

## Distributions of krill and Antarctic silverfish and correlations with environmental variables in the western Ross Sea, Antarctica

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Table S1. Statistical significance metrics obtained from the spatial autocorrelation analysis for each species and each environmental variable using the entire data set (western Ross Sea scale). Statistically significant z-scores and p-values are indicated by bold text.

		Western Ross Sea Scale					
		Moran's I Index	Expected Index	z-score	p-value	Variance	Results
<b>Antarctic Krill</b>							
	Biomass	0.0401	-0.0028	0.760	0.4474	0.0032	Random
	Bathymetry	0.7257	-0.0028	<b>12.796</b>	<b>&lt;0.0005</b>	0.0032	Clustered
	Temperature	0.7925	-0.0029	<b>12.617</b>	<b>&lt;0.0005</b>	0.0040	Clustered
	Chla	0.7640	-0.0034	<b>12.100</b>	<b>&lt;0.0005</b>	0.0040	Clustered
	MLD	0.6291	-0.0028	<b>11.124</b>	<b>&lt;0.0005</b>	0.0032	Clustered
	Sea Ice	0.7744	-0.0028	<b>13.669</b>	<b>&lt;0.0005</b>	0.0032	Clustered
	Speed	0.6307	-0.0028	<b>11.212</b>	<b>&lt;0.0005</b>	0.0032	Clustered
	Coast	0.6417	-0.0028	<b>11.302</b>	<b>&lt;0.0005</b>	0.0033	Clustered
	Shelf Break	0.7936	-0.0028	<b>13.962</b>	<b>&lt;0.0005</b>	0.0033	Clustered
<b>Crystal Krill</b>							
	Biomass	0.8018	-0.0030	<b>11.760</b>	<b>&lt;0.0005</b>	0.0047	Clustered
	Bathymetry	0.3428	-0.0030	<b>4.870</b>	<b>&lt;0.0005</b>	0.0050	Clustered
	Temperature	0.6922	-0.0030	<b>9.693</b>	<b>&lt;0.0005</b>	0.0051	Clustered
	Chla	0.5378	-0.0030	<b>7.534</b>	<b>&lt;0.0005</b>	0.0052	Clustered
	MLD	0.7539	-0.0030	<b>10.587</b>	<b>&lt;0.0005</b>	0.0051	Clustered
	Sea Ice	1.5303	-0.0030	<b>21.410</b>	<b>&lt;0.0005</b>	0.0051	Clustered
	Speed	0.6442	-0.0030	<b>9.172</b>	<b>&lt;0.0005</b>	0.0050	Clustered
	Coast	0.9119	-0.0030	<b>12.770</b>	<b>&lt;0.0005</b>	0.0051	Clustered
	Shelf Break	1.2455	-0.0030	<b>17.380</b>	<b>&lt;0.0005</b>	0.0052	Clustered
<b>Antarctic Silverfish</b>							
	Abundance	0.7315	-0.0025	<b>14.023</b>	<b>&lt;0.0005</b>	0.0027	Clustered
	Bathymetry	0.8768	-0.0025	<b>16.406</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	Temperature	0.9754	-0.0025	<b>18.223</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	Chla	0.8038	-0.0025	<b>15.028</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	MLD	0.8705	-0.0025	<b>16.320</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	Sea Ice	1.1585	-0.0025	<b>21.731</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	Speed	0.6049	-0.0025	<b>11.494</b>	<b>&lt;0.0005</b>	0.0028	Clustered
	Coast	1.0193	-0.0025	<b>19.048</b>	<b>&lt;0.0005</b>	0.0029	Clustered
	Shelf Break	1.1897	-0.0025	<b>22.230</b>	<b>&lt;0.0005</b>	0.0029	Clustered

Table S2. Statistical significance metrics obtained from the spatial autocorrelation analysis for each species and each environmental variable using the data set defined by the 99% confidence interval obtained from the hot spot analysis (hot spot scale). Statistically significant p-values and z-scores are indicated by bold text.

	Hot Spot Scale					
	Moran's I index	Expected Index	z-score	p-value	Variance	Results
<b>Antarctic Krill</b>						
Biomass	-0.0499	-0.0256	-0.127	0.8988	0.0362	Random
Bathymetry	0.9280	-0.0256	<b>4.975</b>	<b>&lt;0.0005</b>	0.0367	Clustered
Temperature	0.6785	-0.0256	<b>3.730</b>	<b>&lt;0.0005</b>	0.0356	Clustered
Chla	0.7537	-0.0256	<b>4.121</b>	<b>&lt;0.0005</b>	0.0358	Clustered
MLD	0.9062	-0.0256	<b>4.913</b>	<b>&lt;0.0005</b>	0.0360	Clustered
Sea Ice	0.3531	-0.0256	<b>2.300</b>	<b>0.0215</b>	0.0271	Clustered
Speed	0.7850	-0.0256	<b>4.322</b>	<b>&lt;0.0005</b>	0.0352	Clustered
Coast	0.5266	-0.0256	<b>2.918</b>	<b>0.0035</b>	0.0358	Clustered
Shelf Break	1.0884	-0.0256	<b>5.941</b>	<b>&lt;0.0005</b>	0.0352	Clustered
<b>Crystal Krill</b>						
Biomass	-0.1317	-0.0227	-0.665	0.5062	0.0268	Random
Bathymetry	0.6851	-0.0227	<b>4.251</b>	<b>&lt;0.0005</b>	0.0277	Clustered
Temperature	0.4304	-0.0227	<b>2.978</b>	<b>0.0029</b>	0.0232	Clustered
Chla	0.9143	-0.0227	<b>5.637</b>	<b>&lt;0.0005</b>	0.0276	Clustered
MLD	0.5988	-0.0227	<b>3.901</b>	<b>&lt;0.0005</b>	0.0254	Clustered
Sea Ice	0.8470	-0.0227	<b>5.266</b>	<b>&lt;0.0005</b>	0.0273	Clustered
Speed	0.7110	-0.0227	<b>4.483</b>	<b>&lt;0.0005</b>	0.0268	Clustered
Coast	0.5437	-0.0227	<b>3.544</b>	<b>&lt;0.0005</b>	0.0255	Clustered
Shelf Break	0.8193	-0.0227	<b>5.092</b>	<b>&lt;0.0005</b>	0.0273	Clustered
<b>Antarctic Silverfish</b>						
Abundance	0.6843	-0.0222	<b>4.162</b>	<b>&lt;0.0005</b>	0.0288	Clustered
Bathymetry	0.7499	-0.0222	<b>4.595</b>	<b>&lt;0.0005</b>	0.0282	Clustered
Temperature	0.4670	-0.0222	<b>2.971</b>	<b>0.0030</b>	0.0271	Clustered
Chla	0.5686	-0.0222	<b>3.504</b>	<b>&lt;0.0005</b>	0.0284	Clustered
MLD	1.0631	-0.0222	<b>7.120</b>	<b>&lt;0.0005</b>	0.0232	Clustered
Sea Ice	0.5809	-0.0222	<b>3.713</b>	<b>&lt;0.0005</b>	0.0264	Clustered
Speed	0.3690	-0.0222	<b>2.402</b>	<b>0.0163</b>	0.0265	Clustered
Coast	0.5084	-0.0222	<b>3.178</b>	<b>0.0015</b>	0.0279	Clustered
Shelf Break	0.5794	-0.0222	<b>3.584</b>	<b>&lt;0.0005</b>	0.0282	Clustered

Table S3. Variance, eigenvalue, and eigenvector for each significant mode associated with each species and environmental variable obtained from the EOF analysis using the entire data set (western Ross Sea scale).

	Variance (%)	eigenvalue (%)	Longitude (°E)	Latitude (°S)	Bio/Abu	Water Depth (m)	Surface Speed (m s <sup>-1</sup> )	Water Temperature (°C)	Distance to Coast (m)	Sea Ice (% coverage)	Chlorophyll a (mg m <sup>-3</sup> )	Distance to 700-m shelf break (m)	Mixed Layer Depth (m)
<b>Antarctic krill</b>													
Mode 1	38.0408	4.1845	0.0933	-0.4362	-0.1516	-0.2251	-0.1686	-0.4420	-0.3031	-0.0230	0.4514	0.4267	0.1595
Mode 2	16.7840	1.8462	0.1696	0.0387	0.0780	0.5207	-0.3655	0.1285	-0.2867	0.5995	-0.0756	0.2626	-0.1619
Mode 3	11.8658	1.3052	-0.4021	0.0445	-0.2160	-0.2342	0.3204	-0.1916	-0.0572	0.3768	0.0763	0.0094	-0.6666
Mode 4	10.4930	1.1542	-0.6877	-0.2286	0.1543	0.1580	-0.4305	-0.0053	0.4651	0.0261	0.1214	0.0534	0.0782
<b>Crystal krill</b>													
Mode 1	36.3198	3.9952	-0.1197	0.4016	-0.1439	0.0215	0.2907	0.4354	0.3845	-0.2123	-0.3051	-0.4633	-0.1689
Mode 2	17.5336	1.9287	-0.1672	-0.2321	-0.2816	-0.4894	0.0849	-0.1542	0.2322	-0.5112	0.4598	-0.1209	0.1645
Mode 3	10.6007	1.1661	-0.7238	-0.1387	0.3192	0.0896	0.0854	-0.0584	0.1427	0.1492	0.2102	0.0626	-0.4955
Mode 4	9.2116	1.0133	-0.4015	-0.2865	-0.4704	0.4655	-0.0964	0.2210	0.1040	0.1554	-0.0317	0.0339	0.4728
<b>Antarctic silverfish</b>													
Mode 1	39.7454	4.3720	0.3999	0.3310	-0.1988	0.1126	0.2056	0.3900	0.3653	-0.2756	-0.2788	-0.4437	0.0020
Mode 2	21.5040	2.3654	-0.2790	0.3446	0.2068	0.4277	-0.1289	0.2655	-0.2116	0.4384	-0.4446	0.0268	-0.2351
Mode 3	12.5986	1.3858	0.0878	-0.1871	-0.2721	0.4381	-0.5948	0.1705	0.1484	-0.0107	0.0278	0.1606	0.5097

Table S4. Variance, eigenvalue, and eigenvector for each significant mode associated with each species and environmental variable obtained from the EOF analysis using the data set defined by the 99% confidence interval obtained from the hot spot analysis (hot spot scale).

	Variance (%)	eigenvalue (%)	Longitude (°E)	Latitude (°S)	Bio/Abu	Water Depth (m)	Surface Speed (m s <sup>-1</sup> )	Water Temperature (°C)	Distance to Coast (m)	Sea Ice (% coverage)	Chlorophyll a (mg m <sup>-3</sup> )	Distance to 700-m shelf break (m)	Mixed Layer Depth (m)
<b>Antarctic krill</b>													
Mode 1	43.9355	4.8329	0.3550	0.2699	0.0260	0.4392	-0.2125	0.4368	0.3365	0.0271	-0.3341	0.1867	0.3334
Mode 2	23.3014	2.5631	0.2711	-0.2628	0.2588	-0.1467	0.3758	0.1337	0.2761	-0.4840	-0.1432	-0.5232	0.0716
Mode 3	12.8679	1.4155	-0.2904	0.5492	-0.3476	0.0304	0.3837	0.0465	-0.3486	-0.2790	-0.2994	-0.1377	0.1869
Mode 4	10.0035	1.1004	0.2615	-0.0485	-0.5284	-0.0101	0.3140	0.0303	0.2576	0.3447	-0.2596	-0.0517	-0.5433
<b>Crystal krill</b>													
Mode 1	39.7965	4.3776	-0.4431	-0.0760	0.0459	0.0205	-0.2185	-0.3706	-0.4328	0.3197	-0.3850	0.3650	0.1985
Mode 2	17.8685	1.9655	0.0197	-0.4518	-0.0150	0.5867	0.1879	-0.1276	-0.0091	-0.2613	-0.0029	0.3466	-0.4593
Mode 3	15.0290	1.6532	-0.1967	0.4888	0.3858	0.1643	-0.3075	-0.3856	-0.1017	-0.2958	0.1996	-0.2441	-0.3258
<b>Antarctic silverfish</b>													
Mode 1	47.8882	5.2677	-0.4177	-0.0788	-0.1113	0.1168	-0.3882	-0.3744	-0.4075	0.2465	-0.3238	0.3714	0.1813
Mode 2	21.6667	2.3833	0.0279	0.3489	-0.0721	-0.5852	0.0108	0.1869	0.0146	0.4111	-0.2533	-0.2325	0.4554
Mode 3	10.9538	1.2049	0.1463	-0.7336	0.0160	-0.0008	0.2244	0.3223	0.1543	0.2397	-0.1392	0.3238	0.2836
Mode 4	10.2622	1.1288	0.0393	0.0460	0.8922	0.0524	0.1554	-0.0355	-0.1727	0.0723	-0.3502	-0.0607	-0.1037