

Figure S1a. Degradation profiles (boxplots) of all monitored alkanes at all locations in the summer and winter.



Percentage values were obtained by dividing concentration values at 3, 7, 10, 15, 28 or 42 days by concentration values at 0 days.



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Aromatic compound



Figure S2a. Degradation profiles (boxplots) of all monitored aromatic compounds at all locations in the summer and winter. \*: There was a power failure to the GFI (General Fault Interrupter) plug on the dock that powered the shakers (due to inclement weather so the flasks were not shaking for approximately 72 hours).



**Figure S2b.** Percentage depletion degradation profiles (boxplots) of all monitored aromatic compounds at all locations in the summer and winter. \*: There was a power failure to the GFI (General Fault Interrupter) plug on the dock that powered the shakers (due to inclement weather so the flasks were not shaking for approximately 72 hours). Percentage values were obtained by dividing concentration values at 3, 7, 10, 15, 28 or 42 days by concentration values at 0 days.









## Terranova – Winter SW BH SW BH+Disp SW BH+Oil SW BH+Oil Disp 75 Taxon Clavibacter Vibrio 50 Aequorivita Octadecabacter Shewanella 25 Saccharophagus Roseobacte Candidatus Pun Candidatus Puniceispirillum 0 Pseudomonas Cycloclasticus Glaciecola Thalassolituus 75 Lacinutrix Polaribacter Contigs Alteromonas 50 Marinobacter Candidatus Pelagibacte Candidatus Pelagibacter Colwellia 25 Pseudoalteromonas Alcanivorax 0 Bins\_TN1GW Bins\_TN3GW Bins\_TN1GW Bins\_TN1GW MG\_TN2GW MG\_TN2GW MG\_TN3GW MG\_TN3GW MG\_TN3GW MG\_TN13GW MG\_TN13GW MG\_TN13GW Bins\_TN3GW Bins\_TN3GW Bins\_TN3GW Bins\_TN3GW Bins\_TN3GW Bins\_TN20GW MG\_TN1GW MG\_TN3GW MG\_TN10GW MG\_TN11GW TN10GW TN10GW TN11GW TN12GW Bins\_TN21GW Bins\_TN17GW 3ins\_TN18GW AG\_TN19GW MG\_TN21GW MG\_TN18GW Bins\_TN16GM MG\_TN20GM MG\_TN16GM Bins\_TN19G MG\_TN17GM Bins\_

Figure S3. Genus level taxonomy comparison between contigs-centric and bins-based approaches. Contigs-based population profiles were obtained by summarizing taxonomic lineages assigned to each contigs. Metagenome bins population profiles were obtained by summarizing consensus taxonomic lineages as described above (See Additional file 3 -Metagenome bins validation for methodology).

Taxon

Vibrio

Colwellia

Vibrio

Saccharophagus

seudomonas

Thalassolituus

Alteromonas

/arinobacte

Pseudoaltero

Alcanivorax

Lacinutrix

Colwellia



**Figure S4.** Alpha diversity metrics (Observed species/bins and Shannon indexes) computed from all 601 metagenome bins. Each bar represent a sample. Statistical significance was assessed with an ANOVA followed by a post-hoc Tukey test: For each station and season, all comparisons between T0 and other conditions were significant with an adjusted *p*-value lower than at least 0.05. Y-axis corresponds to sample names. Diversity indices were computed using the bins abundance table (Supplemental Information 2 datasets - Table S3).



**Figure S5.** Beta diversity (Bray-Curtis) metrics computed from all 601 metagenome bins (*Supplemental Information 2 datasets - Table S3*). Each point represents a sample. Permanova was performed using the "adonis" function of the vegan library.

10-Alteromonadales (Marinobacter)	12-Alteromonadales (Colwellia)	16-Alteromonadales (Marinobacter)	18-Oceanospirillales (Thalassolituus)	1-Oceanospirillales (Alcanivorax)	23-Alteromonadales (Colwellia)	25-Alteromonadales (Marinobacter)	27-Oceanospirillales (Thalassolituus)	2-Oceanospirillales (Alcanivorax)	32-Oceanospirillales (Thalassolituus)	36-Oceanospirillales (Alcanivorax)	3-Thiotrichales (Cycloclasticus)	46-Flavobacteriales (Zunongwangia)	4-Alteromonadales (Alteromonas)	5-Alteromonadales (Pseudoalteromonas)	6-Alteromonadales (Glaciecola)	71-Alteromonadales (Colwellia)	82-Oceanospirillales (Alcanivorax)	8-Oceanospirillales (Alcanivorax)	9-Alteromonadales (Colwellia)	
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8-6-4-2-6-	•																			Hibernia Winter SW_BH+Oil_Disp T5
																· · · · · · · · · · · · · · · · · · ·			•	Hibernia Winter SW_BH+Oil T42
8-4-2-																				Hibernia Winter SW_BH+Oil T5
O 2 4 6 8 0 2 4																				
monadal obacter)	monadal vellia)	monadal obacter)	ospirillal solituus)	ospirillale iivorax)	monadal vellia)	monadal obacter)	ospirillal solituus)	sspirillal <del>(</del> iivorax)	ospirillal solituus)	ospirillal iivorax)	trichales lasticus)	oacterial( gwangia)	nonadal <del>(</del> monas)	nonadale teromon	nonadal∈ iecola)	monadal vellia)	ospirillal iivorax)	sspirillal( iivorax)	nonagaie wellia)	

log2(CPM) MT

A)

Abundance - MT in function of MG - Hibernia -

B)



log2(CPM)

C)

Figure S6. Metatranscriptome gene abundance in function of metagenome gene abundance for each bin at A) Hibernia, B) Terranova and C)Thebaud. Average CPM values of each gene were log<sub>2</sub> transformed for both metatranscriptome and metagenome datasets and ratios of RNA:DNA for each gene of each bin were fitted with a non-parametric smoothing (Loess).