

PERMANOVA

Permutational MANOVA

Resemblance worksheet

Name: ITS2_Heron_OTU_rm1_stand_sqrt_resem
 Data type: Similarity
 Selection: All
 Standardise Samples by Total
 Transform: Square root
 Resemblance: S17 Bray Curtis similarity

Sums of squares type: Type III (partial)
 Fixed effects sum to zero for mixed terms
 Permutation method: Unrestricted permutation of raw data
 Number of permutations: 999

Factors

Name	Type	Levels
Site	Fixed	3
Habitat	Fixed	4
Season	Fixed	2

PAIR-WISE TESTS

Term 'SitexHabitatxSeason' for pairs of levels of factor 'Site'

Within level 'Coral' of factor 'Habitat'
 Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	2.1341	0.026	35
Site 1, Site 3	2.3768	0.037	35
Site 2, Site 3	2.9879	0.026	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	24.149		
Site 2	0.59781	38.372	
Site 3	4.5072	2.0357	54.372

Within level 'Coral' of factor 'Habitat'
 Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	3.0904	0.031	26
Site 1, Site 3	2.2594	0.034	35
Site 2, Site 3	3.1734	0.031	26

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	41.494		
Site 2	0	71.201	
Site 3	0.64663	0	37.264

Within level 'Water' of factor 'Habitat'
 Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	1.2749	0.32	35
Site 1, Site 3	1.1837	0.372	35
Site 2, Site 3	0.85511	0.534	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	44.924		
Site 2	31.737	34.156	
Site 3	25.459	28.492	18.754

Within level 'Water' of factor 'Habitat'
 Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	1.6812	0.062	35
Site 1, Site 3	1.5354	0.084	35
Site 2, Site 3	1.5012	0.105	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	25.194		
Site 2	28.584	59.469	
Site 3	27.389	48.814	50.864

Within level 'Sediment' of factor 'Habitat'
 Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	0.61882	0.64	35
Site 1, Site 3	0.77718	0.544	35
Site 2, Site 3	0.67299	0.666	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	22.346		
Site 2	31.004	27.797	
Site 3	24.565	28.646	18.427

Within level 'Sediment' of factor 'Habitat'
 Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	1.721	0.037	35
Site 1, Site 3	1.3894	0.128	35

site 2, site 3 1.2134 0.105 35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	21.446		
Site 2	14.4	40.874	
Site 3	19.407	34.825	35.121

Within level 'Macroalgae' of factor 'Habitat'

Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	0.91197	0.566	35
Site 1, Site 3	1.2231	0.32	35
Site 2, Site 3	1.0201	0.493	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	41.309		
Site 2	34.032	25.544	
Site 3	39.011	33.308	48.247

Within level 'Macroalgae' of factor 'Habitat'

Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Site 1, Site 2	1.4682	0.229	35
Site 1, Site 3	1.0596	0.307	35
Site 2, Site 3	1.1814	0.235	35

Denominators

Groups	Denominator	Den.df
Site 1, Site 2	1*Res	6
Site 1, Site 3	1*Res	6
Site 2, Site 3	1*Res	6

Average Similarity between/within groups

	Site 1	Site 2	Site 3
Site 1	20.395		
Site 2	30.547	59.233	
Site 3	16.857	33.356	18.017

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Resemblance worksheet

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Factors

Name	Type	Levels
Site	Fixed	3
Habitat	Fixed	4
Season	Fixed	2

PAIR-WISE TESTS

Term 'SiteXHabitatXSeason' for pairs of levels of factor 'Habitat'

Within level 'Site 1' of factor 'Site'
 Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, water	1.9667	0.032	35
Coral, Sediment	1.759	0.028	35
Coral, Macroalgae	2.0048	0.022	35
water, Sediment	1.8927	0.027	35
water, Macroalgae	2.0597	0.035	35
Sediment, Macroalgae	1.8972	0.03	35

Denominators

Groups	Denominator	Den.df
Coral, water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
water, Sediment	1*Res	6
water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	water	Sediment	Macroalgae
Coral	24.149			
water	7.3198	44.924		
Sediment	1.4713	8.303	22.346	
Macroalgae	7.3793	19.117	9.0107	41.309

Within level 'Site 1' of factor 'Site'
 Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, water	1.8154	0.057	35
Coral, Sediment	1.9069	0.032	35
Coral, Macroalgae	1.7885	0.028	35
water, Sediment	1.4332	0.06	35
water, Macroalgae	1.0325	0.487	35
Sediment, Macroalgae	1.2297	0.169	35

Denominators

Groups	Denominator	Den.df
Coral, Water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
Water, Sediment	1*Res	6
Water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	Water	Sediment	Macroalgae
Coral	41.494			
Water	6.0304	25.194		
Sediment	2.5169	10.647	21.446	
Macroalgae	3.2482	19.681	13.157	20.395

Within level 'Site 2' of factor 'Site'

Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, Water	2.166	0.031	35
Coral, Sediment	2.1852	0.03	35
Coral, Macroalgae	2.1471	0.03	35
Water, Sediment	1.6845	0.036	35
Water, Macroalgae	1.3594	0.116	35
Sediment, Macroalgae	1.538	0.13	35

Denominators

Groups	Denominator	Den.df
Coral, Water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
Water, Sediment	1*Res	6
Water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	Water	Sediment	Macroalgae
Coral	38.372			
Water	7.1766	34.156		
Sediment	0.36327	11.437	27.797	
Macroalgae	2.1144	20.077	11.174	25.544

Within level 'Site 2' of factor 'Site'

Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, Water	4.4398	0.029	35
Coral, Sediment	3.5823	0.024	35
Coral, Macroalgae	4.6275	0.021	35
Water, Sediment	2.8059	0.032	35
Water, Macroalgae	2.966	0.035	35
Sediment, Macroalgae	2.2828	0.025	35

Denominators

Groups	Denominator	Den.df
Coral, Water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
Water, Sediment	1*Res	6
Water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	Water	Sediment	Macroalgae
Coral	71.201			
Water	7.3181	59.469		
Sediment	1.6238	15.879	40.874	
Macroalgae	2.4901	28.773	27.4	59.233

Within level 'Site 3' of factor 'Site'
 Within level 'Spawning' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, water	2.2787	0.02	35
Coral, Sediment	2.2497	0.027	35
Coral, Macroalgae	3.0117	0.027	35
water, Sediment	1.0815	0.419	35
water, Macroalgae	1.4343	0.054	35
Sediment, Macroalgae	1.7305	0.058	35

Denominators

Groups	Denominator	Den.df
Coral, water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
water, Sediment	1*Res	6
water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	Water	Sediment	Macroalgae
Coral	54.372			
Water	3.63	18.754		
Sediment	3.6304	16.483	18.427	
Macroalgae	7.787	20.045	12.177	48.247

Within level 'Site 3' of factor 'Site'
 Within level 'Summer' of factor 'Season'

Groups	t	P(perm)	Unique perms
Coral, water	2.394	0.025	35
Coral, Sediment	2.2506	0.025	35
Coral, Macroalgae	1.6934	0.029	35
water, Sediment	2.533	0.027	35
water, Macroalgae	1.6464	0.034	35
Sediment, Macroalgae	1.2543	0.103	35

Denominators

Groups	Denominator	Den.df
Coral, water	1*Res	6
Coral, Sediment	1*Res	6
Coral, Macroalgae	1*Res	6
water, Sediment	1*Res	6
water, Macroalgae	1*Res	6
Sediment, Macroalgae	1*Res	6

Average Similarity between/within groups

	Coral	Water	Sediment	Macroalgae
Coral	37.264			
Water	11.531	50.864		
Sediment	4.938	11.23	35.121	
Macroalgae	6.4231	17.345	19.682	18.017

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Resemblance worksheet

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Factors

Name	Type	Levels
Site	Fixed	3
Habitat	Fixed	4
Season	Fixed	2

PAIR-WISE TESTS

Term 'SitexHabitatxSeason' for pairs of levels of factor 'Season'

Within level 'Site 1' of factor 'Site'
 Within level 'Coral' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.7129	0.115	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	24.149	
Summer	9.67	41.494

Within level 'Site 1' of factor 'Site'
 Within level 'Water' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.7255	0.032	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	44.924	
Summer	13.616	25.194

Within level 'Site 1' of factor 'Site'
 Within level 'Sediment' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.4411	0.134	35

Denominators

Groups	Denominator	Den.df

Spawning, Summer 1*Res 6

Average Similarity between/within groups

	Spawning	Summer
Spawning	22.346	
Summer	10.123	21.446

Within level 'Site 1' of factor 'Site'

Within level 'Macroalgae' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.6239	0.026	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	41.309	
Summer	13.95	20.395

Within level 'Site 2' of factor 'Site'

Within level 'Coral' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	2.5993	0.024	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	38.372	
Summer	18.263	71.201

Within level 'Site 2' of factor 'Site'

Within level 'Water' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	2.238	0.029	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	34.156	
Summer	19.882	59.469

Within level 'Site 2' of factor 'Site'

Within level 'Sediment' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.6988	0.063	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	27.797	
Summer	16.659	40.874

Within level 'Site 2' of factor 'Site'
 Within level 'Macroalgae' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	2.3636	0.029	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	25.544	
Summer	9.6785	59.233

Within level 'Site 3' of factor 'Site'
 Within level 'Coral' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.6655	0.03	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	54.372	
Summer	30.266	37.264

Within level 'Site 3' of factor 'Site'
 Within level 'Water' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.7469	0.022	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	18.754	
Summer	16.923	50.864

Within level 'Site 3' of factor 'Site'
 Within level 'Sediment' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.4282	0.042	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	18.427	
Summer	16.097	35.121

Within level 'Site 3' of factor 'Site'
 Within level 'Macroalgae' of factor 'Habitat'

Groups	t	P(perm)	Unique perms
Spawning, Summer	1.7098	0.031	35

Denominators

Groups	Denominator	Den.df
Spawning, Summer	1*Res	6

Average Similarity between/within groups

	Spawning	Summer
Spawning	48.247	
Summer	11.527	18.017