

1. Testing for differences in cryptofaunal communities between backreef habitat types

Table S1. Summary statistics of PERMANOVA on variation in community composition by (a) Total density, (b) Total biomass, (c) Richness (d) Phylum (e) Order (f) Family among backreef site groupings and sites. Significant values in bold.

	Factor	df	SS	Pseudo-F	p
(a) Total density	Backreef group	1	1730.2	0.2864	0.8045
	Site	4	24160	10.032	0.0001
	Residuals	30	18061		
	Total	35			
(b) Total biomass	Backreef group	1	0.0479	0.015	0.9989
	Site	4	12.582	1.522	0.2159
	Residuals	30	61.996		
	Total	35			
(c) Richness	Backreef group	1	0.14954	0.0968	0.802
	Site	4	6.1735	3.9666	0.010
	Residuals	30	11.673		
	Total	35			
(d) Phylum	Backreef group	1	1491.5	1.06	0.4052
	Site	4	5650	4.94	0.0001
	Residuals	30	8577.6		
	Total	35			
(e) Order	Backreef group	1	3024.8	0.9850	0.5076
	Site	4	3070.7	4.052	0.0001
	Residuals	30	757.84		
	Total	35			
(f) Family	Backreef group	1	5365.2	1.204	0.3962
	Site	4	17825	3.4648	0.0001
	Residuals	30	38585		
	Total	35			

2. Testing for differences in cryptofaunal communities between rubble habitat types

Table S2. Summary statistics of PERMANOVA on variation in community composition by (a) Total density, (b) Total biomass, (c) Richness (d) Phylum (e) Order (f) Family among rubble habitat types and sites. Significant values in bold.

	Factor	df	SS	Pseudo-F	p
(a) Total density	Habitat	1	744.54	0.23907	0.7215
	Site	10	31144	6.1962	0.0003
	Residuals	24	12063		
	Total	35			
(b) Total biomass	Habitat	1	4.1785	1.823	0.2096
	Site	10	22.921	1.1574	0.3578
	Residuals	24	24	1.9803	
	Total	35			
(c) Richness	Habitat	1	0.003063	0.003898	0.9514
	Site	10	7.8599	1.8616	0.1032
	Residuals	24	10.133		
	Total	35			
(d) Phylum	Habitat	1	1965	0.66565	0.7153
	Site	10	29520	2.3391	0.0001
	Residuals	24	30290		
	Total	35			
(e) Order	Habitat	1	1361	0.65789	0.7127
	Site	10	20687	2.921	0.0001
	Residuals	24	16997		
	Total	35			
(f) Family	Habitat	1	238.59	0.24461	0.928
	Site	10	9753.7	3.4488	0.0001
	Residuals	24	6787.6		
	Total	35			

3. Testing for dispersal effects amongst groups

Table S3. Summary statistics of PERMDISP on variation in community composition by (a) Total density, (b) Total biomass, (c) Richness (d) Phylum (e) Order (f) Family among rubble habitat types and sites.

	Factor	df1	df2	Pseudo-F	p
(a) Total density	Rubble Habitat	1	34	3.003	0.173
(b) Total biomass	Rubble Habitat	1	34	2.680	0.209
(c) Richness	Rubble Habitat	1	34	0.958	0.441
(d) Phylum	Rubble Habitat	1	34	0.039	0.856
(e) Order	Rubble Habitat	1	34	0.759	0.412
(f) Family	Rubble Habitat	1	34	0.093	0.768

4. Taxonomic list of motile cryptofauna found at Palmyra Atoll

Table S4. Taxonomic list of cryptofauna found at Palmyra Atoll listed by reef zone and site.

Reef	Site	Phylum	Class	Order	Family
Backreef	Mid Barren	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	Mid Barren	Annelida	Polychaeta	Eunicida	Dorvilleidae
Backreef	Mid Barren	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	Mid Barren	Annelida	Polychaeta	Phyllodocida	Glyceridae
Backreef	Mid Barren	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	Mid Barren	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Backreef	Mid Barren	Annelida	Polychaeta	Phyllodocida	Pilargidae
Backreef	Mid Barren	Annelida	Polychaeta	Phyllodocida	Syllidae
Backreef	Mid Barren	Annelida	Polychaeta	Sabellida	Sabellidae
Backreef	Mid Barren	Annelida	Polychaeta	Scolecida	Capitellidae
Backreef	Mid Barren	Annelida	Polychaeta	Spionida	Chaetopteridae
Backreef	Mid Barren	Annelida	Polychaeta	Spionida	Paraonidae
Backreef	Mid Barren	Annelida	Polychaeta	Spionida	Spionidae
Backreef	Mid Barren	Annelida	Polychaeta	Terebellida	Cirratulidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Brachyura
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Hippolytidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Paguroidea
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Palaemonidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	Mid Barren	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	Mid Barren	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae

Backreef	Mid Barren	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	Mid Barren	Echinodermata	Asterozoa	Spinulosida	Echinasteridae
Backreef	Mid Barren	Echinodermata	Holothurozoa	Holothuriida	Holothuriidae
Backreef	Mid Barren	Echinodermata	Ophiurozoa	Ophiurida	Ophiurida
Backreef	Mid Barren	Mollusca	Gastropoda	Littorinimorpha	Cypraeidae
Backreef	Mid Barren	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	Mid Barren	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	Mid Barren	Nemertea	Nemertea	Nemertea	Nemertea
Backreef	Mid Barren	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Backreef	North Barren	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	North Barren	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	North Barren	Annelida	Polychaeta	Phyllodocida	Glyceridae
Backreef	North Barren	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	North Barren	Annelida	Polychaeta	Phyllodocida	Syllidae
Backreef	North Barren	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Brachyura
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Galatheidae
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Hippolytidae
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Majidae
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	North Barren	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	North Barren	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	North Barren	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	North Barren	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Backreef	North Barren	Arthropoda	Malacostraca	Isopoda	Janiroidea
Backreef	North Barren	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae
Backreef	North Barren	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	North Barren	Echinodermata	Ophiurozoa	Ophiurida	Ophiurida
Backreef	North Barren	Mollusca	Bivalvia	Bivalvia	Bivalvia
Backreef	North Barren	Mollusca	Bivalvia	Mytilida	Mytilidae
Backreef	North Barren	Mollusca	Gastropoda	Littorinimorpha	Cypraeidae
Backreef	North Barren	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	North Barren	Mollusca	Gastropoda	Littorinimorpha	Triviidae
Backreef	North Barren	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	North Barren	Nemertea	Nemertea	Nemertea	Nemertea
Backreef	Penguin Spit	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	Penguin Spit	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	Penguin Spit	Annelida	Polychaeta	Phyllodocida	Glyceridae
Backreef	Penguin Spit	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	Penguin Spit	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Backreef	Penguin Spit	Annelida	Polychaeta	Phyllodocida	Syllidae
Backreef	Penguin Spit	Annelida	Polychaeta	Scolecida	Capitellidae
Backreef	Penguin Spit	Annelida	Polychaeta	Scolecida	Orbiniidae
Backreef	Penguin Spit	Annelida	Polychaeta	Spionida	Chaetopteridae
Backreef	Penguin Spit	Annelida	Polychaeta	Spionida	Spionidae

Backreef	Penguin Spit	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Brachyura
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Galatheidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Hippolytidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Paguroidea
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Palaemonidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Backreef	Penguin Spit	Arthropoda	Malacostraca	Isopoda	Isopoda
Backreef	Penguin Spit	Arthropoda	Malacostraca	Isopoda	Janiroidea
Backreef	Penguin Spit	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	Penguin Spit	Chordata	Actinopterygii	Gobiiformes	Gobiidae
Backreef	Penguin Spit	Echinodermata	Asteroidea	Spinulosida	Echinasteridae
Backreef	Penguin Spit	Echinodermata	Ophiuroidea	Ophiurida	Ophiurida
Backreef	Penguin Spit	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	Penguin Spit	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	Penguin Spit	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Backreef	Rubble Pile	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	Rubble Pile	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	Rubble Pile	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	Rubble Pile	Annelida	Polychaeta	Phyllodocida	Syllidae
Backreef	Rubble Pile	Annelida	Polychaeta	Scolecida	Capitellidae
Backreef	Rubble Pile	Annelida	Polychaeta	Spionida	Spionidae
Backreef	Rubble Pile	Annelida	Polychaeta	Terebellida	Terebellidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	Rubble Pile	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Decapoda	Brachyura
Backreef	Rubble Pile	Arthropoda	Malacostraca	Decapoda	Majidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Isopoda	Janiroidea
Backreef	Rubble Pile	Arthropoda	Malacostraca	Mysida	Mysidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae
Backreef	Rubble Pile	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	Rubble Pile	Echinodermata	Asteroidea	Spinulosida	Echinasteridae
Backreef	Rubble Pile	Echinodermata	Holothuroidea	Holothuriida	Holothuriidae
Backreef	Rubble Pile	Echinodermata	Ophiuroidea	Ophiurida	Ophiurida
Backreef	Rubble Pile	Mollusca	Bivalvia	Cardiida	Cardiida
Backreef	Rubble Pile	Mollusca	Bivalvia	Myida	Myida

Backreef	Rubble Pile	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	Rubble Pile	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	Rubble Pile	Mollusca	Polyplacophora	Chitonida	Ischnochitonidae
Backreef	Rubble Pile	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Backreef	South Barren	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	South Barren	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	South Barren	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	South Barren	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Backreef	South Barren	Annelida	Polychaeta	Phyllodocida	Polynoidae
Backreef	South Barren	Annelida	Polychaeta	Phyllodocida	Syllidae
Backreef	South Barren	Annelida	Polychaeta	Spionida	Spionidae
Backreef	South Barren	Annelida	Polychaeta	Terebellida	Cirratulidae
Backreef	South Barren	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Galatheidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Hippolytidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Paguroidea
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Palaemonidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Portunidae
Backreef	South Barren	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	South Barren	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	South Barren	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	South Barren	Arthropoda	Malacostraca	Isopoda	Sphaeromatidae
Backreef	South Barren	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae
Backreef	South Barren	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	South Barren	Echinodermata	Asterozoa	Spinulosida	Echinasteridae
Backreef	South Barren	Echinodermata	Ophiurozoa	Ophiurida	Ophiurida
Backreef	South Barren	Mollusca	Gastropoda	Littorinimorpha	Cypraeidae
Backreef	South Barren	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	South Barren	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	South Barren	Mollusca	Nudibranchia	Nudibranchia	Nudibranchia
Backreef	South Barren	Nemertea	Nemertea	Nemertea	Nemertea
Backreef	South Barren	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Backreef	Tortogonia	Annelida	Polychaeta	Amphinomida	Amphinomidae
Backreef	Tortogonia	Annelida	Polychaeta	Eunicida	Dorvilleidae
Backreef	Tortogonia	Annelida	Polychaeta	Eunicida	Eunicidae
Backreef	Tortogonia	Annelida	Polychaeta	Phyllodocida	Glyceridae
Backreef	Tortogonia	Annelida	Polychaeta	Phyllodocida	Nereididae
Backreef	Tortogonia	Annelida	Polychaeta	Phyllodocida	Polynoidae
Backreef	Tortogonia	Annelida	Polychaeta	Spionida	Spionidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Amphipoda	Gammarida
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Alpheidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Galatheidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Majidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Paguroidea

Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Palaemonidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Decapoda	Xanthidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Isopoda	Anthuridae
Backreef	Tortogonia	Arthropoda	Malacostraca	Isopoda	Cirolanidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Backreef	Tortogonia	Arthropoda	Malacostraca	Isopoda	Janiroidea
Backreef	Tortogonia	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Backreef	Tortogonia	Echinodermata	Holothuroidea	Holothuriida	Holothuriidae
Backreef	Tortogonia	Echinodermata	Ophiuroidea	Ophiurida	Ophiurida
Backreef	Tortogonia	Mollusca	Gastropoda	Littorinimorpha	Cypraeidae
Backreef	Tortogonia	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Backreef	Tortogonia	Mollusca	Gastropoda	Mytilida	Mytilidae
Backreef	Tortogonia	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Backreef	Tortogonia	Mollusca	Polyplacophora	Chitonida	Ischnochitonidae
Backreef	Tortogonia	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Forereef	FR3	Annelida	Polychaeta	Eunicida	Eunicidae
Forereef	FR3	Annelida	Polychaeta	Phyllodocida	Chrysopetalidae
Forereef	FR3	Annelida	Polychaeta	Phyllodocida	Nereididae
Forereef	FR3	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Forereef	FR3	Annelida	Polychaeta	Phyllodocida	Syllidae
Forereef	FR3	Annelida	Polychaeta	Polychaeta	Polychaeta
Forereef	FR3	Annelida	Polychaeta	Scolecida	Capitellidae
Forereef	FR3	Arthropoda	Malacostraca	Amphipoda	Gammarida
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Alpheidae
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Brachyura
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Galatheididae
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Majidae
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Forereef	FR3	Arthropoda	Malacostraca	Decapoda	Xanthidae
Forereef	FR3	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Forereef	FR3	Arthropoda	Malacostraca	Isopoda	Sphaeromatidae
Forereef	FR3	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae
Forereef	FR3	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Forereef	FR3	Mollusca	Bivalvia	Cardiida	Cardiida
Forereef	FR3	Mollusca	Bivalvia	Ostreida	Pteriidae
Forereef	FR3	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Forereef	FR3	Nemertea	Nemertea	Nemertea	Nemertea
Forereef	FR5	Annelida	Polychaeta	Eunicida	Eunicidae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Eunicidae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Glyceridae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Nereididae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Polynoidae
Forereef	FR5	Annelida	Polychaeta	Phyllodocida	Syllidae
Forereef	FR5	Annelida	Polychaeta	Spionida	Spionidae

Forereef	FR5	Annelida	Polychaeta	Terebellida	Flabelligeridae
Forereef	FR5	Arthropoda	Malacostraca	Amphipoda	Gammarida
Forereef	FR5	Arthropoda	Malacostraca	Decapoda	Brachyura
Forereef	FR5	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Forereef	FR5	Arthropoda	Malacostraca	Isopoda	Anthuridae
Forereef	FR5	Arthropoda	Malacostraca	Isopoda	Gnathiidae
Forereef	FR5	Arthropoda	Malacostraca	Isopoda	Janiroidea
Forereef	FR5	Arthropoda	Malacostraca	Isopoda	Sphaeromatidae
Forereef	FR5	Arthropoda	Malacostraca	Stomatopoda	Gonodactylidae
Forereef	FR5	Arthropoda	Malacostraca	Tanaidacea	Tanaidacea
Forereef	FR5	Mollusca	Bivalvia	Cardiida	Cardiida
Forereef	FR5	Mollusca	Bivalvia	Myida	Myida
Forereef	FR5	Mollusca	Bivalvia	Ostreida	Pteriidae
Forereef	FR5	Mollusca	Gastropoda	Littorinimorpha	Triviidae
Forereef	FR5	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Forereef	FR5	Mollusca	Gastropoda	Nudibranchia	Nudibranchia
Forereef	FR5	Sipuncula	Sipuncula	Sipuncula	Sipuncula
Forereef	FR9	Annelida	Polychaeta	Amphinomida	Amphinomidae
Forereef	FR9	Annelida	Polychaeta	Eunicida	Eunicidae
Forereef	FR9	Annelida	Polychaeta	Phyllodocida	Glyceridae
Forereef	FR9	Annelida	Polychaeta	Phyllodocida	Nereididae
Forereef	FR9	Annelida	Polychaeta	Phyllodocida	Phyllodocidae
Forereef	FR9	Annelida	Polychaeta	Phyllodocida	Syllidae
Forereef	FR9	Annelida	Polychaeta	Scolecida	Glyceridae
Forereef	FR9	Annelida	Polychaeta	Spionida	Spionidae
Forereef	FR9	Annelida	Polychaeta	Terebellida	Terebellidae
Forereef	FR9	Arthropoda	Malacostraca	Amphipoda	Gammarida
Forereef	FR9	Arthropoda	Malacostraca	Decapoda	Brachyura
Forereef	FR9	Arthropoda	Malacostraca	Decapoda	Galatheidae
Forereef	FR9	Arthropoda	Malacostraca	Decapoda	Palaemonidae
Forereef	FR9	Arthropoda	Malacostraca	Decapoda	Pilumnidae
Forereef	FR9	Arthropoda	Malacostraca	Decapoda	Xanthidae
Forereef	FR9	Arthropoda	Malacostraca	Isopoda	Anthuridae
Forereef	FR9	Arthropoda	Malacostraca	Isopoda	Janiroidea
Forereef	FR9	Mollusca	Bivalvia	Bivalvia	Bivalvia
Forereef	FR9	Mollusca	Bivalvia	Cardiida	Cardiida
Forereef	FR9	Mollusca	Gastropoda	Littorinimorpha	Lamellariinae
Forereef	FR9	Mollusca	Gastropoda	Neogastropoda	Neogastropoda
Forereef	FR9	Sipuncula	Sipuncula	Sipuncula	Sipuncula

5. Scales of variation in cryptofaunal density, biomass, and richness (univariate)

Table S5. Results of the hierarchical nested ANOVA tests, using a restricted maximum likelihood estimation model on total density, total biomass, and richness. All factors were treated as random effects. Significance effects for $\alpha = 0.05$ are shown in **bold**.

Scale	df	MS	F	p	Variance Component (%)
Total density					
Reef	1	0.0814	0.5206	0.475	2.8e ⁻⁸
Site	7	1.1053	7.0708	<0.001	48.8
Residual = Scoop	36				51.1
Total	44				
Total biomass					
Reef	1	11.6205	6.6989	0.014	34.6
Site	7	1.8067	1.0415	0.420	10.6
Residual = Scoop	36				54.8
Total	44				
Richness					
Reef	1	0.1205	0.2599	0.613	0.0
Site	7	1.3167	2.8413	0.018	35.6
Residual = Scoop	36				64.4
Total	44				

6. Scales of variation in cryptofaunal community composition (multivariate)

Table S6. Permutational multivariate ANOVA based on Bray-Curtis dissimilarities of relative percent cover of cryptofauna community composition at three taxonomic levels - Phylum, Order and Family. Significance effects for $\alpha = 0.05$ are shown in **bold**.

Source	df	MS	Pseudo-F	p (perm)	Variance component (%)
Family					
Reef	1	7984.9	2.4566	0.021	23.4
Site	7	4084.4	3.132	0.0001	30.0
Residual = Scoop	36	1304.1			46.6
Total	44				
Order					
Reef	1	5163.3	2.5073	0.038	23.9
Site	7	2611.8	3.3907	0.0001	30.8
Residual = Scoop	36	770.27			45.2
Total	44				
Phylum					
Reef	1	2733.8	3.1509	0.045	28.0
Site	7	1125.3	4.2247	0.0001	31.8
Residual = Scoop	36	266.36			40.2
Total	44				

7. Jackknife resampling sensitivity analysis

Table S7. Jackknife resampling analysis for all community metrics across three hierarchical spatial scales. Resampling was conducted $n = 10$ times for two ‘types’ of jackknife analysis – leave-one-out (i.e. 1 sample removed from each resampled dataset) and 18 samples removed from each resampled dataset.

Spatial scale	Response variable	Original variance component	No. of samples removed	Mean jackknife variance component	Bias	Std Error	Confidence Interval
Reef Zone	Family	18.11	1	18.28	1.55	1.81	14.74 < y < 21.83
Site	Family	23.23	1	23.32	0.81	0.85	21.67 < y < 24.98
Scoop	Family	36.09	1	36.11	0.13	0.52	35.09 < y < 37.12
Reef Zone	Family	18.11	18	17.78	-3.00	5.79	6.44 < y < 29.12
Site	Family	23.23	18	23.02	-1.89	4.55	14.11 < y < 31.93
Scoop	Family	36.09	18	35.99	-0.90	2.44	31.21 < y < 40.78
Reef Zone	Order	14.682	1	13.61	-9.67	1.93	9.82 < y < 17.39

Site	Order	18.923	1	19.52	5.37	0.62	18.31 < y < 20.73
Scoop	Order	27.75	1	27.86	0.97	0.55	26.78 < y < 28.94
Reef Zone	Order	14.68	18	13.84	-7.50	3.29	7.40 < y < 20.30
Site	Order	18.92	18	18.89	-0.32	4.36	10.34 < y < 27.43
Scoop	Order	27.75	18	27.81	0.55	1.60	24.67 < y < 30.95
Reef Zone	Phylum	11.38	1	7.71	-33.07	0.92	5.90 < y < 9.52
Site	Phylum	12.92	1	13.53	5.47	0.55	12.44 < y < 14.62
Scoop	Phylum	16.32	1	16.65	2.99	0.51	15.65 < y < 17.66
Reef Zone	Phylum	11.38	18	7.43	-35.58	5.72	-3.79 < y < 18.64
Site	Phylum	12.92	18	13.32	3.66	5.41	2.72 < y < 23.94
Scoop	Phylum	16.32	18	15.83	-4.39	2.66	10.61 < y < 21.05
Reef Zone	Total density	8.53e-11	1	6.3e-11	-2.01e-10	3.78e-10	-6.78e-10 < y < 8.04e-10
Site	Total density	0.15	1	0.15	0.03	0.01	0.13 < y < 0.17
Scoop	Total density	0.16	1	0.16	0.02	0.014	0.13 < y < 0.18
Reef Zone	Total density	8.53e-11	18	1.23e-08	1.10e-07	1.10e-07	-2.03e-07 < y < 2.27e-07
Site	Total density	0.15	18	0.14	-0.07	0.20	-0.26 < y < 0.54
Scoop	Total density	0.15	18	0.14	-0.13	0.09	-0.03 < y < 0.32
Reef Zone	Total biomass	0.67	1	0.65	-0.19	0.14	0.38 < y < 0.92
Site	Total biomass	0.06	1	0.07	0.09	0.10	-0.12 < y < 0.3
Scoop	Total biomass	1.69	1	1.68	-0.09	0.24	1.21 < y < 2.15
Reef Zone	Total biomass	0.67	18	0.58	-0.79	1.02	-1.42 < y < 2.59
Site	Total biomass	0.06	18	0.162	0.918	0.73	-1.27 < y < 1.60
Scoop	Total biomass	1.69	18	1.46	-2.03	0.73	0.03 < y < 2.89
Reef Zone	Richness	0.00	1	4.47e-10	4.02e-9	2.58e-9	-4.61e-9 < y < 5.50e-9
Site	Richness	0.14	1	0.11	-0.27	0.20	-0.29 < y < 0.50
Scoop	Richness	0.47	1	0.34	-1.12	0.58	-0.80 < y < 1.49
Reef Zone	Richness	0.00	18	0.002	0.02	0.01	-0.02 < y < 0.02
Site	Richness	0.14	18	0.11	-0.23	0.21	-0.3 < y < 0.53
Scoop	Richness	0.47	18	0.42	-0.42	0.60	-0.75 < y < 1.60