

INDEX

Fishery Bulletin: Vol. 86, No. 1-4

ABLE, KENNETH W.—see GRIMES et al.

"Accumulation of age pigments (lipofuscin) in two cold-water fishes," by Maria Vernet, John R. Hunter, and Russell D. Vetter, 401

"Age and growth of larval gulf menhaden, *Brevoortia patronus*, in the northern Gulf of Mexico," by Stanley M. Warlen, 77

"Age, morphology, developmental biology, and biochemical genetic variation of Yukon River fall chum salmon, *Oncorhynchus keta*, and comparisons with British Columbia populations," by Terry D. Beacham, Clyde B. Murray, and Ruth E. Withler, 663

"Age-specific vulnerability of Pacific sardine, *Sardinops sagax*, larvae to predation by northern anchovy, *Engraulis mordax*," by John L. Butler and Darlene Pickett, 163

Ageing studies
lipofuscin in larval fish, 401
menhaden, gulf, 77
see also Otoliths

Algae, benthic
recruitment of spiny lobsters, 331

Allocyttus sp.—see Oreo, black

Alosa sapidissima—see Shad, American

Alvinocaris markensis
new decapod crustacean species, 263

Alvinocaris muricola
new decapod crustacean species, 263

Alvinocaris spp.
key to species, 263

Alvinocaris stactophila
new decapod crustacean species, 263

AL-YAMANI, J.—see DAGG et al.

Amphipods
shrimp diets, 543

"Analyses of the relationship between the distribution of searching effort, tuna catches, and dolphin sightings within individual purse seine cruises," by Tom Polacheck, 351

Anchovy, northern
predation on sardine larvae, 163

Anoplopoma fimbria—see Sablefish

"Appendage injury in Dungeness crabs, *Cancer magister*, in south-eastern Alaska," by Susan M. Shirley and Thomas C. Shirley, 156

Apristurus brunneus—see Shark, scyliorhinid

Armorhead, pelagic
biogeography, 453

ARMSTRONG, DAVID A.—see ROGERS et al.

ARNOLD, CONNIE R.—see BROWN-PETERSON et al.

"Aspects of the biology of two scyliorhinid sharks, *Apristurus brunneus* and *Parmaturus xaniurus*, from the upper continental slope off southern California," by Jeffrey N. Cross, 691

Atheresthes evermanni—see Flounder, kamchatka

Atheresthes stomias—see Flounder, arrowtooth

Atlantic croaker
distribution and abundance, 129

BAGLIVO, JENNY A.—see BROUSSEAU and BAGLIVO

Banded drum
distribution and abundance, 129

BARLOW, JAY, "Harbor porpoise, *Phocoena phocoena*, abundance estimation for California, Oregon, and Washington: I. Ship surveys," 417

BARLOW, JAY, CHARLES W. OLIVER, TERRY D. JACKSON, and BARBARA L. TAYLOR, "Harbor porpoise, *Phocoena phocoena*, abundance estimation for California, Oregon, and Washington: II. Aerial surveys," 433

BARSHAW, DIANA E., and DONALD R. BRYANT-RICH, "A long-term study on the behavior and survival of early juvenile American lobster, *Homarus americanus*, in three naturalistic substrates: eelgrass, mud, and rocks," 739

Bass, striped
stomach contents, 397

BAYLIFF, WILLIAM H., "Integrity of schools of skipjack tuna, *Katsuwonus pelamis*, in the eastern Pacific Ocean, as determined from tagging data," 631

BEACHAM, TERRY D., CLYDE B. MURRAY, and RUTH E. WITHLER, "Age, morphology, developmental biology, and biochemical genetic variation of Yukon River fall chum salmon, *Oncorhynchus keta*, and comparisons with British Columbia populations," 663

BECKER, D. SCOTT, "Relationship between sediment character and sex segregation in English sole, *Parophrys vetulus*," 517

"Behavior of southern right whales, *Eubalaena australis*, feeding

feeding on the Antarctic krill, *Euphausia superba*," by William M. Hamner, Gregory S. Stone, and Bryan S. Obst, 143

Behavior studies

- English sole, 830
- lobster, American, 791
- plankton, 842

Biochemical genetics—see Genetic studies

Black drum

- distribution and abundance, 129
- trotline fishery, 109

BLAYLOCK, ROBERT A., "Distribution and abundance of bottlenose dolphin, *Tursiops truncatus* (Montagu, 1821), in Virginia," 797

Bluefish

- spawning season, 237

BOEHLERT, GEORGE W., and TAKASHI SASAKI, "Pelagic biogeography of the armorhead, *Pseudopentaceros wheeleri*, and recruitment to isolated seamounts in the North Pacific Ocean," 453

BOLZ, GEORGE R., and R. GREGORY LOUGH, "Growth through the first six months of Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, based on daily otolith increments," 223

Boonea impressa—see Snail, pyramidellid

Bootstrap method

- sablefish abundance, 445

BOURKE, ROBERT E.—see WATSON et al.

Breeding habits—see Reproductive studies

Brevoortia patronus—see Menhaden, gulf

BRILL, RICHARD W.—see WATSON et al.

BROOKS, E. R.—see MULLIN and BROOKS

BROUSSEAU, DIANE J., and JENNY A. BAGLIVO, "Life tables for two field populations of soft-shell clam, *Mya arenaria*, (Mollusca: Pelecypoda) from Long Island Sound," 567

BROWN-PETERSON, NANCY, PETER THOMAS, and CONNIE R. ARNOLD, "Reproductive biology of the spotted seatrout, *Cynoscion nebulosus*, in South Texas," 373

BRUCE, B. D., "Larval development of blue grenadier, *Macruronus novaezelandiae* (Hector), in Tasmanian waters," 119

BRYANT-RICH, DONALD R.—see BARSHAW and BRYANT-RICH

BUTLER, JOHN L.—see WATANABE et al.

BUTLER, JOHN L., and DARLENE PICKETT, "Age-specific vulnerability of Pacific sardine, *Sardinops sagax*, larvae to predation by northern anchovy, *Engraulis mordax*," 163

BUTLER, MARK J., IV—see HERRNKIND et al.

Bythograea mesatlantica

- new decapod species, 263

CAHOON, LAWRENCE B., and CRAIG R. TRONZO, "A comparison of demersal zooplankton collected at Alligator Reef, Florida, using emergence and reentry traps," 838

CALLAHAN, MICHAEL W.—see SEKI and CALLAHAN

Cancer magister—see Crab, Dungeness

Cancer oregonensis—see Crab, *Cancer*

Carbon isotopes

- shrimp diets, 543

Caridea: Bresiliidae

- key to species, 263

CASTRO, MARGARIDA, and KARIM ERZINI, "Comparison of two length-frequency based packages for estimating growth and mortality parameters using simulated samples with varying recruitment patterns," 645

Catsharks—see Shark, scyliorhinid

Chacellus filiformis

- bathymetric and geographic distribution, 67

Char, Arctic

- predation on salmon, 611

CHEN, CHE-TSUNG, TZYH-CHANG LEU, and SHOOU-JENG JOUNG, "Notes on reproduction in the scalloped hammerhead, *Sphyrna lewini*, in northeastern Taiwan waters," 389

CHESS, JAMES R.—see HOBSON and CHESS

Clam, soft-shell

- life tables, 567

Cod, Atlantic

- growth, 223

"Cojoined twin adult shrimp (Decapoda: Penaeidae)," by Austin B. Williams, 595

COLLINS, MARK R., and CHARLES A. WENNER, "Occurrence of young-of-the-year king, *Scomberomorus cavalla*, and Spanish, *S. maculatus*, mackerels in commercial-type shrimp trawls along the Atlantic coast of the southeast United States," 394

Cololabis saira—see Saury, Pacific

"A comparison of demersal zooplankton collected at Alligator Reef, Florida, using emergence and reentry traps," by Lawrence B. Cahoon and Craig R. Tronzo, 838

"Comparison of two length-frequency based packages for estimating growth and mortality parameters using simulated samples with varying recruitment patterns," by Margarida Castro and Karim Erzini, 645

- "A comprehensive theory on the etiology of burnt tuna," by Cheryl Watson, Robert E. Bourke, and Richard W. Brill, 367
- CONOVER, DAVID O.—see NYMAN and CONOVER
- Copepod nauplii
distribution and abundance, 319
- COSTON-CLEMENTS, LINDA—see HOSS et al.
- COUTU, J.-M.—see DUTIL and COUTU
- COWAN, JAMES H., JR., and RICHARD F. SHAW. "The distribution, abundance, and transport of larval sciaenids collected during winter and early spring from the continental shelf waters off west Louisiana," 129
- Crab, *Cancer*
occurrence off British Columbia, 525
- Crab, Dungeness
abundance, 603
appendage injury, 156
dissolved oxygen levels, 604
megalopae associations, 299
- Crab, Gulf stone
megalopa stage, 289
- CRANE, S. A.—see DAVIES et al.
- Crassostrea gigas*—see Oyster, Japanese
- Crassostrea virginica*—see Oyster, American
- CRECCO, VICTOR A.—see SAVOY and CRECCO
- Croaker, Atlantic
metabolic responses to temperatures, 483
- Croaker, white
food-seeking, 251
- CROSS, JEFFREY N. "Aspects of the biology of two scyliorhinid sharks, *Apristurus brunneus* and *Parmaturus xaniurus*, from the upper continental slope off southern California," 691
- Crustacean, decapod
bathymetric and geographic distribution, 67
- CURRENS, KENNETH P., CARL B. SCHRECK, and HIRAM M. LI. "Reexamination of the use of otolith nuclear dimensions to identify juvenile anadromous and nonanadromous rainbow trout, *Salmo gairdneri*," 160
- Cynoscion arenarius*—see Seatrout, sand
- Cynoscion nebulosus*—see Seatrout, spotted
- Cynoscion regalis*—see Weakfish
- DAGG, M. J., P. B. ORTNER, and J. AL-YAMANI. "Winter-time distribution and abundance of copepod nauplii in the northern Gulf of Mexico," 319
- DAVIES, N. M., R. W. GAULDIE, S. A. CRANE, and R. K. THOMPSON. "Otolith ultrastructure of smooth oreo, *Pseudocyttus maculatus*, and black oreo, *Allocyttus* sp., species," 499
- DEW, C. BRAXTON. "Stomach contents of commercially caught Hudson River striped bass, *Morone saxatilis*, 1973–1975," 397
- Diet—see Food habits
- Disease studies
oysters, American, 553
- Dissodactylus juveniles*
bathymetric and geographic distribution, 67
- Dissolved oxygen levels
prawn mortality, 601
- "The distribution, abundance, and transport of larval sciaenids collected during winter and early spring from the continental shelf waters off west Louisiana," by James H. Cowan, Jr. and Richard F. Shaw, 129
- "Distribution and abundance of bottlenose dolphin, *Tursiops truncatus* (Montagu, 1821), in Virginia," by Robert A. Blaylock, 797
- DITTY, JAMES G., GLEN G. ZIESKE, and RICHARD F. SHAW. "Seasonality and depth distribution of larval fishes in the northern Gulf of Mexico above latitude 26°00'N," 811
- DOERZBACHER, JEFF F.—see McEACHRON et al.
- Dolly Varden
salmon predation, 613
- Dolphin, bottlenose
population studies, 797
- Dolphin, spotted
sightings within tuna, purse seine cruises, 351
- DUTIL, J.-D., and J.-M. Coutu. "Early marine life of Atlantic salmon, *Salmo salar*, postsmolts in the northern Gulf of St. Lawrence," 197
- Early marine life of Atlantic salmon, *Salmo salar*, postsmolts in the northern Gulf of St. Lawrence," by J.-D. Dutil and J.-M. Coutu, 197
- "An econometric analysis of net investment in Gulf shrimp fishing vessels," by John B. Penson, Jr., Ernest O. Tetty, and Wade L. Griffin, 151
- Economic studies
fishery capital stock and investment approach, 339
shrimp fishing vessels, 151
tuna, "burnt", 367
- "The effect of the ectoparasitic pyramidellid snail, *Boonea impressa*, on the growth and health of oysters, *Crassostrea virginica*, under field conditions," by Elizabeth A. Wilson, Eric N. Powell, and Sammy M. Ray, 553
- "The effects of siltation on recruitment of spiny lobsters, *Panulirus argus*," by William F. Herrnkind, Mark J. Butler IV, and Richard A. Tankersley, 331

- El Niño
ichthyoplankton off Chile, 1
- "Electrophoretic identification of early juvenile yellowfin tuna, *Thunnus albacares*," by John E. Graves, Marie A. Simovich, and Kurt M. Schaefer, 835
- ELSTON, RALPH A.—see FARLEY et al.
- EMLÉN, JOHN M.—see McINTYRE et al.
- English sole
population studies, 826
- Engraulis mordax*—see Anchovy, northern
- Environmental studies
ichthyoplankton off Chile, 1
rockfish, blue, 715
see also Feeding habitats; Habitat studies
- Enzymes
tuna, "burnt", 367
- EPIFANIO, CHARLES E., DAVID GOSHORN, and TIMOTHY E. TARGETT, "Induction of spawning in the weakfish, *Cynoscion regalis*," 168
- ERZINI, KARIM—see CASTRO and ERZINI
- "Estimation of natural mortality in fish stocks: A review," by E. F. Vetter, 25
- Estuarine studies
shrimp, penaeid, 543
- Eubalaena australis*—see Whales, southern right
- Euchirograpsus americanus*
bathymetric and geographic distribution, 67
- Euphausia superba*—see Krill, Antarctic
- "Evaluation of variability in sablefish, *Anoplopoma fimbria*, abundance indices in the Gulf of Alaska using the bootstrap method," by Michael F. Sigler and Jeffrey T. Fujioka, 445
- "Experimental manipulation of population density and its effects on growth and mortality of juvenile western rock lobsters, *Panulirus cygnus* George," by Richard F. Ford, Bruce F. Phillips, and Lindsay M. Joll, 773
- "Extractable lipofuscin in larval marine fish," by M. M. Mullin and E. R. Brooks, 407
- FARLEY, C. AUSTIN, PETER H. WOLF, and RALPH A. ELSTON, "A long-term study of 'microcell' disease in oysters with a description of a new genus, *Mikrocytos* (g. n.), and two new species, *Mikrocytos machini* (sp. n.) and *Mikrocytos roughleyi* (sp. n.)," 581
- "The feeding habits of two deep slope snappers, *Pristipomoides zonatus* and *P. auricilla*, at Pathfinder Reef, Mariana Archipelago," by Michael P. Seki and Michael W. Callahan, 807
- Feed habitats
mesotide areas, 703
see also Food habits
- "A field method for determining prey preferences of predators," by N. B. Hargreaves, 763
- FELDER, DARRYL L.—see MARTIN et al.
- FINN, JAMES E.—see McINTYRE et al.
- Fish habitats—see Habitat studies
- FISHER, JOSEPH P.—see PEARCY and FISHER
- Fishery, commercial
capital stock and investment approach, 339
flounder, yellowtail, 91
Hawaiian handline, 367
reducing bycatch using trotline, 109
tuna, 351, 367
- Fishes
associations with crab megalopae, 299
- Flatfish
population studies, 826
- Flounder, arrowtooth
morphological comparison, 608
- Flounder, gulf
growth studies, 832
- Flounder, kamchatka
morphological comparison, 608
- Flounder, yellowtail
variation in CPUE, 91
- Food habits
bass, striped, 397
croaker, white, 251
rockfish, blue, 717
salmon, Pacific, 213
salmon postsmolts, 197
salmon predation, 613
shark, scyliorhinid, 697
shrimp, penaeid, 543
snapper, 807
whales, southern right, 143
- "Food habits and daily ration of Greenland halibut, *Reinhardtius hippoglossoides*, in the eastern Bering Sea," by M. S. Yang and P. A. Livingston, 675
- "Food pathways associated with penaeid shrimps in a mangrove-fringed estuary," by Allan W. Stoner and Roger J. Zimmerman, 543
- FORD, RICHARD F., BRUCE F. PHILLIPS, and LINDSAY M. JOLL, "Experimental manipulation of population density and its effects on growth and mortality of juvenile western rock lobsters, *Panulirus cygnus* George," 773
- FUJIOKA, JEFFREY T.—see SIGLER and FUJIOKA

"Functional regression equations for zooplankton displacement volume, wet weight, dry weight, and carbon: A correction," by Peter H. Wiebe, 833

"Further support for the hypothesis that internal waves can cause shoreward transport of larval invertebrates and fish," by Alan L. Shanks, 703

Gadus morhua—see Cod, Atlantic

GAULDIE, R. W.—see DAVIES et al.

Gear, trawls
crab sampling, 529

Genetic studies
salmon, chum, 665

Genyonemus lineatus—see Croaker, white

Glycogen, muscle
spawning of sea scallop, 597

GOSHORN, DAVID—see EPIFANIO et al.

GOULD, EDITH, DIANE RUSANOWSKY, and DONNA A. LUEDKE, "Note on muscle glycogen as an indicator of spawning potential in the sea scallop, *Placopecten magellanicus*," 597

GRAVES, JOHN E., MARIE A. SIMOVICH, and KURT M. SCHAEFER, "Electrophoretic identification of early juvenile yellowfin tuna, *Thunnus albacares*," 835

GREEN, ALBERT W.—see McEACHRON et al.

Grenadier, blue
larval development, 119

GRIFFIN, WADE L.—see PENSON et al.

GRIMES, CHURCHILL B., CHARLES F. IDELBERGER, KENNETH W. ABLE, and STEPHEN C. TURNER, "The reproductive biology of tilefish, *Lopholatilus chamaeleonticeps* Goode and Bean, from the United States Mid-Atlantic Bight, and the effects of fishing on the breeding system," 745

"Growth of Pacific saury, *Cololabis saira*, in the northeastern and northwestern Pacific Ocean," by Yoshiro Watanabe, John L. Butler, and Tsukasa Mori, 489

Growth studies
cod, Atlantic, 223
flounder, gulf, 832
haddock, 223
lobster, American, 789
lobster, spiny, 775
menhaden, gulf, 77
saury, Pacific, 489
tropical fish, 645

"Growth through the first six months of Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, based on daily otolith increments," by George R. Bolz and R. Gregory Lough, 223

GUNDERSON, DONALD R.—see ROGERS et al.

Habitat studies
fishing effects, 746
mesotide areas, 703
lobster, American, 791
rockfish, blue, 719

Haddock
growth, 228

Halibut, Greenland
food habits, 675

HAMNER, WILLIAM M., GREGORY S. STONE, and BRYAN S. OBST, "Behavior of southern right whales, *Eubalaena australis*, feeding on the Antarctic krill, *Euphausia superba*," 143

Haplosporidium nelsoni
parasitic effects on oysters, 553

"Harbor porpoise, *Phocoena phocoena*, abundance estimation for California, Oregon, and Washington: I. Ship surveys," by Jay Barlow, 417

"Harbor porpoise, *Phocoena phocoena*, abundance estimation for California, Oregon, and Washington: II. Aerial surveys," by Jay Barlow, Charles W. Oliver, Terry D. Jackson, and Barbara L. Taylor, 433

HARGREAVES, N. B., "A field method for determining prey preferences of predators," 763

Hatchery studies
salmon, coho, 173
smolt release, 655

Hedonic approach
fishery capital stock and investment, 339

HERRNKIND, WILLIAM F., MARK J. BUTLER IV, and RICHARD T. TANKERSLEY, "The effects of siltation on recruitment of spiny lobsters, *Panulirus argus*," 331

HOBSON, EDMUND S., and JAMES R. CHESS, "Trophic relations of the blue rockfish, *Sebastes mystinus*, in a coastal upwelling system off northern California," 715

Homarus americanus—see Lobster, American

HOSS, DONALD E., LINDA COSTON-CLEMENTS, DAVID S. PETERS, and PATRICIA A. TESTER, "Metabolic responses of spot, *Leiostomus xanthurus*, and Atlantic croaker, *Micropogonias undulatus*, larvae to cold temperatures encountered following recruitment to estuaries," 483

Humboldt Current area
ichthyoplankton off Chile, 1

HUNTER, JOHN R.—see VERNET et al.

Hydrothermal discharge
Alvinocaris spp., 263

Ichthyoplankton—see Plankton studies

IDELBERGER, CHARLES F.—see GRIMES et al.

Identification methods
tuna, yellowfin, 835

"Induction of spawning in the weakfish, *Cynoscion regalis*," by Charles E. Epifanio, David Goshorn, and Timothy E. Targett, 168

"Integrity of schools of skipjack tuna, *Katsuwonus pelamis*, in the eastern Pacific Ocean, as determined from tagging data," by William H. Bayliff, 631

"Interannual variation of ichthyoplankton composition and abundance relations off northern Chile, 1964–85," by Valerie J. Loeb and Omar Rojas, 1

JAHN, A. E., D. M. GADOMSKI, and M. L. SOWBY, "On the role of food-seeking in the suprabenthic habit of larval white croaker, *Genyonemus lineatus* (Pisces: Sciaenidae)," 251

JAMIESON, GLEN S., and ANTAN C. PHILLIPS, "Occurrence of *Cancer* crab (*C. magister* and *C. oregonensis*) magalopae off the west coast of Vancouver Island, British Columbia," 525

JAMIESON, GLEN S., and ELLEN K. PIKITCH, "Vertical distribution and mass mortality of prawns, *Pandalus platyceros*, in Saanich Inlet, British Columbia," 601

JOLL, LINDSAY M.—see FORD et al.

JOUNG, SHOOU-JENG—see CHEN et al.

Kingfish, southern
distribution and abundance, 129

KIRKLEY, JAMES E., and DALE E. SQUIRES, "A limited information approach for determining capital stock and investment in a fishery," 339

KOSKI, K V.—see MURPHY et al.

Krill, Antarctic
feeding of whales, 143

Larimus fasciatus—see Banded drum

"Larval development of blue grenadier, *Macruronus novaezealandiae* (Hector), in Tasmanian waters," by B. D. Bruce, 119

Larval studies
cod, Atlantic, 223
continental shelf, 703
copepod nauplii, 319
crab, cancer, 525
crab, Dungeness, 299
crab, Gulf stone, 289
croaker, Atlantic, 483
croaker, white, 251
fishes, 299
grenadier, blue, 119

haddock, 223
ichthyoplankton off Chile, 1
lipofucin for ageing, 407
menhaden, gulf, 77
mesotide areas, 703
northern Gulf of Mexico, 811
sardine, Pacific, 163
sciaenids, 129
spot, 483

Laurencia spp.—see Algae, benthic

Leiostomus xanthurus—see Spot

"Length-weight relationships for gulf flounder, *Paralichthys albigutta*, from North Carolina," by Glen W. Safrit and Frank J. Schwartz, 832

LEU, TZYH-CHANG—see CHEN et al.

LI, HIRAM M.—see CURRENS et al.

Life history studies
clams, soft shell, 567
juvenile Pacific salmon, 213
shark, scyliorhinid, 691

"Life tables for two field populations of soft-shell clam, *Mya arenaria*, (Mollusca: Pelecypoda) from Long Island Sound," by Diane J. Brousseau and Jenny A. Baglivo, 567

"A limited information approach for determining capital stock and investment in a fishery," by James E. Kirkley and Dale E. Squires, 339

LIN, BIING-HWAN, and NANCY A. WILLIAMS, "Specifying a functional form for the influence of hatchery smolt release on adult salmon production," 655

Line transect methods
porpoise, harbor, 429

Lipofuscins
ageing methods, 401
larval marine fish, 407

Lithodes maja
bathymetric and geographic distribution, 67

LIVINGSTON, P. A.—see YANG and LIVINGSTON

Lobster, American
behavior and survival, 789

Lobster, spiny
population studies, 773
siltation and recruitment, 331

LOEB, VALERIE J., and OMAR ROJAS, "Interannual variation of ichthyoplankton composition and abundance relations off northern Chile, 1964–85," 1

"A long-term study of 'microcell' disease in oysters with a description of a new genus, *Mikrocytos* (g. n.), and two new species, *Mikrocytos mackini* (sp. n.) and *Mikrocytos roughleyi* (sp. n.)," by C. Austin Farley, Peter H. Wolf, and Ralph A. Elston, 581

"A long-term study on the behavior and survival of early juvenile American lobster, *Homarus americanus*, in three naturalistic substrates: eelgrass, mud, and rocks," by Diana E. Barshaw and Donald R. Bryant-Rich, 789

Lopholatilus chamaeleonticeps—see Tilefishes

LOUGH, R. GREGORY—see BOLZ and LOUGH

LUEDKE, DONNA A.—see GOULD et al.

Mackerel, king

occurrence of in shrimp trawls, 394

Mackerel, Spanish

occurrence of in shrimp trawls, 394

Macruronus novaezelandiae—see Grenadier, blue

MARTIN, JOEL W., FRANK M. TRUESDALE, and DARRYL L. FELDER, "The megalopa stage of the Gulf stone crab, *Menippe adina* Williams and Felder, 1986, with comparison of megalopae in the genus *Menippe*," 289

Mathematical methods

abundance survey, 448

chi-square tests, 634

CPUE for yellowtail flounder, 91

investment in shrimp fishing vessels, 151

length-frequency distribution, 645

mortality in fish stocks, 25

population estimates, 617

regression equations, 833

salmon survival, 655

MATLOCK, GARY C.—see McEACHRON et al.

MAYO, RALPH K.—see O'Brien and MAYO

McEACHRON, LAWRENCE W., JEFF F. DOERZBACHER, GARY C. MATLOCK, ALBERT W. GREEN, and GARY E. SAUL, "Reducing the bycatch in a commercial trotline fishery," 109

McINTYRE, JOHN D., REGINALD R. REISENBICHLER, JOHN M. EMLER, RICHARD L. WILMOT, and JAMES E. FINN, "Predation of Karluk River sockeye salmon by coho salmon and char," 611

"The megalopa stage of the Gulf stone crab, *Menippe adina* Williams and Felder, 1986, with comparison of megalopae in the genus *Menippe*," by Joel W. Martin, Frank M. Truesdale, and Darryl L. Felder, 289

Melanogrammus aeglefinus—see Haddock

MENDELSSOHN, ROY, "Some problems in estimating population sizes from catch-at-age data," 617

Menhaden, gulf

age and growth, 77

Menippe adina—see Crab, Gulf stone

Menticirrhus americanus—see Kingfish, southern

"Metabolic responses of spot, *Leiostomus xanthurus*, and Atlantic croaker, *Micropogonias undulatus*, larvae to cold temperatures encountered following recruitment to estuaries," by Donald E. Hoss, Linda Coston-Clements, David S. Peters, and Patricia A. Tester, 483

"Microcell" disease
oysters, 581

Micropogonias undulatus—see Croaker, Atlantic

Microstomus pacificus—see Sole, Dover

Migration studies

salmon, Atlantic, 197

salmon, coho, 173

salmon, Pacific, 213

"Migrations of coho salmon, *Oncorhynchus kisutch*, during their first summer in the ocean," by William G. Pearcy and Joseph P. Fisher, 173

Mikrocytos mackini

"microcell" disease in oysters, 581

Mikrocytos roughleyi

"microcell" disease in oysters, 581

Mobula japonica

key to species, 56

Mobula munkiana

key to species, 60

Mobula, spp.—see Rays, mobulid

Mobula tarapacana

key to species, 62

Mobula thurstoni

key to species, 49

Monte Carlo method

abundance survey method, 448

MORI, TSUKASA—see WATANABE et al.

Morone axatilis—see Bass, striped

"Morphological differences between two congeneric species of pleuronectid flatfishes: Arrowtooth flounder, *Atheresthes stomias*, and Kamchatka flounder, *A. evermanni*," by Mei-Sun Yang, 608

Mortality

estimates, 671

length-frequency analysis, 645

lobster, spiny, 777

methods of fish stock estimation, 25

MULLIN, M. M., and E. R. BROOKS, "Extractable lipofuscin in larval marine fish," 407

Munida forceps

bathymetric and geographic distribution, 67

- Munida longipes*
bathymetric and geographic distribution, 67
- Munidopsis alvisca*
new decapod species, 263
- Munids
abundance, 602
dissolved oxygen levels, 604
- MURPHY, MICHAEL L., JOHN F. THEDINGA, and K V. KOSKI, "Size and diet of juvenile Pacific salmon during seaward migration through a small estuary in southeastern Alaska," 213
- MURRAY, CLYDE B.—see BEACHAM et al.
- Mya arenaria*—see Clam, soft-shell
- "Natural history of the rays on the genus *Mobula* in the Gulf of California," by Guiseppe Notarbartolo-di-Sciara, 45
- "New marine decapod crustaceans from waters influenced by hydrothermal discharge, brine, and hydrocarbon seepage," by Austin B. Williams, 263
- NOTARBARTOLO-DI-SCIARA, GUISEPPE, "Natural history of the rays on the genus *Mobula* in the Gulf of California," 45
- "Note on muscle glycogen as an indicator of spawning potential in the sea scallop, *Placopecten magellanicus*," by Edith Gould, Diane Rusanowsky, and Donna A. Luedke, 597
- "Notes on decapod and euphausiid crustaceans, continental margin, western Atlantic, Georges Bank to western Florida, USA," by Austin B. Williams, 67
- "Notes on reproduction in the scalloped hammerhead, *Sphyrna lewini*, in northeastern Taiwan waters," by Che-Tsung Chen, Tzyh-Chang Leu, and Shouu-Jeng Joung, 389
- NYMAN, ROBERT M., AND DAVID O. CONOVER, "The relation between spawning season and the recruitment of young-of-the-year bluefish, *Pomatomus saltatrix*, to New York," 237
- O'BRIEN, LORETTA, and RALPH K. MAYO, "Source of variation in catch per unit effort of yellowtail flounder, *Limanda ferruginea* (Storer), harvested off the coast of New England," 91
- OBST, BRYAN S.—see HAMNER et al.
- "Occurrence of young-of-the-year king, *Scomberomorus cavalla*, and Spanish, *S. maculatus*, mackerels in commercial-type shrimp trawls along the Atlantic coast of the southeast United States," by Mark R. Collins and Charles A. Wenner, 394
- "Occurrence of *Cancer* crab (*C. magister* and *C. oregonensis*) megalopae off the west coast of Vancouver Island, British Columbia," by Glen S. Jamieson and Antan C. Phillips, 525
- "Oceanographic associations of neustonic larval and juvenile fishes and Dungeness crab megalopae off Oregon," by Jonathan M. Shenker, 299
- "On the role of food-seeking in the suprabenthic habit of larval white croaker, *Genyonemus lineatus* (Pisces: Sciaenidae)," by A. E. Jahn, D. M. Gadowski, and M. L. Sowby, 251
- Oncorhynchus gorbusha*—see Salmon, pink
- Oncorhynchus keta*—see Salmon, chum
- Oncorhynchus kisutch*—see Salmon, coho
- Oncorhynchus nerka*—see Salmon, sockeye
- Oncorhynchus* spp.—see Salmon, Pacific
- Oreo, black
otolith ultrastructure, 499
- Oreo, smooth
otolith ultrastructure, 499
- ORTNER, P. B.—see DAGG et al.
- Ostrea edulis*—see Oyster, flat
- Ostrea lusida*—see Oyster, Olympia
- "Otolith ultrastructure of smooth oreo, *Pseudocyttus maculatus*, and black oreo, *Alloctytus* sp., species," by N. M. Davies, R. W. Gaudie, S. A. Crane, and R. K. Thompson, 499
- Otoliths
bluefish, 237
cod, Atlantic, 223
haddock, 223
menhaden, gulf, 77
oreo, black, 499
oreo, smooth, 499
saury, Pacific, 489
trout, rainbow, 160
- Oyster, American
growth and health, 553
- Oyster, flat
"microcell" disease, 581
- Oyster, Japanese
"microcell" disease, 581
- Oyster, Olympia
"microcell" disease, 581
- Pandalus jordani*—see Shrimp, pink
- Pandalus platyceros*—see Prawn, spot
- Panulirus argus*—see Lobster, spiny
- Panulirus cygnus*—see Lobster, spiny
- Parasite studies
oyster growth, 553
oysters, 581
- Parmaturus xaniurus*—see Shark, scyliorhinid

- Parophrys vetulus*—see English sole
- Pathology
oysters, 581
- PEARCY, WILLIAM G., and JOSEPH P. FISHER, "Migrations of coho salmon, *Oncorhynchus kisutch*, during their first summer in the ocean," 173
- "Pelagic biogeography of the armorhead, *Pseudopentaceros wheeleri*, and recruitment to isolated seamounts in the North Pacific Ocean," by George W. Boehlert and Takashi Sasaki, 453
- Penaeus brasiliensis*—see Shrimps, penaeid
- Penaeus notialis*—see Shrimps, penaeid
- Penaeus subtilis*—see Shrimps, penaeid
- PENSON, JOHN B., JR., ERNEST O. TETTY, and WADE L. GRIFFIN, "An econometric analysis of net investment in Gulf shrimp fishing vessels," 151
- Perkinsus marinus*
parasitic effects on oysters, 553
- PETERS, DAVID S.—see HOSS et al.
- PHILLIPS, ANTAN C.—see JAMIESON and PHILLIPS
- PHILLIPS, BRUCE F.—see FORD et al.
- Phocoena phocoena*—see Porpoise, harbor
- PICKETT, DARLENE—see BUTLER and PICKETT
- PIKITCH, ELLEN K.—see JAMIESON and PIKITCH
- Placopecten magellanicus*—see Scallop, sea
- Plankton studies, 1, 129, 299, 704, 723, 811, 833, 838
- Pogonias cromis*—see Black drum
- POLACHECK, TOM, "Analyses of the relationship between the distribution of searching effort, tuna catches, and dolphin sightings within individual purse seine cruises," 351
- Polychaetes, capitellid
shrimp diets, 543
- Pomatomus saltatrix*—see Bluefish
- Population studies
dolphin, bottlenose, 797
English sole, 823
larval fishes, 811
lobster, spiny, 775
mackerel, Pacific, 622
methods, 617
porpoise, harbor, 417, 433
sablefish, 445
salmon, chum, 663
shark, scyliorhinid, 694
- Porpoise, harbor
abundance estimation, 417, 433
- Postsmolts
salmon, Atlantic, 197
- POWELL, ERIC N.—see WILSON et al.
- Prawn, spot
distribution and mortality, 601
- Predation
salmon, 763
sardine larvae, 163
- "Predation of Karluk River sockeye salmon by coho salmon and char," by John D. McIntyre, Reginald R. Reisenbichler, John M. Emlen, Richard L. Wilmot, and James E. Finn, 611
- Pristipomoides auricilla*—see Snapper
- Pristipomoides zonatus*—see Snapper
- Pseudocyttus maculatus*—see Oreo, smooth
- Pseudopentaceros wheeleri*—see Armorhead, pelagic
- Purse seine
salmon, coho, 173
searching effort, tuna catches, and dolphin sightings, 351
- RAY, SAMMY M.—see WILSON et al.
- Rays, mobulid
natural history, 45
key to species, 48
- Red drum
reducing bycatch, 109
- "Reducing the bycatch in a commercial trotline fishery," by Lawrence W. McEachron, Jeff F. Doerzbacher, Gary C. Matlock, Albert W. Green, and Gary E. Saul, 109
- "Reexamination of the use of otolith nuclear dimensions to identify juvenile anadromous and nonanadromous rainbow trout, *Salmo gairdneri*," by Kenneth P. Currens, Carl B. Schreck, and Hiram M. Li, 160
- Reinhardtius hippoglossoides*—see Halibut, Greenland
- REISENBICHLER, REGINALD R.—see McINTYRE et al.
- "The relation between spawning season and the recruitment of young-of-the-year bluefish, *Pomatomus saltatrix*, to New York," by Robert M. Nyman and David O. Conover, 237
- "Relationship between sediment character and sex segregation in English sole, *Parophrys vetulus*," by D. Scott Becker, 517
- "Reproductive biology of the spotted seatrout, *Cynoscion nebulosus*, in South Texas," by Nancy Brown-Peterson, Peter Thomas, and Connie R. Arnold, 373

"The reproductive biology of tilefish, *Lopholatilus chamaeleonticeps* Goode and Bean, from the United States Mid-Atlantic Bight, and the effects of fishing on the breeding system," by Churchill B. Grimes, Charles F. Idelberger, Kenneth W. Able, and Stephen C. Turner, 745

Reproductive studies
bluefish, 237
larval fishes, 811
oyster, American, 553
scallop, sea, 597
seatrout spawning, 129
seatrout, spotted, 373
shark, hammerhead, 389
tilefishes, 745, 752
weakfish, 168

Rockfish, blue
habitat studies, 715

ROGERS, CHRISTOPHER W., DONALD R. GUNDERSON, and DAVID A. ARMSTRONG, "Utilization of a Washington estuary by juvenile English sole, *Parophrys vetulus*," 823

ROJAS, OMAR—see LOEB and ROJAS

RUSANOWSKY, DIANE—see GOULD et al.

Sablefish
abundance indices, 445

Saccostrea commercialis—see Oyster, flat

SAFRIT, GLEN W., and FRANK J. SCHWARTZ, "Length-weight relationships for gulf flounder, *Paralichthys albigutta*, from North Carolina," 832

Salmo gairdneri—see Trout, rainbow

Salmo salar—see Salmon, Atlantic

Salmon, Atlantic
postsmolts, 197

Salmon, chum
population spawning, 663
size and diet of juveniles, 213
smolts and adult production, 655

Salmon, coho
ocean migrations, 173
predation, 611
predators, 763
size and diet of juveniles, 213
smolts and adult production, 655

Salmon, Pacific
size and diet of juveniles, 213

Salmon, pink
predators, 763
size and diet of juveniles, 213

Salmon, sockeye
predation, 611

Salvelinus alpinus—see Char, Arctic

Salvelinus malma—see Dolly Varden

Sampling techniques
plankton, 838
sole, English, 517

Sardine, Pacific
vulnerability to predation, 163

Sardinops sagax—see Sardine, Pacific

SASAKI, TAKASHI—see BOEHLERT and SASAKI

SAUL, GARY E.—see McEACHRON et al.

Saury, Pacific
growth, 489

SAVOY, THOMAS F., and VICTOR A. CRECCO, "The timing and significance of density-dependent and density-independent mortality of American shad, *Alosa sapidissima*," 467

Scallop, sea
spawning potential, 597

SCHAEFER, KURT M.—see GRAVES et al.

Schooling
tuna, skipjack, 631

SCHRECK, CARL B.—see CURENS et al.

Sciaenops ocellatus—see Red drum

Scomberomorus cavalla—see Mackerel, king

Scomberomorus maculatus—see Mackerel, Spanish

"Seasonality and depth distribution of larval fishes in the northern Gulf of Mexico above latitude 26°00'N," by James G. Ditty, Glen G. Zieske, and Richard F. Shaw, 811

Seatrout, sand
larval spawning, 129

Seatrout, spotted, 109
reproductive biology, 373

Sebastes mystinus—see Rockfish, blue

Sediment character
sex segregation in English sole, 517

SEKI, MICHAEL P., and MICHAEL W. CALLAHAN, "The feeding habits of two deep slope snappers, *Pristipomoides zonatus* and *P. auricilla*, at Pathfinder Reef, Mariana Archipelago," 807

Sex segregation
sole, English, 517

Shad, American
mortality rates, 467

- SHANKS, ALAN L., "Further support for the hypothesis that internal waves can cause shoreward transport of larval invertebrates and fish," 703
- Shark, scyliorhinid
biology, 691
- Sharks, hammerhead
reproduction, 389
- SHAW, RICHARD F.—see DITTY et al.
- SHAW, RICHARD F.—see COWAN AND SHAW
- SHENKER, JONATHAN M., "Oceanographic associations of neustonic larval and juvenile fishes and Dungeness crab megalopae off Oregon," 299
- SHIRLEY, SUSAN M., and THOMAS C. SHIRLEY, "Appendage injury in Dungeness crabs, *Cancer magister*, in southeastern Alaska," 156
- SHIRLEY, THOMAS C.—see SHIRLEY and SHIRLEY
- Shrimp, gulf
investment in fishing vessels, 151
- Shrimp, pink
abundance, 603
dissolved oxygen levels, 604
- Shrimp, roughback
cojoined (two headed) specimen, 595
- Shrimps, penaeid
food pathways, 543
- SIGLER, MICHAEL F., and JEFFREY T. FUJIOKA, "Evaluation of variability in sablefish, *Anoplopoma fimbria*, abundance indices in the Gulf of Alaska using the bootstrap method," 445
- SIMOVICH, MARIE A.—see GRAVES et al.
- "Size and diet of juvenile Pacific salmon during seaward migration through a small estuary in southeastern Alaska," by Michael L. Murphy, John F. Thedinga, and K V. Koski, 213
- Snail, pyramidellid
parasitic effects on oysters, 553
- Snapper
food habits, 807
- Sole, Dover
lipofuscin for ageing, 401
- Sole, English
sex segregation, 517
- "Some problems in estimating population sizes from catch-at-age data," by Roy Mendelsohn, 617
- "Sources of variation in catch per unit effort of yellowtail flounder, *Limanda ferruginea* (Storer), harvested off the coast of New England," by Loretta O'Brien and Ralph K. Mayo, 91
- Spawning season
bluefish, 237
- Spawning studies—see Reproductive studies
- "Specifying a functional form for the influence of hatchery smolt release on adult salmon production," by Biing-Hwan Lin and Nancy A. Williams, 655
- Sphyrna lewini*—see Sharks, hammerhead
- Sphyrna mokarran*—see Sharks, hammerhead
- Sphyrna zygaena*—see Sharks, hammerhead
- Spot
distribution and abundance, 129
metabolic responses to temperatures, 483
- SQUIRES, DALE E.—see KIRKLEY and SQUIRES
- Stenella attenuata*—see Dolphin, spotted
- Stomach contents
halibut, Greenland, 676
- "Stomach contents of commercially caught Hudson River striped bass, *Morone saxatilis*, 1973–1975," by C. Braxton Dew, 397
- STONE, GREGORY S.—see HAMNER et al.
- STONER, ALLAN W., and ROGER J. ZIMMERMAN, "Food pathways associated with penaeid shrimps in a mangrove-fringed estuary," 543
- Submersibles
decapod crustaceans, 67
prawn distribution, 602
- Survey, Pacific
growth, 489
- Surveys
aerial, 433
bootstrap, 445
ichthyoplankton off Chile, 1
lobster, spiny, 331
porpoise, harbor, 417
ship, 417
sole, English, 517
- Tagging studies
tuna, skipjack, 631
- TANKERSLEY, RICHARD T.—see HERRNKIND et al.
- TARGETT, TIMOTHY E.—see EPIFANIO et al.
- Temperature studies
spot, 483
croaker, Atlantic, 483
- TESTER, PATRICIA A.—see HOSS et al.
- TETTY, ERNEST O.—see PENSON et al.

- THEDINGA, JOHN F.—see MURPHY et al.
- THOMAS, PETER—see BROWN-PETERSON et al.
- THOMPSON, R. K.—see DAVIES et al.
- Thunnus albacares*—see Tuna, yellowfin
- Thunnus obesus*—see Tuna, bigeye
- Tide studies, 703
- Tilefishes
reproductive biology, 745
- "The timing and significance of density-dependent and density-independent mortality of American shad, *Alosa sapidissima*," by Thomas F. Savoy and Victor A. Crecco, 467
- Trachypenaeus similis*—see Shrimp, roughback
- Trawls, shrimp
occurrence of mackerel, 394
- TRONZO, CRAIG R.—see CAHOON and TRONZO
- "Trophic relations of the blue rockfish, *Sebastes mystinus*, in a coastal upwelling system off northern California," by Edmund S. Hobson and James R. Chess, 715
- Trotlines, 109
- Trout, rainbow
lipofuscin for ageing, 401
otolith identification, 160
- TRUESDALE, FRANK M.—see MARTIN et al.
- Tuna
distribution within purse seine cruises, 351
- Tuna, bigeye
burnt tuna 367
- Tuna, "burnt"
etiology, 367
- Tuna, skipjack
schooling, 631
tag studies, 631
- Tuna, yellowfin
burnt tuna, 367
identification of juveniles, 835
- Turbot—see Halibut, Greenland
- TURNER, STEPHEN C.—see GRIMES et al.
- Tursiops truncatus*—see Dolphin, bottlenose
- Upwelling and downwelling
northern California coast, 715
South Atlantic Bight, 703
- "Utilization of a Washington estuary by juvenile English sole, *Parophrys vetulus*," by Christopher W. Rogers, Donald R. Gundersen, and David A. Armstrong, 823
- VERNET, MARIA, JOHN R. HUNTER, and RUSSELL D. VETTER, "Accumulation of age pigments (lipofuscin) in two cold-water fishes," 401
- "Vertical distribution and mass mortality of prawns, *Pandalus platyceros*, in Saanich Inlet, British Columbia," by Glen S. Jamieson and Ellen K. Pikitch, 601
- VETTER, E. F., "Estimation of natural mortality in fish stocks: a review," 25
- VETTER, RUSSELL D.—see VERNET et al.
- WARLEN, STANLEY M., "Age and growth of larval gulf menhaden, *Brevoortia patronus*, in the northern Gulf of Mexico," 77
- WATANABE, YOSHIRO, JOHN L. BUTLER, and TSUKASA MORI, "Growth of Pacific saury, *Cololabis saira*, in the north-eastern and northwestern Pacific Ocean," 489
- WATSON, CHERYL, ROBERT E. BOURKE, and RICHARD W., BRILL, "A comprehensive theory on the etiology of burnt tuna," 367
- Wave slicks, 703
- Weakfish
induction of spawning, 168
- WENNER, CHARLES A.—see COLLINS and WENNER
- Western rock lobster—see Lobster, spiny
- Whales, southern right
behavior, 143
feeding, 143
- WIEBE, PETER H., "Functional regression equations for zooplankton displacement volume, wet weight, dry weight, and carbon: a correction," 833
- WILLIAMS, AUSTIN B., "Cojoined twin adult shrimp (Decapoda: Penaeidae)," 595
- WILLIAMS, AUSTIN B., "New marine decapod crustaceans from waters influenced by hydrothermal discharge, brine, and hydrocarbon seepage," 263
- WILLIAMS, AUSTIN B., "Notes on decapod and euphausiid crustaceans, continental margin, western Atlantic, Georges Bank to western Florida, USA," 67
- WILLIAMS, NANCY A.—see LIN and WILLIAMS
- WILMOT, RICHARD L.—see McINTYRE et al.
- WILSON, ELIZABETH A., ERIC N. POWELL, and SAMMY M. RAY, "The effect of the ectoparasitic pyramidellid snail, *Boonea*

impressa, on the growth and health of oysters, *Crassostrea virginica*, under field conditions." 553

"Winter-time distribution and abundance of copepod nauplii in the northern Gulf of Mexico," by M. J. Dagg, P. B. Ortner, and J. Al-Yamani, 319

WITHLER, RUTH E.—see BEACHAM et al.

WOLF, PETER H.—see FARLEY et al.

YANG, M. S., and P. A. LIVINGSTON, "Food habits and daily ration of Greenland halibut, *Reinhardtius hippoglossoides*, in the

eastern Bering Sea," 675

YANG, MEI-SUN, "Morphological differences between two congeneric species of pleuronectid flatfishes: Arrowtooth flounder, *Atheresthes stomias*, and Kamchatka flounder, *A. evermanni*," 608

Yukon River salmon, 663

ZIESKE, GLEN G.—see DITTY et al.

ZIMMERMAN, ROGER J.—see STONER and ZIMMERMAN

Zooplankton—see Plankton studies