

INDEX

- abundance estimation, 63
- Abyssal
 map of plains and basins, 13, Fig. 1.12
- Abyssal demersal fishes, 347
 Atlantic, Indian Pacific Oceans, 354,
 Table 5.7
- Abyssal demersal fishes North Atlantic,
 350–2, Table 5.6
- abyssal hills, 14, 353
- abyssal plain, 7, 14, 47, 50, 63, 108, 169,
 263
- abyssal zone, 4, 13, 347
- Abyssoberyx levisquamosus*, 239
- Abyssobrotula galathea*, 44, 70, 138, 231,
 356
- Abyssopelagic zone,
 definition, 4, 6
- Acanthochaenus luetkenii*, 240, 349
- Acantholiparis*, 260
- Acanthonus armatus*, 231, 341
- Acanthuroidei, 265
- Acentrophryne*, 313
- Achiropsettidae, southern flounders, 84,
 296
- Achiropsetta tricholepis*, 296
- acoustic backscatter, 48
- Acropomatidae, lanternbellies, 265
- Acropoma*, 131, 265
- Acropoma japonicum* (glowbelly), 265,
 Fig. 4.32a
- Actinopterygii, 69–71, 74, 79, 155, 335
 Ray-finned fishes, 155
- Aculeola*, 149
- Aethotaxis*, 281
- African coelacanth, 315
- Agassiz
 trawl, 56
- Age
 of maturity, 114, Fig. 3.19a
- Age maximums of deep-sea teleosts, 115,
 Table 3.3
- Aggasiz, Alexander, 39
- Agglomerular kidneys, 119
- Agnatha, 72–4, 76
- Agonidae, poachers, 257
- Agrostichthys parkeri*, 205
- Agulhas Current, 27, 335
- mesopelagic fishes, 334
- Ahliesaurus*, 190
- Aiakas*, 280
- Akarotaxis nudiceps*, 283
- Alabes bathys*, 238
- Alaska Pollock, 226
- Albatrossia pectoralis*, 54, 214, 366
 jaw protrusion index, 214, Fig. 4.24
- Albert, Prince of Monaco, 40
- Albulidae, 155
- ALBULIFORMES (bonefishes), 155
- Alcock, Alfred, 44, Table 1.3
- Alcockia rostrata*, 231
- Aldrovandia*, 133, 156
- Alepisauridae, lancet fishes, 82, 194
- ALEPISAUROIDEI, 193
- Alepisaurus*, 194, 196
- Alepisaurus feror* (Long snouted
 lancetfish), 194, Fig. 4.17c
- Alepocephalidae, slickheads or
 smoothheads, 71, 81, 85, 113, 117,
 123, 125, 166, 168, 319,
 359, 362
- Alepocephalids, 120, 349
- ALEPOCEPHALIFORMES, 81, 166–71
- Alepocephalus*, 168–9, 341
- Alepocephalus bairdii* (Baird's slickhead),
 168, Fig. 4.13
- Alepocephalus bairdii*, Fishery, 383,
 Table 6.2
- Alertichthys blacki*, 253
- Alfonsino, 241, 244, 270, 291, 316, 339,
 347, 365, 396–7, Fig. 4.28b
- Alfonsino, Fishery, 382–3, Table 6.2
- Allocareproctus*, 263
- Alloctytus*, 208, 396
- Alloctytus niger*, Fishery, 382,
 Table 6.2
- Alloctytus verrucosus* (warty dory), 208,
 Fig. 4.21a
- Alopias*, 150
- Alopiidae, 150
- Alvin*, see HOV
- Amblyraja*, 79, 154, 394
- Ambophthalmos*, 259
- ambush predators, 108
- Amphibia Nantes*, 36
- Anabantoidei, 265
- Anarhichadidae, wolffishes, 280
- Anarhichas*, 280, 347
- Anarhichas denticulatus* (northern
 wolffish), 280, Fig. 4.32d
- ancient deep-water fish fauna, 72, 85
- Andriashev, Anatole Petrovich, 43, 45,
 Table 1.3, Fig. 4.33
- Andriashevia aptera*, 276
- angel sharks, 145
- Angler, Fishery, 381, Table 6.2
- anglerfish, 85, 308, 310, Fig. 4.35
- anglerfishes, deep-sea, 304–5
- Anguilla anguilla*, 161, 166
- Anguillidae, freshwater eels, 166
- Anguilliformes, eels, 80, 92, 158–66,
 348
- Anomalopidae, flashlight fishes, 131,
 242
- Anoplogaster*, 113
- Anoplogaster cornuta* (common
 fangtooth), 241, Fig. 4.28a
- Anoplogastridae, fangtooth, 83, 241
- Anoplopoma fimbria*, (Sablefish), 47, 62,
 84, 214, 249, 255, 387, 398,
 Fig. 4.31c
- Fishery, 381, Table 6.2
- Anoplopomatidae, sablefishes, 84, 255
- ANOPOLOMATOIDEI, 249, 255
- Anopterus*, 196
- anoxia, 21, 25
- Anoxic
 Oceanic events in earth history, 73,
 Fig. 2.7
- Antarctic butterflyfish, 291
- Antarctic circumpolar current, 27, 200
- Antarctic demersal fish families 348,
 Table 5.5
- Antarctic Ocean
 mesopelagic fishes, 335
- Antarctic toothfish, Fishery, 383,
 Table 6.2
- Antennarioidei, 85
- Anthias*, 267
- Antigonia*, 293
- Antimora*, 66, 90–1, 103, 112, 124, 134,
 222, 342, 349, 359, 362

- fishery, 397, 401
Antimora rostrata (blue antimora, blue hake), 222, Fig. 4.25c
 swimming speed, 107, Fig. 3.16a
Antipodocottus, 257
Apagesoma, 231
 aphakic gap, 123
 Aphanopodinae, 290
Aphanopus, 290
Aphanopus carbo (black scabbardfish), 37, 287, 344, 398, Fig. 4.32g
 Fishery, 382, Table 6.2
 Aphyonidae, aphyonids, blind cusk-eels, 83, 125, 235, 237–8, 348–9, 359
Aphyonus, 237
Aphyonus gelatinosus
 Gelatinous blindfish, Plate 7a
Apogonops anomalus, 265
Apristurus, 78, 151, 393
Apristurus microps (Smalleye catshark), 151, Fig. 4.7
Aptocyclus ventricosus, 260
 Arabian Sea, 25–6, 28, 30, 34, 181, 203, 255, 304, 353
 mesopelagic fishes, 333
Araiphos, 178
 Arctic cod, 226, 319
 Arctic Ocean, 13
 Abyssal basins, 14, Fig. 1.13
 mesopelagic fishes, 319
 Arctic rockling, 226
Arctogadus glacialis, 226
Arctozenus, 194, 334
Arctozenus risso (Spotted barracudina), 194, Fig. 4.17c
 Argentina, 171
Argentina silus (greater argentine), 171, 364, 384, Fig. 4.14a
 Fishery, 383, Table 6.2
Argentina sphyraena, Fishery, 383, 384, Table 6.2
 Argentine, fish species, 384
 Argentine, silver smelts, Fishery, 381, Table 6.2
 Argentinidae, argentines or herring smelts, 113, 171, 301
 ARGENTINIFORMES, marine smelts, 171–5, 395
Argentinolycus, 280
Argyripnus, 177
Argyropelecus, 35, 42, 125, 127, 133, 178
gigas (Hatchetfish), Plate 5a
Argyropelecus aculeatus (lovely hatchetfish), 178, Fig. 4.15b
 heart size and water content, 105, Fig. 3.14
 Arhynchobatinae (Softnose skates), 154
Arhynchobatis, 154
Ariomma, 293
Ariomma melanum (brown driftfish), 293, Fig. 4.32h
 Ariommatidae, ariomids, 293
Aristostomias, 130, 132, 186
 armorhead, 275, 399
Arnoglossus, 294
 Arrival times at bait, 112, Fig. 3.17
 arrowtooth eel, 160, Fig. 4.12a
 Artedi, Peter, 36
Artedidracon, 282
 Artedidraconidae, barbelled plunderfishes, 84, 119, 281
Artediellina antelope, 257
 artisanal fisheries, 35, 363, 367, 390, 399
Aseraggodes, 297
Asquamiceps, 169–70
 assfish, 231, 341, Fig. 4.26
Assurger anzac, 290
Asthenomacrus, 214
Astronestes niger, 93, Fig. 3.4
Astronesthes, 93, 132, 180–1
Astronesthes gemmifer, 183, Fig. 4.15d
 Astronesthinae, snaggletooths, 180
Asymbolus, 151
Ataxolepis, 246
Ataxolepis apus, 246, Fig. 4.29b
 Ateleopodidae, jellynose fishes, 186
 ATELEOPODIFORMES, 82, 186
Ateleopus, 187
Atheresthes, 296
 Atlantic Ocean
 mesopelagic fishes, 334
 origin, 20
 Atlantic, Tropical and West Equatorial
 mesopelagic fishes, 334
Atractodenchelys, 158
Atrobucca, 273
Atrophacanthus japonicus, 300
Aulastomatomorpha, 169
 AUOLOPIFORMES (Lizardfishes), 187
 fishery, 395
Aulotrachichthys, 131, 242
 Australia, fishery, 143, 216, 220, 244, 251, 253, 267, 272–3, 281, 388–9, 391–4, 396, 398, 402
 Australia, Indian ocean slopes, 341
 Australia, South
 Bathyal fishes, 343
Austroglossus microlepis, 297, 399
 Fishery, 382, Table 6.2
Austrolycus, 280
Autosub. See AUV
 AUV, 65, 353
 Autonomous Underwater Vehicles, 65
 AUV, Autonomous Underwater Vehicle
Autosub 6000, 65, Fig. 1.51
Avocettina, 165–6, 320
 Azoic deep-sea, 68, 86
 azoic hypothesis
 Edward Forbes, 37
 back arc basin, 7
 bacterial light organ, 131, 175, 188
 bacterial mats, 359
 Baird's slickhead, Fishery, 383, Table 6.2
 baited camera, 263
 baited hooks, 47, 51, 148
Bajacalifornia, 117, 123, 169–70
 Banda Sea, 13, 15, 333
Barathrites, 108, 112, 120, 231, 353, 356
Barathrodemus, 231
Barathronus, 237–8
Barathronus bicolor, 237, Fig. 4.26c
Barbantus, 168
Barbapellis pterygalces, 277
 barbel, 131, 133, 180, 182, 184, 186, 222, 224, 259, 282, 313
Barbourisia rufa (Velvet whalefish), 245, 398, Fig. 4.29a
 Gill size, 104, Fig. 3.13
 Barbourisiidae, red whalefishes, 83, 245, 362
 Barents Sea, 386
 barreleye 171, Fig. 4.14
 Basking shark, 150
 bass 265, Fig. 4.32a
Bassanago, 161
 basslet, 265, 268
Bassogigas, 43, 231
Bassozetus, 99, 231, 356, 359
Bassozetus robustus (robust assfish), 231, Fig. 4.26b
Bathgadus, 213
Bathophilus, 184
Bathygonus nigripinnis (blackfin poacher), 257, Fig. 4.31d
 Bathyal
 Map of world habitat distribution, 11, Fig. 1.10

- Bathyal demersal fishes
geographic connectivity, 340, Fig. 5.5
species depth ranges in the NE Atlantic, 335, Fig. 5.2
NE Pacific, 345, Table 5.4
New Zealand EEZ, 343, Table 5.3
- bathyal zone
definition, 4
- Bathyanthias*, 267
- Bathychaunax*, 302
- Bathyclupea*, 274
- Bathyclupea gracilis* (slender deepsea herring), 274, Fig. 4.32c
- Bathyclupeidae, deep-sea herrings, 274
- Bathycongrus*, 161
- Bathyraco*, 283
- Bathyraco macrolepis*, 283, Fig. 4.32e
- Bathyracoridae, Antarctic dragonfishes, 84, 283
- Bathygadinae, 213, 220
- Bathygadus*, 220, 342
- Bathygadus antrodes*
jaw protrusion index, 213, Fig. 4.24
- Bathygadus melanobranchus* (Vaillant's grenadier), 220, Fig. 4.25b
- Bathylaco*, 168
- Bathylaco nigricans* (black warrior), 168, Fig. 4.13
- Bathylaconidae, bathylaconids, 81, 113, 166, 168
- Bathylagichthys*, 175
- Bathylagidae, Deep-sea smelts, 171, 175, 362
- Bathylagoidea*, 175
- Bathylagus*, 89, 175
- Bathylutichthyidae, 259
- Bathylutichthys taranetzi*, 259
- Bathyluchnops*, 123, 173
- Bathymaster signatus*, 276
- Bathymasteridae, ronquils, 276
- bathymetry, 14–15, 47
- Bathymicrops*, 125, 190–1
- Bathyonus*, 231
- bathypelagic
fishes, 318
light environment, 122
- Bathypelagic zone
definition, 6
- Bathyphylax*, 300
- Bathyphysa conifera*, 271
- Bathyprion*, 169
- Bathypterois*, 47, 89, 93, 125, 190, 349, 353
- Bathypterois longipes* (Abyssal spiderfish), 191, Fig. 4.17a
- Bathyraja*, 79, 118, 153–4, 394, 401
- Bathyraja pallida* (Pale ray), 154, Fig. 4.9
- Bathysauridae, deep-sea lizard-fishes, 191
- Bathysauroides*, 123, 188
- Bathysauropsis*, 188
- Bathysauropsis gracilis* (black lizardfish), 188, Fig. 4.17a
- Bathysaurus*, 90, 108, 191, 349, 353
- Bathysaurus ferax* (Deep-sea lizardfish), 191, Fig. 4.17b
- Bathyscaphe, see HOV
- Bathysolea*, 297
- Bathysolea profundicola* (deepwater sole), 297, Fig. 4.33b
- Bathysoma*
Cretaceous fossil, 204
- BATHYSOMI, 204
- Bathysphere*, see HOV
- Bathysphyraenops*, 265
- Bathytroctes*, 169
- Bathytroctes microlepis*
Brain areas, 119, Fig. 3.20
- Bathytyphlops*, 191
- Bathytyphlops marionae*
Gill size, 104, Fig. 3.13
- Batoidea
subdivision, 152–5
- Batrachoididae, toadfishes, 238
- BATRACHOIDIFORMES, 131, 238
- Bay of Bengal
mesopelagic fishes, 333
- Beaked redfish, Fishery, 381, Table 6.2
- Bean, Tarleton H., 39, 45, Table 1.3
- Beebe, William, 42
- Bellingshausenia*, 280
- Bellottia*, 235
- Bembradium*, 255
- Bembradium roseum*, 255, Fig. 4.31c
- Bembras*, 255
- Bembridae, deep-water flatheads, 255
- Bembrops*, 286
- Bembrops platyrhynchus* (Natal duckbill), 285, Fig. 4.32f
- Benguela hake, 225
Fishery, 383, Table 6.2
- Benguela Upwelling
mesopelagic fishes, 335
- Bentartia*, 280
- Benthalbella*, 131, 193
- Benthalbella infans* (Zugmayer's pearleye), 193, Fig. 4.17b
- Benthenchelys*, 162
- benthic boundary layer, 34, 111, 187, 190, 319
- benthic feeding, 170, 196, 311, 344
- Benthobatis*, 152
- Benthocometes*, 232
- Benthodesmus*, 290
- Benthosema*, 27, 198, 203, 317, 319, 333–4, 365, 396
- Benthosema pterotum*, Fishery, 382, Table 6.2
- Benthosema suborbitale* (Smallfin lanternfish), 201, Fig. 4.18b
- Bering Straits, 344
- Bertella idiomorpha*, 309
- Berycidae, Alfonsinos, 244, 316
- BERYCIFORMES, 83, 241–5
- Beryx*, 111
- Beryx decadactylus*, 207, 244, 316, 347
Fishery, 383, Table 6.2
- Beryx mollis*, 244
- Beryx splendens*, 207, 244, 270, 291, 342
- Beryx splendens* (splendid alfonsino), 207, 244, 270, 291, 342, Fig. 4.28b
- Beryx* spp, Fishery, 382, Table 6.2
- Bigelow's ray, 154, Fig. 4.9
- bigscale, 83, 117, 121, 240, 397
- Bilabria*, 276
- bill fishes, 289
- binocular fish, 173, Fig. 4.14b
- biogenic structures, 11, 347, 402
- biological clock, 135
- biological pump, 30–1, 74–5
- bioluminescence, 42, 46, 122, 127, 132, 149, 166, 198, 265, 268, 284
at food fall, 159
bacterial, 131
communication, 132
in *Eipigonus*, 270
in *Evermanella*, 194
in sharks, 78
in situ observations, 42, 63
intrinsic, 132
Malacosteus red, 124
Occurrence by family and genus, 128, Table 3.4
squaliformes, 145
stimulated by trawls, 57
- biomass, 342
- Benthic depth trends, 32, Fig. 1.25
- Benthic, global map, Plate 1b
- distribution with depth and region, 31–5

- mesopelagic fishes, 317
 Pelagic depth trends, 33, Fig. 1.26
 Pelagic-benthic relationship, 33,
 Fig. 1.27
 Biomass of demersal fishes depth trend,
 340, Fig. 5.4
 Biomes, Ocean. (Longhurst), 28, Table 1.2
 BIOSPEEDO expedition, 234, 237
 bipolar distribution of species, 171, 222,
 240, 342
 bird beak shark, *Deania*, 148
 birdbeak dogfish 146, Fig. 4.4a
 Black cardinal fish, 268
 Black oreo, Fishery, 382, Table 6.2
 Black scabbardfish, 287, 290, 398, 401
 Fishery, 382, Table 6.2
 Black Sea, 14
 Black swallower, 284
 Blackbelly rosefish, 84, 249, 339, 398,
 Fig. 4.31a
 Blackbelly rosefish, Bluemouth, Fishery,
 382, Table 6.2
 Blackfin goosefish, Fishery, 383, Table 6.2
 blackfin sorcerer 162, Fig. 4.12a
 Blackhead salmon, 170
 Blackspot seabream, 273
 Blenniodei, 265, 286
 Blob sculpin, 259
 Blobfish, 259, Fig. 4.31d
 blood plasma, 103
 Blue eye trevalla, 291
 Blue grenadier, hoki, blue hake, 220, 389
 Fishery, 381, Table 6.2
 Blue ling, 226
 Fishery, 382, Table 6.2
 Blue Nose, 291
 Blue whiting, 83, 171, 226, 248, 364, 379,
 384, 400
 Fishery, 381, Table 6.2
 Bluemouth, 249, 398
 Bluenose sea bass, 291
 Bluenose warehou, 291, 399
 Fishery, 383, Table 6.2
 Boarfish, 208, 274–5, 293, 391, 400,
 Fig. 4.32h
 Fishery, 381, Table 6.2
 Bobtail eel 163, Fig. 4.12b
 body shape
 change with depth, 92
 Bohr effect 95, Fig. 3.6
Bolinichthys, 200
Bolinia euryptera, 257
Bonapartia, 176
 Bonefishes, 155
 boom and bust fishery, 384
Borophryne apogon, 313
Borostomias, 117, 181, 319
 Bothidae, lefteye flounders, 84, 294
Bothrocarina, 279
Bothrocarina, 279
Brachybembras aschemeieri, 255
 Brain sensory areas 119, Fig. 3.20
 trends with depth 120, Fig. 3.21
 Brain morphology, 119
Brama brama, 271
 bramble sharks, 145
 Bramidae, pomfrets, 271
Branchiostegus doliatius (ribbed tilefish),
 270, Fig. 4.32b
 Brauer, August, 39
Bregmaceros, 185, 228
Bregmaceros cantori (striped codlet), 228,
 Fig. 4.25d
 Bregmacerotidae, codlets, 228
 Brembropinae, 286
 Brent Spar, 403
Brephostoma carpenter, 270
Breviraja, 154
Brinkmannella elongata, 270
 Bristlemouths, 176
Brochiraja, 154
Brosme brosme, 226, 384
 Fishery, 381, Table 6.2
 Brosmophycinae, 237
 Brotulinae, 229
Brotulotaenia, 229
Brotulotaenia brevicauda, 229,
 Fig. 4.26a
 Brotulotaeniinae, 229
Bryozoichthys, 280
 buckler, spiny scales of batfish
 Ogocephalidae, 304
Bufoceratias, 307
 Buoyancy, 93–102
 energy saving, 93
 from gas in swim bladder, 96, Fig. 3.9a
 lipids, 100
 of eggs, 118
 reduced skeleton, 101
 Buoyancy comparison of shallow and
 deep sea fish, 101, Table 3.1.
 bycatch, 142, 145, 151, 155, 169, 171,
 204, 208, 214, 216–19, 222, 224,
 244, 248, 251–3, 270, 273, 289–91,
 293, 297, 316, 364–5, 367, 384,
 389–94, 396–7, 399, 401, 403
 bycatch in deep-sea shrimp fisheries, 187,
 224, 244, 276, 384, 393
Bythites, 235, 237
 Bythitidae, viviparous brotulas, 235
 Bythitinae, 235
 BYTHITOIDEI, 235–8
Cabillus macrophthalmus, 287
 cable
 deep sea, 50
Caecorinchus, 216
 California Current
 mesopelagic fishes, 319
Callanthias, 268
 Callanthiidae, gropos, 268
 Callionymidae, dragonets, 287
 CALLIONYMOIDEI, 265, 286
Callionymus, 287
 Callorhynchidae, 77, 142–3
 Calypso Deep, 353
 camera sledge, 63
 cameras underwater. See imaging systems
 Camouflage
 mesopelagic and bathypelagic 125,
 Fig. 3.25
 Canyon, 34
 fish fauna, 341
 Nazare, Portuguese margin, Plate 1c
 Cape armourhead, 274
 Cape bonnetmouth, 272, 399
 Fishery, 383, Table 6.2
 Cape hake, 210, 384, Fig. 4.25c
 Fishery, 381, Table 6.2
 Caproidae, boarfishes, 293, 299
Capromimus, 208
Capros aper (boarfish), 294,
 Fig. 4.32h
 Fishery, 381, Table 6.2
 Capture methods
 Agassiz, Sigsbee or Blake trawl, 56,
 Fig. 1.40
 Baited trap 53, Fig. 1.36
 beam trawl, 55, Fig. 1.39
 bottom trawling, 54–8
 Conical plankton net, 58, Fig. 1.43
 dredge, 54, Fig. 1.38
 Gill net, 54, 364, Fig. 1.37
 Isaacs-Kidd Mid-water Trawl (IKMT),
 60, Fig. 1.46
 Long line, 52, 54, Fig. 1.35
 MOCNESS Multiple Opening/ Closing
 Net, 60, Fig. 1.45
 Otter trawl, single warp, 57, Fig. 1.42

- Capture methods (cont.)
 Otter trawl, twin warp, 56, Fig. 1.41
 Pelagic trawling, 364
 Rectangular Mid-water Trawl RMT, 59, Fig. 1.44
- Capture-imaging methods
 Epibenthic sledge, 63, Fig. 1.48
 Remotely Operated Vehicle (ROV), 64, Fig. 1.49
- Carangidae, Jacks and Pompanos, 271
 Carapidae, pearlfishes, 83, 228
 Carapinae, 229
 Carboniferous, Period, 77
 CARCHARHINIFORMES, 150–2, 393
Carcharias, 149
Carcharodon, 150
Careproctus, 43, 47, 260, 262, 264, 358–9
 snailfish, Plate 7b
Careproctus hyaleius, 261, 262, 359, 360, Table 5.9, Fig. 4.31e
Careproctus oregonensis (smallfin snailfish), 260, Fig. 4.31e
- Caribbean Sea, 353
 Caristiidae, manefishes, veifins, 271
 Caristiinae, 271
Caristius, 271
Caristius macropus (manefish), 265, Fig. 4.32b
- carrion, 31, 34, 48, 73, 92, 112, 141, 144, 244, 282, 299, 364
- cascades
 of dense water to the deep, 23–4
- Caspian Sea, 2
Cataetx, 235
Cataetx chthamalorhynchus, 235, Fig. 4.26c
- Catalog of Fishes, 49
 catshark, 151–2, 393
Caulolatilus, 270
Caulophryne, 305
Caulophryne pelagica, 306, Fig. 4.35b
- Caulophrynidae, fanfins, 305
- Celebes sea, 333
- Cell membranes, 90
- Celtic Sea, 2
- Cenozoic, 76
- Centriscidae, snipefishes and shrimpfishes, 248
Centriscops humerosus, 248
Centroberyx, 244, 397
Centroberyx affinis (redfish), 242, Fig. 4.28b
- Centrobranchus*, 203
Centrobranchus nigrocellatus larva, 202, Fig. 4.18c
Centrodraco, 287
Centrodraco atrifilum, 287, Fig. 4.32g
- Centrolophidae, medusafishes, 291
Centrolophus niger, 291
- Centrophoridae, 147
Centrophorus, 2, 75, 108, 116, 148, 364, 392–3
Centrophorus squamosus (leafscale gulper shark), 148, Fig. 4.4a
Centrophryne spinulosa, 311, Fig. 4.35e
- Centrophrynidae, deepsea anglers, prickly seadevils, 311
Centroscyllium, 149, 392
Centrosymnus, 52, 66, 78, 112, 149, 364, 392
Centrosymnus coelolepis (Portuguese dogfish) 149, Fig. 4.4b, Plate 3a
- cephalic organ
 of *Ipnois*, 191
- Cephaloscyllium*, 78, 151
Cepola haasti, 275
- Cepolidae, Bandfishes, 275
Ceratias, 121, 311
Ceratias uranoscopus (stargazing seadevil), 314, Fig. 4.35f
- Ceratiidae, seadevils, 311
 Ceratioid, 42, 93, 99, 113, 121, 127, 131, 133, 304, 307, 319, 362
 Ceratioid angler fish
Himantolophus, Plate 8b
- Ceratioidea, deep-sea anglerfishes, 304–13
 luminescent organs, 131
- Ceratioidei, 85
Ceratoscopelus, 48, 100, 108, 200, 318
Ceratoscopelus warmingii (Warming's lantern fish), 200, Fig. 4.18a
- Cetichthys*, 246
- Cetomimidae, flabby whalefishes, 83, 246
 CETOMIMIFORMES, 245, 398
Cetomimoides parri, 246
Cetomimus, 246
Cetomimus punctatus, 247, Fig. 4.29b
Cetonurichthys subinflatus, 216
Cetonurus, 216, 342
- Cetorhinidae, 150, 362
Cetorhinus, 100, 150
Cetostoma regani, 246
Chaenocephalus, 283
Chaenodraco, 283
Chaenophryne, 307
- Chaetodontidae (169) (butterfly fishes, 274
 Challenger deep, 15
Champoscephalus, 283
Champsodon, 284
Champsodon capensis (gaper), 284, Fig. 4.32f
- Champsodontidae, Gapers, 284
 Channichthyidae, crocodile icefishes, 84, 127, 283
Channichthys, 283
 Channoidei, 265
Chascanopsetta, 84, 294
Chascanopsetta lugubris (Pelican flounder), 295, Fig. 4.33a
- Chatham Rise, 2, 169, 268, 342, 388, 393
Chauliodus, 35, 89, 119, 182, 184, 317, 319–20, 333
Chauliodus sloani (Sloane's viperfish), 182, Fig. 4.15d
 heart size and water content, 105, Fig. 3.14
- Chaunacidae, sea toads, coffinfishes, 302
 Chaunacoidei, 85
Chaunacops, 302
Chaunacops coloratus, 302, Fig. 4.35a
Chaunax, 302
- chemosensitivity, 154
Cherublemma emmelas, 229
Chiasmodon, 284, 319
Chiasmodon niger, 284
 heart size and water content, 105, Fig. 3.14
- Chiasmodontidae, swallowers, 83, 284
 Chile, fisheries, 231, 253, 387–9, 397
Chimaera, 36, 142–3, 391
Chimaera monstrosa (Rabbitfish), 143, Fig. 4.2
 Chimaeras, 143, Fig. 4.2
- Chimaeridae, 77, 142–3, 391
Hydrolagus affinis, Plate 2b
- CHIMAERIFORMES, 142–3
Chionobathyscus dewitti, 283, Fig. 4.32e
Chionodraco, 283
Chirophryne xenolophus, 309
Chirostomias, 184
- Chlamydoselachidae, 144
Chlamydoselachus, 135, 144, 392
Chlamydoselachus anguineus (frilled shark), 144, Fig. 4.3

- Chlopsidae, 160
Chlopsis, 160
 chloride cells, 118
 Chlorophthalmidae, green eyes, 188
 CHLOROPHTHALMOIDEI, 188
Chlorophthalmus, 89, 123, 131, 188, 207, 301, 341, 347
 fishery, 395
Chlorophthalmus agassizi (Shortnose greeneye), 188, Fig. 4.17a
 chlorophyll, 28, 34
 Surface concentration CZCS image, Plate 1a
 cholesterol, 100
 Chondrichthyes 142–55
 Depth distributions 71, Fig. 2.5
Chironema, 286
 Chun, Carl, 39, 58
 Circadian rhythm, 135
 circumglobal fishes, 362
Cirrhigaleus, 148
 Citharidae, Large Scale flounders, 84, 294
Citharoides, 294
 Citrate synthase (CS), 88, 89, Fig. 3.2b
 citrus fruits, 405
 Cladodontomorph, 74
 claspers
 in male chimaeras, 142
Clidoderma, 296
 climate change, 405
Coccorella, 131, 194
Coccorella atlantica (Atlantic sabretooth), 194, Fig. 4.17b
 cod, codling 224, Fig. 4.25c
 coelenterazine, 132
 Coelocanth, 85, 315, Fig. 4.36
 COELOCATHIFORMES, 314–16
Coelophrys, 304
Coelorhynchus, 216
Coelorinchus, 213, 216–17, 219
Coelorinchus carribaeus, 341
Coelorinchus fasciatus (Banded whiptail), 216, Fig. 4.25a
Coelorinchus gilberti
 jaw protrusion index 214, Fig. 4.24
Coelorinchus gilberti, jaws 213, Fig. 4.23
Coelorinchus japonicus
 jaw protrusion index 214, Fig. 4.24
Coelorinchus kishinouyei
 jaw protrusion index 214, Fig. 4.24
Coelorinchus macrochir
 jaw protrusion index 214, Fig. 4.24
Coelorinchus mediterraneus, 341
 Cold seep 12, 279, 358
 list of fish species 359, 360, Table 5.9
Coloconger scholesi (Indo-Pacific shorttail conger), 158, Fig. 4.12a
 Colococongridae, 161
 Comoro Islands, 315
Conger, 161
 Congiopodidae, Pigfishes, horsefishes or racehorses, 253
Congiopus coriaceus (deep-sea pigfish) 249, 253, Fig. 4.31b
 Congridae, conger eels, 161
Conocara, 169–70, 349, 353
 Conodonts, 72, 76
 Conservation, 118, 316, 363, 392
 Constellationfish 178, Fig. 4.15a
 Continental and oceanic crust, 6, Fig. 1.4
 Continental Drift
 Deep Sea over 500 million years 16, Fig. 1.15
 continental rise, 9
 continental shelf, 4
 Cook Islands, 398
 Cookie cutter shark 132, 145, 147, Fig. 4.4a
 coral, 11
 coral fish association, 108, 235, 251, 276, 347, 402
 Coral Sea
 mesopelagic fishes, 333
 coronary arteries, 104
Coryphaenoides, 11, 36, 54, 62, 87, 114, 116, 118, 124, 134, 136, 341, 349, 353, 356, 359, 362, 364, 366, 398, 401
Coryphaenoides armatus, (Abyssal grenadier), 38, 47, 57, 66, 90, 106, 112–13, 121, 133, 136, 215, 217, 353, Plate 6b, Fig. 4.25a
 Energy cost of swimming, 107, Fig. 3.15b
 ingesting tracking transmitter, 67, Fig. 1.52
 swimming speed 107, Fig. 3.16b
Coryphaenoides marginatus
 jaw protrusion index 214, Fig. 4.24
Coryphaenoides rupestris, 54, 104, 116, 136, 217, 219
 fishery, 382, 387, 395, 401, Table 6.2
Coryphaenoides yaquinae, 66, 82, 99, 113, 212, 358
Cosmocampus profundus, 249
 cost of transport, 106
 Cottidae, sculpins, 257
 COTTOIDEI, 249, 257
 Cottunculinae, fathead sculpins, 259
Cottunculus, 259
Cottunculus spinosus, 249, Fig. 4.31d
 counter illumination, 127, 132, 149, 178
 crested flounders, 297
 Cretaceous–Paleogene extinction, 75
 crocodile icefishes, 127
Crossostomus, 280
 Crozet Plateau, 353
 cruminal organ, 113, 171
Cruriraja, 154
Cryodraco, 283
Cryothernia, 281
Cryptosaras coesii, 311
Crystallias matsushimae, 260
Crystallichthys, 260
Ctenochirichthys longimanus, 309
Ctenolabrus rupestris, buoyancy, 101, Table 3.3.
Cubiceps pauciradiatus (bigeye cigarfish), 291, Fig. 4.32h
 Currents
 Global surface circulation 27, Fig. 1.23.
 ocean bottom, 24
 cusk-eels, 71, 83, 125, 229, 349, Fig. 4.26
 Cuvier, Georges, 35
 Cyclopteridae, lumpsuckers, 259
Cyclopterus lumpus, 260
Cyclothone, 35, 42, 82, 99, 133, 176, 317, 319, 333–4
 pallida (bristlemouth), Plate 4b
Cyclothone microdon (Veiled anglemouth), 176, Fig. 4.15a
Cyema, 163
Cyema atrum (bobtail eel), 163, Fig. 4.12b
 Cyematidae, bobtail snipe eels, 80, 163
 Cynoglossidae, tonguefishes, 84, 297
Cynoglossus, 297
Cynomacurus piriei, 217
 Cyttidae, lookdown dories, 208
Cyttomimus, 208
Cyttopsis, 208
 Cyttopsis rosea (rosy dory), 208, Fig. 4.21a
Cyttus australis, 208
Cyttus novaezealandiae, 208
Cyttus traversi (king dory), 208, Fig. 4.21a
 CZCS
 Coastal Zone Color Scanner, 29, 47

- Dacodraco*, 283
Dactylobatus, 154
Dactyloptena tiltoni, 249
 Dactylopteridae, Flying gurnards, 249
 DACTYLOPTEROIDEI, 249
Dadyanos, 280
 daggertooth, 196
Dalatias, 75, 145, 392–3
 Dalatiidae, 78, 145, 362
Danacetichthys galathenus, 246
Danaphos, 178
Danaphryne nigrifilis, 309
Dasycottus setiger, 259
Davidijordania, 276
 Dealfish, 205–6, 396, Fig. 4.19b
Deania, 148
Deania calcea (birdbeak dogfish), 146,
 Fig. 4.4a
 Deep Free Vehicle. See Lander
 deep scattering layer, 48, 145, 317
 Deep-Sea Fishermen, 2
 Deep water formation, 21
 Global ocean circulation 22, Fig. 1.17
 Mediterranean Sea 23, Fig. 1.18
 thermo-haline circulation 21, Fig. 1.16
 deep-bottom snapper fishermen, 398
 Pacific Ocean, 396
 deepest living fish, 43, 263
 deep-sea fisheries
 definition, 2, 383
 Deep-Sea flathead, 255
 Deep-sea Herring, 274
 deep-sea pigfish, 253
 Deep-sea smelt, Fishery, 382, Table 6.2
 Deep-sea trevally, 291
 Deepwater dragonet, 287
 Deepwater sole, fishery, 297
 Deepwater stingray, 152, Fig. 4.8
 degenerate eyes, 237
 Demersal bathyal fishes, 335
 species depth ranges in the NE Atlantic
 335, Fig. 5.3
 dense water cascades, 23–4
Dentex fourmanoiri, 273
 depletion of nontarget species, 244
 Depth
 correlation with class species number
 70, Fig. 2.4
 of commercial fishing, 366
 Distribution of living species 68, Fig. 2.1
 global hypsographic curve 4, Fig. 1.2
 maximum lengths 69, Fig. 2.2
 Maximum limits for fishes, 137, Table 3.7
 Squaliformes and Scylliorhinae
 comparison 151, Fig. 4.5
 transects from coast to abyss 2,
 Fig. 1.1
 trends in species number per class, 69,
 Fig. 2.3
 Zones of the world ocean 2–5, Fig. 1.3
Derepodichthys, 279
 Derichthyidae, longneck eels, 161
Derichthys, 161
Derichthys serpentinus (narrownecked
 oceanic eel), 158, Fig. 4.12a
Dermatias platynogaster, 307, 310,
 Fig. 4.35d
Desmodema, 205
 Devil anglerfish, Fishery, 382, Table 6.2
 Devonian
 age of fishes, 17, 72–4, 76–7, 79, 85, 314
 dextral and sinistral flatfish, 294
 Diaphini, 199
Diaphus, 100, 125, 132, 184, 199, 316,
 320, 333, 335
Diaphus dumerilii, 196, Fig. 4.18a
Diaphus rafinesquii
 heart size and water content, 105,
 Fig. 3.14
Diastobranchus, 158, 342
 Diatoms, 73
Dibranchus, 131, 304
Diceratias, 307
 Diceratiidae, double anglers, 307
Diceratias bispinosus, two-rod anglerfish,
 307, Fig. 4.35d
Dicrolene, 232, 341
Dieidolycus, 279
 diel vertical migration, 317
Diogenichthys, 203, 317, 320
Diogenichthys atlanticus larva, 202,
 Fig. 4.18c
Diplacanthopoma, 235
Diplophos, 177
Diplospinus multistriatus, 289
Dipturus, 36, 154, 342, 394
Diretmichthys parini (Parin's spinyfish),
 241–2, Fig. 4.28a
 Diretmidae, spinyfins, 83, 242, 362
Diretmoides pauciradiatus, 242
Diretmoides veriginae, 242
Diretmus argenteus, 242
Discoverichthys praecox, 191
 Discovery of deep-sea fishes
 cumulative numbers named since 1700,
 44, Fig. 1.33
Dissostichus, 281, 344, 366, 389–90, 394,
 398
Dissostichus eleginoides (Patagonian
 toothfish), 84, 281, Fig. 4.32e
 diet, 199
 Fishery, 381, Table 6.2
Dissostichus mawsoni, 264
 Fishery, 383, Table 6.2
Ditropichthys storeri, 125, 246
Doederleinia berycoides, 265
Dolicholagus, 175
Dolichopteroides, 173
Dolichopteroides binocularis 171, Fig. 4.14a
Dolichopteryx, 123, 173–4
Dolichosudis, 194
Dolloidraco longedorsali, 282
Dolopichthys, 309
 dolphin
 carcass, 53, 349
 dory, 208–9, Fig. 4.21
Draconetta xenica, 287
 Draconettidae, slope dragonets, 287
 dragonet, 287
 dragonfish 182, Fig. 4.15d
 dragonfishes, 82, 84, 113, 130, 132, 180,
 182, 184–5, 283, 317
 Drake Passage, 20, 22, 27, 200
 Dredge, 54
 drumming muscles, 133–4, 231, 253
 dwarf male, 42, 118, 304
 dwarf snailfishes, 264
 dwarfism
 decrease in size with depth, 91
Dysalotus, 284
Dysomma, 158
Dysommima, 158, 359
Dysommima rugosa, 360, Table 5.9
 ear, 119, 134
Ebinania, 259
Echinomacurus, 125, 218
 Echinorhinidae, 145
Echinorhinus, 100, 145, 393
Echinorhinus cookei (prickly shark), 145,
 Fig. 4.4a
Echiodon, 229, 356
Echiodon cryomargarites (messmate), 229,
 Fig. 4.26a
Echistoma, 185, 320
 Ecoregions, mesopelagic 319, Table 5.1,
 Fig. 5.2
Ectreposebastes imus (Midwater
 scorpionfish), 250, 252, Fig. 4.31a

- Edentoliparis*, 260
Edentoliparis terraenovae, 264
 eel city, 158
 eelpout, 276, 339–40, 359
 Eels and relatives, 155–66
 eels, bathypelagic, 163
 eelskin, 141
 EEZ, 366
 egg
 buoyancy, 119
 number (fecundity), 117
 of hagfish, 117
Einara, 169
Eknomoliparis chirichignoae, 263
 Elasmobranch, 143
Elassodiscus, 263
 ELASSOMATOIDEI, 265, 276
 electric organ, 206
 electric rays, 152
Electrona, 200, 335
Electrona risso (Electric lantern fish), 200,
 Fig. 4.18b
 Electronini, 200
 electroreceptor organ, 316
 Elopomorpha, 80, 126–7, 158
Embassichthys bathybius, 296
 embryos, 118, 142, 199, 238, 251
 Emmelichthyidae, rovers, 272
Emmelichthys, 272, 301, 399
Emmelichthys nitidus, 272
Emmelichthys nitidus nitidus (Cape
 bonnetmouth), 272, Fig. 4.32c
 Fishery, 383, Table 6.2
 Emperor Seamounts, 251, 255
Enchelybrotula, 233
 Endemic and Invasive
 deep-sea families, 71, Fig. 2.6.
 endothermy
 Opah, *Lampris*, 204
 Energy cost
 of swimming, 105–8, Fig. 3.15a
 of gas-filled swim bladder 96, Fig. 3.9b
 for lipid buoyancy, 97
 to fill swim bladder, 97
 Enzyme activity and depth 88, Fig. 3.2
Epetriodus freddyi, 233
 epifauna, 111
 Epigonidae, deepwater cardinal fishes, 268
Epigonus, 123, 268, 270, 339, 399
Epigonus telescopus (black cardinal fish),
 123, 268, 399, Fig. 4.32b
Epinephelus, 267
Epinnula, 290
 Eptatretinae, 139
Eptatretus, 69, 87, 112, 359, 391
Eptatretus cirrhatus (New Zealand or
 Broadgilled hagfish, 139, Fig. 4.1
Eptatretus deani
 on whale carcass, Plate 2a
Eptatretus strickrotti, 360, Table 5.9
Eretmichthys pinnatus, 233
Eretmophorus kleinenbergi, 224
Ereunias grallator, 257, Fig. 4.31c
 Ereuniidae, deep-water sculpins, 257
Ericandersonia, 276
Eridacnis radcliffei (pygmy ribbontail
 catshark), 151, Fig. 4.7
Erilepis zonifer, 255, 398
Erythrocles, 273
 esca, 131, 301, 305–7, 309, 311, 313
 Escolar, 289, Fig. 4.32g
 Etmopteridae, 78, 145, 149
Etmopterus, 36, 112, 145, 149, 392
Etmopterus princeps (great lanternshark),
 148, Fig. 4.4b
 Euclichthyidae, eucla cod, 226
Euclichthys polynemus (Eucla cod), 223,
 226, Fig. 4.25c
Eucryphycus, 279
Eumecichthys fiski (unicorn crestfish),
 205–6, Fig. 4.19b
Eumegistus brevorti, 271
Eupogonesthes, 181
Euprotomicroides, 145
Eurymen, 259
 Eurypharyngidae, gulper or pelican eels,
 163, 318
Eurypharynx, 89, 127
Eurypharynx pelecanooides, 163
 Pelican eel, 163, Fig. 4.12b, Plate 3b
Eurypleuron owasianum, 229
Eustomias, 184
Eustomias schmidti (Schmidt's
 dragonfish), 183, Fig. 4.15d
Eutaeniophorus festivus (Festive
 ribbonfish), 245–6, Fig. 4.29a
Eutelichthys leptochirus, 264
Evermannella, 194
 Evermannellidae, sabretooth fishes, 113,
 193
 Evolution, 38, 68, 74, 85, 95, 139, 213, 315
 evolutionary engine, 344
 Evolutionary tree and time scale
 Batoidea (Skates and Rays), 79, Fig. 2.11
 Fishes, 72, Fig. 2.7
 Holocephali (chimaeras), 77, Fig. 2.9
 Myxini (hagfishes), 76, Fig. 2.8
 Selachii (Sharks), 78, Fig. 2.10
 Teleostei (Actinopterygii, ray finned
 fishes 80, Fig. 2.12
Evoxymetopon, 290
 Exclusive Economic Zone (EEZ), 363
 Excretion, 118
 Exploited deep-fish species, 379,
 Table 6.1
 Exploration voyages, see research vessels
 and expeditions
 extinction, 17, 20, 68, 74–5, 83
 extinction and replacement, 75, 86
 eye, 123
 aphakic gap 123, Fig. 3.24
 degenerate, 233
 retina 122, Fig. 3.23
 rudimentary in *Myxine*, 140
 tubular, 122, Fig. 3.23
 eyestalks, 175
 False brotulas, 238
 False catchshark, 152, Fig. 4.7
 fangtooth, 241, Fig. 4.28a
 Faroe Islands, fishery, 384, 387, 390,
 395–6, 400
 Fathead, 259
 faunal zonation, 339
 fbd–fish base depth, 1
 Fecundity, 114, 116–18, 155, 175, 244,
 258, 280, 316, 389
 trend with depth, 117, Fig. 3.19b
 feeding, 108
 Feeding rates, 114, Fig. 3.18
Fenestrata, 154, 347
Figaro, 151, 393
 fish bites
 on deep-sea cables, 195
 fish down, 388
 fish meal, 294, 391
 FishBase, 1, 49, 70, 139, 366–7
 Fisheries,
 Depth distribution, 367, Fig. 6.3
 Depth related impact on demersal
 fishes, 402, Fig. 6.7
 Depth trend, fishing deeper, 366,
 Fig. 6.1c
 Environmental impact, 402
 Global trends, 365, Fig. 6.2
 List of exploited deep-sea species,
 368–78, Table 6.1
 Number of exploited species per Order,
 379, Fig. 6.4

- Fisheries (cont.)
 Size and depth of exploited species,
 367, Fig. 6.2
 Species accounts.
Albatrossia, 214
Anarhichas, wolffish, 280
Anoplopoma fimbria, sablefish, 255
Antimora, 222
Aphanopus, scabbardfish, 290
Ariomma, 293
 armorhead, *Pentaceros*, 275
Beryx, alfonisino, 244
Bregmaceros, 227
Callanthias ruber, 268
Capros aper, boarfish, 294
Channichthyidae, 283
 chimaeras, 142
Coelorinchus, 215
Coryphaenoides rupestris, 217
Cyttus, 208
Diaphus, 199
Dissostichus, 281
Doederleinia berycoides, 267
 dories, Zeiformes, 208
Emmelichthys, 273
Erelepis zonifer, 255
Genypterus, kingklip, New Zealand
 Ling, 231
Helicolenus, Ocean Perch, 251
Histioporus, *Zanclistius*, 275
Hoplostethus atlanticus, orange
 roughy, 244
Hoplostethus cadenati, Black
 slimehead, 244
Hyperoglyphe, 291
Lampyanctodes hectoris, 199
Lepidonotothen squamifrons, 281
Lepidopus, 290
Lepidorhynchus denticulatus, 218
 Ling, tusk. *Molva*, 226
Lopholatilus chamaeleonticeps,
 tilefish, 270
Macroramphosus scolopax, 248
Macrourus berglax, 218
Macruronus, hoki, 220
Malacephalus, 219
Merluccius, hake, 225
Mesobius, 219
Micromesistius, blue whiting, 226
Muraenolepis, moray cod, 212
Neobythites, 234
Nezumia, 218
Notolychnus, 199
 Oreos, 208
Ostichthys kaianus, 245
Pagellus bogaraveo, Red sea bream,
 273
Plagiogeneion, 273
Polymixia, 207
Reinhardtius hippoglossoides, 296
Scorpaena scrofa, 252
Sebastes, redfish, Pacific Ocean
 perch, 251
 Serranidae, seabass, grouper, 268
Setarches, 252
Synagrops, 267
Trachyrincus, 221
Trachyscorpia cristulata echinata,
 252
Trichiurus, hairtail, 291
Trigla, 253
 Wreckfishes, 267
Zoarces americanus, ocean pout, 276
 Species catch trends since 1950
 Angler, *Lophius piscatorius*, 389,
 Fig. 6.6n.
 Argentines and silver smelts,
Argentina silus, *A. sphyraena*,
 385, Fig. 6.6d.
 Beaked Redfish, *Sebastes mentella*,
 390, Fig. 6.6r
 Blue Whiting, *Micromesistius*
poutassou, 387, Fig. 6.6j.
 Boarfish, *Capros aper*, 391, Fig. 6.6t
 Cape Hakes, *Merluccius paradoxus*,
M. capensis. 385, Fig. 6.6e
 Greenland Halibut, *Reinhardtius*
hippoglossoides., 385, Fig. 6.6f.
 Grenadiers *Coryphaenoides rupestris*
 and other species, 387, Fig. 6.6h.
 Hoki, *Macruronus novaezelandiae*,
 389, Fig. 6.6o.
 Ling, *Molva molva*, 385, Fig. 6.6a.
 Oilfish, *Ruvettus pretiosus*, 390,
 Fig. 6.6s
 Orange Roughy, *Hoplostethus*
atlanticus, 388, Fig. 6.6k.
 Pacific Ocean Perch, *Sebastes alutus*,
 385, Fig. 6.6c.
 Patagonian grenadier,
Macruronus magellanicus, 389,
 Fig. 6.6p.
 Patagonian Toothfish, *Dissostichus*
eleginoides, 389, Fig. 6.6q.
 Pink cusk eel *Genypterus blacodes*,
 389, Fig. 6.6m.
 Sablefish, *Anoplopoma fimbria*, 387,
 Fig. 6.6g
 South Pacific Hake, *Merluccius gayi*,
 387, Fig. 6.6i.
 Southern Blue Whiting,
Micromesistius australis, 388,
 Fig. 6.6l
 Tusk, *Brosme brosme*, 385, Fig. 6.6b.
 List of exploited deep-sea species,
 368–78, Table 6.1
 Taxonomic composition of world catch,
 380, Fig. 6.5
 fjords, 11, 148
Flagellostomias, 185
Florenciella lugubris, 270
 flounder 295, Fig. 4.33a
Foetorepus, 287
 food consumption rates, 113
 food falls, 30–1, 62, 112–13, 217
 food supply, 1, 12, 30, 34, 70, 87, 92, 305,
 358
 Forbes, Edward, 37–8
 azoic hypothesis, 37
 fossils
 of deep sea fishes, 41
 France, fishery, 387
free-fall. See Lander
 frilled shark 144, Fig. 4.3
 frostfish, 290, 399
Gadella, 224
Gadiculus argenteus, 226
 Gadidae, cods, 83, 89, 222, 226–8, 344,
 379
 GADIFORMES, 82, 210–28
 Gadinae, 226
 GADOIDEI, 222
Gadomus, 213, 220, 342
Gadomus colletti, jaws, 213, Fig. 4.23,
 Fig. 4.24
 Gaidropsarinae, rocklings, 226
Gaidropsarus argentatus (Arctic rockling),
 226, Fig. 4.25d
Gaidropsarus ensis, 226
 Galapagos rift, 358
 Galeomorphi, Superorder, 78, 143,
 149–52
Galeus, 36, 78, 151, 341, 393
 gamefish, 2, 251, 267, 270
 Garman, Samuel Walton, 39, 44,
 Table 1.3
 Gas gland 93, Fig. 3.4, Fig. 3.5
 function 95, Fig. 3.7

- gas secretion
 in swim bladder, 93
- GASTEROSTEIFORMES, 248
- Gavialiceps*, 162
- GEBCO
 General Bathymetric Chart of the
 Oceans, 10, 15, 46
- gelatinous
 egg masses, 251, 302
 tissues, 101
 zooplankton, 30–1, 101, 113, 134, 169,
 171, 175, 228, 240, 260, 275, 281,
 293, 301, 304, 364
- Gempylidae, snake mackerels,
 289–90
- Gempylus*, 290
- genetic barcodes, 49
- Genioliparis*, 260, 264
- Genypterus*, 287, 366, 389
 fishery, 397
- Genypterus blacodes* (pink cusk-eel), 230,
 389, Fig. 4.26a
 Fishery, 381, Table 6.2
- Genypterus capensis*, 231
 Fishery, 382, Table 6.2
- Genypterus chilensis*, 231
- Gephyroberyx*, 242, 397
- Gephyroberyx darwini* (Darwin's
 slimehead), 242, Fig. 4.28b
- Gerlachea australis*, 283
- German Deep Sea Expedition 1898–1899,
 39
- gibberfish, 240
- Gibberichthyidae, gibberfishes, 83, 240
- Gibberichthys*, 240
- Gibberichthys pumilus* (gibberfish), 240,
 Fig. 4.27
- Gigantactinidae, whipnose anglers, 311
- Gigantactis*, 311
- Gigantactis macronema*, 314, Fig. 4.35f
- gigantism
 increase in size with depth, 91
- Gigantura*, 192, 317
- Gigantura indica* (Telescopefish), 187,
 Fig. 4.17b
- Giganturidae, telescope fishes, 42, 82,
 187, 192, 362
- GIGANTUROIDEI, 191
- Gilbert, Charles Henry, 39, 44, Table 1.3,
 Fig. 1.31,
- Gilbertidia pustulosa*, 259
- gill nets, 54, 364, 384, 389, 391
- gills, 103–4, 118
- filament length, 104, Fig. 3.13
- rakers for feeding, 111
- gissu
 Japanese gissu, bonefish, 155
- Global
 warming, 208, 210, 405
- global anoxic event, 405
- global cooling, 74
- Glossanodon*, 171, 301, 395
- glowbelly, 265, Fig. 4.32a
- glycosaminoglycans, 101
- Glyptocephalus*, 296
- Glyptophidium*, 233
- gobies, 287
- Gobiesocidae, clingfishes, 238
- GOBIESOCIFORMES, 238
- Gobiidae, gobies, 287
- Gobioidei, 265
- GOBIOIDEI, 287
- Gobionotothen*, 281
- goblin shark 149, Fig. 4.6
- Golden redfish, 84
- Gollum*, 152
- Gondwana, 17, 20, 74, 280
- Gonichthyini, 203
- Gonichthys*, 203
- Gonostoma*, 89, 99, 101, 105, 133,
 176, 317
- Gonostoma denudatum*
 eye 123, Fig. 3.24c
 heart size and water content, 105,
 Fig. 3.14
- Gonostoma elongatum*, buoyancy, 101,
 Table 3.1
- Gonostomatidae, Bristlemouths, 82, 99,
 121, 123, 130, 132, 176, 317–18,
 333, 362
- Goode, George B., 39, 45, Table 1.3
- Gosztonyia*, 280
- GPS
 Global Positioning System, 46, 50
- Grammatidae, basslets, 268
- Grammatonotus*, 268
- Grammatostomias*, 184
- Grammicolepididae, tinsselfishes, 210
- Grammicolepis*, 210
- Grammicolepis brachiusculus*
 (thorny tinsselfish), 211,
 Fig. 4.21b
- Great Australian Bight, 342
- Great Meteor Seamount, 42
- Great white shark, 150
- Greater Argentine, 384
- Greater argentine, Greater silver smelt,
 Fishery, 383, Table 6.2
- Greater forkbeard, Fishery, 383,
 Table 6.2
- Greater Silver Smelt, 384
- Greater silver smelt, Fishery, 383,
 Table 6.2
- Greeneyes, 188, 341, Fig. 4.17a
- greeneye spurdog 148, Fig. 4.4b
- Greenland halibut 294, 296, Fig. 4.33a
 Fishery, 381, Table 6.2
- grenadier 212, Fig. 4.25a
- Grenadiers, rattails NEI, Fishery, 381,
 Table 6.2
- grouper, 267
- Guentherus*, 187
- Guentherus altivela* (Jellynose), 186,
 Fig. 4.16
- Guinea Basin
 mesopelagic fishes, 335
- Gulf hake, 227
- Gulf of California
 mesopelagic fishes, 320
- Gulf of Mexico, 13, 20, 34, 47, 57, 161–2,
 170, 181–2, 184–6, 199, 207, 222,
 228, 231, 234–5, 237, 252–3, 270,
 272, 274, 334, 341, 391
 mesopelagic fishes, 334
- Gulf Stream, 27, 29
- Gulper eel, 163, Fig. 4.12b
- Gulper shark, 2, 108, 116, 148, 392
- Günther, Albert, 1, 35, 37–9, 49, Table 1.3,
 Fig. 1.29
- Gurgesiella*, 154
- Gustatory area, 119
- Guttigadus*, 224
- Gvozdarus*, 281
- Gymnelinae, 276
- Gymnelopsis*, 276
- Gymnelus*, 276
- Gymnoscopelini, 199
- Gymnoscopelus*, 199, 335, 366
- Gymnoscyphus ascitus*, 238
- Gymnothorax*, 159
- Gyrinichthys minytrems*,
 263
- Gyrinomimus*, 246
- Hadal Trenches, list, 16, Table 1.1.
- Hadal zone, 4–5, 15, 70–1, 163, 228, 240,
 356
 definition, 4
 fish fauna, 356

- Hadal zone (cont.)
 snail fishes, liparids, 358
 List of Fishes, 357, **Table 5.8**
- Hadropareia*, 277
- Hadropogonichthy*, 279
- haematocrit, 105
- haemoglobin, 84, 94, 127, 283, 362
- Hagfish, 76
 on whale carcass, **Plate 2a**
- Hagfish, 139, **Fig. 4.1**
 slime, 141
 Fishery, 383, **Table 6.2**
- hair-cell sensory systems, 134
- hairtail, 291
- Hakes, 210, 225, **Fig. 4.25**
- Halargyreus johnsonii* (slender codling),
 224, **Fig. 4.25c**
- Halicmetus*, 304
- Halieutaea*, 304
- Halieutichthys*, 304
- Halieutopsis*, 304
- Halieutopsis galatea*, 303, **Fig. 4.35a**
- Halimochirurgus*, 300
- Halosauridae, 80, 120, 156, 359, 362
- Halosauropsis*, 156, 342, 401
- Halosauropsis macrochir* (Abyssal halosaur), 156, **Fig. 4.11**
- Halosaurus*, 133, 156
- Haplomacrourus nudirostris*, 218
- Haplophryne mollis* (soft leftvent angler),
 42, 313, **Fig. 4.35f**
- Haptenchelys*, 159
- Haptenchelys texis*, 360, **Table 5.9**
- Harpadon erythraeus*, 188
- Harriotta*, 135–6, 142–3, 348
- hatchetfish 175, 178, **Fig. 4.15b**
- Headlight fish, 132
- hearing, 134
- Heart, 104–5
 weight variation, 105, **Fig. 3.13**
- Hector's lanternfish, Fishery, 382,
Table 6.2
- Heezen and Tharp, 46
- Heinke's Law, 91
- Helicolenus*, 84, 114, 249, 339, 347, 398
- Helicolenus barathri*, 251
- Helicolenus dactylopterus* (blackbelly
 rosefish), 249, **Fig. 4.31a**
- Helicolenus dactylopterus*, Fishery, 382,
Table 6.2
- Hellenic Trench, 353
- helminth parasites, 136
- Heminodus philippinus*, 253
- Hemirhamphidae, sea ravens, 257
- Hemitripterus bolini* (Bigmouth sculpin),
 257, **Fig. 4.31d**
- Hephthocara*, 235
- Heptranchias*, 144, 392
- herbivory, 108
- hermaphroditism, 118, 187
- Herwigia*, 168
- Heterophotus*, 182
- Heterophotus ophistoma* (Wingfin
 snaggletooth), 182, **Fig. 4.15d**
- Heteroscymnoides*, 145
- HEXAGRAMMOIDEI, 249, 255
- Hexanchidae, cow sharks, 144
- HEXANCHIFORMES, 144, 392
- Hexanchus*, 100, 112, 392–3
- Hexanchus griseus* (bluntnose sixgill
 shark), 144, **Fig. 4.3**
- Hexatrygon bickelli* (Sixgill stingray), 152,
Fig. 4.8
- Hexatrygonidae, 152
- Himantolophidae, footballfishes, 305
- Himantolophus*, 305, 307
 Ceratioid angler fish, **Plate 8b**
- Himantolophus groenlandicus*,
 Atlantic footballfish, 308,
Fig. 4.35c
- Hintonia candens*, 200
- Hippoglossinae, Halibuts, 296
- Hippoglossoides*, 296
- Hippoglossus hippoglossus*, 36, 294, 399
- Hispidoberycidae, 83
- Hispidoberyx ambagiosus*, 241
- Histiobranchus*, 80, 87, 102, 159, 348,
 353
- Histiobranchus bathybius*, deep-water
 arrowtooth eel, 159, **Fig. 4.12a**
- Histiodraco veliferi*, 282
- Histiopterinae, 274–5
- Histiopterus typus*, 275
- Hjort, Johan, 41
- Hoki, 220, 343, 379, 389, 391, 400,
Fig. 4.25b
 Fishery, 381, **Table 6.2**
- Holcomycteronus*, 125, 233, 356
- Hollardia goslinei*, 300
- Holocentridae, soldierfish, 245
- HOLOCENTROIDEI, 245
- Holocephali, 35, 71, 76, 142
- Holohalaelus*, 151
- holothurian
 in fish diet, 311
- Holtbyrnia*, 168
- Homostolus acer*, 233, 397
- hooks
 design for fishing, 363
- Hoplichthyidae, Ghost Flatheads, 255
- Hoplichthys haswelli*, Armoured flathead,
 255, **Fig. 4.31c**
- Hoplobrotula*, 134, 233, 397
- Hoplostethus*, 242
- Hoplostethus atlanticus*, orange roughy,
 40, 93, 101, 111, 241, 244, 270,
 342, 344, 347, 364–5, 388, 393,
 400–1, **Fig. 4.28b**
 Fishery, 382, **Table 6.2**
- Hoplostethus cadenati*, 242, 397
- Hoplostethus mediterraneus*, 244
- houndshark, 152, 393
- HOV, Human Occupied Vehicle, 65, 271
Alvin, 48
Archimède, 263
 Bathyscaphe, 47, 263, 294, 358
 Bathysphere, 42
Johnson Sea Link, 268, 271, 274, 301
Mir, 48
Nautile, 48, 159, 234
Shinkai, 48
Trieste, 47, 294
- Howella*, 131, 265
- Howella brodiei*, pelagic basslet, 265,
Fig. 4.32a
- Howellidae, Oceanic basslets, 265
- Humboldt current
 mesopelagic fishes, 333
- Hydrolagus*, 142–3, 342, 391
- Hydrolagus affinis*, **Plate 2b**
- Hydrothermal vent, 12, 48, 53, 139, 158–9,
 231, 234–5, 237, 262, 276, 279,
 297, 299, 402
 fishes, 358–62
 list of fish species, 359, 360,
Table 5.9
- Hydrozoa, 271
- Hygophum*, 99, 203, 317–18, 334
- Hygophum hygomi*
 heart size and water content 105,
Fig. 3.14
- Hymenocephalus*, 131, 218
- Hymenocephalus striatissimus*
 jaw protrusion index, 214, **Fig. 4.24**
- Hyperoglyphe*, 270, 291, 399
- Hyperoglyphe antarctica* (blunose
 warehou), 270, 291, **Fig. 4.32g**
- Hyporthodus*, 267
- hypoxia, 98, 362

- Iago*, 152, 393
icefish, 280
icefishes, 84, 280, 283
Iceland, fishery, 226, 294, 384, 389–90, 395, 399
Icelus, 257
ICES, 58
International Council for the Exploration of the Sea, 41
Ichthyococcus, 180
Ichthyococcus ovatus, Lightfish, 180, Fig. 4.15c
ichthyology, 35, 38, 40, 42–3, 46–7
Ichthyosaur, 291
Icosteidae, ragfishes, 286
Icosteoidae, 265
ICOSTEOIDEI, 286
Icosteus aenigmaticus, ragfish, 286, Fig. 4.32f
Idiacanthinae, Black Dragonfishes, 185
Idiacanthus, 185, 320
Idiacanthus fasciola (Ribbon sawtail fish), 185, Fig. 4.15d
Idiastion, 252
Idiolorhynchus andriashevi, 222
Idiolychnus urolampus, 199
Ijimaia, 187
Ijimaia loppei (Loppe's tadpole fish), 187, Fig. 4.16
IKMT
Isaacs-Kidd Mid-Water Trawl, 60
illegal, unreported and unregulated (IUU) catches, 390
illicium, 301–2, 304–5, 307, 309, 311, 313
Iluocoetes, 280
Ilyophinae subfamily, 158
Ilyophis, 53, 158, 316, 356, 359
Ilyophis saldanhai, 360, Table 5.9
Imaging systems, 61–5
immune system, 136
Indian Ocean
bathyal demersal fish fauna, 341
mesopelagic fishes, 333
Indo-Pacific Pocket Basins
mesopelagic fishes, 333
Infauna, 111
ink sac, 205
Insentiraja, 155
International Code for Zoological Nomenclature, 36
Ioichthys, 173
Ipnopidae, deep-sea tripod fishes, 82, 111, 188, 190, 362
Ipnops, 125, 191
Ipnops agassizii (grideye fish), 191, Fig. 4.17a
Iran, 17, 396
iris, 123
Isistius, 132, 145, 366
Isistius brasiliensis (cookie cutter shark), 146, Fig. 4.4a
Istiophoridae, 289
Isurus, 158
IUU, 390
Iwamoto, Tomio, 46, Table 1.3
Japan
deep-sea fishing, 363
Japan Trench, 2, 13, 24, 43, 231, 263, 358
Japan, fisheries, 141, 234, 238, 273, 384, 387, 389, 391, 393, 395–7, 399
Japonoconger, 161
Japonolaeops dentatus, 296
Japonolycodes, 279
jaw morphology of macrouridae, 213
jellyfish, 74, 149, 235, 286, 291–3
Jellynose, 186, Fig. 4.16
jellynose fishes, 82
Johnson Sea Link, see HOV
Johnsonina eriomma, 300
Jordan, David Starr, 42
Kali, 284
Kali macrodon, 285, Fig. 4.32f
Kamoharua megastoma, 296
Kathetostoma, 286, 342
Kermadec Trench, 50, 353, 356
kidneys, 118
Kingklip, 231, 287, 389, 397
Fishery, 382, Table 6.2
kitefin sharks, 145
Krefflichthys anderssoni, 200
Krusensterniella, 277
K-T extinction, 75, 77
Kumba, 218
Kurile-Kamchatka Trench, 43
Kuronezumia, 218
Kuroshio current, 27, 203, 333
Kurtoidei, 265
Lactate dehydrogenase (LDH) activity, 88, 90, 362, Fig. 3.2a
Laemonema, 224
Lagiocrusichthys, 193
Lagocephalus lagocephalus, 301
Lake Baikal, 2
Lamna, 150
Lamnidae, 150
LAMNIFORMES, 149–50
Lampadena, 200, 335
Lampanyctini, 200
Lampanyctodes hectoris (Hector's lanternfish), 196, 199, 335, 396, Fig. 4.18a
Fishery, 381, Table 6.2
Lampanyctus, 117, 200, 205, 318
Lampanyctinae, 198–9
Lampichthys procerus, 200
Lampridae, Opahs, 204
LAMPRIFORMES, 82, 203
fishery, 396
Lampris, 203–4, 396
Lampris guttatus (opah), 204, Fig. 4.19a
Lamprogrammus, 233
Lancetfish 194, Fig. 4.17c
Lander, 51, 61
baited sea floor and tethered, 61, Fig. 1.47
operating principle, 52, Fig. 1.34
language of science, 49
Lanternfish, 99, 196, Fig. 4.18
Lantern shark, 145, 148, Fig. 4.4b
lanternbellies, 265
Lasiognathus, 309
Lasiognathus beebeyi, 312, Fig. 4.35e
lateral line, 92, 113, 119, 121, 134–5, 142, 177, 190–1, 233–5, 246, 274
lateral line system, 121, 135, 142
Latimeria chalumnae (Coelacanth), 65, 70, 85, 314, Fig. 4.36
Latimeria menadoensis, 315
Latimeridae, gombessas, coelocanths, 314
Latin language, 49
Lepidion, 63, 224, 347
Lepidion lepidion (Mediterranean codling), 224, Fig. 4.25c
Lepidoblepharon ophthalmolepis, 294
Lepidocybium flavobrunneum, 289
Lepidocybium flavobrunneum (escolar), 289, Fig. 4.32g
Lepidonotothen squamifrons, 281
Lepidoperca, 268
Lepidophanes, 200, 334
Lepidopodinae, 290
Lepidopus, 290

- Lepidopus caudatus*, Fishery, 382, Table 6.2
- Lepidorhombus*, 84, 294, 399
- Lepidorhombus whiffiagonis* (megrim), 294, Fig. 4.33a
Fishery, 382, Table 6.2
- Lepidorhynchus denticulatus*, 218
- Lepidotrigla*, 253
- Lepophidium*, 229
- Leptacanthichthys gracilispinis*, 309
- Leptobrotula breviventralis*, 233
- Leptocephalus, 80, 126, 155–7, 161, 359, Fig. 4.10
Halosauroropsis, 156, Fig. 4.11
Notacanthus, 156, Fig. 4.11
- Leptocephalus giganteus*, 156–7, Fig. 4.11
- Leptochilichthys*, 169
- Leptoderma*, 169–70
- Leptostomias*, 89, 185, 320
- Lesser Silver smelt, 384
Fishery, 383, Table 6.2
- Lestidiops*, 194
- Lestrolepis*, 131, 194
- Letholycus*, 280
- Leucicorus*, 233
- Leucobrotula adipata*, 238
- Leucogrammolycus brychios*, 279
- Leucoraja*, 154
- Leuroglossus*, 117, 175, 320
- life cycle of deep-sea fishes, 1, 57, 65, 70, 85, 91, 161, 166, 358–9, 401
- Light
mesopelagic 122, Fig. 3.22
- light organ, 127, 173, 185, 219, 265
Acropoma, 265
of *Coccorella ventralis*, 194
Coelorinchus, 217
Coryphaenoides, 217
Eurypharynx, 163
squaliformes, 145
Kumba, 218
Linophryne, 131
Malacephalus, 219
Odontomacrus, 219
Paralepididae, 194
perianal in *Chlorophthalmus*, 131, 188
Steindachneria, Luminous hake, 222
- lightfish, 180, Fig. 4.15c
- Lindbergichthys*, 281
- Ling, 36, 226, 384, 389, 398, 403
Fishery, 381, Table 6.2
- Linkenchelys*, 158
- Linnaeus, Carl, 36
- Linophryne*, 313
Light organs, 131
- Linophryne algibarbata*, 313, Fig. 4.35f
- Linophrynidae, leftvent seadevils,, 313
- Lioscorpius*, 252
- Liparidae, Liparids, snailfishes, 44, 72, 84, 92, 102, 112, 116, 125, 344, 348–9, 356, 358
- Liparis*, 260, 262
- Lipariscus*, 260
- Lipariscus nanus*, 264
- lipid buoyancy, 138
- Lipogenys*, 156
- Lipolagus*, 175
- lizardfish, 187, 191, Fig. 4.17a
- Lobianchia*, 199
- Lonchopisthus lemur*, 268
- long line, 52, 149, 151, 156, 212, 244, 282
- longevity, 244
- Longfin escolar, 287
- longneck eel, 161
- Lophelia* deep sea coral, 403
- Lophiidae, goosefishes, monkfish, anglerfish, 85, 302
- LOPHIIFORMES, 85, 299, 301–13
- Lophiodes*, 302
- Lophiomus setigerus*, 302
- Lophius*, 36, 105, 108, 114, 119, 132, 302, 364, 389, 400
- Lophius piscatorius*, Fishery, 381, Table 6.2
- Lophius vomerinus*, Fishery, 382, Table 6.2
- Lophodolos*, 307
- Lophodolos acanthognathus* (whalehead dreamer), 310, Fig. 4.35d
- Lopholatilus chamaeleonticeps*, 270, 399
- Lopholiparis flerxi*, 263
- Lophotodidae, crestfishes, 205
- Lophotus*, 205
- Lotinae, 226
- Lowe, Robert T., 37
- Loweina*, 203
- luciferin, 132
- Lucigadus*, 218
- Luciobrotula*, 233
- Luciosudis*, 190
- luminous fluid, 168
- Luminous hake, 210, 222, Fig. 4.25b
- luminous organ, see light organ
- luminous roughly, 131
- Lumpenella longirostris* (longsnout prickleback), 280, Fig. 4.32d
- lumpsucker, 260
- Lutjanidae, snappers, 273
- Lycenchelys*, 279
- Lycenchelys antarctica*, 279, Fig. 4.32d
- Lycodapus*, 279
- Lycodes*, 277, 340, 356
- Lycodichthys*, 119, 280
- Lycodinae, 277
- Lycogrammoides*, 279
- Lycinema*, 279
- Lycionodes*, 225
- Lyczoarces regani*, 280
- Lyczoarcinae, 280
- lymph system, 105
- Lyopsetinae, slender soles, 296
- Lyopsetta exilis*, 296
- Macroparalepis*, 195
- macrophyte, 108
- Macropinna*, 123, 173
- Macropinna microstoma* (barreleye), 173, Fig. 4.14a
- Macroramphosus scolopax* (longspine snipefish), 248, Fig. 4.30
- Macrorhamphosodes*, 300
- Macrorhamphosodes uradoi* (Trumpetsnout), 300, Fig. 4.34
- Macrosmia phalacra*, 214, 218
- Macrouridae, grenadiers, rattails, whiptails, 44, 83, 89, 92, 114, 120, 125, 134, 136, 301, 342–4, 348–9, 353, 356, 359, 362, 379, 387
diet and jaw protrusion index, 213, Fig. 4.23, Fig. 4.24
Fishery, 381, Table 6.2
- Macrourinae, 214
- MACROUROIDEI, 212
- Macrouroides inflaticeps* (inflated whiptail), 222, Fig. 4.25b
- Macrouroidinae, 222
- Macrourus*, 218, 340, 401
- Macrourus berglar* (roughhead grenadier), 218, Fig. 4.25a
- Macrourus carinatus*, Fishery, 382, Table 6.2
- Macruronus novaezelandiae*, Fishery, 381, Table 6.2
- Macrurocyttus*, 210
- Macruronidae, Southern Hakes, 220
- Macruronus*, 220
- Macruronus magellanicus*, 220, 379, 389

- Fishery, 381, **Table 6.2**
- Macruronus novaezelandiae* (Blue grenadier, hoki), 220, 389, 391, **Fig. 4.25b**
- Madeira, 24, 35, 37, 47, 159, 220, 252, 287, 290, 363, 394, 396, 398
- Maderia Abyssal Plain, 353
- Magadanichthys*, 277
- Magnisudis*, 195
- mako shark, 158
- Malacanthidae, tilefishes, 270
- Malacephalus*, 219
- Malacocephalus*, 220
- Malacocephalus laevis*
 jaw protrusion index 213, **Fig. 4.24**
- Malacocottus*, 259
- Malacoraja*, 154
- Malacosarcus macrostoma*, 240
- Malacosteinae, Loosejaws, 186
- Malacosteus*, 124, 131–2, 186
- Malacosteus niger* (stoplight loosejaw, red flashlight fish), 186, **Fig. 4.15d**
- Malakichthys*, 267
- Malthopsis*, 304
- management failure, 390
- Mancopsetta maculata*, 296
- Manducus*, 177
- manned submersible, see HOV, human occupied vehicle
- Manta*, ray, 153
- Margrethia*, 176
- Mariana Trench, 15, 356
- marine mammal
 shark injuries, 145
- Marine Stewardship Council, 384
- Marleyella*, 296
- marlin, 2, 150, 242
- Marukawichthys*, 257
- Mastigopterus imperator*, 233
- Masturus lanceolatus* (sharptail mola), 301, **Fig. 4.34**
- Mataeocephalus*, 219
- Maulisia*, 168
- Mauritania, Cape Verde
 mesopelagic fishes, 334
- Maurolicinae, Pearlsides, 177
- Maurolicus*, 118, 178, 320, 334–5
 fishery, 395
- Maurolicus muelleri*, Fishery, 382, **Table 6.2**
- Maynea*, 280
- Meadia*, 158
- Mediterranean Sea, 14, 23
- Abyssal fish fauna, 353
- bathyal demersal fish fauna, 340
- deep water formation, 23, **Fig. 1.18**
- geological history, 20
- map of deep basins, 15, **Fig. 1.13**
- mesopelagic fishes, 334
- Megachasma*, 150
- Megachasmidae, 150
- Megafauna, 111
- Megalomycter teevani*, 246
- Megalomycteridae, 83, 246
- megamouth shark, 150
- megrim, 294, **Fig. 4.33a**
 Fishery, 382, **Table 6.2**
- Melamphaes*, 240, 318, 320
- Melamphaidae, Bigscale fishes, 113, 240, 317–18, 320, 362, 397
- Melanocetidae, black sea devils, 305
- Melanocetus*, 121, 305
- Melanocetus johnsonii* (humpback anglerfish), 308, **Fig. 4.35c**
 heart size and water content 105, **Fig. 3.14**
 illustration *Validiva* report, 1906, 40, **Fig. 1.31**
- Melanolagus*, 175
- Melanolagus bericoides* (bigscale deepsea smelt), 175, **Fig. 4.14c**
- Melanonidae, pelagic cods, 225
- Melanonus*, 121, 125, 225, 317
- Melanostigma*, 277
- Melanostigma atlanticum* (Atlantic soft pout), 265, **Fig. 4.32d**
- Melanostomias*, 185
- Melanostomiinae, Scaleless black dragonfishes, 184
- Melatonin, 136
- Melodichthys hadrocephalus*, 237
- Mentodus*, 168
- Menziesichthys bacescui*, 263
- Mephisto fraserbrunneri*, 301
- Merlucciidae, hakes, 225
- Merluccius*, 225, 364, 379, 384, 387, 389, 394
- Merluccius capensis*, 225
 Fishery, 383, **Table 6.2**
- Merluccius capensis/paradoxus*, Fishery, 381, **Table 6.2**
- Merluccius gayi*, Fishery, 381, **Table 6.2**
- Merluccius paradoxus*, 225
- Merluccius paradoxus* (deep-water Cape hake), 225, **Fig. 4.25c**
- Merluccius polli*, Fishery, 383, **Table 6.2**
- Mesobius*, 219
- Mesopelagic
 light field, 122, **Fig. 3.22**
- Mesopelagic fishes
 Diel change in depth distribution, 319, **Fig. 5.1**
 Ecoregions, 319, **Fig. 5.2**
 Species occurrence by ecoregion, 321–32, **Table 5.1**
- mesopelagic zone
 definition, 6
- Messinian Salinity Crisis, 20, 340
- Metabolic enzyme activity
 depth relationship, 88, **Fig. 3.2**
- Metabolic rate
 depth relationship, 88, **Fig. 3.1**
- metamorphosis
Notacanthus, 157
- Metamorphosis, 155–6, 205, 229, 304–5, 311
- Metelectrona*, 203
- Meteorita erythroptis*, 237
- Mezozoic, 76
- Microichthys*, 270
- Microlophichthys microlophus*, 309
- Micromesistius australis*, 226
 Fishery, 381, **Table 6.2**
- Micromesistius poutassou* (blue whiting), 83, 171, 226, 248, 364, 379, 387, 391, **Fig. 4.25d**
 Fishery, 381, **Table 6.2**
- Microphotolepis*, 168
- Microstoma*, 171, 320
- Microstomatidae, pencil smelts, 171, 318
- Microstomus pacificus*, 296
- Mid-Atlantic Ridge, 156–7, 163, 216, 219, 318, 338, 341, 359, **Fig. 5.5**
- middle depths fishery, New Zealand, 384
- mid-ocean ridge, 6, 10–11, 46, 212, 234, 335, 349
 Map of distribution 11, **Fig. 1.10**
- Mirapinna, 246
- Mirapinna esau* (hairyfish), 246, **Fig. 4.29a**
- Mirapinnidae, 83, 246
- Mirognathus*, 169
- Miroscyllium*, 149
- Mirrorbelly, 173, **Fig. 4.14b**
- Mitsukurina*, 149
- Mitsukurina owstoni* (goblin shark), 149, **Fig. 4.6**
- Mitsukurinidae, 149, 362

- MOCNESS, 60
Multiple Opening/Closing Net and Environmental Sensing System, 60
- Mola mola*, 301, Fig. 4.34
- Molidae, ocean sunfishes, 301
- Mollisquama*, 145
- Molva dypterygia*, 226, 398
Fishery, 382, Table 6.2
- Molva molva*, 36, 226, 384
Fishery, 381, Table 6.2
- Monognathidae, one jaw gulpers, 80, 163
- Monognathus*, 87, 165
- Monognathus berteli*, 163, Fig. 4.12b
- Monolene*, 296
- Monomitopus*, 233
- Monomitopus nigripinnis*, group, 233
- Monomitopus pallidus*, group, 233
- Monomitopus torvus*, group, 233
- Mora moro*, 37, 90, 225, 341, 397
- moray cod, 212
- Moray eel, 159
- Moridae, Deepsea cods, 222
- Mullidae, goatfishes, 274
- Muraenesocidae, pike congers, 162
- Muraenidae, Moray eels, 159
- Muraenolepididae, eel cods or moray cods, 82, 212
- Muraenolepidoidei, 210
- Muraenolepis*, 212
- Muraenolepis microps* (smalleye moray cod), 212, Fig. 4.25a
- Murray, John, 38, 41
- Muscle, 102–3
diameters of red and white fibres, 103, Fig. 3.12
Proportion of red fibres, 102, Fig. 3.11
- myocardium, 104
- Myctophid, 196, Fig. 4.18
- Myctophid larvae, 196, Fig. 4.18c
- Myctophidae, lanternfishes, 82, 117, 125, 149, 196, 198, 207, 316–17, 319, 334, 362, 365
- MYCTOPHIFORMES, 82, 131–2, 196–203
- MYCTOPHIFORMES, fishery, 395
- Myctophinae, 198, 200
- Myctophini, 203
- Myctophum*, 93, 99, 125, 198, 203, 334
punctatum (lanternfish), Plate 6a
- Myctophum selenops* larva, 202, Fig. 4.18c
- Myliobatidae, 153
- MYLIOBATIFORMES (stingrays), 152–3
fishery, 394
- Myroconger*, 159
- Myrocongridae, 159
- Myxine*, 35–6, 139, 347, 391
- Myxine glutinosa* (Atlantic hagfish), 139, Fig. 4.1
- Myxini, 69–70, 335, 348
- Myxinidae, Fishery, 383, Table 6.2
- MYXINIFORMES, hagfishes, 139
- Myxininae, 76, 139
- Nalbantichthys elongatus*, 276
- Nannobranchium*, 100, 125, 200
- Nannobranchium atrum* (Dusky lanternfish), 200, Fig. 4.18b
- Nannobranchium regale* larva, 202, Fig. 4.18c
- Nansenia*, 171
- Nansenia groenlandica* (Greenland argentine), 171, Fig. 4.14a
- Narctes*, 169–70
- Narcine*, 152
- Narcinidae, 152
- Narkidae, 152
- narrownecked eel, 161, Fig. 4.12a
- Nautila*, submersible, See HOV
- Nealotus tripes*, 289
- Nectoliparis*, 260
- Nectoliparis pelagicus* (tadpole snailfish), 260, Fig. 4.31e
- Nemamyxine*, 139
- Nematops*, 296
- Nemichthyidae, snipe eels, 158, 165, 362
- Nemichthys*, 135, 165–6
snipe eel, Plate 4a
- Nemichthys scolopaceus* (Slender snipe eel), 163, Fig. 4.12b
- Nemipteridae, threadfin breams, 273
- Neoachirosetta milfordi* (finless flounder), 294, 296, Fig. 4.33a
- Neobythites*, 134, 234
- Neobythites analis* (Black-edged cusk-eel), 234, Fig. 4.26b
- Neobythitinae, 134, 231, 356
- Neobythitoides serratus*, 234
- Neocaristius heemstrai*, 271
- Neoceratias spinifer* (Spiny seadevil), 305–6, Fig. 4.35b
- Neoceratiidae, toothed seadevil, 305
- Neocetropogon mesedai*, 253
- Neocyema*, 163
- Neocyttus*, 208, 293, 347, 396
- Neopinnula*, 289
- Neomerinthe*, 252
- Neomyxine*, 139
- Neonesthes*, 182
- Neopagetopsis*, 283
- Neophrynichthys heterospilos*, 259
- Neoraja*, 154
- Neoscombrops*, 267
- Neoscopelidae, blackchins, 196
- Neoscopelus*, 196, 344
- Neoscopelus microchir* (Shortfin neoscopelid), 196, Fig. 4.18a
- Neosebastidae, 252
- Neoselachii, 77
- Nesiarchus nasutus*, 289
- Nessorhamphus*, 161, 166
- Net avoidance by fishes, 196, 365, 396
- Nettastoma*, 162
- Nettastoma melanurum* (blackfin sorcerer), 162, Fig. 4.12a
- Nettastomatidae duckbill eels, 162
- neuromasts, 135, 233, 238
- New Hebrides Trench, 356
- New Zealand, 34, 38, 84, 141
EEZ fisheries, 2, 143, 169, 208, 216–17, 220, 226, 230, 244, 251, 255, 268, 273–4, 291, 363, 391, 393, 396–402
- Nezumia*, 118, 136, 219, 341, 347, 401
- Nezumia condylura*
jaw protrusion index, 213, Fig. 4.24
- Nezumia sclerorhynchus* (Roughtip grenadier), 219, Fig. 4.25a
- Nielsen, Jørgen, 44, Table 1.3
- Nomeidae, driftfishes, 291
- Normanichthyoidei, 249, 257
- Normichthys*, 168
- North Atlantic Drift
mesopelagic fishes, 334
- North Atlantic Ocean
demersal fishes, 335
- North Atlantic, Central
mesopelagic fishes, 334
- Norwegian Basin
deep demersal fish fauna, 340
- Notacanthidae (spiny eels), 156
- NOTACANTHIFORMES, 156–8
- Notacanthus*, 36, 125, 133, 156, 401
- Notacanthus chemnitzii* (Snubnosed spiny eel), 156, Fig. 4.11
- Notocetichthys trunovi*, 246
- Notolepis*, 195
- Notoliparis*, 125, 263, 356, 358
- Notoliparis antonbruuni*, 358

- Notoliparis kermadecensis*, 263
 Hadal snailfish, 249, Fig. 4.31e,
 Plate 8a
 Notolychnini, 198
Notolychnus valdiviae (Topside lampfish),
 196, 198, 317, 334, Fig. 4.18a
Notolycode, 280
Notomuraenobathys microcephalus, 212
Notomyxine, 139
Notophycis, 225
Notoraja, 155
Notoscopelus, 41, 100, 199
 Notosudidae, waryfishes, 42, 190
Notothenia, 281
 Nototheniidae, cod icefishes, 84, 281
 NOTOTHENIOIDEI, 84, 265, 280–3, 344
Nototheniops, 281
 numbfish, 152
Nybelinella, 237
- OAE, 68, 75
 Oceanic Anoxic Event, 75
 oarfish, 70, 135
 OBIS
 Ocean Biogeographic Information
 System, 49
Obliquogobius turkayi, 287
 Ocean
 Basin Formation, 6
 ocean acidification, 405
 ocean margin, 335
 Map of Active and Passive, 9, Fig. 1.7
 passive, active, fore arc and back arc
 basins, 8, Fig. 1.6
 Ocean perch, 251, 384, 398
 Ocean sunfish, 301
 Oceanic Crust
 Formation and sea floor spreading, 6,
 Fig. 1.5
 Odontaspidae, 149, 362
Odontaspis, 149
Odontoliparis, 260
Odontomacrus murrayi, 219
Odontostomias, 185
Odontostomops normalops, 194
 Ogocephalidae, batfishes, 85, 303
Ogocephalus, 304
Oidophorus, 279
 Oilfish, *Ruvettus*, 290, 316, 366, 390, 398
 Fishery, 381, Table 6.2
Okamejei, 154
 olfactory and gustatory systems, 133
 Olfactory bulb, 119
- Omosudidae, Hammerjaws, 194
Omosudis, 194
Oneirodes, 309, 335
Oneirodes krefftii (Krefft's dreamer), 312,
 Fig. 4.35e
 Oneirodidae, Dreamers, 307
Opaeophacus acrogeneus, 276
 Opah, 203–4, 396
Ophichthus, 162
 Ophidiidae, cusk eels, 72, 229–35
 OPHIDIIFORMES, 44, 83, 228–38
 Ophidiinae, 134, 229
 OPHIDIOIDEI, 228
Ophthalmolycus, 279
 Opisthoproctidae, Barrel eyes or
 spookfishes, 172
Opisthoproctus, 173
Opisthoproctus grimaldii (mirrorbelly),
 173, Fig. 4.14b
Opisthoproctus soleatus (barreleye), 173,
 Fig. 4.14b
Opistognathus leprocarus, 268
Opostomias, 185
 Optic tectum, 119
 Orange roughy, 40, 83, 93, 101, 111, 241,
 244, 270, 343–4, 364–5, 388, 393,
 396, 401, Fig. 4.28b
 Fishery, 382, Table 6.2
 oranges, 401
 oreo, 208
Oreosoma atlanticum, 208
 Oreosomatidae, oreos, 208
 organic matter, 31
 OSMERIFORMES, 395
Osteodiscus, 263
Ostichthys kaianus, 245
 Ostracoberycidae, Shellskin alfonosinos,
 268
Ostracoberyx, 268
Ostracoberyx dorygenus, 268, Fig. 4.32b
 Ostracoderms, 72
 Otocephala, Subdivision, 166
 otolith, 134
 Otter trawl, 56
 ovoviviparity, 145
Owstonia, 275
 Oxygen
 concentration in seawater, 25, 26,
 Fig. 1.20, Fig. 1.21
 saturation of haemoglobin, 94,
 Fig. 3.6
 secretion in swim bladder, 95,
 Fig. 3.7
- Transport into the deep sea, 21,
 Fig. 1.16
 Oxygen consumption, 88, Fig. 3.1
 Oxygen Minimum Zone (OMZ), 25, 75,
 104, 286, 333, Fig. 1.21
 Oxynotidae, 78, 147, 341
Oxynotus, 147, 392
Oxynotus bruniensis (prickly dogfish),
 145, Fig. 4.4a
- Pachycara*, 88, 279
Pachycara caribbaeum, 279, 360,
 Table 5.9
Pachycara gymninium, 88, 279, 360,
 Table 5.9
Pachycara rimae, 279, 360, Table 5.9
Pachycara saldanhai, 265, 279, 360,
 Table 5.9, Fig. 4.32d
Pachycara sulaki, 360, Table 5.9
Pachycara thermophilum, 279, 360,
 Table 5.9
Pachystomias, 132, 185
 Pacific Ocean, 20
 mesopelagic fishes, 319
 Pacific ocean perch, 84, 251, Fig. 4.31a
 Fishery, 381, Table 6.2
 Pacific Ocean
 bathyal fish fauna, 344
 mesopelagic fishes, 319
Paedophryne amanuensis, 313
Pagellus bogaraveo, 273
Pagothenia, 281
 Palaeozoic fishes, 74
Palmoliparis beckeri, 260
 Pangaea, 16–17, 20, 68
 Panthallasa, 17
Parabembras, 255
 Parabemridae, deep-water flatheads, 255
Parabothus, 296
Parabrotula, 238
Parabrotula plagiophthalma (false cusk),
 238, Fig. 4.26c
 Parabrotulidae, false brotulas, 235, 238
Paracallionymus costatus, 287
 Paracaristiinae, 271
Paracaristius, 271
Paracetonus flagellicauda, 219
Paradiplospinus, 289
Paraheminodus murrayi, 253
Parahollandia, 301
 Paralepididae, barracudinas, 82, 113, 194,
 362
Paralepis, 195

- Paralichthyidae, sand flounders, 84, 294
Paraliparis, 102, 112, 260, 262–3, 340, 356
Paraliparis bathybius (black seasnail), 264, Fig. 4.31e
Paramyxine, 139
Paranotothenia, 281
Parasciadonus, 237
Parascolopsis, 273
parasites
in deep-sea fishes, 136
parasitic males of Ceratioid anglerfish, 304
Parasudis, 188
Parataeniophorus, 247
Parateleopus, 187
Paratrachichthys trailli, 244
Paratriacanthodes, 301
Paraulopidae, 188
Paraulopus, 188
Parazen pacificus, 208
Parazenidae, smooth dories, 208
parental care, 116, 118, 358
Paristiopterus, 275
Parmaturus, 151
Parmops echinatus, 131, 242
particulate organic matter, 30–1, 34, 73, 108, 198, 353, 358
Parvilux, 200
Patagolycus, 280
Patagonian grenadier, 220, 379, 389
Fishery, 381, Table 6.2
Patagonian toothfish, 84, 199, 281, 366, 390, 398, 400
Fishery, 381, Table 6.2
Patagonotothen, 281
Pavoraja, 155
pearl organ, 193
pearleye, 193, Fig. 4.17b
pearlfishes, 83, 228
Pearlsides, 177
Pectinatus, 168
Pelagic Armorheads, 275
pelagic basslet, 265
Pelagic deep sea fishes, 317–35
pelagic trawl, 60
pelagic trawlers, 251, 387, 391
pelican eel, 163, Fig. 4.12b
penis, 235, 238
Penopus, 234
Penopus microphthalmus, 234, Fig. 4.26b
Pentaceros, 274, 365, 399–400, 404
Pentaceros richardsoni (pelagic armourhead), 275, Fig. 4.32c
Pentaceros wheeleri, 275
Pentacerotidae, armorheads, 274
Pentacerotinae, 274
Pentanchus, 151
Pentherichthys, 307
Percichthyidae, 265
PERCIFORMES, 264–94
Percis, 257
PERCOIDEI, 265
Percophidae, duckbills, 286
Peristediidae, armoured searobins, armoured gurnards, 253
Peristedion, 253
Peristedion truncatum (black armoured searobin), 253, Fig. 4.31b
Perspasia, 168
Peru–Chile Trench, 358
Peruvian hake, 225
Petromyzon, 36, 69, 141, 348
Petromyzontidae, 141
PETROMYZONTIFORMES, 141
Phenacoscorpius, 252
pheromone, 133, 165
Pholidichthyoidei, 265, 286
Phosichthyidae, lightfishes, 130, 176, 317, 320, 362
Phosichthys, 180
Photocorynus spiniceps, 313
Photonectes, 185
photophore, (also see light organs), 132, 145, 149, 168, 175, 177–8, 180, 186, 198, 284
red-light emitting in *Malacosteus*, 186
red-light emitting in *Pachystomias*, 185
of Scopelarchids, modified muscle, 193
Photostomias, 89, 131, 186
Photostylus, 121, 168
Photostylus pycnopterus (starry smooth-head), 168, Fig. 4.13
photosynthesis, 1, 6, 10, 21, 30
Phucocoetes, 280
Phycinae, Phycid hakes, 227
Phycis blennoides, Fishery, 383, Table 6.2
Phyllorhinichthys, 309
Physiculus, 225
physoclist, 93
physostome, 93
phytodetritus, 30
Piccard, Jacques, 47
Piedrabuenia, 280
piezolytes, 91
Pink cusk-eel, 230, 366, 389, 397
Fishery, 381, Table 6.2
pipefishes, 248
piscivores, 108, 111, 320
Plagiogeneion, 273, 399
Plagiopsetta, 297
planktivor, 150
Platyberyx, 271
Platycephalidae, flatheads, 255
Platycephaloidei, 249, 253
Platyroctidae, 81
Platyroctes, 168
Platyroctidae, tubeshoulders (Searsiidae), 81, 113, 127, 132, 166, 168, 318, 362
Plectrogeniidae, stinger flatheads, 253
Plectrogenium, 253
Plectrogenium nanum, 253, Fig. 4.31b
Plesienchelys, 280
Plesiobatidae, 152
Plesiobatis, 152
Plesiobatis daviesi (Deepwater stingray), 152, Fig. 4.8
Pleuragramma, 281
Pleuronectidae, righteye flounders, 84, 296
PLEURONECTIFORMES (flatfishes), 83, 294
Pliotrema, 144
poacher, 257
Poecilopsetta, 296
Poecilopsetta beanii (deepwater dab), 297, Fig. 4.33b
Poecilopsettinidae, bigeye flounders, 296
Pogonolycus, 280
Pogonophryne, 119, 283
Pogonophryne permitini (finespotted plunderfish), 282, Fig. 4.32e
Polar Abyssal fish fauna, 356
Pollichthys, 180
Polyacanthonotus, 156, 348, 401
Polyipnus, 178
Polyipnus polli (round hatchetfish), 179, Fig. 4.15b
Polymetme, 180
Polymixia, 83, 207, 316, 396
Polymixia nobilis (Stout beardfish), 207, Fig. 4.20
Polymixiidae, beardfishes, 207
POLYMIXIIFORMES, 83, 207
fisheries, 396
Polyprion, 37, 267, 291, 399

- Polyprion americanus* (wreckfish), 267, Fig. 4.32a
- Polyprionidae, Wreckfishes, 267
- polyunsaturated fatty acids (PUFAs), 359
- Pontinus*, 252, 398
- pop-up. See Lander
- Porcupine Abyssal Plain, 353
- Porcupine Seabight
 demersal fish assemblage, 335
- Porichthys*, 131
- Porichthys bathoiketes*, 238
- Porogadus*, 234
- Poromitra*, 117, 135, 240, 320
- Poromitra atlantica*, 240, Fig. 4.27
- Poromitra capito*
 heart size and water content 105, Fig. 3.14
- Portugal, 148
- Portugal, fishery, 35, 248, 363, 396, 398
- Portuguese dogfish 149, Fig. 4.4b
- Praya reticulata*, 272
- predators, 108
- pressure, 90–1
 adiabatic heating of seawater, 23
 and depth limits, 138
 effects on cell membranes, 90
 effects on enzyme reactions, 90
 effects on fishes, 87
 effects on metabolism, 91
 effects on muscle contraction, 103
 lethal effects, 87
 sensing, 134
- pricklefishes, 239, 241
- prickly shark, 145, Fig. 4.4a
- primary production, 28, 31, 34, 73, 108
- Priolepis goldshmidtae*, 287
- PRISTIFORMES, 152
- Pristiophoridae, 144
- PRISTIOPHORIFORMES, 78, 144
- Pristiophorus*, 145
- Procetichthys krefftii* 246, 248, Fig. 4.29b
- Prognathodes guyotensis*, 274
- Prognatholiparis ptychomandibularis*, 263
- Promethichthys prometheus*, 289
- Promyllantor*, 161
- Promyllantor purpureus*, 162, Fig. 4.12a
- Pronotogrammus*, 268
- Proscylliidae, 152
- proteins, muscle, 90
- Protogrammus sousai*, 287
- Protomyctophum*, 99, 200, 320
- Protosciaena*, 273
- protrusible jaws, 82, 149, 205, 207, 282–3
- Psammobatis*, 155
- Pseudnos*, 260, 264
- Pseudnos griseus*, 264, Fig. 4.31e
- Psenopsis*, 291
- Pseudanthias*, 268
- Pseudobathylagus*, 175
- Pseudocetonurus septifer*, 219
- Pseudochaenichthys*, 283
- Pseudocyttus maculatus*, 208, 393, 396
 Fishery, 382, Table 6.2
- Pseudohowellia intermedia*, 265
- Pseudoliparis*, 43, 263, 358
- Pseudoliparis amblystomopsis*, 43, 263
- Pseudonezumia*, 219
- Pseudonotoliparis rassi*, 263
- Pseudonus*, 235
- Pseudopentaceros*, 275, 344
- Pseudoplichthys*, 161
- Pseudoscopelus*, 83, 131, 284
- Pseudoscopelus altipinnis*, 284, Fig. 4.32f
- Pseudotriakidae, 152, 393
- Pseudotriakis*, 152, 393
- Pseudotriakis microdon* (false catshark), 152, Fig. 4.7
- Psychrolutes*, 259
- Psychrolutes phricus* (blob sculpin), 259, Fig. 4.31d
- Psychrolutidae, fathead sculpins and blobfish, 257, 259
- Pterothrissus*, 155, 395
- Pterothrissus gissu* (Japanese gissu), 155, Fig. 4.10
- Pterygotrigla*, 253, 398
- Pterygotrigla picta* (Spotted gurnard), 253, Fig. 4.31b
- Puck pinnata*, 309
- Puerto Rico Trench, 231
- Pycnocraspedum*, 234
- pygmy ribbontail catshark, 151, Fig. 4.7
- Pyramodon*, 229
- Pyramodontinae, 229
- Pyrolycus manusanus*, 279, 361, Table 5.9
- Pyrolycus moelleri*, 361, Table 5.9
- Pyrosoma*, 169, 275
- r and K selection, 114
- Rabbitfish 143, Fig. 4.2
- Racovitza*, 283
- Radiicephalidae, tapertails, 205
- Radiicephalus elongatus* (tapertail), 205–6, Fig. 4.19b
- ragfish 285–6, Fig. 4.32f
- Raja*, 36, 154, 340, 394
- Rajella*, 69, 79, 154–5
- Rajella bigelowi* (Bigelow's ray), 154, Fig. 4.9
- Rajidae, 79, 153, 348, 359
 Antarctica, 344
- RAJIFORMES, 153
 fisheries, 394
- Rajinae (Hardnose skates), 153
- Rastrinus scutiger*, 257
- rate of population increase, 114, 244
- ration, 114
- rattails, 212
- rays, skates, 152–5, Fig. 4.9
- recreational fishing. See gamefish
- Red cusk-eel, 231
- red flashlight fish, 183, Fig. 4.15d
- Red Sea, 14
- Red Sea Bream, 273
- Red Snapper, 397
- redfish, 66, 84, 244, 251, 390, 395, 398
- Regalecus*, 36, 70, 82, 135, 203, 205
- Regalecus glesne* (king of herrings), 207, Fig. 4.19b
- Regaliciidae, oarfishes, 205
- Regan, Charles Tate, 42, 45, Table 1.3
- Reinhardtius*, 296
- Reinhardtius hippoglossoides* (Greenland halibut), 214, 218, 295–6, 340, 363, 379, 384, Fig. 4.33a
 Fishery, 381, Table 6.2
- reproductive adaptations, 118
- research vessels and expeditions, 50
Albatross Sweden, 43
Albatross USFCS, 39
Alpha Helix, 44
Atlantis II, 44
Atlantis, 234
Challenger HMS, 38–9, 56, 212
Dana, 42
Discovery, 44
G. O. Sars, 61
Galathea, 43
Haku Maru, 44
Hirondelle, 40
James Cook, 50
Jean Charcot, 44
John Elliot Pillsbury RV, 43
Kaharoa, 50
Lighting HMS, 38
Mabahiss, 42
Melville, 44

- research vessels and expeditions (cont.)
Meteor, 42, 44
Michael Sars, 41
Point Lobus, 50
Porcupine HMS, 38
Princess Alice, 40
Talisman, 39
Travailleur, 39
Valdivia, 39, 58
- respiration, 362
- rete mirabile, 93–6, Fig. 3.4, Fig. 3.5
 gas secretion, 97, Fig. 3.7
 length with depth, 98, Fig. 3.8a
- retina, 123, 190
 ganglion cell densities, 125
- Rexea*, 289
Rexea solandri, 289
Rexichthys johnpaxtoni, 289
Rhadinesthes, 182
Rhamphocetichthys savagei (Savage's
 birdsnouted whalefish), 247–8,
 Fig. 4.29b
Rhincodon, 149
Rhinobatos, 152
Rhinochimaera, 142–3
Rhinochimaera atlantica (Straightnose
 rabbitfish), 143, Fig. 4.2
Rhinoliparis, 260, 263
Rhinoraja, 155
Rhinosolea microlepidota, 294
Rhodichthys regina, 264
Rhodichthys, 260
Rhynchactis, 311
Rhynchogadus hepaticus, 225
Rhynchohyalus, 123, 173
Rhynchohyalus natalensis (glasshead
 barreleye), 173, Fig. 4.14b
Ribaldo, 397
 ribbonfish, 205, 246
 Ridge scaled rattail, Fishery, 382, Table 6.2
 Ring net, 58
 Ring of Fire
 Pacific Ocean active margin, 9, Fig. 1.7
Rinoctes, 169
Rinoctes nasutus (abyssal smooth-head),
 167, 170, Fig. 4.13
 Risso, Antoine, 2, 37, 49, 293, 404–5
 Portrait 37, 45, Fig. 1.28, Table 1.3
 RMT
 Rectangular mid-water trawl, 59
Robia legula, 305
Robinsichthys arrowsmithensis, 287
 rockcod, 281
 rockfish, 251–2, 398
 rockling, 226
Rondeletia, 245
Rondeletia loricata (Redmouth whalefish),
 245, Fig. 4.29a
 Rondeletiidae, redmouth whalefishes, 83,
 245
 Root effect 95, 362, Fig. 3.6
Rosenblattia, 270
Rosenblattichthys, 193
 Rosy seabass, 267
 rough sharks, 147
 roughly, 242
Rouleina, 168
 Roundnose grenadier, 387
 Fishery, 382, Table 6.2
 ROV remotely operated vehicle, 64–5,
 156–7, 236, 260, 302
Isis, 64, Fig. 1.49
Jason, 311
Kaiko, 48
Nereus, 48
Ventana, 50
Rubicundus, 139
 rubyfish, 273
 Rudderfish, 291
Ruvettus pretiosus, 63, 100, 290, 316, 363,
 390, 398
 Fishery, 381, Table 6.2
- Sablefish 249, 255, 387, 398, 400, Fig. 4.31c
 Fishery, 381, Table 6.2
 sabretooth fish 192, 194, Fig. 4.17b
Saccogaster, 235
 Saccopharyngidae, swallowers, 80, 163, 318
 SACCOPHARYNGIFORMES, 163
Saccopharynx, 127, 163
Saccopharynx ampullaceus (gulper eel),
 163, Fig. 4.12b
Sagamichthys, 168
 salps, 30, 170, 175, 196, 199, 203, 273,
 275, 281, 291–3
 Samaridae, crested flounders, 297
Samariscus, 297
Samariscus longimanus (longfinned
 flounder), 297, Fig. 4.33b
 San Diego Trough, 47
 sand tiger shark, 149
Santelmoa, 280
 SARCOPTERYGII, 85, 314–16
Sarritor, 257
Satyricthys, 254
 sawbelly, 242
 sawsharks, 144
 scabbardfish, 287, Fig. 4.32g
Scalicus orientalis, 255
 Scavenging and non-scavenging fishes,
 92, Fig. 3.3b
 scavenging fishes (necrophages), 30–1,
 48, 73, 112–13, 159, 356
 arrival time at bait, 112, Fig. 3.17
 size in relation to depth, 92
Schedophilus, 291
Schroederichthys, 151
Sciadonus, 125, 237
 Sciaenidae, drums, croakers, 273
Scomber, 104–5, 141, 388, 391
 Scombridae, 289
 SCOMBROIDEI, 265, 289
 Scombrolabracidae, longfin escolar, 287
 Scombrolabraoidei, 265
Scombrolabrax heterolepis (longfin
 escolar), 287–8, Fig. 4.32g
 Scombroproidae, gnomefishes, 270
Scombrops, 270, 301
 Scopelarchidae, pearleyes, 193, 362
Scopelarchoides, 193
Scopelengys, 196
Scopelengys tristis (Pacific blackchin),
 196, Fig. 4.18a
Scopeloberyx, 240, 318–19
Scopelogadus, 113, 121, 125, 240, 320
Scopelopsis multipunctatus, 200
Scopelosaurus, 123, 190
Scopelosaurus lepidus (blackfin waryfish),
 190, Fig. 4.17a
 Scopthalmidae, turbot, 84, 294
Scorpaena, 252, 398
Scorpaena scrofa (Red scorpionfish), 250,
 252, Fig. 4.31a
 Scorpaenidae, Scorpionfishes, 84, 252
Scorpaenodes, 252
 SCORPAENOIDEI, 84, 249
 scorpionfish, 249, 252, Fig. 4.31a
 sculpin, 257, 259
 Scyliorhinidae, 78, 151, 342, 393
Scyliorhinus, 135, 151
Scymnodalatis, 149
Scymnodon, 149, 392–3
 sea lamprey, 69, 141, 348
 Sea of Japan
 mesopelagic fishes, 333
 seamount, 6, 10, 46, 210, 257, 267, 275,
 287, 302, 340, 344, 349, 402
Adelosebastes, 251
 Bathysauridae, 191

- breeding grounds, 118
 classification, knolls, oceanic islands, 10
 Congrid eels, 161
 fishery, 275, 279, 289, 293, 396, 399–400, 404
 fishes, 103, 319, 349, Fig. 5.6
 geological origin, 6
 Halosaurs, 156
 hatchet fish, 178
 hydrothermal vent, 359
 lightfish, 180, 320
 Macrouridae, 218
 Myctophidae, 199
 sharks, 147
Searsia, 168
Searsia koefoedi (Koefoed's searsid), 167, Fig. 4.13
 searsid, 168, Fig. 4.13
 Searsiidae, 168
Searsioides, 168
Sebastes, 66, 84, 171, 251, 340, 344, 384, 390, 395, 398
Sebastes aleutianus, 251
Sebastes alutus (Pacific ocean perch), 84, 250–1, Fig. 4.31a
 Fishery, 381, Table 6.2
Sebastes marinus, 340, 390
Sebastes mentella, 251, 390, 398
 Fishery, 381, Table 6.2
Sebastes norvegicus, 84, 251
 Sebastidae, rockfishes, 84, 249
Sebastobus, 47, 251
 secondary circulatory system, 105
 secondary deep-water fish fauna, 85
 sediment trap, 31, 34
 Seine Abyssal Plain, 353
 Selachii (Sharks), 71, 75, 77, 79, 143–52
Selachophidium, 234
Seleniolytus, 277
 Semelparity, 117
 sensory perception, 119
Seriola lalandi, 271
Seriola caerulea, 291, 391, 399
Seriola caerulea, Fishery, 383, Table 6.2
 Serranidae, sea basses and groupers, 267
Serrivomer, 125, 165–6, 317, 319
Serrivomer beanii (Stout sawpalate), 165, Fig. 4.12b
Serrivomer sector
 Gill size 104, Fig. 3.13
 Serrivomeridae, sawtooth eels, 165
Setarches guntheri, 252
Setarches longimanus, 252
 Setarchidae, deep-sea bristly scorpionfishes, 252
 Setubal artisanal shark fishery, 38
 Sexual dimorphism, 85, 118, 131, 133, 149, 165, 184–5, 231, 234, 238, 246, 283, 287, 304, 313
 Shallow-water Cape hake, Fishery, 383, Table 6.2
 Sharks, 143–52
 fisheries, 145
 oil, 393
 origins, 77
Shinkai See HOV
 ship. Exploration voyages, research vessel, See research vessel
 shoulder organs
 of Platytroctidae luminescence, 127, 132, 168
Sigmops, 105, 177, 319
Sigmops bathyphilus
 eye 124, Fig. 3.24c
Sigmops elongatum
 heart size and water content, 105, Fig. 3.14
 eye, 123, Fig. 3.24c
 Silver gemfish, 289
 Silver roughly, 244
 Silver scabbardfish, 290
 Fishery, 382, Table 6.2
 silver smelts, Fishery, 381, Table 6.2
 Silvery lightfish, Fishery, 382, Table 6.2
 silvery reflective skin, 127, 205
Simenchelys, 158
Sio nordenskjoldii, 240, 397
 Siphonophorae, 271
 sixgill shark, 144, Fig. 4.3
 Sixgill stingray, 152, Fig. 4.8
 size in relation to depth, 91
 size and shape variation with depth, 92, Fig. 3.3.
 skates and rays, 152–5
 Skilfish, 255
 skin taste buds, 121
 Skinnycheek lanternfish, Fishery, 382, Table 6.2
Sladenia, 302
Sladenia remiger (Celebes monkfish), 302, Fig. 4.35a
 sleeper shark, 148
 slickheads, 167, 168–71, Fig. 4.13
 slimeheads, 242–4, Fig. 4.28b
 smallest mature vertebrate, 313
 Smalleye catshark, 151, Fig. 4.7
 smelts, marine, 171–5, Fig. 4.14c
 smooth-heads, 168–71, Fig. 4.13
 Smooth oreo dory, Fishery, 382, Table 6.2
 snailfish, 249, 260–4, Fig. 4.31e
Careproctus, Plate 7b
 snipe eel, 163, Fig. 4.12b
 snipefish, 248, Fig. 4.30
Snyderidia, 229
Snyderidia canina, 229, Fig. 4.26a
 sodium pump, 90
 Soleidae, soles, 297
Solivomer, 196, 333
Solocisquama, 304
 Somali Current
 mesopelagic fishes, 333
 Somniosidae, 148
Somniosus, 116, 145, 148, 366
 sound, 133
 produced by deep-sea fish, 134
 South Africa, fisheries, 42, 143, 199, 220, 225, 231, 244, 249, 272, 275, 291, 384, 388, 391, 395–400
 South China Sea, 333
 South Fiji Basin, 353
 South Pacific hake, Fishery, 381, Table 6.2
 Southern blue whiting, 226
 Fishery, 381, Table 6.2
 Southern Ocean, 42, 84–5, 139, 143, 155, 175–6, 181, 194, 199, 212, 216–18, 224–5, 233, 259–60, 262–4, 277, 279–84, 289, 319, 335, 344, 362, 387, 397
 Soviet Union, 384, 387, 390, 396, 399
 deep-sea fishing fleet, 363
 Spain, fishery, 148, 384, 387, 396–8
 Sparidae, sea breams, porgies, 273
 species complexes, 362
 species richness, 132, 335, 339, 344, 349, 402
Spectrunculus, 108, 112, 234, 349, 353, 359, 366, 397
Spectrunculus grandis (Pudgy cuskeel), 234, Fig. 4.26b
Sphagemacrurus, 220
Sphenanthias, 276
Sphyrnaops, 270
Spicomacrurus, 220
Spicomacrurus kuronumai
 jaw protrusion index, 214, Fig. 4.24
 spiderfish, 191, Fig. 4.17a
Spiniphryne, 307

- spiny eel, 156, Fig. 4.11
spookfishes, 82, 171–3
squalene, 96–7, 100, 392–3
Squalidae, 148, 342, 359, 362
SQUALIFORMES, 145–9
Squaliolus, 145
Squalogadus modificatus, 222
Squaloliparis flerxi, 263
Squalomorphii, Superorder, 78, 144–9
Squalus, 36, 75, 78, 148, 393
Squalus montalbani (Indonesian greeneye spurdog), 148, Fig. 4.4b
squaretail, 293
Squatina, 145, 391
Squatinae, 145
SQUATINIFORMES, 145, 391
stalked eyes, 175
Stein, David, 46, Table 1.3
Steindachneria argentea (Luminous hake), 221–2, 228, 341, Fig. 4.25b
Steindachneriidae, Luminous Hakes, 222
Stemonidium, 165
Stemonosudis, 195
Stenobranchius, 99–100, 117, 200, 319
Stephanoberycidae, pricklefishes, 239
STEPHANOBERYCIFORMES, 83, 239–41
fishery, 397
Stephanoberyx monae, 239–40, Fig. 4.27
Stereolepis, 267
Sternoptychinae, Hatchetfishes, 128, 133, 177, 178
Sternoptychidae, hatchetfishes, 82, 99, 125, 127, 130, 176, 317, 320, 333, 335, 362
Sternoptyx, 36, 125, 127, 133, 178, 320
Sternoptyx diaphana (Diaphanous hatchet fish), 178, Fig. 4.15b
Stichaeidae, pricklebacks, 280
sting ray, deepwater, 152
stingaree, 152, 394
stingrays, 152, Fig. 4.8
Stlengis, 257
Stomias, 37, 99, 180, 182, 320
Stomias boa boa (Boa dragonfish), 182, Fig. 4.15d, Plate 5b
Stomiidae, barbeled dragonfishes, 82, 113, 130, 132, 176, 180, 182, 317–18
STOMIIFORMES, 130, 132, 175–86
fishery trials, 395
Stomiinae, dragonfishes & viperfishes, 182
stoplight fish, 186
STROMATEOIDEI, 265, 291, 293
Stygiomedusa,
fish-jellyfish association, 236
Stylephoridae, tube eye, thread tail, 210
STYLEPHORIFORMES, 210
Stylephorus, 83
Stylephorus chordatus (tube-eye), 82, 122, 125, 210, Fig. 4.22
stylophthalmine larvae
eyes on stalks, 175
subduction, 7, 12, 15, 17, 20–1
Subsistence fishermen, 367
sucking disc, 238, 260
suction feeding, 207, 212, 358
Sudis, 195
Sudis hyalina, 195, Fig. 4.17c
Sulu Sea, 13, 196, 333
sustainable fishery, 244, 384, 387–92, 400–1, 403, 405
swallower, 284
swim bladder, 87, 93, 138, Fig. 3.4, Fig. 3.5
gas secretion, 97, Fig. 3.7
gaunine content and depth, 96, Fig. 3.8b
oxygen storage, 228
pneumatic duct, 93
sound detection, 134
sound production, 133
swimming speed
maximum, 102
optimum, 106
tracked deep sea fish, 108, Fig. 3.16
Swordfish, 289
symbiosis
Caristiidae – siphonophore, 271
Liparids and crabs, 262
Thalassobathia – jellyfish, 235–6
Symbolophorus, 99, 203
Symphurus, 297, 299, 359
Symphurus maculopinnis, 299, 361, Table 5.9
Symphurus thermophilus (Western Pacific tonguefish), 299, 361, Table 5.9, Fig. 4.33b
Symphysanodon, 267
Symphysanodon berryi (slope bass), 267, Fig. 4.32a
Symphysanodontidae, slope fishes, 267
Synagrops, 267, 334
Synaphobranchidae, cutthroat eels, 80, 120, 125, 158, 316, 342, 353, 356, 359, 362
Synaphobranchinae, subfamily, 159
Synaphobranchus, 37, 63, 91, 104, 125, 136, 159, 401
Synaphobranchus affinis
Gill size, 104, Fig. 3.13
Syngnathidae, pipefishes and seahorses, 249
SYNGNATHIFORMES, 248, 398
SYNODONTOIDEI, 188
Taaningichthys, 198, 200, 335
Taaningichthys paurolychnus, 200, Fig. 4.18b
Tactostoma, 101, 185
TAENOSOMI, 204
tag
data logger, 67
pop-up, 67, 108
satellite, 108
tracking of eels, 67, 166
tagging of fishes, 65
Talismania, 169–70
Talismania bifurcata (threadfin slickhead), 170, Fig. 4.13
Tanaka, Shigeho, 41
tapertail, 205
tapetum, 124–5, 190
Taranetzella, 279
Tarletonbeania, 100, 203
Tarletonbeania crenularis (Blue lanternfish), 203, Fig. 4.18b
larva, 202, Fig. 4.18c
Tasman Sea
mesopelagic fishes, 333
Tasmania, 342
taste buds, 133
Tauredophilidium hextii, 234
Teleostei, origins, 73
telescope fish, 192
Telescopefish, 192, Fig. 4.17b
Temnocora candida, 263
temperate ocean basses, 265
Temperature–depth profiles
Arctic, Atlantic, Mediterranean, 25, Fig. 1.20
tenaculae
in male chimaeras, 142
Tethys Ocean, 17, 20, 79
Tethys Seaway, 20
Tetragonuridae, squaretails, 293
Tetragonurus, 293
Tetragonurus cuvieri (smalleye squaretail), 292, Fig. 4.32h
Tetraodontidae, puffers, 301
TETRAODONTIFORMES, 299, 300, 301, 313

- Tetrapturus angustirostris*, 289
Tetrarogidae, waspfishes, 253
Thalassenchelys, 161
Thalassobathia pelagica, 235,
Fig. 4.26c
Thaumatoichthyidae, wolftap anglers,
309
Thaumatoichthys, 108, 309, 311
Thaumatoichthys axeli, 312, Fig. 4.35e
Theragra chalcogramma, 226
Thermarces andersoni, 279, 361, Table 5.9
Thermarces cerberus, 279, 361,
Table 5.9
Thermarces pelophilum, 279, 361, Table 5.9
Thermichthys hollisi, 235, 237, 359–60,
Table 5.9, Fig. 4.26c
Thermobiotus, 158
Thermobiotus mytilogeiton, 360, Table 5.9
thermohaline circulation, 22, 75, 405
Thomson, Charles Wyville, 38
Thorogobius rofeni, 287
Thorophos, 178
Threadfin rockling, 226
thresher shark, 150
Thunnus maccoyii, 289
Thyrsites, 290
Thyrsitoides marleyi, 290
Thyrsitops lepidopoides, 290
Thysanactis, 185
Time sense in the deep sea, 135
Timorichthys disjunctus, 237
tinseltfish, 210
tinseltfish, 210–11 Fig. 4.21b
TMAO, 91, 137–8
Tongaichthys robustus, 290
tooth plates, 142
toothed whales, 166
TORPEDIFORMES, 152
Torpedinidae, 152
Torpedo, electric ray, 152
Tosarhombus, 296
total world marine fish catch, 365
toxicity
of *Tetragonus*, 293
Trachichthyidae, roughies, 83,
242–4
TRACHICHTHYOIDEI, 241
Trachichthys australis, 244
TRACHINOIDEI, 265, 283
Trachipteridae, ribbon fishes, 205
Trachipterus, 205, 396
Trachipterus arcticus (dealfish), 205,
Fig. 4.19b
Trachonurus, 220
Trachurus, 271
Trachyrinchidae, roughnose grenadiers, 222
Trachyrincinae, 222
Trachyrincus, 222, 337, 341, 343,
Table 5.2, Table 6.1, Fig. 4.25b
Trachyrincus murrayi (roughnose
grenadier), 222, Fig. 4.25b
Trachyscorpia, 251, 398
tracking of fishes, 65, 316
sharks, 149–50
Code activated transponder system, 66,
Fig. 1.53
grenadier ingesting transmitter, 66,
Fig. 1.52
transparency
means of camouflage, 125
trap. See Capture methods
trawl. See Capture methods
trawling environmental impact, 403
Trematomus, 281
Triacanthidae, 299
Triacanthodes, 301
Triacanthodidae, spike fishes, 299
Triakidae, 152
Triassic–Jurassic extinction, 74
Trichiuridae, cutlassfishes, hairtails,
290–1
Trichiurus, 291
Trieste, see HOV
Trigla, 253
Triglidae, searobins, gurnards, 253
Triglops scepticus, 257
Trigonolampa, 185
Tri-methyl amine oxide, see TMAO
Tripnoturus, 100, 117, 200, 320
Triplophos, 177
tripod fishes, 89, 93, 125, 187, 190,
Fig. 4.17a
Tripterochthys, 225
Trophic guilds of deep-sea fishes. 108,
Table 3.2
Tuamotuichthys, 237
Tubbia tasmanica, 291
tube-eye, 210, Fig. 4.22
tubular eye, 122–3, 125, 173, 193
Tucker trawl, 59
tuna, 2, 104, 150, 178, 194, 204, 242, 273,
289, 390
turbidite flow, 9
Tusk, 226, 384
Fishery, 381, Table 6.2
Tydemania navigatoris, 301
Tylerius spinosissimus, 301
Typhlonus nasus, 234
Tyrannophryne pugnar, 309, 312, Fig. 4.35e
Uncisudis, 196
United Kingdom, 41, 398
Upeneus davidaromi, 274
upwelling, 25, 28, 34–5, 122–3, 127, 171,
199–200, 225, 319–20, 334, 342
Uranoscopidae, stargazers, 286
urea, 91, 138
Urolophidae, 152
Urolophus, 152, 394
Urophycis cirrata (Gulf hake), 210, 227,
Fig. 4.25d
Valenciennellus, 133, 178
Valenciennellus tripunctulatus
(Constellationfish), 175, Fig. 4.15a
Vargula, 132, 159
Veliferidae, velifers, 204
Venefica, 162
Ventichthys biospeedoi (East-Pacific vent
brotula), 231, 234, 359, 360, Table
5.9, Fig. 4.26b
Ventrifossa, 220, 301
Verasper, 296
vertical migration, 30, 150, 165, 176, 198,
238, 317, Fig. 5.1
vestmentiferan tube worms, 359
vexillifer larva of Carapidae, 228
Vinciguerria, 82, 180, 320, 335
Vinciguerria attenuata (Slender lightfish),
180, Fig. 4.15c
viperfish, 182, Fig. 4.15d
Vision, 121–5
Vitiazella cubiceps, 248
Viviparity, 83, 152, 228, 235, 237–8, 251,
349, 359
VME, vulnerable marine ecosystem, 402
volcanoes, underwater
endemic fishes, 359
Volodichthys, 262
Vomeridens infuscipinnis, 283
Walsh, Don, 47
warm-blooded fish, 204
waryfish 187, 190, Fig. 4.17a
watery flesh, 166
West coast sole, Fishery, 382, Table 6.2
Whale carcass
hagfish, 141, Plate 2a
whalefish, 245, 318, 398

- whiptail, 216, Fig. 4.25a
 White warehou, 291, 399
 Fishery, 383, Table 6.2
 Willughby, Francis, 35
 winch for deep- sea cables, 50
 Winds
 Global atmospheric circulation, 27,
 Fig. 1.23
Winteria, 123
Winteria telescopa (binocular fish), 124,
 173, Fig. 4.14b
 wolffish, 280, Fig. 4.32d
Woodsia, 180
 Woodward, Arthur Smith, 41
 WoRMS
 World Register of Marine Species, 49
 Wreckfish, 267, 399, Fig. 4.32a

Xeneretmus, 257
Xenodermichthys, 85, 168–9
Xenodermichthys copei (bluntnout
 smooth-head), 169, Fig. 4.13

 heart size and water content, 105,
 Fig. 3.14
Xenolepidichthys, 210
Xenomystax, 161
Xenophthalmichthys, 171
Xenophthalmichthys danae, 172, Fig. 4.14a
Xiphias gladius, 289
Xyelacyba myersi, 104, 234
 Gill size, 104, Fig. 3.13

Yarella, 180

Zalieutes, 304
Zameus, 149
Zanclistius elevatus, 275
Zearaja, 154
 Zeidae, dories, 210
 ZEIFORMES, 82, 208–10
 fishery, 396
zeitgeber, 136
Zenion, 208
Zenion hololepis, 208, Fig. 4.21b

Zenionidae, armoreye dories, 208
Zenopsis, 210
Zenopsis conchifer (silvery john dory),
 210, Fig. 4.21b
Zesiticulus, 257
Zesticelus profundorum (flabby sculpin),
 257, Fig. 4.31c
Zeus, 210
Zoarcas, 276
 Zoarcidae, eelpouts, 72, 84, 111, 238,
 276–80, 339, 344, 348, 356,
 359
 Zoarcinae, 276
 ZOARCOIDEI, 265, 276
 Zoological nomenclature, International
 code, 36
 zooplankton, 30–1, 33, 108, 113,
 171, 180–1, 195, 198, 210,
 212, 226, 240, 273, 281,
 301, 364
Zu, 205
 zygoparity, 251