

**Diversity of the Deep**  
Data

**Sample A**

A	B	C	D	E
Species	Abundance	relative abundance (P <sub>i</sub> )	ln(P <sub>i</sub> )	P <sub>i</sub> ln(P <sub>i</sub> )
<i>Ridgeia piscesae</i>	1060	0.554	-0.591	-0.327
<i>Branchinotogluma grasslei</i>	0	0.000		0.000
<i>Branchinotogluma hessleri</i>	0	0.000		0.000
<i>Branchinotogluma sandersi</i>	0	0.000		0.000
<i>Opisthotrochopodus tunnicliffeae</i>	0	0.000		0.000
<i>Lepidonotopodium piscesae</i>	21	0.011	-4.513	-0.049
<i>Paralvinella palmiformis</i>	692	0.361	-1.018	-0.368
<i>Paralvinella pandorae</i>	26	0.014	-4.299	-0.058
<i>Paralvinella sulfincola</i>	0	0.000		0.000
<i>Amphisamytha galapagensis</i>	0	0.000		0.000
<i>Lepetodrilus fucensis</i>	75	0.039	-3.240	-0.127
<i>Depressigyra globulus</i>	38	0.020	-3.920	-0.078
<i>Provanna variabilis</i>	2	0.001	-6.864	-0.007
<i>Ammothea verenae</i>	1	0.001	-7.557	-0.004
Species Richness (S):	8			
Number of Individuals (N):	1915			
Shannon-Wiener Index of Diversity (H')	1.019			
Species Evenness (H'/ln(S)):	0.490			

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**Sample B**

A	B	C	D	E
Species	Abundance	relative abundance (P <sub>i</sub> )	ln(P <sub>i</sub> )	P <sub>i</sub> ln(P <sub>i</sub> )
<i>Ridgeia piscesae</i>	1503	0.260	-1.346	-0.350
<i>Branchinotogluma grasslei</i>	22	0.004	-5.570	-0.021
<i>Branchinotogluma hessleri</i>	8	0.001	-6.582	-0.009
<i>Branchinotogluma sandersi</i>	10	0.002	-6.358	-0.011
<i>Opisthotrochopodus tunicliffeae</i>	7	0.001	-6.715	-0.008
<i>Lepidonotopodium piscesae</i>	39	0.007	-4.997	-0.034
<i>Paralvinella palmiformis</i>	3478	0.602	-0.507	-0.305
<i>Paralvinella pandorae</i>	69	0.012	-4.427	-0.053
<i>Paralvinella sulfincola</i>	226	0.039	-3.240	-0.127
<i>Amphisamytha galapagensis</i>	0	0.000		0.000
<i>Lepetodrilus fucensis</i>	79	0.014	-4.291	-0.059
<i>Depressigyra globulus</i>	312	0.054	-2.918	-0.158
<i>Provanna variabilis</i>	20	0.003	-5.665	-0.020
<i>Ammothea verenae</i>	0	0.000		0.000
Species Richness (S):	12			
Number of Individuals (N):	5773			
Shannon-Wiener Index of Diversity (H')	1.155			
Species Evenness (H'/ln(S)):	0.465			

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**Sample C**

A	B	C	D	E
Species	Abundance	relative abundance (P)	$\ln(P_i)$	$P_i \ln(P_i)$
<i>Ridgeia piscesae</i>	1290	0.105	-2.253	-0.237
<i>Branchinotogluma grasslei</i>	45	0.004	-5.609	-0.021
<i>Branchinotogluma hessleri</i>	0	0.000		0.000
<i>Branchinotogluma sandersi</i>	39	0.003	-5.752	-0.018
<i>Opisthotrochopodus tunnicliffeae</i>	12	0.001	-6.931	-0.007
<i>Lepidonotopodium piscesae</i>	23	0.002	-6.280	-0.012
<i>Paralvinella palmiformis</i>	1150	0.094	-2.368	-0.222
<i>Paralvinella pandorae</i>	171	0.014	-4.274	-0.060
<i>Paralvinella sulfincola</i>	70	0.006	-5.167	-0.029
<i>Amphisamytha galapagensis</i>	11	0.001	-7.018	-0.006
<i>Lepetodrillus fucensis</i>	6756	0.550	-0.598	-0.329
<i>Depressigyra globulus</i>	2667	0.217	-1.527	-0.332
<i>Provanna variabilis</i>	44	0.004	-5.632	-0.020
<i>Ammothea verenae</i>	3	0.000	-8.317	-0.002
Species Richness (S):	13			
Number of Individuals (N):	12281			
Shannon-Wiener Index of Diversity (H')	1.294			
Species Evenness (H'/ln(S)):	0.504			

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**Sample D**

A	B	C	D	E
Species	Abundance	relative abundance (P)	$\ln(P_i)$	$P_i \ln(P_i)$
<i>Ridgeia piscesae</i>	700	0.263	-1.336	-0.351
<i>Branchinotogluma grasslei</i>	2	0.001	-7.194	-0.005
<i>Branchinotogluma hessleri</i>	0	0.000		0.000
<i>Branchinotogluma sandersi</i>	9	0.003	-5.690	-0.019
<i>Opisthotrochopodus tunnicliffeae</i>	0	0.000		0.000
<i>Lepidonotopodium piscesae</i>	17	0.006	-5.054	-0.032
<i>Paralvinella palmiformis</i>	1790	0.672	-0.397	-0.267
<i>Paralvinella pandorae</i>	20	0.008	-4.891	-0.037
<i>Paralvinella sulfincola</i>	20	0.008	-4.891	-0.037
<i>Amphisamytha galapagensis</i>	0	0.000		0.000
<i>Lepetodrilus fucensis</i>	86	0.032	-3.433	-0.111
<i>Depressigyra globulus</i>	19	0.007	-4.943	-0.035
<i>Provanna variabilis</i>	0	0.000		0.000
<i>Ammothea verenae</i>	0	0.000		0.000
Species Richness (S):	9			
Number of Individuals (N):	2663			
Shannon-Wiener Index of Diversity (H')	0.895			
Species Evenness (H'/ln(S)):	0.407			

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**Sample E**

A	B	C	D	E
Species	Abundance	relative abundance (P)	$\ln(P_i)$	$P_i \ln(P_i)$
<i>Ridgeia piscesae</i>	15	0.004	-5.461	-0.023
<i>Branchinotogluma grasslei</i>	5	0.001	-6.560	-0.009
<i>Branchinotogluma hessleri</i>	0	0.000		0.000
<i>Branchinotogluma sandersi</i>	1	0.000	-8.169	-0.002
<i>Opisthotrochopodus tunnicliffeae</i>	5	0.001	-6.560	-0.009
<i>Lepidonotopodium piscesae</i>	20	0.006	-5.173	-0.029
<i>Paralvinella palmiformis</i>	1705	0.483	-0.728	-0.351
<i>Paralvinella pandorae</i>	236	0.067	-2.705	-0.181
<i>Paralvinella sulfincola</i>	4	0.001	-6.783	-0.008
<i>Amphisamytha galapagensis</i>	5	0.001	-6.560	-0.009
<i>Lepetodrilus fucensis</i>	705	0.200	-1.611	-0.322
<i>Depressigyra globulus</i>	809	0.229	-1.473	-0.338
<i>Provanna variabilis</i>	20	0.006	-5.173	-0.029
<i>Ammothea verenae</i>	0	0.000		0.000
Species Richness (S):	12			
Number of Individuals (N):	3530			
Shannon-Wiener Index of Diversity (H')	1.311			
Species Evenness (H'/ln(S)):	0.528			

### DISCUSSION QUESTIONS (ANSWERS):

1. Sample C
2. Sample E
3. Sample E
4. When used individually, species richness and species evenness do not give a complete picture of the structure of the community, but when used together, the diversity of the community can be expressed and compared to other communities.
5. No, the sample with the most species (highest species richness) did not have the highest species diversity. Sample E had a similar number of species as sample C, but the individuals were distributed more evenly (higher species evenness) and thus, sample E had a higher species diversity. Samples with high species richness AND high species evenness have the highest index of species diversity ( $H'$ ).
6. Sample C is dominated by gastropods (the limpet *Lepetodrilus fucensis* and the snail *Depressigyra globulus*), but sample E is dominated by the worm *Paralvinella palmiformis* and the snail *Depressigyra globulus*. The conditions at the different sample sites must vary enough to favor one species over another.

