

The following supplement accompanies the article

## Processes controlling the benthic food web of a mesotrophic bight (KwaZulu-Natal, South Africa) revealed by stable isotope analysis

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**Supplement.** The supplement provides a literature review for diets of the organisms (or similar species) collected in this study (Table S1) as well as 2 matrices providing a food web visualization for the MixSIR results for shallow species (30–200 m) (Fig. S1) and deep species (201–600 m) (Fig. S2)

**Table S1.** Collection of animals in the summer (S) or winter (W) season, total number of animals collected, collection depth, depth recorded in the literature and diet description. For animals where diet could not be found in the literature, the diet of a close relative is described; in those instances, the animal in question is mentioned

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m ± SD)	Literature depth (m)	Reference
S+W	<i>Acropoma japonicum</i> (n = 9)	Teleost	Foraminiferans; sponges; coelenterates; bivalves; gastropods; cephalopods; polychaetes; crustaceans; echinoderms; Osteichthyes	302.97 ± 92.69	1 – 500 <sup>a</sup>	Rainer (1992)
S	<i>Actinoptilum molle</i> (n = 3)	Pennatulacea	Based on the diet of deep-water corals, detrital and suspended matter	34.75	12 – 333	Roberts et al. (2006)
S+W	<i>Aristaeomorpha foliacea</i> (n = 21)	Decapod	Crustacean and Osteichthyes, cephalopod important in some areas	446.49 ± 116.75	120 – 1300	Bello & Pipitone (2002)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m ± SD)	Literature depth (m)	Reference
S	<i>Arothron immaculatus</i> (n = 6)	Teleost	Benthic algae; benthic invertebrates; detritus	117.96 ± 11.02	1 – 17 <sup>a</sup>	Masuda & Allen (1993)
S+W	<i>Atrubucca nibe</i> (n = 9)	Teleost	Crustacea: Mysidacea, Natantia, Anomura; Cephalopoda; Osteichthyes	56.08 ± 15.55	45 – 200 <sup>a</sup>	Fennessy (2000)
S+W	<i>Chaceon macphersoni</i> (n = 9)	Decapod	Based on <i>Chaceon notialis</i> . Osteichthyes; gastropods; nematods; Polychaeta, Ophiuroidea	434.04 ± 10.55		Domingos et al. (2007)
S	<i>Champsodon capensis</i> (n = 3)	Teleost	Osteichthyes	69.49	64 – 552 <sup>a</sup>	Zhang et al. (2005)
S+W	<i>Chaunax pictus</i> (n = 18)	Teleost	N/A	352.65 ± 125.55	200 – 1000 <sup>a</sup>	
S+W	<i>Chelidonichthys kumu</i> (n = 21)	Teleost	Great variety of crustaceans; echinoid; pelecypods; Osteichthyes; cephalopods	135.20 ± 87.11	1 – 200 <sup>a</sup>	Godfriaux (1970)
W	<i>Chelidonichthys queketti</i> (n = 3)	Teleost	Polychaetes; wide variety of crustaceans; bivalves; gastropods; cephalopods; Osteichthyes	118.87	0 – 150 <sup>a</sup>	Meyer & Smale (1991b)
S+W	<i>Chlorophthalmus punctatus</i> (n = 33)	Teleost	Osteichthyes such as myctophids and phosichthyids; Natantia and other organisms	454.37 ± 73.02	280 – 450 <sup>a</sup>	Karuppasamy et al. (2008)
S+W	<i>Citharoides macrolepis</i> (n = 17)	Teleost	Based on <i>Citharoides macrolepidotus</i> ; benthic invertebrates	291.21 ± 113.54	182 – 200 <sup>a</sup>	Hensley (2001)
S	<i>Coelorinchus denticulatus</i> (n = 3)	Teleost	Based on <i>Coelorinchus fasciatus</i> ; polychaete; echinoderms; wide variety of crustaceans; cephalopods; Osteichthyes	250.55	64 – 335 <sup>a</sup>	Meyer & Smale (1991b)
S+W	<i>Coelorinchus trunovi</i> (n = 38)	Teleost	Based on <i>Coelorinchus fasciatus</i> ; polychaete; echinoderms; wide variety of crustaceans; cephalopods; Osteichthyes	464.91 ± 77.86	421 – 552 <sup>a</sup>	Meyer & Smale (1991b)
W	<i>Cubiceps whiteleggii</i> (n = 6)	Teleost	Zooplankton, especially salps	418.80 ± 10.02	1 – 100 <sup>a</sup>	Gorelova et al. (1994)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m $\pm$ SD)	Literature depth (m)	Reference
S+W	<i>Cynoglossus attenuatus</i> (n = 18)	Teleost	Benthic invertebrates	31.70 $\pm$ 6.76		Fischer et al. (1990)
S	<i>Cynoglossus lida</i> (n = 6)	Teleost	Zoobenthos, diatoms, prawns ( <i>Lucifer</i> ) cuttlefish, Osteichthyes, benthic algae, amphipods, crabs, isopods, starfish, bivalves, gastropods, polychaetes, fish egg, copepods, jellyfish	232.26 $\pm$ 2.00	24 – 27 <sup>a</sup>	Rajaguru (1992)
S	<i>Diaphus knappi</i> (n = 6)	Teleost	Based on <i>Diaphus taaningi</i> and <i>D. theta</i> ; zooplankton: fish larval stages; planktonic invertebrates, planktonic copepods and other planktonic crustaceans; zoobenthos: benthic crustaceans, polychaetes	349.31 $\pm$ 108.18	24 – 27 <sup>a</sup>	Baird et al. (1975); Moku et al. (2000)
S+W	<i>Haliporoides triarthrus</i> (n = 45)	Decapod	Based on <i>Haliporoides sibogae</i> ; foraminiferans; sponges; coelenterates; bivalves; gastropods; cephalopods; polychaetes; crustaceans; echinoderms; Osteichthyes	441.84 $\pm$ 10.02	360 – 460 <sup>b</sup>	Rainer (1992)
S+W	<i>Helicolenus dactylopterus</i> (n = 15)	Teleost	Primarily benthic crustaceans, polychaetes found in smaller-sized animals	520.90 $\pm$ 44.49		Macpherson (1985)
S	<i>Histioteuthis celetaria</i> (n = 3)	Cephalopod	Based on <i>Histioteuthis reversa</i> and <i>H. bornnelli</i> ; Crustacea: Natantia; Osteichthyes; Cephalopoda	528.52		Quetglas et al. (2010)
S+W	<i>Johnius fuscolineatus</i> (n = 15)	Teleost	Polychaeta; Crustacea: Mysidacea, Stomatopoda, Natantia, Anomura, Brachyura; Cephalopoda; Pelecypoda; Gastropoda; Asteroidea; Osteichthyes	34.20 $\pm$ 6.09	1 – 40 <sup>a</sup>	Fennessy (2000)
S+W	<i>Johnius dorsalis</i> (n = 9)	Teleost	Polychaeta; Crustacea: Copepoda, Ostracoda, Mysidacea, Stomatopoda, Natantia, Anomura, Brachyura; Cephalopoda; Pelecypoda; Osteichthyes	40.23 $\pm$ 8.23	1 – 40 <sup>a</sup>	Fennessy (2000)
W	<i>Leiognathus equulus</i> (n = 3)	Teleost	Great variety of zooplankton and phytoplankton species; pelagic copepod dominant, some benthic animals also found	31.09	10 – 110 <sup>a</sup>	Tiews et al. (1968)
S+W	<i>Lepidotrigla faurei</i> (n = 33)	Teleost	Based on <i>Lepidotrigla cavillone</i> ; crustaceans: euphausiids, mysids, decapod (Natantia and Reptantia), Amphipoda	126.10 $\pm$ 147.67	50 – 175 <sup>a</sup>	Terrats et al. (2000)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m $\pm$ SD)	Literature depth (m)	Reference
S+W	<i>Lithognathus mormyrus</i> (n = 3)	Teleost	Osteichthyes; Echinoidea; gastropods; decapods; amphipods; other crustaceans; bivalves; Sedentaria; Errantia	34.29 $\pm$ 0.50	0 – 150 (usually 10 – 20) <sup>a</sup>	Kallianiotis et al. (2005)
S	<i>Mactra aequisulcata</i> (n = 3)	Bivalve	N/A	32.92		
S+W	<i>Merluccius paradoxus</i> (n = 11)	Teleost	Osteichthyes; crustaceans; cephalopods and cannibalism	491.78 $\pm$ 74.34	200–850 <sup>a</sup>	Pillar & Wilkinson (1995)
S+W	<i>Metanephrops mozambicus</i> (n = 27)	Decapod	Based on <i>Metanephrops andamanicus</i> , <i>M. australiensis</i> and <i>M. boschmai</i> ; Osteichthyes, crustacean and cephalopod (squid); in very small amounts, other preys were bivalves, gastropods and foraminiferans	434.64 $\pm$ 37.33	187 – 842	Wassenberg & Hill (1989)
W	<i>Metapenaeus monoceros</i> (n = 6)	Decapod	Small crustaceans: copepods, mysids, Tanaidacea, amphipods, decapod larvae; vegetable matter; diatoms; polychaetes; detritus	38.86 $\pm$ 7.51	10 – 30 <sup>b</sup>	George (1974)
S	<i>Munida incerta</i> (n = 3)	Decapod	Based on <i>Munida sarsi</i> ; selective deposit feeder; has been recorded preying on krill	448.06		Garm & Høeg (2000); Hudson & Wigham (2003)
S+W	<i>Neoscombrops annectens</i> (n = 15)	Teleost	N/A	362.10 $\pm$ 73.42	100 – 550 <sup>a</sup>	
W	<i>Nephropsis stewarti</i> (n = 3)	Decapod	N/A	563.27	500 – 750 <sup>b</sup>	
W	<i>Nototodarus hawaiiensis</i> (n = 3)	Cephalopod	Based on <i>Nototodarus gouldi</i> ; crustaceans; Osteichthyes and cephalopods	427.94		O'Sullivan & Cullen (1983)
S	<i>Ornithoteuthis volatilis</i> (n = 9)	Cephalopod	Based on <i>Ornithoteuthis antillarum</i> ; epi- and mesopelagic species of mesa- and macroplanktonic and micronektonic crustaceans, nemertines, chaetognaths, heteropods, molluscs, cephalopod (squid) and Osteichthyes.	332.23 $\pm$ 83.21		Arkhipkin et al. (1998)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m ± SD)	Literature depth (m)	Reference
S+W	<i>Otolithes ruber</i> (n = 15)	Teleost	Crustacea: Natantia, Brachyura, Mysidacea, Stomatopoda, Anomura; Osteichthyes; Cephalopoda; Polychaeta; Pelecypoda; vegetation; prawns; <i>Acetes</i> ; <i>Squilla</i> ; Apogonid fishes and juvenile sciaenids	37.49 ± 6.98	10 – 40 <sup>a</sup>	Fennessy (2000)
W	<i>Ovalipes iridescens</i> (n = 3)	Decapod	Based on <i>Ovalipes stephensoni</i> ; amphipods; isopods; gastropods; bivalves; polychaetes; Ormithoteuthis; decapods, corals; echinoderms	232.26		Haefner (1985)
S+W	<i>Pagellus natalensis</i> (n = 45)	Teleost	Benthic crustaceans and invertebrates, non-annelid worms	102.29 ± 73.55	? – 150 <sup>a</sup>	Van der Elst & Adkin (1991)
W	<i>Palinurus delagoae</i> (n = 2)	Decapod	Based on <i>Palinurus elephas</i> ; Crustacea: isopod, decapods, other; gastropods; bivalves; Polyplacophora; scaphopods; Cephalopoda; Brachiopoda; Echinoidea; Ostrichthyes; Chondrichthyes; algae; polychaete; ascidians	427.94		Gofi et al. (2001)
W	<i>Penaeus indicus</i> (n = 3)	Decapod	N/A	32.00	1 – 90 <sup>c</sup>	
S	<i>Parapenaeopsis acclivirostris</i> (n = 3)	Decapod	Based on <i>Parapenaeus longirostris</i> ; Osteichthyes; cephalopods; crustaceans; polychaetes; foraminiferans	29.26		Sobrino et al. (2005)
S	<i>Parapenaeus investigatoris</i> (n = 6)	Decapod	Based on <i>Parapenaeus longirostris</i> ; Osteichthyes; cephalopods; crustaceans; polychaetes; foraminiferans	163.68 ± 95.16		Sobrino et al. (2005)
S	<i>Penaeopsis balssi</i> (n = 3)	Decapod	N/A	405.99		
S	<i>Phalium craticulatum</i> (n = 3)	Gastropod	N/A	568.76		
S	<i>Pleistacantha ori</i> (n = 3)	Decapod	N/A	234.09		
S	<i>Plesionika martia</i> (n = 3)	Decapod	Consist mainly of benthic-pelagic crustaceans: euphausiids	407.82		Cartes (1993)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m $\pm$ SD)	Literature depth (m)	Reference
S+W	<i>Pliotrema warren</i> (n = 15)	Elasmobranch	Cephalopods; Osteichthyes; crustaceans: shrimp/prawn, mysids	254.21 $\pm$ 100.45	60 – 430 <sup>a</sup>	Compagno et al. (1989)
S	<i>Polyipnus indicus</i> (n = 6)	Teleost	N/A	487.36 $\pm$ 67.09	50 – 500 <sup>a</sup>	
S	<i>Polysteganus coeruleopunctatus</i> (n = 3)	Teleost	Based on <i>Polysteganus undulosus</i> ; pelagic fishes, small reef fish; cephalopods and crustaceans	107.90	? – 100 <sup>a</sup>	Garratt (1996)
S+W	<i>Pomadasys olivaceus</i> (n = 18)	Teleost	Benthic crustaceans and invertebrates, non-annelid worms	52.12 $\pm$ 20.56		Van der Elst & Adkin (1991)
S+W	<i>Portunus sanguinolentus</i> (n = 20)	Decapod	Predator of slow-moving benthic macro-invertebrates; preference for crustaceans and molluscs; females preferred Osteichthyes in addition to crustaceans; although fish remains are important, it is unlikely that <i>P. sanguinolentus</i> can actively hunt healthy fish	32.28 $\pm$ 6.14	10 – 30; females up to 80 m	Sukumaran & Neelakantan (1997)
S+W	<i>Heteropriacanthus cruentatus</i> (n = 15)	Teleost	Crustaceans: pistol or snapping shrimp, swimming crabs, isopods, stomatopods; cephalopods: octopus; Osteichthyes; polychaetes	200.07 $\pm$ 67.60	3 – 300 (usually 3 – 35 m) <sup>a</sup>	Hiatt & Strasburg (1960)
S+W	<i>Pseudorhombus elevates</i> (n = 18)	Teleost	Unspecified zoobenthos	56.69 $\pm$ 31.69	7 – 200 <sup>a</sup>	Fischer et al. (1990)
S	<i>Pseudorhombus natalensis</i> (n = 6)	Teleost	Unspecified zoobenthos	132.59 $\pm$ 107.18	60 – 260 <sup>a</sup>	Fischer et al. (1990)
S	<i>Raja (dipturus) springeri</i> (n = 9)	Elasmobranch	Osteichthyes; cephalopods: squid/cuttlefish; crustaceans	310.89 $\pm$ 144.02	88 – 740 <sup>a</sup>	Compagno et al. (1989); Ebert et al. (1991)
S	<i>Ranella olearium</i> (n = 3)	Gastropod	N/A	336.50		
S	<i>Rhinobatos holcorhynchus</i> (n = 3)	Elasmobranch	N/A	230.43	75 – 253 <sup>a</sup>	

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m ± SD)	Literature depth (m)	Reference
S+W	<i>Rossia</i> sp. (n = 6)	Cephalopod	Based on <i>Rossia macrosoma</i> ; crustaceans; Osteichthyes and molluscs	416.97 ± 12.02		Mangold-Wirz (1963)
S+W	<i>Satyrichthys adeni</i> (n = 12)	Teleost	N/A	232.59 ± 1.60	58 – 295 <sup>a</sup>	
S+W	<i>Saurida undosquamis</i> (n = 32)	Teleost	Osteichthyes; crustaceans: shrimp/prawn, <i>Panaeus</i> spp., <i>Stolephorus</i> sp., crabs; cephalopods: octopus, squid/cuttlefish; other mollusks; fish egg and larvae	123.07 ± 78.70	1 – 350 <sup>a</sup>	Bingel & Avsar (1988)
S+W	<i>Sepia acuminata</i> (n = 5)	Cephalopod	Most cuttlefish feed mostly on crustaceans and Osteichthyes	234.09		Castro & Guerra (1990)
W	<i>Sepia incerta</i> (n = 3)	Cephalopod	Most cuttlefish feed mostly on crustaceans and Osteichthyes	118.87	90 – 345 <sup>b</sup>	Castro & Guerra (1990)
S+W	<i>Sepia officinalis (vermiculata)</i> (n = 9)	Cephalopod	Polychaetes; Crustacea; cephalopods; Osteichthyes; cannibalism is common	57.91 ± 17.37	? – 200 <sup>c</sup>	Castro & Guerra (1990)
S	<i>Sepia</i> sp. (n = 3)	Cephalopod	Most cuttlefish feed mostly on crustaceans and Osteichthyes	27.43		Castro & Guerra (1990)
S	<i>Sphoeroides pachygaster</i> (n = 3)	Teleost	Cephalopods	234.09	50 – 250 <sup>a</sup>	Schneider (1990)
W	<i>Spicara australis</i> (n = 3)	Teleost	Based on <i>Spicara axillaris</i> ; Crustacea: Copepoda, Amphipoda, mysids, euphausiids, bivalves	232.26	80 – 400 <sup>a</sup>	Meyer & Smale (1991a)
S+W	<i>Squalus megalops</i> (n = 18)	Elasmobranch	Crustacea; Cephalopoda; Polychaeta; Osteichthyes	247.20 ± 84.74	80 – 300 <sup>a</sup>	Ebert et al. (1992)
S+W	<i>Synagrops japonicus</i> (n = 21)	Teleost	Echinoderms: starfish; Osteichthyes; euphausiids; cephalopods	386.92 ± 108.97	100 – 800 <sup>a</sup>	Yamamura et al. (1998)
W	<i>Upeneus moluccensis</i> (n = 3)	Teleost	Crustaceans most important food item: Decapoda, Copepoda; other items include Polychaeta; Bivalvia; Gastropoda; Cephalopoda; Echinodermata; Osteichthyes	69.49	10 – 120 <sup>a</sup>	Kaya et al. (1999)

Season collected	Name (no. of individuals sampled)	Description	General prey items	Collection depth (m ± SD)	Literature depth (m)	Reference
S	<i>Upeneus cf. suahelicus</i> (n = 3)	Teleost	Mainly Osteichthyes and crustaceans; other benthic invertebrates	27.43	5 – 100 <sup>a</sup>	Prabha & Manjulatha (2008)
S+W	<i>Veladona togata</i> (n = 26)	Cephalopod	Based on <i>Octopus vulgaris</i> ; crustaceans: large variety of large and small crustaceans; molluscs: bivalves; limpets; octopus, other; polychaetes	414.01 ± 95.78	400 – 600	Smith (2003); Silva et al. (2009)

<sup>a</sup>Depth data obtained from [www.FishBase.com](http://www.FishBase.com) database

<sup>b</sup>Depth data obtained from [www.SeaLifeBase.com](http://www.SeaLifeBase.com) database

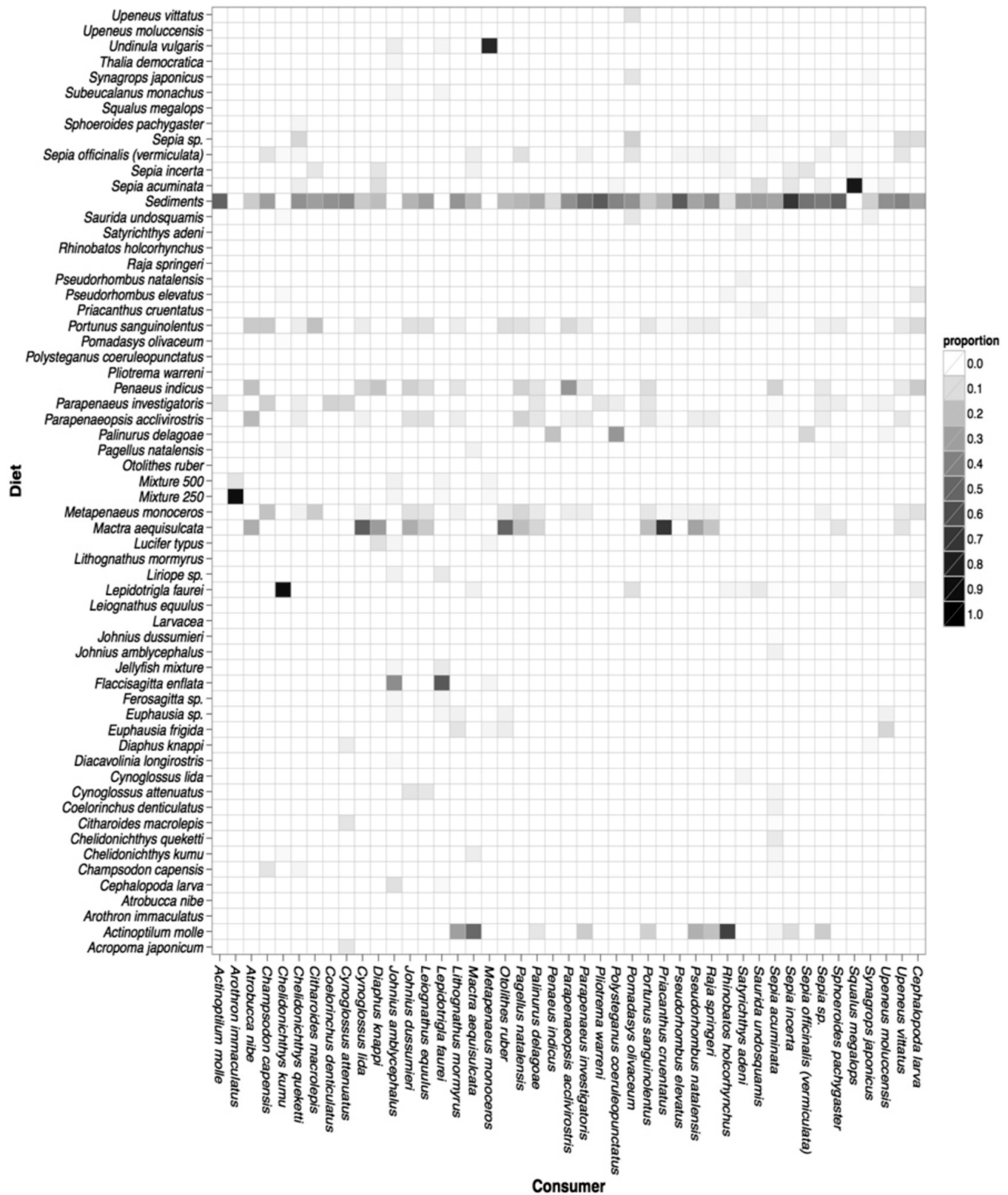
<sup>c</sup>Data depth obtained from [www.FAO.org/fishery/](http://www.FAO.org/fishery/) database



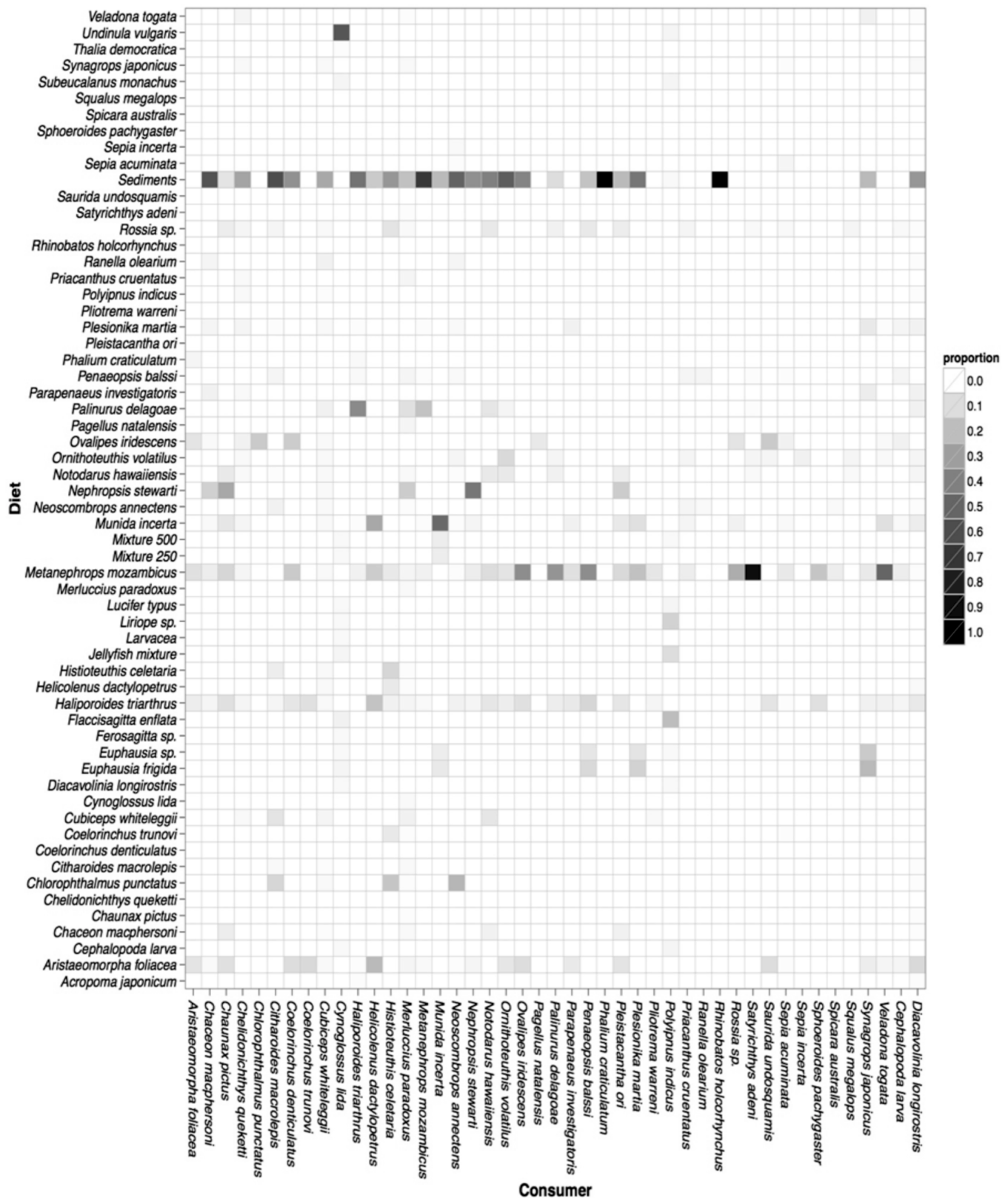
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**Fig. S1.** Food-web matrix showing mixing model results for shallow (up to 200 m) animals for the entire Bight. Refer to text and Table S1 for more information.



**Fig. S2.** Food-web matrix showing mixing model results for deep (201 to 568 m) animals for the entire Bight. Refer to text and Table S1 for more information.