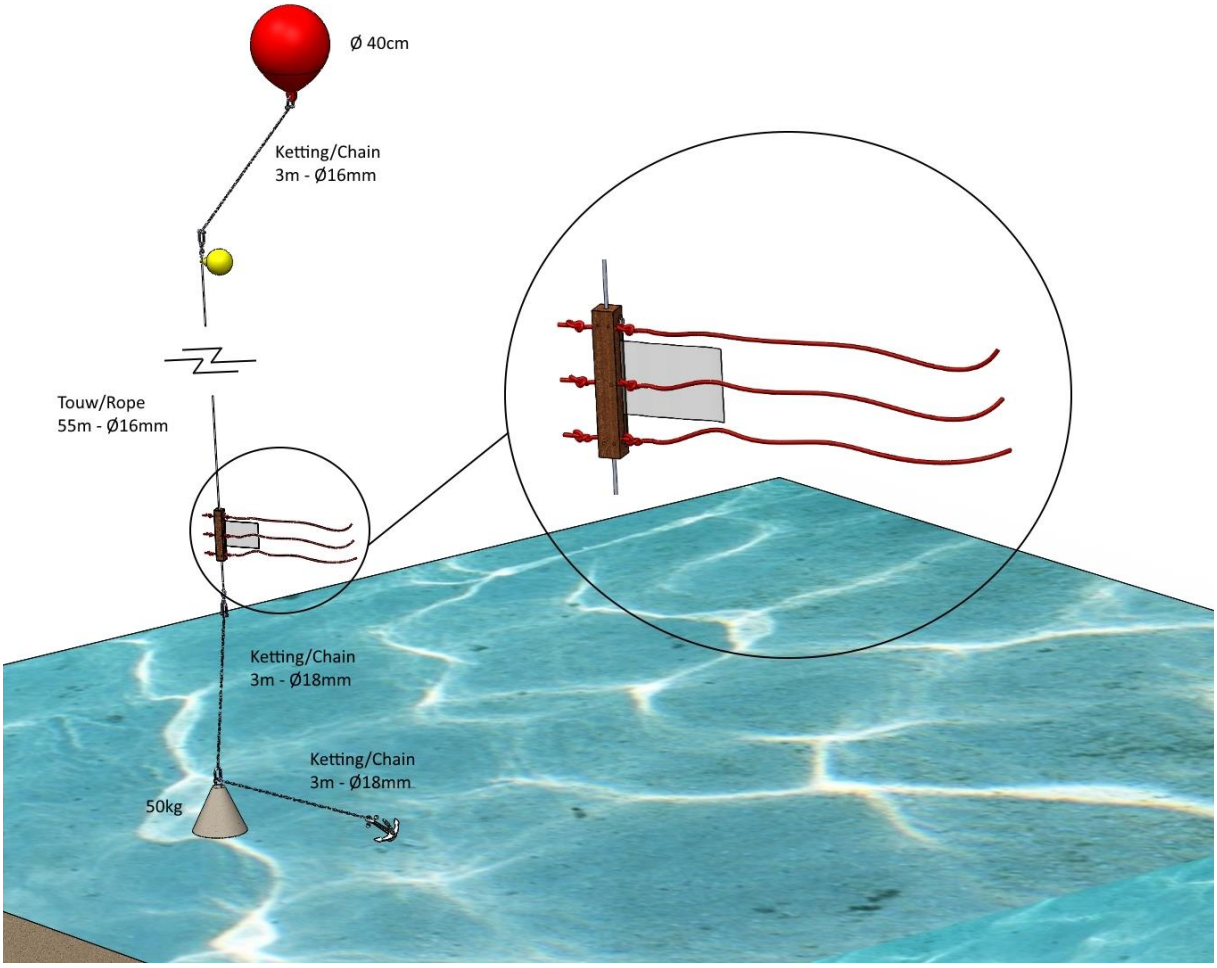

Figure S2. Technical plan (not on scale) of the construction used to expose plastic in the Belgian part of the North Sea. Three pieces of each type of plastic were attached to a wooden block, which was secured in a construction comprising a buoy, ropes (ø 16 mm), chains and an anchor and concrete weights. The azobé wooden block sinks to the seafloor, thus bringing the plastic close to the sediment, and the concrete weight and anchor keep the construction in place during strong currents and tides.

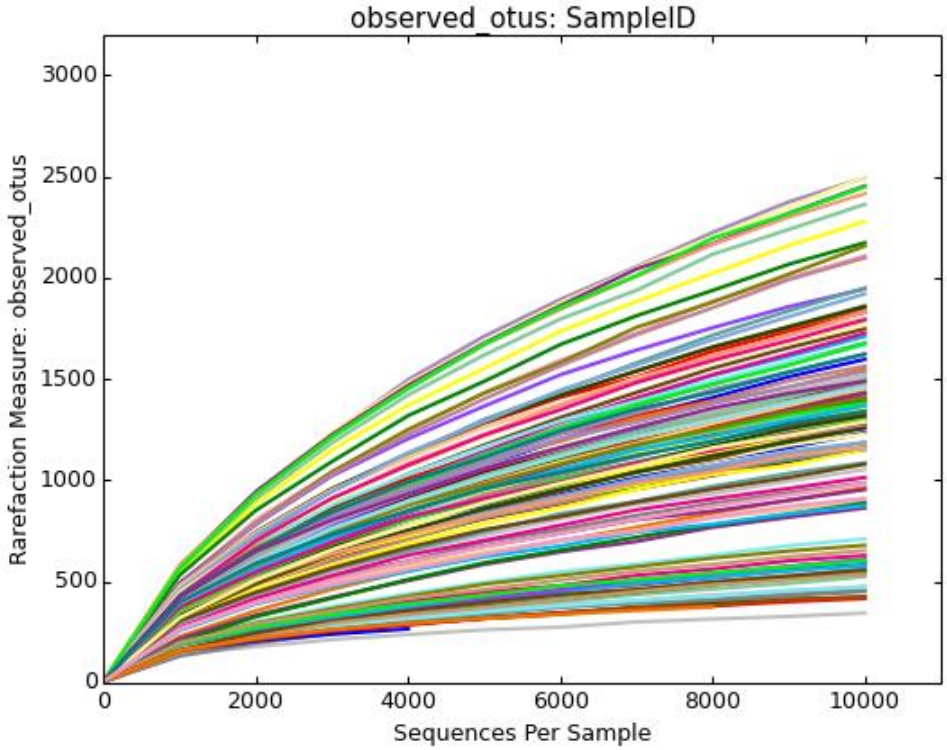

Figure S3 Rarefaction analysis of the bacterial communities of plastic, seawater and sediment sampled during the exposure of the plastic in the harbor and offshore. Analysis was done using an upper rarefaction depth of 10,000 sequences.

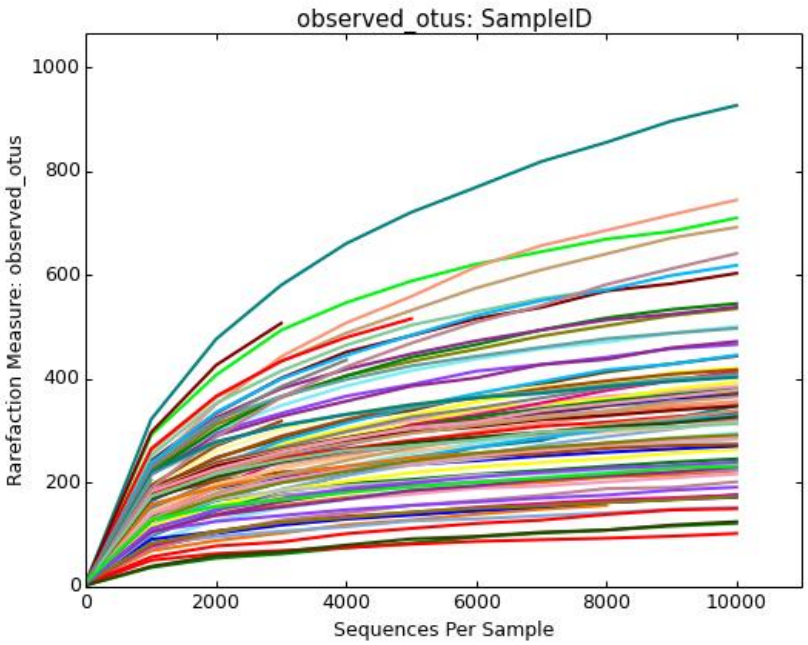

Figure S4 Rarefaction analysis of the fungal communities of plastics, seawater and sediment sampled during the exposure of the plastic in the harbor and offshore. Analysis was done using an upper rarefaction depth of 10,000 sequences.

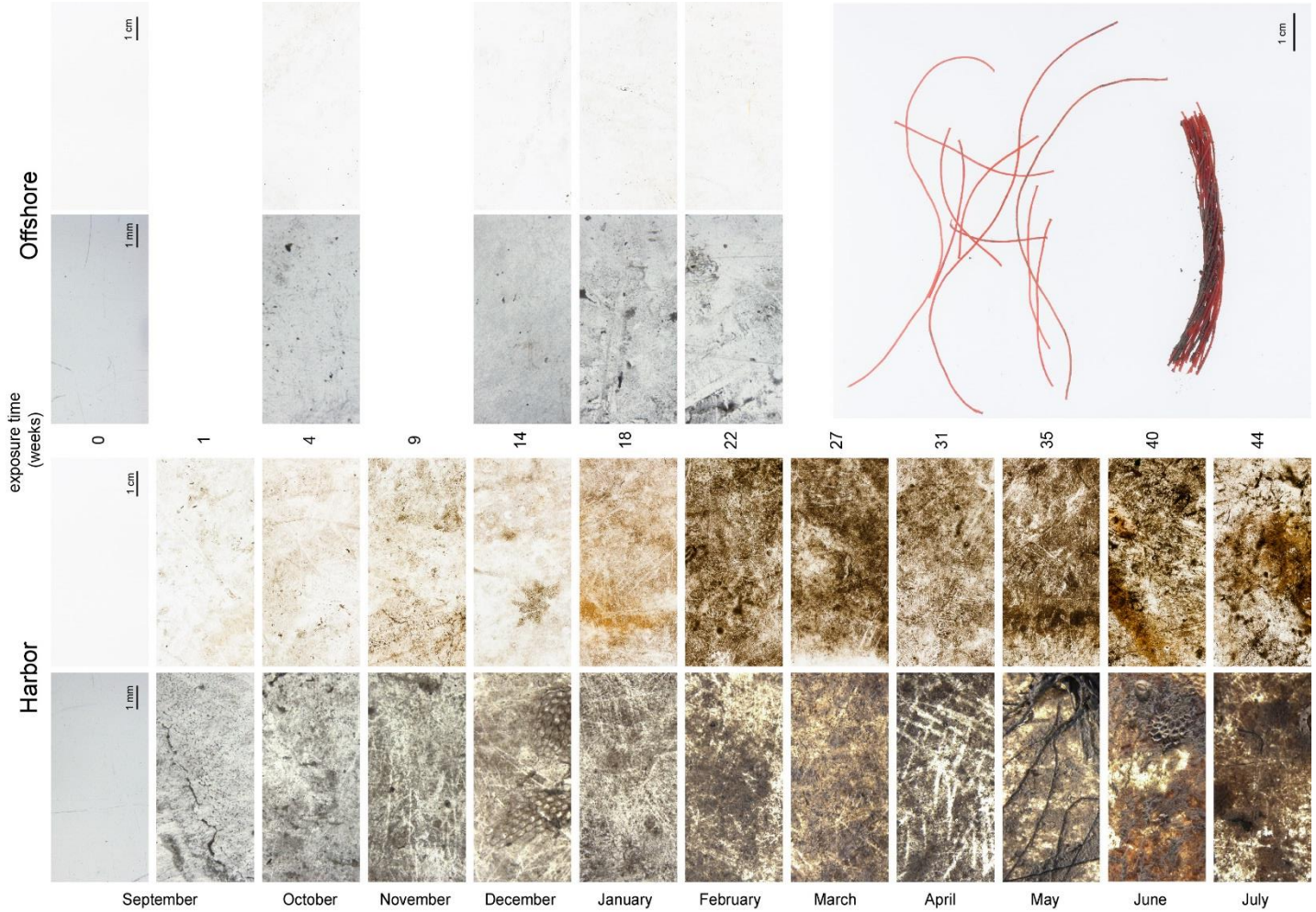

Figure S5. Macro- and microscopic images of the coating formed on plastic sheets during prolonged exposure to harbor (bottom panels) and offshore (top panels) conditions. lower column of each panel: microscopic images (scale bar 1 mm), upper column of each panel: macroscopic images (scale bar 1 cm). A piece of dolly rope is shown in the bottom right panel. Exposure time is indicated in weeks.

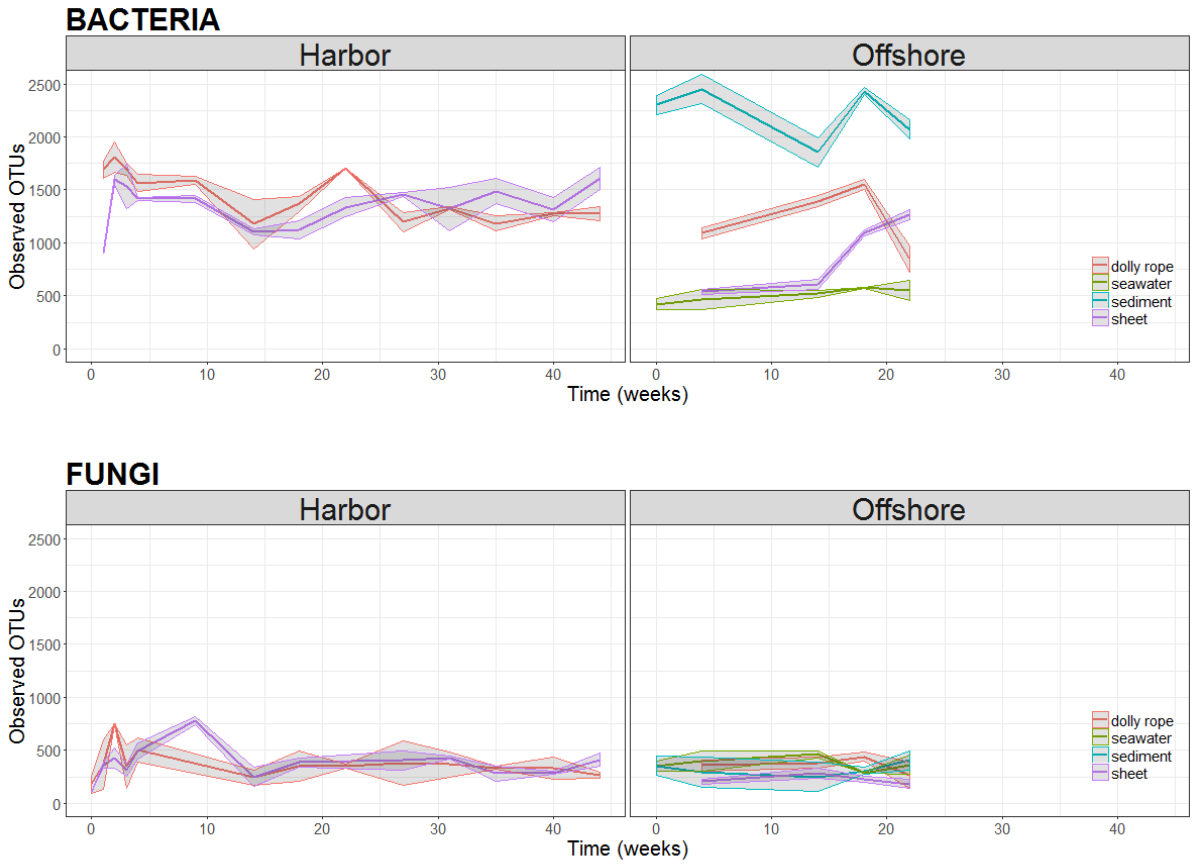

Figure S6. Richness of the bacterial and fungal communities on plastics, seawater, and sediment during 44 weeks (harbor) or 22 weeks (offshore) of exposure, based on the number of observed OTUs at a rarefaction depth of 10,000 sequences. The richness of plastic sheets and dolly ropes are shown in purple and red, respectively. The number of unique OTUs in seawater and sediment are indicated in green and blue, respectively. The shaded grey area represents the 95% confidence bands. Top panels: bacterial community richness. Bottom panels: fungal community richness.

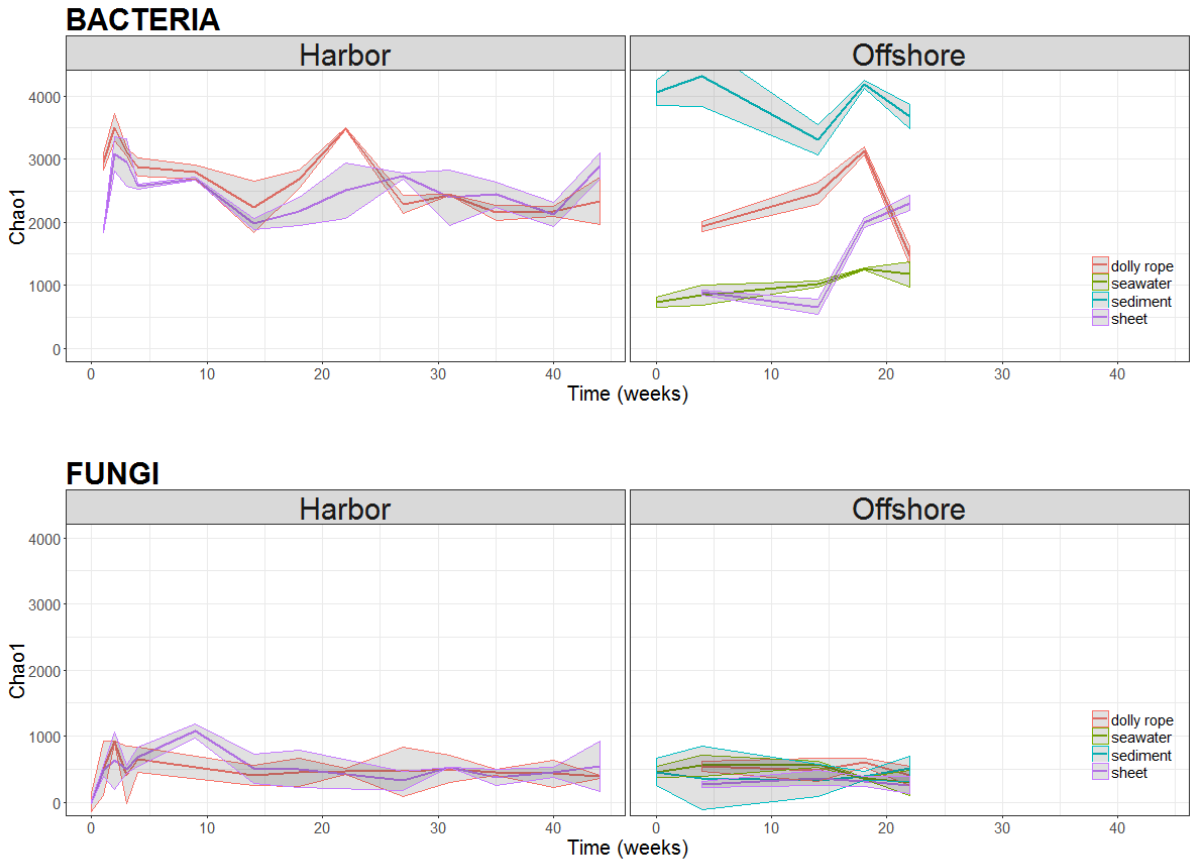

Figure S7. Chao1 indices, a richness estimation of microbial communities, of the bacterial and fungal communities on plastics, seawater, and sediment during 44 weeks (harbor) or 22 weeks (offshore) of exposure, calculated at a rarefaction depth of 10,000 sequences. The chao1 indices of plastic sheets and dolly ropes are shown in purple and red, respectively. The number of unique OTUs in seawater and sediment are indicated in green and blue, respectively. The shaded grey area represents the 95% confidence bands. Top panels: bacterial community richness. Bottom panels: fungal community richness.

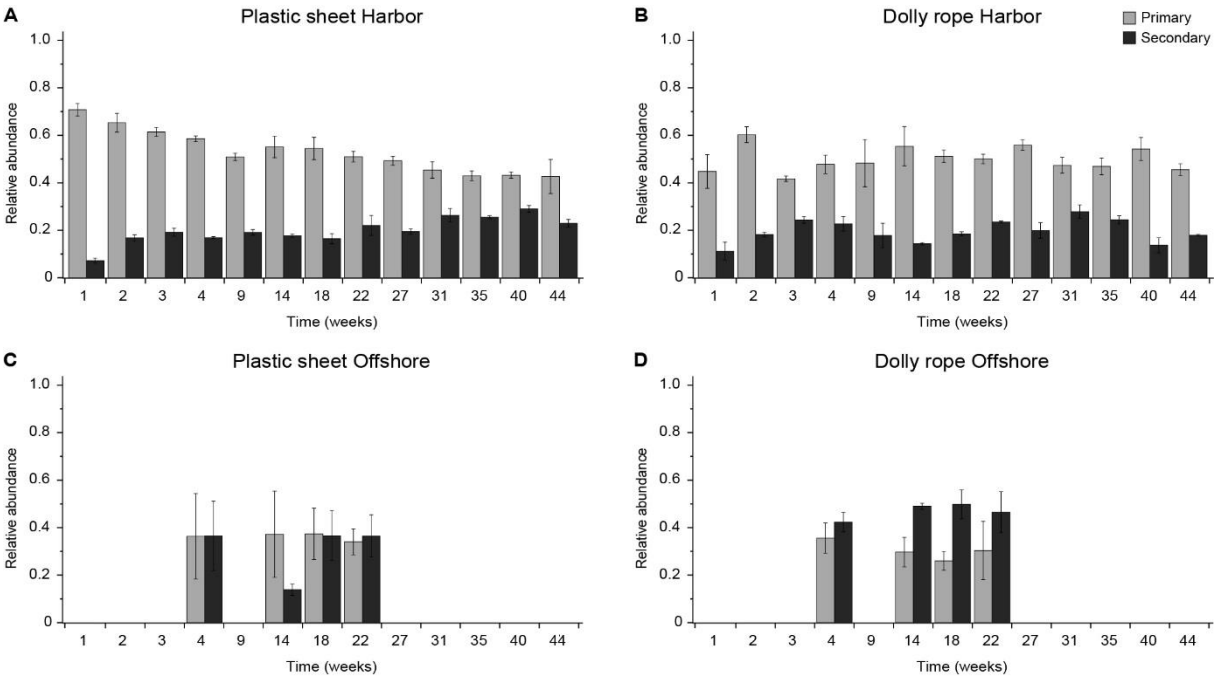

Figure S8. Representation of the primary (alpha- and gammaproteobacteria) and secondary (bacteroidetes) colonizers on plastics during the exposure period. A) plastic sheets exposed at the harbor (44 weeks), B) dolly ropes exposed at the harbor (44 weeks), C) plastic sheets exposed offshore (22 weeks), D) dolly ropes exposed offshore (22 weeks).

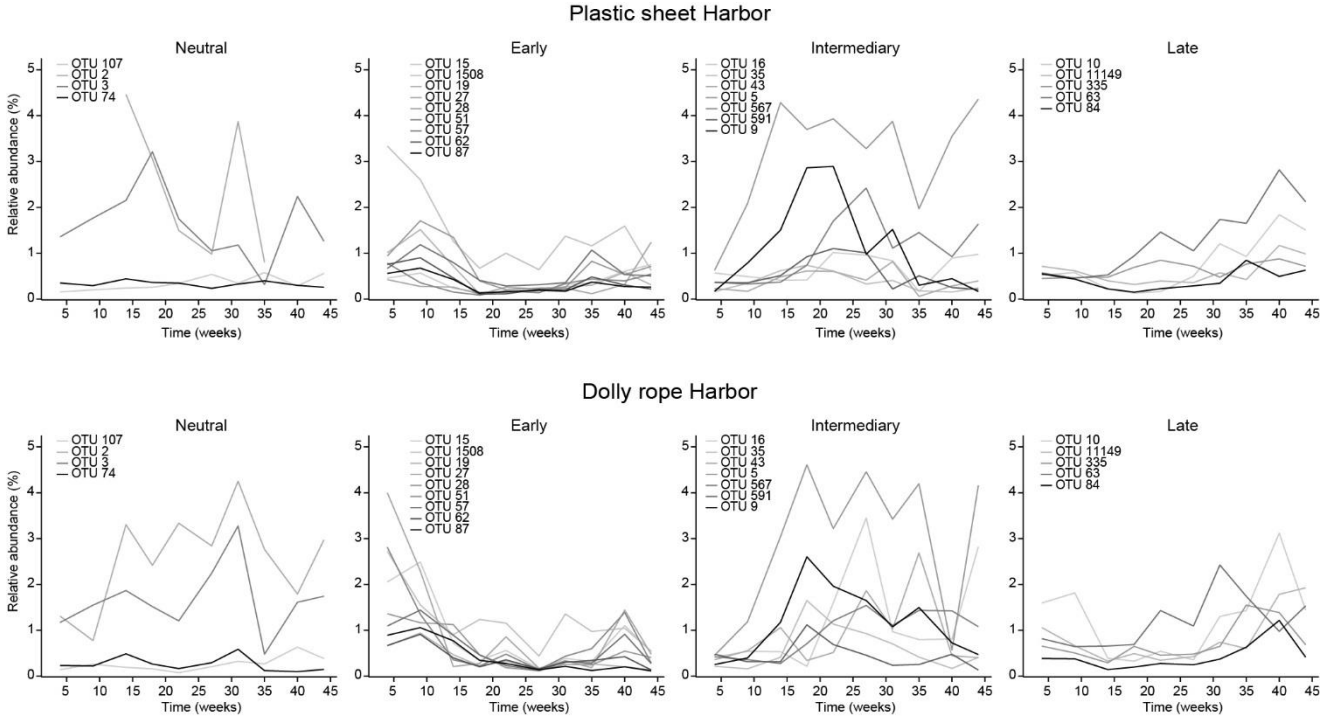

Figure S9. Relative abundance of the core OTUs during exposure of plastic at the harbor. Top: temporal profile of OTU abundance on plastic sheets, bottom: temporal profile of OTU abundance on dolly ropes. OTUs are defined as a core member if they represent at least 0.1% of the sample in at least 90% of all samples per environment. Based on their temporal profile, the core members can be divided into four groups: (1) neutral, (2) early colonizers, with higher abundance at the beginning of the exposure period, (3) intermediate colonizers, with higher abundance in the middle/end of the exposure period, and (4) late colonizers with higher abundance towards the end of the exposure period.

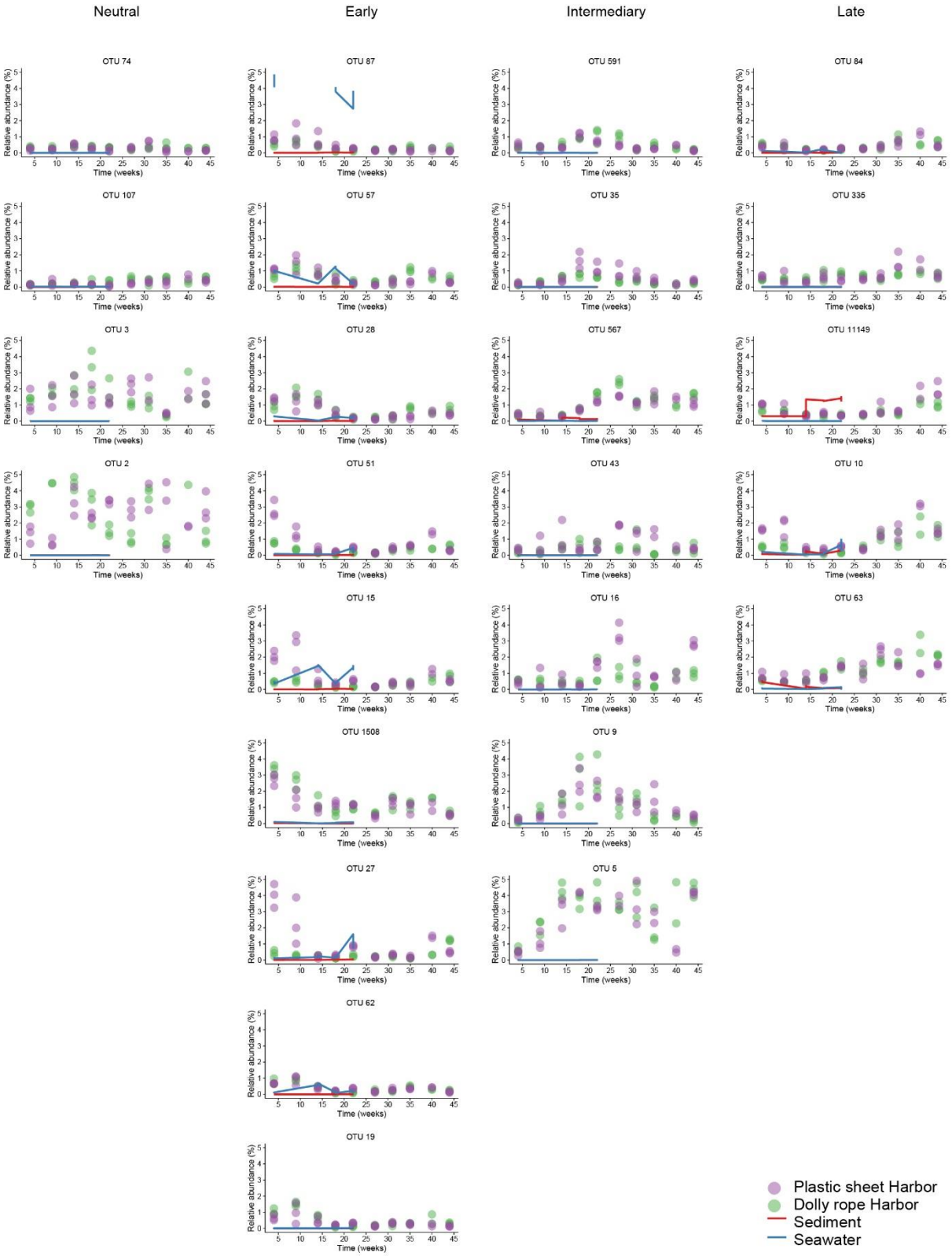

Figure S10. Abundance profiles of core OTUs on plastics exposed at the harbor. The temporal profile of each OTU is shown as relative abundance on plastic sheets (purple) and dolly ropes (green). Mean values of seawater (blue) and sediment (red) are included for comparison. OTU taxonomic assignment is described in Table 1.

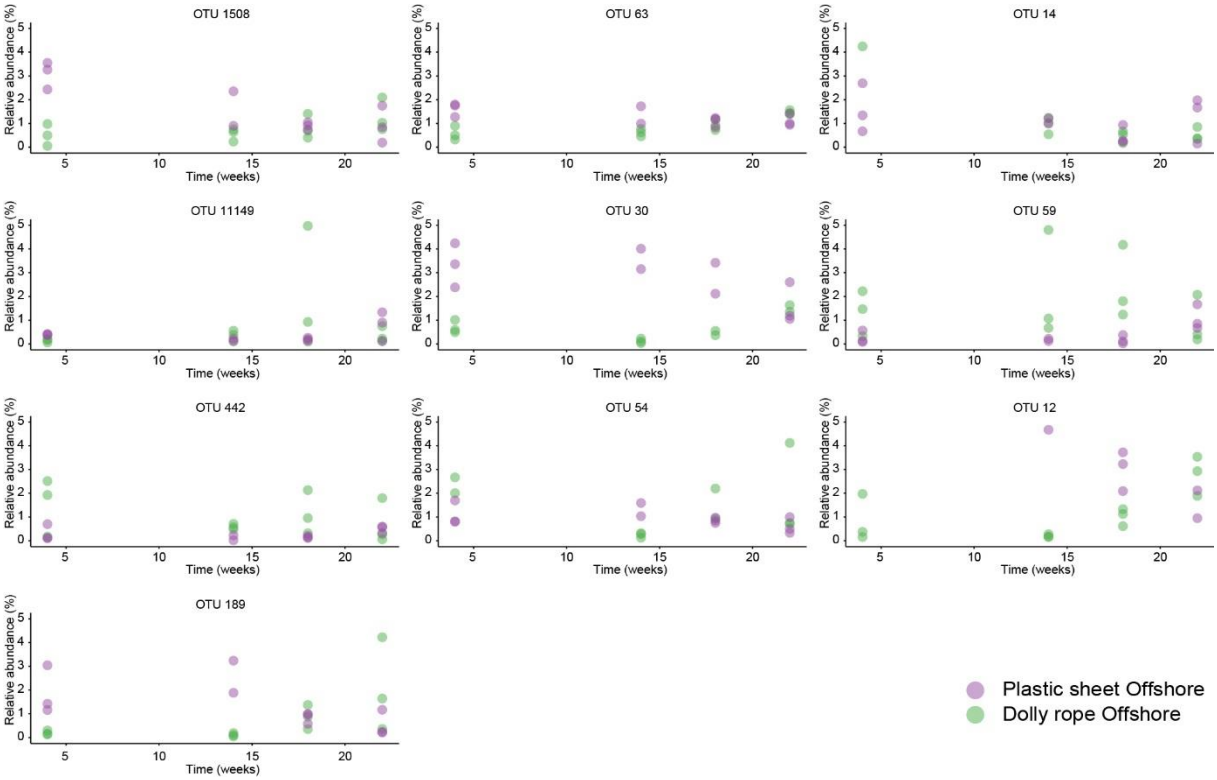

Figure S11. Abundance profiles of core OTUs of plastics exposed offshore. The temporal profile of each OTU is shown as relative abundance on plastic sheets (purple) and dolly ropes (green). OTU taxonomic assignment is described in Table 1.

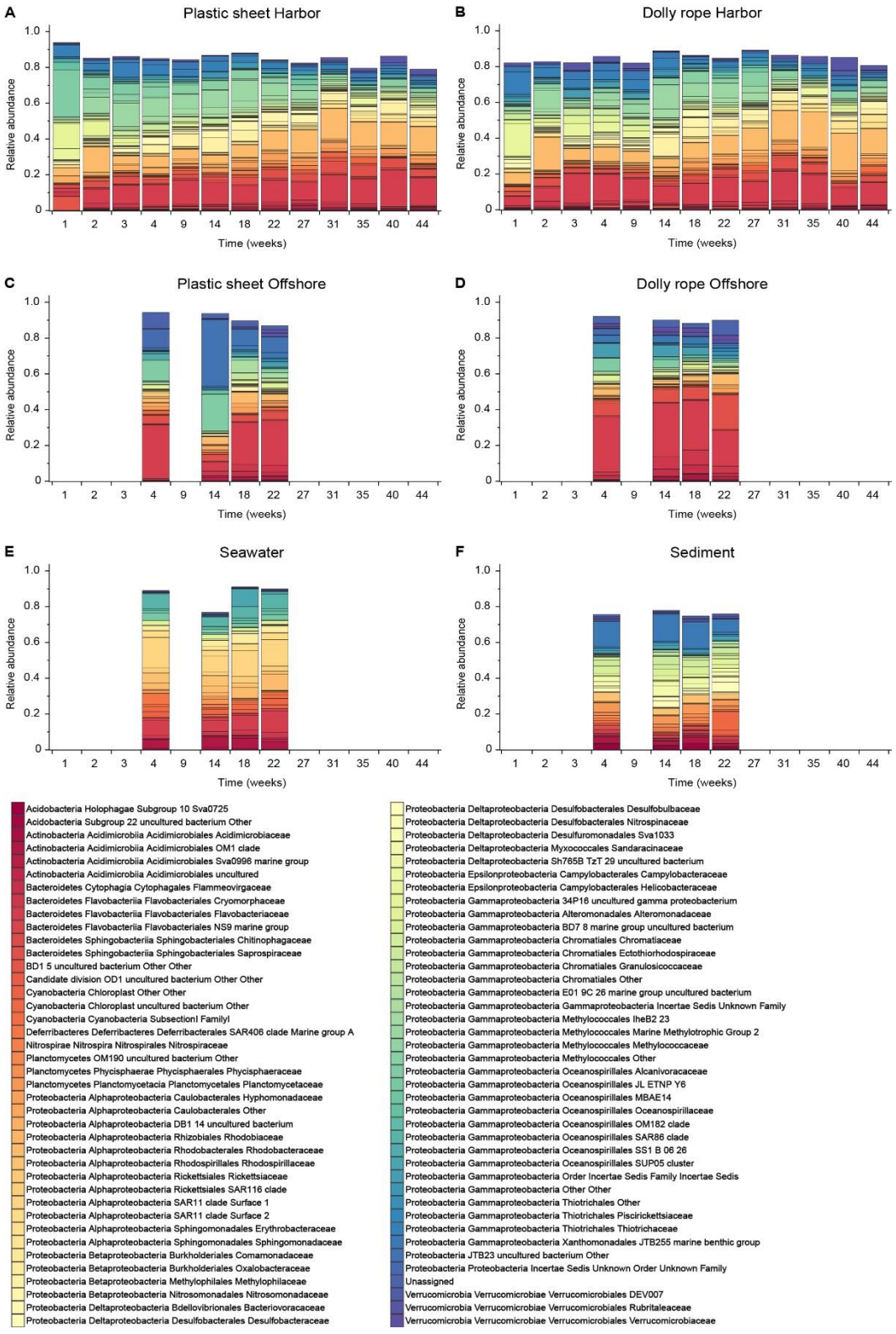

Figure S12. Mean relative abundances of the different bacterial families (16S V3-V4 region) on plastic items (n=3), sediment (n=3) and seawater (n=3) in the North Sea. Only families representing at least 1% of the community are shown. A: Bacterial family abundance of plastic sheets exposed to the harbor, B: Bacterial family abundance of dolly ropes exposed to the harbor, C: bacterial family abundance of plastic sheets exposed offshore, D: bacterial family abundance of dolly ropes exposed offshore, E: bacterial family abundance of seawater sampled offshore, and F: bacterial family abundance of sediment sampled offshore.

Table S1: Properties of the harbor and offshore environment. Pollutant concentrations of the harbor are obtained from the "Vlaamse Milieu Maatschappij", which measure the pollutants on a yearly base. This table is original and created by the author. Information concerning pollutant concentrations offshore were obtained from De Witte et al. (2016). Measured properties are obtained from Flanders Marine Institute (VLIZ), Belgium (2015).

GENERAL FEATURES	Harbor
Sedimenttype	Silt, by which it can adsorb organic pollutants (see pollutant concentration, sediment characteristics)
Pollutants	Presence of organic pollutants, POPs
Sampling depth	6 m
Anthropogenic activities	land run-off ship discharges pollution through waste pipes
Currents	relatively weak
Tides, currents and waves	**Harbor**
Wave height (cm)	65,0
Pollutant concentrations (mg/ kg DM)	**Harbor**
Zn (µg g-1)	750
Cd (µg g-1)	5
Pb (µg g-1)	230
Cu (µg g-1)	179
Cr (µg g-1)	102
Ni (µg g-1)	30
Hg (µg g-1)	900
polyaromatic carbohydrates (PAK) (µg g-1)	6,09
Polychlorinated biphenyls (PCB) (ng g-1)	102
Sediment characteristics	**Harbor**
Total organic carbon (TOC) (% OC)	3,33
Median grain size (µm)	106,8

MEASURED PROPERTIES	Harbor										
	sep/15	okt/15	nov/15	dec/15	jan/16	feb/16	mar/2016	apr/16	may/2016	june/2016	july/2016
Temperature (°C)	/	12,3	10,6	10,9	7,7	6,6	6,5	9,9	10,5	14,6	20,6
Conductivity (µS/cm)	/	37.600	37.000	38.000	34.900	31.600	33.300	37.000	34.500	37.500	47.100
pH	/	7,9	8,0	8,2	8,0	7,9	8,1	8,3	8,5	7,9	8,3
Oxygen (mg/L)	/	6,3	/	8,6	7,1	/	12,5	13,3	7,9	9,2	10,1
Salinity (PSU)	/	32,4	33,3	34,1	33,9	31,3	33,4	34,0	30,9	30,4	31,7
Density (kg/m^3)	/	1.024,5	1.025,5	1.026,2	1.026,5	1.024,6	1.026,3	1.026,2	1.023,7	1.022,5	1.023,7

GENERAL FEATURES	Offshore
Sediment type	Sand
Pollutants	Sediment type is almost inert; hard to adsorb pollutants
Sampling depth	26 m
Anthropogenic activities	Activities covering the wind farm Fisheries
Currents	Strong
Tides, currents and waves	**Offshore**
Wave height (cm)	182,1
Pollutant concentrations (mg/ kg DM)	**Offshore**
Zn (µg g-1)	124,9
Cd (µg g-1)	0,4
Pb (µg g-1)	34,7
Cu (µg g-1)	16,1
Cr (µg g-1)	73,5

Ni (µg g-1)	22,4										
Hg (µg g-1)	173										
polyaromatic carbohydrates (PAK) (µg g-1)	0,6										
Polychlorinated biphenyls (PCB) (ng g-1)	5,3										
Sediment characteristics	**Offshore**										
Total organic carbon (TOC) (% OC)	0,09										
Median grain size (µm)	678,4										
MEASURED PROPERTIES	**Offshore**										
	sep/15	okt/15	nov/15	dec/15	jan/16	feb/16	mar/2016	apr/16	may/2016	june/2016	july/2016
Temperature (°C)	16,3	13,1	11,3	10,4	6,5	7,7	/	9,4	12,7	15,8	19,8
Conductivity (µS/cm)	42.876	38.760	38.274	37.646	32.481	35.463	/	34.968	38.657	39.331	44.847
pH	8,1	7,9	8,0	8,2	7,9	8,0	/	8,4	8,4	8,1	8,2
Oxygen (mg/L)	7,7	8,0	8,3	8,8	7,3	7,0	/	/	7,3	10,0	9,0
Salinity (PSU)	33,8	32,8	34,0	34,2	32,4	34,5	/	32,3	33,1	31,1	32,7
Density (kg/m^3)	1.024,8	1.024,8	1.026,0	1.026,3	1.025,5	1.027,0	/	1.025,1	1.025,1	1.022,9	1.023,1

Table S2: Taxonomy assignment of fungal sequences that could not be classified using the UNITE database. ITS2 sequences were extracted from the total data set and taxonomy was assigned per sequence using BLAST for sequence comparison with the non-redundant nucleotide database of NCBI. Only OTUs that are at least classified at phylum level are represented (336/1904 OTUs).

Sequence ID	Kingdom	Phylum	Class	Order	Family	Genus	Species
691483354	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae		Cladosporium
691483354	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae		Cladosporium
691483354	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae		Cladosporium
83416019	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Mycosphaerellaceae	Mycosphaerella	sp. CPC 12200
613485589	Fungi	Ascomycota	Dothideomycetes	Capnodiales	Teratosphaeriaceae		Teratosphaeriaceae
329184628	Fungi	Ascomycota	Dothideomycetes	Capnodiales			Capnodiales
663101191	Fungi	Ascomycota	Dothideomycetes	Capnodiales			Capnodiales
675145442	Fungi	Ascomycota	Dothideomycetes	Myriangiales	Elsinoaceae	Elsinoe	sp. YPT-2014b
310780784	Fungi	Ascomycota	Dothideomycetes	Myriangiales	Elsinoaceae		sp. ZLY-2010b
300959438	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Leptosphaeriaceae		Leptosphaeria
386367490	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Lindgomycetaceae	Clohesyomyces	sp. CBS 609.86
386367490	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Lindgomycetaceae	Clohesyomyces	sp. CBS 609.86
386367490	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Lindgomycetaceae	Clohesyomyces	sp. CBS 609.86
386367490	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Lindgomycetaceae	Clohesyomyces	sp. CBS 609.86
386367490	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Lindgomycetaceae	Clohesyomyces	sp. CBS 609.86
530746601	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Phaeosphaeriaceae	Paraphoma	fimeti
329184983	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Phaeosphaeriaceae		Phaeosphaeria
663232113	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	Dendryphiella	eucalyptorum
288964589	Fungi	Ascomycota	Dothideomycetes	Pleosporales	Sporormiaceae	Preussia	dubia
156069286	Fungi	Ascomycota	Dothideomycetes	Pleosporales		Seifertia	azaleae
752503430	Fungi	Ascomycota	Dothideomycetes	Pleosporales			sp. KO-groupF 2014
459061959	Fungi	Ascomycota	Dothideomycetes	Pleosporales			sp. MUT 4419
60117101	Fungi	Ascomycota	Dothideomycetes	Tubeufiales	Tubeufiaceae	Acanthostigma	perpusillum
691468083	Fungi	Ascomycota	Dothideomycetes	Venturiales	Sympoventuriaceae	Ochroconis	mirabilis
239948884	Fungi	Ascomycota	Dothideomycetes				sp. 11353

227184133	Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	Coniosporium	sp. h11
4808175	Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	Coniosporium	uncinatum
514074553	Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	Exophiala	sp. 4-11m
118084435	Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	Rhinocladiella	sp. EXP0525F
717325331	Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales			sp. MG24
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
691483364	Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae		Aspergillus
411031165	Fungi	Ascomycota	Eurotiomycetes	Onygenales	Gymnoascaceae	Gymnoascoideus	sp. 24MN34
238058294	Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria	csernaensis
238058320	Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria	elaeina
238058320	Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria	elaeina
381284085	Fungi	Ascomycota	Geoglossomycetes			Nothomitra	cinnamomea
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
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43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata

43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
43349353	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Phaeophyscia	ciliata
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43349678	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Physconia	distorta
43349678	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Physconia	distorta
43349678	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Physconia	distorta
43349678	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Physconia	distorta
292454294	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Rinodina	albana
28460634	Fungi	Ascomycota	Lecanoromycetes	Caliciales	Physciaceae	Rinodina	oleae
156052253	Fungi	Ascomycota	Lecanoromycetes	Candelariales	Candelariaceae	Candelariella	aurella
576637169	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Catillariaceae	Catillaria	chalybeia
327180530	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Catillariaceae	Catillaria	nigroclavata
662180243	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae		Scoliciosporum
589427163	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Anzia	aff. hypoleucoides XW-2014
17016388	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Bacidia	circumspecta
401687104	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Bacidina	adastra
17016357	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Bacidina	arnoldiana
327180415	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Lecania	naegelii
508599195	Fungi	Ascomycota	Lecanoromycetes	Leprocaulales	Leprocaulaceae	Leprocaulon	americanum
264664616	Fungi	Ascomycota	Lecanoromycetes	Ostropales	Stictidaceae	Cryptodiscus	pini
264664619	Fungi	Ascomycota	Lecanoromycetes	Ostropales	Stictidaceae	Cryptodiscus	rhopaloides
82706478	Fungi	Ascomycota	Lecanoromycetes	Ostropales	Stictidaceae	Glomerobolus	gelineus
317184241	Fungi	Ascomycota	Lecanoromycetes	Ostropales			sp. s056
459664031	Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca	albolutescens
909836671	Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae		Caloplaca
190148990	Fungi	Ascomycota	Leotiomycetes	Helotiales	Dermateaceae	Pseudopeziza	medicaginis
765685507	Fungi	Ascomycota	Leotiomycetes	Helotiales	Helotiaceae	Hymenoscyphus	menthae

599082187	Fungi	Ascomycota	Leotiomycetes	Helotiales	Helotiaceae		Rhizoscyphus
506954052	Fungi	Ascomycota	Leotiomycetes	Helotiales	Hyaloscyphaceae	Calycina	claroflava
343411696	Fungi	Ascomycota	Leotiomycetes	Helotiales	Hyaloscyphaceae	Mollisina	uncinata
522820249	Fungi	Ascomycota	Leotiomycetes	Helotiales		Cadophora	luteo-olivacea
411030978	Fungi	Ascomycota	Leotiomycetes	Helotiales		Mycoarthris	sp. 11MA09
663100614	Fungi	Ascomycota	Leotiomycetes	Helotiales			Helotiales
663101933	Fungi	Ascomycota	Leotiomycetes	Helotiales			Helotiales
85679811	Fungi	Ascomycota	Leotiomycetes	Helotiales			sp. AR-6
85679811	Fungi	Ascomycota	Leotiomycetes	Helotiales			sp. AR-6
164518381	Fungi	Ascomycota	Leotiomycetes	Helotiales			sp. IZ-1144
395786986	Fungi	Ascomycota	Leotiomycetes	Helotiales			sp. WMM-2012e
750287129	Fungi	Ascomycota	Leotiomycetes	Helotiales			sp. YM596
330542192	Fungi	Ascomycota	Leotiomycetes	Rhytismatales	Rhytismataceae	Hypoderma	rubi
240936147	Fungi	Ascomycota	Leotiomycetes	Rhytismatales	Rhytismataceae	Lophodermium	sp. 3396
751137766	Fungi	Ascomycota	Leotiomycetes		Pseudeurotiaceae		Pseudeurotium
134147790	Fungi	Ascomycota	Orbiliomycetes	Orbiliales			Orbiliaceae
281376820	Fungi	Ascomycota	Pezizomycetes	Pezizales	Pyronemataceae	Aleuria	sp. PDD 89857
802302575	Fungi	Ascomycota	Saccharomycetes	Saccharomycetales	Phaffomycetaceae	Cyberlindnera	sp. UFMGCLQCA-24SC-02
731445796	Fungi	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetaceae	Kazachstania	bovina
407830430	Fungi	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetaceae		Pichia
411030983	Fungi	Ascomycota	Saccharomycetes	Saccharomycetales		Candida	sp. 12NJ03
629748312	Fungi	Ascomycota	Sordariomycetes	Diaporthales	Stilbosporaceae	Stegonsporium	opalus
354999020	Fungi	Ascomycota	Sordariomycetes	Glomerellales	Glomerellaceae	Colletotrichum	sp. Q038
668593798	Fungi	Ascomycota	Sordariomycetes	Glomerellales	Plectosphaerellaceae	Plectosphaerella	cucumerina
7861898	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Bionectriaceae	Clonostachys	buxi
332113244	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Bionectriaceae	Selinia	pulchra
386137314	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Hypocreaceae	Trichoderma	sp. KBS0814F
414449277	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Hypocreaceae	Trichoderma	sp. UFMGCB 3530
756188703	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	Fusarium	sp. B ES-2015
37956620	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	Nectria	bactridioides

317416175	Fungi	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	Nectria	sp. ICMP 13358
13160430	Fungi	Ascomycota	Sordariomycetes	Hypocreales		Rotiferophthora	angustispora
311335550	Fungi	Ascomycota	Sordariomycetes	Hypocreales			sp. 2 MJ17
745167201	Fungi	Ascomycota	Sordariomycetes	Hypocreales			sp. B1A0854P30CC422
317184233	Fungi	Ascomycota	Sordariomycetes	Hypocreales			sp. s011
334855363	Fungi	Ascomycota	Sordariomycetes	Hypocreales			sp. TA26-23
451991428	Fungi	Ascomycota	Sordariomycetes	Magnaporthales	Magnaporthaceae	Pseudohalonectria	lignicola
451991428	Fungi	Ascomycota	Sordariomycetes	Magnaporthales	Magnaporthaceae	Pseudohalonectria	lignicola
171474488	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Ceriosporopsis	halima
612149086	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Cirrenalia	macrocephala
612149086	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Cirrenalia	macrocephala
734593547	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Remispora	stellata
734593547	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Remispora	stellata
171474483	Fungi	Ascomycota	Sordariomycetes	Microascales	Halosphaeriaceae	Sigmoidea	marina
383511606	Fungi	Ascomycota	Sordariomycetes	Microascales	Microascaceae	Microascus	sp. 4L1
417381864	Fungi	Ascomycota	Sordariomycetes	Sordariales	Chaetomiaceae	Chaetomium	sp. 12144
381145915	Fungi	Ascomycota	Sordariomycetes	Sordariales			Sordariales
301793071	Fungi	Ascomycota	Sordariomycetes	Xylariales	Xylariaceae	Annulohypoxylon	sp. agrAR249
401782384	Fungi	Ascomycota	Sordariomycetes	Xylariales	Xylariaceae		sp. 4Y-Dg3-3
374638339	Fungi	Ascomycota	Sordariomycetes	Xylariales		Basiseptospora	fallax
799667158	Fungi	Ascomycota	Sordariomycetes			Barbatosphaeria	sp. MR 3730
825706285	Fungi	Ascomycota	Sordariomycetes			Xylochrysis	lucida
379332163	Fungi	Ascomycota	Sordariomycetes				sp. 6302
22900833	Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae	Taphrina	epiphylla
33356633	Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae	Taphrina	kruchii
33356633	Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae	Taphrina	kruchii
310687470	Fungi	Ascomycota				Acremonium	longisporum
62866664	Fungi	Ascomycota				Lecophagus	sp. ATCC 56071
612149080	Fungi	Ascomycota				Phaeodactylium	stadleri
618842780	Fungi	Ascomycota				Phialocephala	sp. CM16m2

909836665	Fungi	Ascomycota	Ascomycota
909836665	Fungi	Ascomycota	Ascomycota
313483075	Fungi	Ascomycota	Ascomycota
909836665	Fungi	Ascomycota	Ascomycota
306846857	Fungi	Ascomycota	Ascomycota
307334172	Fungi	Ascomycota	Ascomycota
313483101	Fungi	Ascomycota	Ascomycota
170516642	Fungi	Ascomycota	Ascomycota
313483075	Fungi	Ascomycota	Ascomycota
307334092	Fungi	Ascomycota	Ascomycota
313483016	Fungi	Ascomycota	Ascomycota
334682969	Fungi	Ascomycota	Ascomycota
313483059	Fungi	Ascomycota	Ascomycota
334683050	Fungi	Ascomycota	Ascomycota
313483098	Fungi	Ascomycota	Ascomycota
425474026	Fungi	Ascomycota	cf. Helotiales OTU_021
45558575	Fungi	Ascomycota	limestone ascomycete CR-2004
20531642	Fungi	Ascomycota	litter ascomycete strain its324
571948455	Fungi	Ascomycota	Pezizomycotina
571948455	Fungi	Ascomycota	Pezizomycotina
663101254	Fungi	Ascomycota	Pseudoclathrosphaerina
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
522358218	Fungi	Ascomycota	sp. Di58-1
747038835	Fungi	Ascomycota	sp. Glum003

229597490	Fungi	Ascomycota					sp. H-31
291498478	Fungi	Ascomycota					sp. H33
164518423	Fungi	Ascomycota					sp. IZ-962
66990783	Fungi	Ascomycota					sp. MA 4950
685216946	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Agaricaceae		Agaricaceae
672590390	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Agaricaceae		cf. Coprinus sp.
140104633	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Agaricaceae		sp. PA675
437037596	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Bolbitiaceae	Conocybe	aporos
437037602	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Bolbitiaceae	Pholiotina	vestita
344332921	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Crepidotaceae	Crepidotus	cesatii
761264215	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Lyophyllaceae	Tephrocybe	ozes
218664635	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Marasmiaceae	Marasmius	oreades
298354285	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Omphalotaceae	Marasmiellus	sp. 345-678
261871973	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Psathyrellaceae		Psathyrella
511190125	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Psathyrellaceae		sp. M200T-4-EM2
2289063	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Arrhenia	velutipes
344332764	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Clitocybe	ditopa
751383798	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Lepista	saeva
55783680	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Mycena	epipterygia
315270764	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Mycena	tenerrima
314911910	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Omphalina	cf. rivulicola 35_N3F27
761264214	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae	Rugosomyces	carneus
380745268	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Tricholomataceae		Armillaria
756786794	Fungi	Basidiomycota	Agaricomycetes	Atheliales	Atheliaceae	Cristinia	eichleri
734593553	Fungi	Basidiomycota	Agaricomycetes	Atheliales	Atheliaceae	Digitatispora	marina
380745230	Fungi	Basidiomycota	Agaricomycetes	Atheliales			Atheliales
150035427	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Cantharellaceae		Cantharellaceae
478245230	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Ceratobasidiaceae	Ceratobasidium	sp. CBS 132236
478245230	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Ceratobasidiaceae	Ceratobasidium	sp. CBS 132236
371444232	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Ceratobasidiaceae	Waitea	circinata var. circinata

480327004	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Clavulinaceae		sp. 254 OA-2013
531997186	Fungi	Basidiomycota	Agaricomycetes	Cantharellales	Tulasnellaceae		Tulasnellaceae
306846863	Fungi	Basidiomycota	Agaricomycetes	Cantharellales			Cantharellales
817033528	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae	Hyphoderma	medioburiense
727863127	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae	Sistotrema	brinkmannii
545698357	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae	Sistotrema	oblongisporum
55783691	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae	Sistotrema	sernanderi
803935950	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae		Laetisaria
444332759	Fungi	Basidiomycota	Agaricomycetes	Corticiales	Corticiaceae		Limonomyces
383088102	Fungi	Basidiomycota	Agaricomycetes	Gomphales	Gomphaceae	Ramaria	abietina
27803338	Fungi	Basidiomycota	Agaricomycetes	Gomphales	Gomphaceae	Ramaria	decurrens
33316541	Fungi	Basidiomycota	Agaricomycetes	Gomphales	Gomphaceae	Ramaria	decurrens
374081080	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Meruliaceae	Mycoacia	cf. columellifera 2063
817033272	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Phanerochaetaceae	Ceriporia	purpurea
512501781	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Phanerochaetaceae	Ceriporia	viridans
563426670	Fungi	Basidiomycota	Agaricomycetes	Polyporales	Phanerochaetaceae	Phanerochaete	sp. Y-RN1
756179489	Fungi	Basidiomycota	Agaricomycetes	Polyporales			sp. 7-SU-3-A-15(M)-A.1
33324427	Fungi	Basidiomycota	Agaricomycetes	Russulales	Lachnocladiaceae	Gloiothele	lactescens
328354803	Fungi	Basidiomycota	Agaricomycetes	Russulales			sp. NK268
207059696	Fungi	Basidiomycota	Agaricomycetes	Thelephorales	Typhulaceae	Typhula	maritima
576734291	Fungi	Basidiomycota	Agaricomycetes	Trechisporales	Hydnodontaceae	Trechispora	sp. DLL2011-1
408886237	Fungi	Basidiomycota	Agaricostilbomycetes	Agaricostilbales	Kondoaceae	Bensingtonia	naganoensis
731189315	Fungi	Basidiomycota	Cystobasidiomycetes	Cystobasidiales		Occultifur	sp. UFMG-ABT396
731189315	Fungi	Basidiomycota	Cystobasidiomycetes	Cystobasidiales		Occultifur	sp. UFMG-ABT396
574087205	Fungi	Basidiomycota	Dacrymycetes	Dacrymycetales	Dacrymycetaceae	Dacrymyces	sp. Quinchao 21
820944175	Fungi	Basidiomycota	Exobasidiomycetes	Exobasidiales	Exobasidiaceae	Exobasidium	maculosum
514825741	Fungi	Basidiomycota	Exobasidiomycetes	Exobasidiales	Exobasidiaceae		Exobasidium
597900543	Fungi	Basidiomycota	Exobasidiomycetes	Georgefischeriales	Tilletiariaceae	Tilletiaria	anomala
157003816	Fungi	Basidiomycota	Microbotryomycetes	Microbotryales	Microbotryaceae	Microbotryum	bistortarum
118084487	Fungi	Basidiomycota	Microbotryomycetes				sp. EXP0507F

310894137	Fungi	Basidiomycota	Pucciniomycetes	Septobasidiales	Septobasidiaceae	Septobasidium	sp. JBO-2010f
332182478	Fungi	Basidiomycota	Pucciniomycetes				sp. PIMO_247
762216273	Fungi	Basidiomycota	Tremellomycetes	Tremellales	Bulleraceae	Bullera	alba
20378544	Fungi	Basidiomycota	Tremellomycetes	Tremellales	Trimorphomycetaceae	Trimorphomyces	papilionaceus
20378544	Fungi	Basidiomycota	Tremellomycetes	Tremellales	Trimorphomycetaceae	Trimorphomyces	papilionaceus
227284168	Fungi	Basidiomycota	Tremellomycetes	Trichosporonales	Trichosporonaceae	Cryptococcus	sp. AY-59
152013635	Fungi	Basidiomycota	Ustilaginomycetes	Ustilaginales	Ustilaginaceae	Farysia	acheniorum
37683533	Fungi	Basidiomycota	Ustilaginomycetes	Ustilaginales	Ustilaginaceae	Ustilago	echinata
163263088	Fungi	Basidiomycota					basidiomycete sp. 2696
284468658	Fungi	Basidiomycota					Basidiomycota
157367970	Fungi	Basidiomycota					Basidiomycota
334682945	Fungi	Basidiomycota					Basidiomycota
224459524	Fungi	Basidiomycota					Basidiomycota
604722454	Fungi	Basidiomycota					Basidiomycota
224459524	Fungi	Basidiomycota					Basidiomycota
224459524	Fungi	Basidiomycota					Basidiomycota
380745379	Fungi	Basidiomycota					Basidiomycota
284468634	Fungi	Basidiomycota					Basidiomycota
313483155	Fungi	Basidiomycota					Basidiomycota
339460168	Fungi	Basidiomycota					Basidiomycota
334683002	Fungi	Basidiomycota					Basidiomycota
163257767	Fungi	Basidiomycota					Basidiomycota
283826453	Fungi	Basidiomycota					Basidiomycota
224459524	Fungi	Basidiomycota					Basidiomycota
154082210	Fungi	Basidiomycota					Basidiomycota
443615205	Fungi	Basidiomycota					Basidiomycota
443615205	Fungi	Basidiomycota					Basidiomycota
313483207	Fungi	Basidiomycota					Basidiomycota
334683005	Fungi	Basidiomycota					Basidiomycota
313483137	Fungi	Basidiomycota					Basidiomycota

313483215	Fungi	Basidiomycota					Basidiomycota
307334593	Fungi	Basidiomycota					Basidiomycota
115564916	Fungi	Basidiomycota					ectomycorrhiza (Basidiomycota)
5420147	Fungi	Basidiomycota					root associated basidiomycete 00026
312434604	Fungi	Basidiomycota					sp. TR115
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
157063225	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae	Betamyces	americaemeridionalis
626467656	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Aquamycetaceae	Aquamyces	chlorogonii
597718370	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Dinomycetaceae	Dinomyces	arenysensis
597718370	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Dinomycetaceae	Dinomyces	arenysensis
850543608	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Halomycetaceae	Paranamyces	uniporus
850543616	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Halomycetaceae	Paranamyces	uniporus
850543616	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Halomycetaceae	Paranamyces	uniporus
850543608	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Halomycetaceae	Paranamyces	uniporus
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
380745252	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
380745252	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
380745252	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
460422522	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Rhizophydiaceae		Rhizophydium
626468818	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Coralloidiomyces	digitatus
626468818	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Coralloidiomyces	digitatus

626468818	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Coralloidiomyces	digitatus
626468818	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Coralloidiomyces	digitatus
626468818	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales		Coralloidiomyces	digitatus
365822606	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales			sp. 1 MV-2011
365822606	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales			sp. 1 MV-2011
365822606	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales			sp. 1 MV-2011
365822606	Fungi	Chytridiomycota	Chytridiomycetes	Rhizophydiales			sp. 1 MV-2011
7595704	Fungi	Chytridiomycota	Chytridiomycetes	Spizellomycetales	Spizellomycetaceae	Spizellomyces	dolichospermus
38455787	Fungi	Chytridiomycota	Monoblepharidomycetes	Monoblepharidales	Harpochytriaceae	Harpochytrium	sp. JEL94
511488088	Fungi	Chytridiomycota	Monoblepharidomycetes	Monoblepharidales			Hyaloraphidium
511488088	Fungi	Chytridiomycota	Monoblepharidomycetes	Monoblepharidales			Hyaloraphidium
311408908	Fungi	Chytridiomycota					Chytridiomycota
311408968	Fungi	Chytridiomycota					Chytridiomycota
311409155	Fungi	Chytridiomycota					Chytridiomycota
311408918	Fungi	Chytridiomycota					Chytridiomycota
311409155	Fungi	Chytridiomycota					Chytridiomycota
311408962	Fungi	Chytridiomycota					Chytridiomycota
311409155	Fungi	Chytridiomycota					Chytridiomycota
195931901	Fungi	Chytridiomycota					sp. Mori B3
195931901	Fungi	Chytridiomycota					sp. Mori B3
119567584	Fungi	Entomophthoromycota	Entomophthoromycetes	Entomophthorales	Entomophthoraceae	Zoophthora	radicans
365267103	Fungi	Glomeromycota	Glomeromycetes	Archaeosporales			Archaeosporales
365267103	Fungi	Glomeromycota	Glomeromycetes	Archaeosporales			Archaeosporales
446507737	Fungi	Glomeromycota	Glomeromycetes	Glomerales	Glomeraceae		Glomeraceae
187439754	Fungi						compost fungus
187439755	Fungi						compost fungus
187439755	Fungi						compost fungus
311409145	Fungi						Dikarya
404248178	Fungi						ectomycorrhizal fungus
404248178	Fungi						ectomycorrhizal fungus

77799518	Fungi	ectomycorrhizal fungus
404247993	Fungi	ectomycorrhizal fungus
404248177	Fungi	ectomycorrhizal fungus
193246449	Fungi	endophyte
129562552	Fungi	endophyte
909627792	Fungi	endophyte
291220193	Fungi	endophyte
220967542	Fungi	endophyte sp. P1312D
571948410	Fungi	endophytic fungus

Table S3: Fungal genera present on plastic sampled at the harbor at the end of the exposure experiment (t=44 weeks). Only genera with abundance of at least 1% on at least 1 type of plastic (sheet or dolly rope) are given (mean relative abundance (%) ± standard error).

Phylum	Class	Family	Genus	Sheet	Dolly rope
Ascomycota	Dothideomycetes	Davidiellaceae	*Cladosporium*	3.44±0.38	5.59±2.45
		Incertae sedis	*Unidentified*	2.61±1.06	2.85±1.26
			Other	4.20±2.73	5.00±2.13
		Pleosporaceae	*Alternaria*	1.28±0.69	2.82±2.45
			Other	1.03±0.45	12.93±7.03
		Unidentified	*Unidentified*	1.20±0.85	1.06±0.54
		Other	*Other*	1.79±0.17	0.51±0.13
		Other	*Other*	6.38±3.74	16.34±9.03
	Lecanoromycetes	Candelariaceae	*Candelariella*	14.34±8.44	1.91±1.26
		Physciaceae	*Physconia*	6.54±2.63	5.87±4.44
		Teloschistaceae	*Caloplaca*	18.64±7.02	18.72±8.86
			Unidentified	9.76±8.67	2.37±1.23
			Other	5.12±2.22	5.35±1.91
	Sordariomycetes	Nectriaceae	*Fusarium*	2.18±0.29	3.74±1.90
			Other	1.20±0.56	0.47±0.13
Basidiomycota	Tremellomycetes	Incertae sedis	*Cryptococcus*	1.62±0.49	1.48±0.65

Table S4: Fungal genera present on plastic sampled offshore at the end of the exposure experiment (t=44 weeks). Only genera with abundance of at least 1% on at least 1 type of plastic (sheet or dolly rope) are given (mean relative abundance (%) ± standard error).

Phylum	Class	Family	Genus	Sheet	Dolly rope
Ascomycota	Dothideomycetes	Davidiellaceae	*Cladosporium*	9.59±2.15	0.84±0.38
		Incertae sedis	*Other*	2.58±2.20	0.00±0.00
		Phaeosphaeriaceae	*Phaeosphaeria*	0.10±0.10	2.04±2.00
		Pleosporaceae	*Alternaria*	1.84±1.60	1.47±0.49
			Other	13.43±10.20	3.96±1.63
		Other	*Other*	4.80±2.42	2.28±1.18
		Other	*Other*	2.32±2.18	2.27±1.78
	Eurotiomycetes	Trichocomaceae	*Penicillium*	1.16±1.10	0.08±0.08
	Lecanoromycetes	Candelariaceae	*Candelariella*	1.34±1.12	3.52±1.84
		Lecanoraceae	*Lecanora*	0.78±0.60	1.21±0.84
		Physciaceae	*Physconia*	3.77±2.52	5.29±2.66
		Teloschistaceae	*Caloplaca*	3.36±1.84	8.94±2.61
			Other	4.70±2.36	15.63±3.45
	Leotiomycetes	Erysiphaceae	*Blumeria*	1.86±1.66	0.00±0.00
		Sclerotiniaceae	*Other*	5.97±2.32	0.02±0.02
	Saccharomycetes	Incertae sedis	*Cyberlindnera*	1.57±1.50	0.00±0.00
			Debaryomyces	2.22±2.22	0.02±0.02
		Saccharomycetaceae	*Saccharomyces*	2.22±2.20	0.12±0.10
	Sordariomycetes	Nectriaceae	*Other*	1.53±1.20	0.00±0.00
		Lulworthiaceae	*Lulwoana*	0.00±0.00	3.27±1.64
		Chaetomiaceae	*Other*	2.22±2.20	4.28±4.02
		Other	*Other*	4.92±2.69	0.83±0.53
		Incertae sedis	*Microdochium*	2.22±2.20	0.00±0.00
	Unidentified	Unidentified	*Unidentified*	1.47±1.47	3.56±1.16
	Other	Other	*Other*	1.08±0.96	14.84±1.65
Basidiomycota	Agaricostilbomycetes	Kondoaceae	*Kondoa*	3.56±1.84	0.71±0.46
	Incertae sedis	Malasseziaceae	*Malassezia*	2.13±2.01	3.50±1.52
	Microbotryomycetes	Incertae sedis	*Rhodotorula*	0.42±0.40	2.38±2.03
			Sporobolomyces	0.00±0.00	2.69±0.87
	Tremellomycetes	Incertae sedis	*Dioszegia*	5.60±3.99	0.21±0.21
Zygomycota	Incertae sedis	Mortierellaceae	*Mortierella*	0.00±0.00	1.26±0.55

Table S5: Physicochemical characteristics of seawater and sediment sampled at different locations across the BPNS of a broad sampling campaign in 2014. This table is a copy of those previously published in De Tender et al (2015).

Seawater	Sampling Date	Depth (m)	Temperature (°C)	Salinity (PSU)	Oxygen (%saturation)	Pressure (db)	Conductivity (µS/cm)	Turbidity (NTU)	Oxidation reduction potential (ORP) (mV)	Density (kg/m^3)	Sound Velocity (m/s)
OO	05/03/'14	8.5	7.8	33.5	84.0	8.07	34 704	204.0	218.70	1026.18	1480.20
NP	05/03/'14	6.5	8.0	33.5	78.0	6.05	34 756	154.0	218.47	1025.86	1480.34
ZB	06/03/'14	6.5	7.5	30.5	82.0	6.05	31 012	379.0	188.43	1023.37	1474.31

Sediment	Sampling date	TOC (%)	Inorganic Carbon (%)	Median grain size (µm)
OO	05/03/'14	0.34	1.72	180.39
	01/09/'14	1.18	2.04	108.65
NP	05/03/'14	0.22	2.10	186.95
	28/08/'14	1.02	1.76	199.15
ZB	06/03/'14	2.15	3.80	33.41
	29/08/'14	8.97	15.47	29.06

Table S6: Temporal dynamics in relative abundance of three previously identified fungal PE biodegraders: *M. alpina*, *F. redolens* and *C. cladosporioides*. Relative abundances are given for A) plastic sheets at the harbor, B) dolly ropes at the harbor, C) plastic sheets offshore and D) dolly ropes offshore. The mean relative abundances of other species within the same genera (indicated as "other"), are given for each time point within the exposure period. Time points consisting of less than 3 biological replicates, due to a low number of sequence reads (<10.000/sample) in one or more of the replicates, are excluded from the table.

HARBOR SHEET

Genus	Species	t1	t2	t3	t4	t9	t14	t18	t22	t27	t31	t35	t40	t44
Mortierella	*alpina*	0,00±0,00	0,02±0,02	0,00±0,00	0,09±0,07	0,00±0,00	0,00±0,00	0,00±0,00	/	/	0,00±0,00	0,02±0,02	0,00±0,00	0,00±0,00
	other	0,57±0,57	0,24±0,18	0,02±0,00	0,06±0,04	0,02±0,01	0,20±0,20	0,01±0,01	/	/	0,02±0,02	1,16±0,42	1,84±1,75	0,24±0,15
Fusarium	*redolens*	0,00±0,00	0,14±0,12	0,04±0,01	0,07±0,06	0,00±0,00	0,01±0,00	0,00±0,00	/	/	0,00±0,00	0,00±0,00	0,53±0,44	0,99±0,46
	other	0,15±0,15	0,00±0,00	0,03±0,00	0,00±0,00	0,07±0,05	0,01±0,00	0,00±0,00	/	/	0,00±0,00	0,00±0,00	0,27±0,27	0,10±0,09
Cladosporium	*cladosporioides*	0,14±0,11	0,96±0,73	0,10±0,02	0,16±0,09	0,07±0,01	0,36±0,34	0,02±0,01	/	/	0,13±0,23	0,73±0,49	0,16±0,07	0,83±0,74
	other	2,80±0,97	5,22±0,47	0,11±0,02	1,15±0,26	0,42±0,29	0,41±0,34	1,18±0,10	/	/	0,52±0,13	1,25±0,42	3,66±2,00	0,72±0,11

HARBOR DOLLY ROPE

Genus	Species	t1	t2	t3	t4	t9	t14	t18	t22	t27	t31	t35	t40	t44
Mortierella	*alpina*	0,00±0,00	0,00±0,00	0,00±0,00	0,00±0,00	/	0,00±0,00	/	/	/	0,03±0,03	0,00±0,00	0,00±0,00	0,00±0,00
	other	0,96±0,55	0,00±0,00	2,98±0,15	0,40±0,02	/	0,22±0,00	/	/	/	2,04v2,02	0,13±0,02	2,40±1,96	0,11±0,07
Fusarium	*redolens*	0,01±0,01	0,00±0,00	0,00±0,00	0,00±0,00	/	0,00±0,00	/	/	/	0,05±0,05	0,00±0,00	0,00±0,00	1,33±1,00
	other	0,00±0,00	0,04±0,04	0,00±0,00	0,00±0,00	/	0,08±0,02	/	/	/	0,11±0,11	0,00±0,00	0,01±0,01	0,10±0,07
Cladosporium	*cladosporioides*	0,76±0,40	9,63±1,84	0,89±0,12	0,19±0,05	/	0,08±0,03	/	/	/	0,27±0,17	0,01±0,01	0,36±0,30	0,10±0,04
	other	2,21±0,99	9,24±1,15	1,30±0,56	0,80±0,16	/	0,02±0,01	/	/	/	0,48v0,35	0,15±0,02	1,49±0,73	1,59±0,53

OFFSHORE SHEET

Genus	Species	t1	t2	t3	t4	t9	t14	t18	t22	t27	t31	t35	t40	t44
Mortierella	*alpina*	/	/	/	0,00±0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,00±0,00	/	0,23±0,16	0,00±0,00	0,00±0,00	/	/	/	/	/
Fusarium	*redolens*	/	/	/	0,00±0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,00±0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
Cladosporium	*cladosporioides*	/	/	/	0,02±0,02	/	0,09±0,07	0,40±0,04	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,19±0,08	/	0,41±0,14	0,00±0,00	0,11±0,06	/	/	/	/	/

OFFSHORE DOLLY ROPE

Genus	Species	t1	t2	t3	t4	t9	t14	t18	t22	t27	t31	t35	t40	t44
Mortierella	*alpina*	/	/	/	0,00±0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,26±0,13	/	0,26±0,13	0,77±0,67	0,18±0,09	/	/	/	/	/
Fusarium	*redolens*	/	/	/	0,00v0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,00±0,00	/	0,00±0,00	0,00±0,00	0,00±0,00	/	/	/	/	/
Cladosporium	*cladosporioides*	/	/	/	0,55±0,48	/	0,55±0,48	0,03±0,03	0,00±0,00	/	/	/	/	/
	other	/	/	/	0,69±0,48	/	0,69±0,48	0,65±0,36	0,09±0,07	/	/	/	/	/

>0,10
>0,25
>0,50
>1,00

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