

## **Richard David Brodeur**

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### **Research Interests**

Recruitment processes in marine fishes; the feeding habits and trophic interactions of pelagic and demersal nekton; the ecology, zoogeography and behavior of marine fishes; salmon marine ecology; bioacoustics, fisheries oceanography including environmental and biotic effects on the abundance and distribution patterns of fishes and zooplankton.

### **Education**

Ph.D. Fisheries	University of Washington, Seattle, WA	1990
M.S. Oceanography	Oregon State University, Corvallis, OR	1983
B.S. Fishery Biology	University of Massachusetts, Amherst, MA	1976

### **Positions Held**

Scientific Editor (2008- ), National Marine Fisheries Service, Newport, OR  
Research Fishery Biologist (1991- ), National Marine Fisheries Service, Seattle & Newport, OR  
Visiting Investigator (2006), Pacific Islands Fisheries Science Center, Honolulu, HI  
Visiting Investigator (1998), Pacific Fisheries Environmental Laboratory, Pacific Grove, CA  
Uchida Visiting Fellow (1993), Ocean Research Institute, Tokyo, Japan  
Postdoctoral Fellow (1990-1991), Pacific Biological Station, Nanaimo, B.C., Canada  
Fishery Biologist (1987-1990), National Marine Fisheries Service, Seattle, WA  
Fishery Biologist (1987-1990), Fisheries Research Institute, Univ. of Wash., Seattle, WA  
Senior Research Assistant (1985-1987), Research Assistant (1979-1984), School of Oceanography, Oregon State University, Corvallis, OR  
Fishery Biologist (Summers 1981, 1983) National Marine Fisheries Service, Auke Bay, AK  
Biological Technician (Summer 1979) Office of Scientific Studies, National Park Service, Wellfleet, MA  
Biological Technician (1977-1979) National Marine Fisheries Service, Woods Hole, MA  
Volunteer (1976 and 1978) Woods Hole Oceanographic Institution, Woods Hole, MA  
Research Assistant (Summers 1975-1977) Mass. Coop. Fishery Unit, Amherst, MA  
Guest Student Investigator (1974) Woods Hole Oceanographic Institution, Woods Hole, MA

### **Academic Appointments**

Adjunct Associate Professor (1999-present), Department of Fisheries and Wildlife and College of Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR  
Affiliate Associate Professor (1993-present), School of Fisheries, Univ. of Wash., Seattle, WA

## **Refereed Journal Articles**

- Langton, R.W. and R.D. Brodeur. 1978. Occurrence of a rare adult mud shrimp, *Naushonia crangonoides* Kingsley, 1897, in the Chesapeake Bay Region (Decapoda, Thalassinidea). *Crustaceana* 35(1):96-98.
- Dickinson, J.J., R.L. Wigley, R.D. Brodeur, and S. Brown-Leger. 1980. Distribution of Gammaridean Amphipoda (Crustacea) in the Mid Atlantic Bight Region. *NOAA Tech. Rept. SSRF* 741, 46 p.
- Peterson, W.T., R.D. Brodeur, and W.G. Pearcy. 1982. Food habits of juvenile salmon in the Oregon coastal zone, June 1979. *Fish. Bull.* 80:841-851.
- Brodeur, R.D. 1984. Gastric evacuation rates for two foods in the black rockfish, *Sebastes melanops* (Girard). *J. Fish Biol.* 24:287-298.
- Brodeur, R.D. and W.G. Pearcy. 1984. Food habits and dietary overlap of some shelf rockfishes (Genus *Sebastes*) from the northeastern Pacific Ocean. *Fish. Bull.* 82:269-293.
- Jaenicke, H.W., R.D. Brodeur, and T. Fujii. 1984. Exploratory gillnetting from the *Oshoro maru* for juvenile salmon off Southeast Alaska, 24-25 July 1982. *Bull. Fac. Fish., Hokkaido Univ.* 35:154-160.
- Brodeur, R.D., D.M. Gadowski, W.G. Pearcy, H.P. Batchelder, and C.B. Miller. 1985. Abundance and distribution of ichthyoplankton in the upwelling zone off Oregon during anomalous El Niño conditions. *Est. Coast. Shelf Science* 21:365-378.
- Brodeur, R.D. 1986. Northward displacement of the euphausiid *Nyctiphanes simplex* Hansen to Oregon and Washington waters following the El Niño event of 1982-83. *J. Crust. Biol.* 6:686-692.
- Brodeur, R.D. and W.G. Pearcy. 1986. Distribution and relative abundance of pelagic non-salmonid nekton off Oregon and Washington, 1979-1984. *NOAA Tech. Rep. NMFS* 46, 85 p.
- Brodeur, R.D., H.V. Lorz and W.G. Pearcy. 1987. Food habits and dietary variability of pelagic nekton off Oregon and Washington, 1979-1984. *NOAA Tech. Rep. NMFS* 57, 32 p.
- Brodeur, R.D. and W.G. Pearcy. 1987. Diel feeding chronology, gastric evacuation and estimated daily ration of juvenile coho salmon, *Oncorhynchus kisutch* (Walbaum), in the coastal marine environment. *J. Fish Biol.* 31:465-477.
- Brodeur, R.D. 1988. Zoogeography and trophic ecology of the dominant epipelagic fishes in the northern North Pacific. *Bull. Ocean Res. Inst.* 26(II):1-27.
- Pearcy, W.G., R.D. Brodeur, J.M. Shenker, W.W. Smoker and Y. Endo. 1988. Food habits of

- Pacific salmon and steelhead trout, midwater trawl catches and oceanographic conditions in the Gulf of Alaska, 1980-1985. *Bull. Ocean Res. Inst.* 26(II):29-78.
- Brodeur, R.D. 1989. Neustonic feeding by juvenile salmonids in coastal waters of the Northeast Pacific. *Can. J. Zool.* 67:1995-2007.
- Pearcy, W.G., R.D. Brodeur, and J.P. Fisher. 1990. Distribution and biology of juvenile cutthroat trout (*Oncorhynchus clarki clarki*) and steelhead (*O. mykiss*) in coastal waters off Oregon and Washington. *Fish. Bull.* 88:697-711.
- Brodeur, R.D. and W.G. Pearcy. 1990. Trophic relations of juvenile Pacific salmon off the Oregon and Washington coast. *Fish. Bull.* 88:617-636.
- Quinn, T.P. and R.D. Brodeur. 1991. Intra-specific variations in movement patterns of marine animals. *Amer. Zool.* 31:231-241.
- Brodeur, R.D. 1991. Ontogenetic variations in size and type of prey consumed by juvenile coho, *Oncorhynchus kisutch*, and chinook, *O. tshawytscha*, salmon. *Env. Biol. Fishes* 30:303-315.
- Brodeur, R.D., K.M. Bailey, and S. Kim. 1991. Cannibalism on eggs by walleye pollock *Theragra chalcogramma* in Shelikof Strait, Gulf of Alaska. *Mar. Ecol. Prog. Ser.* 71:207-218.
- Brodeur, R.D. 1992. Factors related to variability in feeding intensity of juvenile coho salmon and chinook salmon. *Trans. Amer. Fish. Soc.* 112:104-114.
- Brodeur, R.D., and D.M. Ware. 1992. Long-term variability of zooplankton biomass in the subarctic Pacific Ocean. *Fish. Oceanogr.* 1:32-38.
- Brodeur, R.D. and W.G. Pearcy. 1992. Effects of environmental variability on trophic interactions and food web structure in a pelagic upwelling ecosystem. *Mar. Ecol. Prog. Ser.* 84:101-119.
- Brodeur, R.D., R.C. Francis, and W.G. Pearcy. 1992. Food consumption by juvenile coho (*Oncorhynchus kisutch*) and chinook salmon (*O. tshawytscha*) on the continental shelf off Washington and Oregon. *Can. J. Fish. Aquat. Sci.* 49:1670-1685.
- Bailey, K.M., R.D. Brodeur, N. Merati, and M.M. Yoklavich. 1993. Predation on walleye pollock (*Theragra chalcogramma*) eggs and yolk-sac larvae by crustacean invertebrates in the western Gulf of Alaska. *Fish. Oceanogr.* 2:30-39.
- Brodeur, R.D. and N. Merati. 1993. Predation on walleye pollock (*Theragra chalcogramma*) eggs in the Western Gulf of Alaska: the roles of vertebrate and invertebrate predators. *Mar. Biol.* 117:483-493.

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- Brodeur, R.D. and D.M. Ware. 1995. Interdecadal variability in distribution and catch rates of epipelagic nekton in the Northeast Pacific Ocean. *Can. Spec. Pub. Fish. Aquat. Sci.* 121:329-356.
- Doyle, M.J., W.C. Rugen, and R.D. Brodeur. 1995. Neustonic ichthyoplankton in the Western Gulf of Alaska during spring. *Fish. Bull.* 93:231-253.
- Brodeur, R.D., M.S. Busby, and M.T. Wilson. 1995. Summer distribution of late-larval and early juvenile walleye pollock (*Theragra chalcogramma*) and associated species in the western Gulf of Alaska. *Fish. Bull.* 93:603-617.
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- Brodeur, R.D., J.M. Napp, M.T. Wilson, S.J. Bograd, E.D. Cokelet, and J.D. Schumacher. 1996. Acoustic detection of mesoscale biophysical features in the Shelikof Sea Valley, and their relevance to pollock in the Gulf of Alaska. *Fish. Oceanogr.* 5: (Suppl. 1):71-80.
- Stabeno, P.J., J.D. Schumacher, K.M. Bailey, R.D. Brodeur, and E.D. Cokelet. 1996. Observed patches of walleye pollock eggs and larvae in Shelikof Strait, Alaska: Their characteristics, formation and persistence. *Fish. Oceanogr.* 5 (Suppl. 1):81-91.
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- Landingham, J.H., M.V. Sturdevant, and R.D. Brodeur. 1998. Feeding habits of juvenile Pacific salmon in marine waters of Southeastern Alaska and Northern British Columbia. *Fish. Bull.* 96:285-302.
- Brodeur, R.D. and M.S. Busby. 1998. Occurrence of an Atlantic salmon *Salmo salar* in the Bering Sea. *Alaska Fish. Res. Bull.* 5:64-66.
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- Brodeur, R.D. and M. Terazaki. 1999. Springtime abundance of chaetognaths in the shelf region of the northern Gulf of Alaska, with observations on the vertical distribution and feeding of *Sagitta elegans*. *Fish. Oceanogr.* 8:93-103.
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- Swartzman, G., R. Brodeur, J. Napp, D. Walsh, R. Hewitt, D. Demer, G. Hunt, and E. Logerwell. 1999. Relating spatial distributions of acoustically-determined patches of fish and plankton: Image analysis, data viewing and spatial proximity. *Can. J. Fish. Aquat. Sci.* 56(Suppl. 1):188-198.
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- Brodeur, R.D., G.W. Boehlert, E. Casillas, M.B. Eldridge, J.H. Helle, W.T. Peterson, W.R. Heard, S. Lindley, and M.H. Schiewe. 2000. A coordinated research plan for estuarine and ocean research on Pacific salmon. *Fisheries* 25:7-16.
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- Emmett, R.L. and R.D. Brodeur. 2001. Recent changes in the pelagic nekton community off Oregon and Washington in relation to physical oceanographic conditions. *North Pacific Anad. Fish. Comm. Bull.* 2:11-20.
- Stockwell, D.A., T.E. Whitley, S.I. Zeeman, K.O. Coyle, J.M. Napp, R.D. Brodeur, A.I. Pinchuk, and G.L. Hunt, Jr. 2001. Anomalous conditions in the south-eastern Bering Sea, 1997: Nutrients, phytoplankton, and zooplankton. *Fish. Oceanogr.* 10:99-116.
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- Doyle, M.J., K.L. Mier, M.S. Busby, and R.D. Brodeur. 2002. Regional variations in springtime ichthyoplankton assemblages in the Northeast Pacific Ocean. *Prog. Oceanogr.* 53: 247-281.
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- Weingartner, T.J., K. Coyle, B. Finney, R. Hopcroft, T. Whitley, R. Brodeur, M. Dagg, E. Farley, D. Haidvogel, L. Halderson, A. Herman, S. Hinckley, J. Napp, P. Stabeno, T. Kline, C. Lee, E. Lessard, T. Royer, and S. Strom. 2002. The Northeast Pacific GLOBEC Program: Coastal Gulf of Alaska. *Oceanogr.* 15: 48-63.
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- Swartzman, G., J. Napp, R. Brodeur, A. Winter, and L. Ciannelli. 2002. Spatial patterns of pollock and zooplankton distribution in the Pribilof Islands, Alaska nursery area and their relationship to pollock recruitment. *ICES J. Mar. Sci.* 59:1167-1186.
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- Baldwin, R.E., T.W. Miller, R.D. Brodeur, K.C. Jacobson. 2008. Expanding the foraging history of juvenile salmon: combining stomach-content and macroparasite-community analyses for studying marine diets. *J. Fish. Biol.* 72:1268-1294.
- Brodeur, R.D., I.A. Fleming, J.M. Bennett, and M.A. Campbell. 2008. Summer distribution and feeding of spiny dogfish (*Squalus acanthias*) off the Washington and Oregon Coasts. *Management and Biology of Dogfish Sharks, Spec. Vol. Amer. Fish. Soc.*
- Suchman, C.L., E.A. Daly, J.E. Keister, W.T. Peterson, and R.D. Brodeur. 2008. Feeding patterns and predation potential of scyphomedusae in a highly productive upwelling region. *Mar. Ecol. Prog. Ser.* 358:161-172.
- Alexander, M., A. Capotondi, A. Miller, F. Chai, R. Brodeur, and C. Deser. 2008. Decadal variability in the Northeast Pacific in a physical-ecosystem model: The role of mixed layer depth and trophic interactions. *J. Geophys. Res.* 113, C02017, doi:10.1029/2007JC004359.
- Barnes, C., D.M. Bethea, R.D. Brodeur, J. Spitz, J., V. Ridoux, C. Pusineri, B.C. Chase, M.E. Hunsicker, F. Juanes, D.O. Conover, A. Kellermann, J. Lancaster, F. Ménard, F.-X. Bard, P. Munk, J.K. Pinnegar, F.S. Scharf, R.A. Rountree, K.I. Stergiou, C. Sassa, A. Sabates, and S. Jennings. 2008. Predator and prey body sizes in marine food webs. *Ecology* 89(3):881.

- Miller T.W., R.D. Brodeur and G.H. Rau. 2008. Carbon stable isotopes reveal relative contribution of shelf-slope production to the northern California Current pelagic community. *Limnol. Oceanogr.* 53: 1493-1503.
- Parnel, M.M, R.L. Emmett, and R.D. Brodeur. 2008. Ichthyoplankton community in the Columbia River Plume off Oregon: effects of fluctuating oceanographic conditions. *Fish. Bull.* 106:161-173.
- Churnside, J., R. Brodeur, J. Horne, P. Adam, K. Benoit-Bird, D.C. Reese, A. Kaltenberg, E. Brown. 2008. Combining techniques for remotely assessing pelagic nekton: getting the whole picture. In: R. Beamish and B. Rothschild (eds.), *The Future of Fisheries Research in North America*. Springer, Berlin.
- Brodeur, R.D., C.L. Suchman, D.C. Reese, T.W. Miller and E.A. Daly. 2008. Spatial overlap and trophic interactions between pelagic fish and large jellyfish in the northern California Current. *Mar. Biol.* 154:649-659.
- Brodeur, R.D., M.B. Decker, L. Ciannelli, J.E. Purcell, N.A. Bond, P.J. Stabeno, E. Acuna, and G.L. Hunt, Jr. 2008. Rise and fall of jellyfish in the eastern Bering Sea in relation to climate regime shifts. *Prog. Oceanogr.* 77:103-111.
- Brodeur, R.D., W.T. Peterson, T.D. Auth, H.L. Soulen, M.M. Parnel and A.A. Emerson. 2008. Abundance and diversity of ichthyoplankton as indicators of recent climate change in an upwelling area off Oregon. *Mar. Ecol. Prog. Ser.* 366: 187-202.
- Litz, M.C., R.L. Emmett, S.S. Heppell and R.D. Brodeur. 2008. Ecology and distribution of the northern subpopulation of northern anchovy (*Engraulis mordax*) off the U. S. West Coast. *CalCOFI Rep.* 49.
- Pool, S.S, R.D. Brodeur, N. L. Goodman, and E.A. Daly. 2008. Abundance, distribution, and feeding patterns of juvenile coho salmon (*Oncorhynchus kisutch*) in the Juan de Fuca Eddy. *Est. Coast. Shelf Sci.* 80: 85-94.
- Suntsov, A.V., and R.D. Brodeur. In press. Trophic ecology of three dominant myctophid species in the northern California Current region. *Mar. Ecol. Prog. Ser.*
- Benkwitt, C., R.D. Brodeur, E.A. Daly, and T.M. Hurst. In press. Diel feeding chronology, gastric evacuation and daily food consumption of juvenile Chinook salmon in coastal waters. *Trans. Amer. Fish. Soc.*
- Chow, S., N. Suzuki, R.D. Brodeur, Y. Ueno. In press. Little population structuring and recent evolution of the Pacific saury (*Cololabis saira*) as indicated by mitochondrial and nuclear DNA sequence data. *Journal of Experimental Marine Biology and Ecology*.

#### **Refereed Papers in Books**

- Miller, C.B., H.P. Batchelder, R.D. Brodeur, and W.G. Percy. 1985. Response of the zooplankton and ichthyoplankton off Oregon to the El Niño event of 1983. In: W.S.

- Wooster and D.J. Fluharty (eds.) *El Niño North: Niño effects in the Subarctic Pacific Ocean*. Washington Sea Grant Pub. pp. 185-187.
- Pearcy, W., J. Fisher, R. Brodeur, and S. Johnson. 1985. Effects of the 1983 El Niño on coastal nekton off Oregon and Washington. In: W.S. Wooster and D.J. Fluharty (eds.) *El Niño North: Niño effects in the Subarctic Pacific Ocean*. Wash. Sea Grant Pub., pp. 188-204.
- Francis, R.C., S.A. Adlerstein, and R.D. Brodeur. 1988. Biological basis for management of commercial fishery resources of the Eastern Bering Sea. In: W.S. Wooster (ed.) *Fisheries Science and Management: Objectives and Limitations*. Springer-Verlag, pp. 187-209.
- Brodeur, R.D. and K.M. Bailey. 1996. Predation on the early life stages of marine fishes: a case study on walleye pollock in the Gulf of Alaska. In: Y. Watanabe, Y. Yamashita, and Y. Oozeki (eds.) *Survival Strategies in Early Life Stages*. A.A. Balkema Press, Rotterdam, Netherlands, pp. 245-259.
- Brodeur, R.D., M.T. Wilson, G.E. Walters, and I.V. Melnikov. 1999. Forage fishes in the Bering Sea: Distribution, species associations, and biomass trends. In: Loughlin, T.R. and K. Ohtani (eds.) *Dynamics of the Bering Sea*. Univ. of Alaska Sea Grant. AK-SG-99-03, pp. 509-536.
- Brodeur, R.D., B. Frost, S.R. Hare, R.C. Francis, and W.J. Ingraham, Jr. 1999. Interannual variations in zooplankton biomass in the Gulf of Alaska and covariations with California Current zooplankton biomass. In: K. Sherman and Q. Tang (eds.) *Large marine ecosystems of the Pacific Rim: Assessment, Sustainability, and Management*. Blackwell Science, pp. 106-135.
- Brodeur, R.D., and K.M. Bailey. 2000. FOCI: A different approach to understanding causes of recruitment variability in marine fishes. In: P.J. Harrison and T.R. Parsons (eds.) *Fisheries Oceanography: An Integrative Approach to Fisheries Ecology and Management*. Fish. Aquat. Resources Ser. 4, Blackwell Science, pp. 24-28.
- Schumacher, J.D., N.A. Bond, R.D. Brodeur, P.A. Livingston, J.M. Napp, and P.J. Stabeno. 2003. Climate change in the Southeastern Bering Sea and some consequences for biota. In: G. Hempel and K. Sherman (eds.) *Large Marine Ecosystems of the World – Trends in Exploitation, Protection and Research*. Vol. 12. Amsterdam: Elsevier Science, pp. 17-40.
- Pearcy, W.G. and R.D. Brodeur. 2008. Nekton. In: J.H. Steele, S.A. Thorpe, and K.K. Turekian, (eds.) *Encyclopedia of Ocean Sciences*, Elsevier Publications.
- van der Lingen, C.D., A. Bertrand, A. Bode, R. Brodeur, L. Cubillos, P. Espinoza, K. Friedland, S. Garrido, X. Irigoien, T. Miller, C. Möllman, R. Rodriguez-Sanchez, H. Tanaka, and A. Temming. 2009. Trophic dynamics of small pelagic fish. In: Checkley, D.M., C. Roy, J. Alheit, and Y. Oozeki (eds.) *Climate Change and Small Pelagic Fishes*.

**Proceedings Edited:**

- Brodeur, R.D., P.A. Livingston, T.R. Loughlin, and A.B. Hollowed. 1996. Ecology of juvenile walleye pollock, *Theragra chalcogramma*. *NOAA Tech. Rep. NMFS* 126, 227 p.
- McKinnell, S.M., R.D. Brodeur, K. Hanawa, A.B. Hollowed, J.J. Polovina, and C.-I. Zhang 2001. Pacific climate variability and marine ecosystem impacts from the tropics to the Arctic. *Prog. Oceanography* 49(1-4), 639 p.
- Dower, J.F. and R.D. Brodeur. 2004. The role of biophysical coupling in concentrating marine organisms around shallow topography. *J. Mar. Systems*. 50(1-2):1-111.
- Sydeman, W.J., R.D. Brodeur, A.S. Bychkov, C.B. Grimes, and S.M. McKinnell. 2006. Top predators “hot spots” in the North Pacific. *Deep-Sea Res. II* 53:247-449.
- Grimes, C.B., R.D. Brodeur, S.M. McKinnell, and L. Haldorson. 2007. Regional comparisons of salmonid life history and ecology in the Northeast Pacific Ocean. *Amer. Fish. Soc. Spec. Symp.* 57, 247 pp.
- Trippell, E.A., R.D. Brodeur, and M. Dickey-Collas. 2009. Reproductive and recruitment processes of exploited marine fish stocks. *J. Northwest Fish. Sci.* 41.

### **Nonrefereed Publications**

- Brodeur, R.D. 1979. Guide to otoliths of some Northwest Atlantic fishes. *Northeast Fishery Center Laboratory Reference* 79-36, 70 pp.
- Brodeur, R.D., W.G. Pearcy, B.C. Mundy, and R.W. Wisseman. 1987. The neustonic fauna in coastal waters of the Northeast Pacific: abundance, distribution and utilization by juvenile salmonids. *Oregon State Univ. Sea Grant Pub. ORESU-TU-87-001*, 61 pp.
- Brodeur, R.D. and P.A. Livingston. 1988. Food habits and diet overlap of various Eastern Bering Sea fishes. *NOAA Tech. Memo. NMFS F/NWC-127*, 76 pp.
- Brodeur, R.D. 1990. Abundance and distribution patterns of zooplankton along the Oregon and Southern Washington Coasts during the summer of 1981. *FRI-UW-9003*, Fisheries Research Institute, Univ. Wash. Seattle, 33 pp.
- Brodeur, R.D. 1990. A synthesis of the food habits and feeding ecology of salmonids in marine waters of the North Pacific. *FRI-UW-9016*, Fisheries Research Institute, Univ. Wash. Seattle, 38 pp.
- Brodeur, R.D. 1997. The importance of various spatial and temporal scales in the interaction of juvenile salmon and the marine environment. In: R.L. Emmett and M.H. Schiewe (eds.) *Estuarine and Ocean Survival of Northeastern Pacific Salmon*. NOAA Tech. Memo. NMFS-NWFSC-29, pp. 197-211.
- Brodeur, R.D., M.T. Wilson, J.M. Napp, P.J. Stabeno, and S. Salo. 1997. Distribution of juvenile pollock relative to frontal structure near the Pribilof Islands, Bering Sea. *Proc. Int. Symp.*

- on the *Role of Forage Fishes in Marine Ecosystems*, Alaska Sea Grant AK-97-01, p. 573-589.
- McCain, B.B., A.D. MacCall, R.L. Emmett, and R.D. Brodeur. 1998. Marine resources of the Pacific Coast Region. In: M.J. Mac, P.A. Opler, C.E. Haecker, and P.D. Doran (eds.) *Status and trends of the nation's biological resources*. Vol. 2, U.S. Dept. Interior, U.S. Geological Survey, pp. 814-824.
- Vance, T.C., C.T. Baier, R.D. Brodeur, K.O. Coyle, M.B. Decker, G.L. Hunt Jr., J.M. Napp, J.D. Schumacher, P.J. Stabeno, D. Stockwell, C.T. Tynan, T.E. Whitledge, T. Wyllie-Echeverria, and S. Zeeman. 1998. Aquamarine waters recorded for the first time in the Eastern Bering Sea. *EOS Trans. Amer. Geophys. Union* 97:610-616.
- Sugisaki, H., R.D. Brodeur, and J.M. Napp. 1998. Summer distribution and abundance of macrozooplankton in the western Gulf of Alaska and southeastern Bering Sea. In: Proc. Int. Symp. on the Subarctic Fisheries Oceanography, *Mem. Fac. Fish. Hokkaido Univ.* 45: 96-112.
- Brodeur, R.D. and M.T. Wilson. 1999. Pre-recruit walleye pollock in the Eastern Bering Sea and Gulf of Alaska Ecosystems. *Proceedings of GLOBEC International Marine Science Symposium on Ecosystem Dynamics*, pp 238-251.
- Pearcy, W.G., K.Y. Aydin, and R.D. Brodeur. 1999. What is the carrying capacity of the North Pacific for salmonids? *PICES Press* 7(2):17-23.
- Hunt, G.L. Jr., C.L. Baduini, R.D. Brodeur, K.O. Coyle, N.B. Kachel, J.M. Napp, S.A. Salo, J.D. Schumacher, P.J. Stabeno, D.A. Stockwell, T.E. Whitledge, S.I. Zeeman. 1999. The Bering Sea in 1998: A second consecutive year of extreme weather-forced anomalies. *EOS. Trans. Amer. Geophys. Union* 80:561-566.
- Brodeur, R.D., P.J. Bentley, R.L. Emmett, T. Miller, and W.T. Peterson. 2000. Sardines in the ecosystem of the Pacific Northwest. *Proc. Sardine 2000 Symposium*. Pacific States Marine Fish. Comm., pp. 90-102.
- Brodeur, R.D. 2001. Micronekton data sets in the North Pacific. In: Impact of climate variability on observation and prediction of ecosystem and biodiversity changes in the North Pacific. (V. Alexander, A. Bychkov, P. Livingston, and S.M. McKinnell, eds.) *PICES Scientific Report* 18: 86-90.
- Brodeur, R.D. 2004. William G. Pearcy: Renaissance oceanographer. *PICES Press* 12:20-23.
- Brodeur, R.D., M.P. Seki, E.A. Pakhomov, and A.V. Suntsov. 2005. Micronekton – What are they and why are they important? *PICES Press* 13:7-11.
- Brodeur, R.D. and O. Yamamura (eds.) 2005. Micronekton of the North Pacific. *PICES Scientific Report* No. 30, 115 pp.

Pool, S.S. and R.D. Brodeur. 2006. Neustonic macrozooplankton abundance and distribution in the Northern California Current, 2000 and 2002. NOAA Tech. Memo. NWFSC-74, 76 pp.

Helle, J.H., L.B. Eisner, E.V. Farley, E.C. Martinson, A. Middleton, J.H. Moss, J.M. Murphy, J.A. Orsi, J. Pohl, M. Sturdevant, A.C. Wertheimer, B.L. Wing, R.D. Brodeur, R. Emmett, C. Bucher, B. MacFarlane, J. Harding, A. Ammann, and C. Zimmerman. 2007. Overview of current juvenile salmon research by the United States. NPAFC Tech. Rep. 7: 12-13.

### **Manuscripts in Submission or Preparation**

Brodeur, R.D. and C.A. Morgan. MS. Cross-shelf variability in hydrography, zooplankton and juvenile chinook diets in relation to the Columbia River Plume. *Est. Coast. Shelf Sci.*

Reese, D.C., R.D. Brodeur, J.H. Churnside, and R.T. O'Malley. MS. Identifying the relationship between sea surface temperature and fish schools in the Northern California Current using LIDAR and satellite imagery. *Ecological Applications*.

Grober-Dunsmore, R., L. Wooninck, C. Wahle, C. Ainsworth, S. Berkeley, J.P. Beets, J. Bohnsack, R. Boulon, R.D. Brodeur, J. Brodziak, J. Field, D.F. Gleason, M.A. Hixon, W.L. Lindberg, M. Miller and L. Morgan. In revision. Vertical zoning in marine protected areas: Ecological considerations for balancing pelagic fishing with conservation of benthic communities. Submitted to *Fisheries*.

Miller T.W. and R.D. Brodeur. MS. Analysis of the northern California Current pelagic food web using stable isotopes and dietary analysis. To be submitted to *Ecology*.

Pool, S.S., D.C. Reese, and R.D. Brodeur. MS. Defining marine habitat of juvenile Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*O. kisutch*) in the northern California Current System. Submitted to *Can. J. Fish. Aquat. Sci.*

Daly, E.A., R.D. Brodeur, and L.A. Weitkamp. MS. Ontogenetic shifts in diets of juvenile and subadult coho and Chinook salmon in coastal marine waters: Important for marine survival? Submitted to *Can. J. Fish. Aquat. Sci.*

Litz, M.C., R.D. Brodeur, R.L. Emmett, S.S. Heppell, R.S. Rasmusson, L. O'Higgins, and M.S. Morris. MS. The effects of variable oceanographic conditions on forage fish lipid content and fatty acid composition in the northern California Current. To be submitted to *Can. J. Fish. Aquat. Sci.*

Phillips, A.J., R.D. Brodeur, and A.V. Suntsov. MS. Micronekton community structure in the epipelagic zone of the northern California Current upwelling system. Submitted to *Prog. Oceanogr.*

Ainley, D.G., K.D. Dugger, R.G. Ford, S.D. Pierce, D.C. Reese, R.D. Brodeur, C.T. Tynan, J.A. Barth. MS. The spatial association of predators and prey at frontal features in the

northern California Current: Competition, predation, or co-occurrence? Submitted to *Mar. Ecol. Prog. Ser.*

### **Committees**

PICES Subarctic Working Group (1992-1993)  
PICES Climate Change and Carrying Capacity Working Group (1993-1994)  
PNCERS Coastal Ocean Program Implementation Advisory Group (1996)  
SBSCC Senior Investigators Committee (1997-2002)  
PICES Micronekton Working Group Chairman (1998-2004)  
PICES Continuous Plankton Recorder Advisory Panel (1999-2003)  
GLOBEC Northeast Pacific Executive Committee (2000-2003)  
PICES Biological Oceanography Committee (2001-2007)  
GLOBEC National Steering Committee (2002-2004)  
CoML POST Coastal Working Group (2002-2004)  
BEST Implementation Plan Working Group (2003-2004)  
PICES Micronekton Sampling Advisory Panel (2003- )  
NWFSC Research Planning Team (2004- )  
NMFS Advanced Sampling Technology Working Group (2007- )

### **Shipboard Experience**

Research Vessels: > 22 months  
Research aboard Fishing Vessels: > 8 months

### **Referee for Journals**

*Fisheries Oceanography*  
*Science*  
*Hydrobiologia*  
*South African Journal of Marine Science*  
*Canadian Journal of Fisheries and Aquatic Sciences*  
*Fishery Bulletin*  
*Transactions of the American Fisheries Society*  
*NPAFC Bulletin*  
*Estuarine, Coastal, and Shelf Science*  
*Deep-Sea Research*  
*Limnology and Oceanography*  
*Journal of Marine Biological Assoc. UK*  
*Current Biology*  
*Marine and Coastal Fisheries*

*Marine Ecology Progress Series*  
*Nature*  
*Journal of Oceanography*  
*ICES Journal of Marine Science*  
*Canadian Journal of Zoology*  
*CalCOFI Reports*  
*Fisheries Research*  
*INPFC Bulletin*  
*Progress in Oceanography*  
*Continental Shelf Research*  
*Marine Biology*  
*Journal of Plankton Research*  
*Research Letters in Ecology*

### **Proposal Reviewer**

*National Science Foundation*  
*National Undersea Research Program*  
*National Science and Engineering Research Council*  
*Cooperative Institute for Marine Resource Studies*

*U.S. GLOBEC*  
*Canada GLOBEC*  
*U.S. Coastal Ocean Program*  
*Saltonstall-Kennedy Program*



*Sea Grant (Washington, California, Alaska)  
North Pacific Research Board*

*Pelagic Fisheries Research Program  
U.S. Ocean Exploration Program*

### **Graduate Committees Co-chaired**

Lorenzo Ciannelli, Ph.D. – Aquatic and Fishery Sciences, Univ. of Washington (1997-2002)  
Todd Miller, Ph.D. – Fisheries and Wildlife, Oregon State University (1999-present)  
Doug Reese, Ph.D. – College of Ocean and Atmospheric Sciences, OSU (2000-2005)  
Also served on numerous M.S. and Ph.D. committees at OSU and UW.

### **Postdoctoral Fellows Supervised**

Dr. Robert Schabetsberger, (Austria) Predator-prey interactions, vertical migration (1996-1998)  
Dr. Hiroya Sugisaki, (Japan) Zooplankton distribution, predation on fish larvae (1997-1998)  
Dr. Alex De Robertis (Scripps) Feeding in turbid environments, bioenergetics (2001-2003)  
Dr. Patrick Ressler (Texas A&M) Zooplankton and fish acoustics, patch studies (2001-2002)  
Dr. Cynthia Suchman (URI) Gelatinous zooplankton feeding, distribution (2002-2004)  
Dr. Douglas Reese (OSU) Spatial and temporal patterns of marine nekton distribution (2005- )  
Dr. Andrey Suntsov (Russia) Ecological relationships of a micronekton community (2006-2008)

### **Special Assignments**

Chief convener of an international workshop entitled "The Importance of Prerecruit Walleye Pollock to the Bering Sea and North Pacific Ecosystems", Seattle WA (1993)  
Organized and co-chaired PICES Biological Oceanography Symposium on "The Biology of the North Pacific Transition Zone", Nemuro, Japan (1994)  
Co-chaired Session on Predation in "Survival Strategies in Early Life Stages of Marine Resources", Yokohama, Japan (1994)  
Organized and co-chaired American Fisheries Society ELH Symposium "Juvenile Fish Studies: Contributions to Early Life History and Recruitment Processes", Seattle, WA (1997)  
Organized and co-chaired PICES Biological Oceanography Symposium on "Micronekton of the North Pacific: Distribution, Biology and Trophic Linkages", Pusan, Korea (1997)  
Wrote NMFS Strategic Research Plan to study salmon in estuaries and oceans (1998)  
Organized and co-chaired Session on "Evidence of Climate Change" in PICES Beyond El Niño Symposium, San Diego CA (2000)  
Co-organized an international workshop on Juvenile Salmon Marine Survival in the latter half of the 1990s, Seattle, WA (2000)  
Co-organized an NPAFC/PICES international workshop on "Factors affecting production of juvenile salmon: Comparative studies on juvenile salmon ecology between the East and West North Pacific Ocean". Tokyo, Japan (2000)  
Co-organized and gave opening remarks for the "International Symposium on Advanced Techniques of Sampling Gear and Acoustical Surveys for Estimation of Fish Abundance and Behavior" held in Hakodate, Japan (2000)  
Co-organized an international workshop on Juvenile Salmon Marine in Marine Ecosystems, Nanaimo, BC (2001)  
Organized and co-chaired PICES Symposium on "The importance of biophysical coupling in concentrating marine organisms around shallow topographies", Qingdao, China (2002)

- Organized and co-chaired American Fisheries Society Symposium "Ocean Ecology of Pacific Salmon", San Diego, CA (2003)
- Organized and co-chaired Ocean Sciences Session entitled "Understanding physical and biological coupling of marine population dynamics: higher trophic levels in the Northeastern Pacific", Portland, OR (2004)
- Organized and co-chaired PICES Session on "Role of gelatinous zooplankton in coastal and oceanic ecosystems", Honolulu, HI (2004)
- Organized American Fisheries Society Symposium entitled "Ocean Ecology of Salmon in Western North America: Regional Comparisons", Anchorage, AK (2005)
- Organized and co-chaired PICES Session on "The Human Dimension of Jellyfish Blooms", Yokohama, Japan (2006)
- Organized and co-convened a NAFO/PICES/ICES International Symposium on "Reproduction and Recruitment Processes of Exploited Marine Fishes", Lisbon, Portugal (2007)

### **Professional Societies**

- American Fisheries Society
- Oceanography Society
- American Institute of Fishery Research Biologists (Chapter Vice Director 1993-94; editorial board of Institute journal 2007- )
- American Geophysical Union
- Gilbert Ichthyological Society

### **Recent Research Grants**

- 1995- "In situ observations of the distribution and behavior of juvenile and adult walleye pollock in relation to oceanographic conditions in the Bering Sea". National Undersea Research Program (with Napp and Wilson).
- 1996- "Monitoring and development of biophysical indices of the southeastern Bering Sea" Southeast Bering Sea Carrying Capacity (with Schumacher, Stabeno, Napp, Hunt, Cullen, and Davis).
- 1996- "Habitat differences in frontal regions around the Pribilof Islands and their importance to juvenile pollock growth and survival in the Bering Sea" Southeast Bering Sea Carrying Capacity (with Napp, Doyle, Wilson, Schumacher, and Francis).
- 1996- "High resolution acoustic and juvenile pollock retrospective data analysis" Southeast Bering Sea Carrying Capacity (with Swartzman, Hunt, Napp, Hewitt).
- 1996- "Analysis of abundance, distribution and species associations of forage fishes in the Bering Sea" Bering Sea FOCI (with Wilson, Walters, and Melnikov).
- 1997- "In situ observations of the distribution and behavior of juvenile and adult walleye pollock in relation to oceanographic conditions in the Bering Sea". National Undersea Research Program (with Napp and Mills).
- 1997- "Analysis of ichthyoplankton abundance, distribution and species associations in the western Gulf of Alaska" US GLOBEC/NOAA Coastal Ocean Program (with Bailey, Doyle, and Matarese).
- 1998- "Monitoring and development of biophysical indices of the southeastern Bering Sea: Phase II" Southeast Bering Sea Carrying Capacity (with Schumacher, Stabeno, Napp, Hunt, Cullen, and Davis).
- 1998- "Habitat differences in frontal regions around the Pribilof Islands and their importance to juvenile pollock growth and survival in the Bering Sea: Phase II" Southeast Bering Sea

- Carrying Capacity (with Napp, Paul, Wilson, Ciannelli, and Francis).
- 1999- "Trophic relationships of juvenile salmon in coastal waters off Oregon and California: top-down or bottom-up control ". US GLOBEC/NOAA Coastal Ocean Program (with Wainwright, Emmett, Jacobson, and Peterson).
- 1999- "Mesoscale and fine-scale distribution of juvenile salmon and associated biota off Oregon and northern California." US GLOBEC/NOAA Coastal Ocean Program (with Casillas, Emmett, Peterson, Fisher and Percy).
- 2000- "Habitat Differences in Frontal Regions around the Pribilof Islands and Their Importance to Juvenile Pollock Survival in the Bering Sea: Phase III" Southeast Bering Sea Carrying Capacity (with Ciannelli, Napp, Francis, and Paul).
- 2000- "Pollock year-class strength: Synthesis of acoustic and net data for age-0 pollock with distributions of predators, prey and environmental data". Southeast Bering Sea Carrying Capacity (with Swartzman, Napp, and Coyle).
- 2001- "Ocean Exploration off the West Coast of the U.S.- Unexplored Benthic Habitats in the Northeast Pacific". NOAA Ocean Exploration Initiative (with Embley, Wakefield, and Baker).
- 2001- "Satellite ocean front mapping in support of salmonid resource management" NOAA/NESDIS Ocean Remote Sensing Program (with Jay, Belkin, and Sanders).
- 2002- "Ichthyoplankton-based indices of climate and ecosystem change" NOAA Fisheries and the Environment Initiative (with Emmett, Peterson, and Boehlert).
- 2003- "Marine nekton as ocean explorers: exploration as an evolved behavior" NOAA Ocean Exploration CoML Initiative (with Boehlert and Mate).
- 2004- "From Upper Estuaries to the Deep Sea: Research Experience for Undergraduates" National Science Foundation (one of 12 Principal Investigators).
- 2004- "Interannual variations in hydrography, zooplankton, and ichthyoplankton off central Oregon" NOAA Stock Assessment Improvement Program Initiative (with Emmett and Peterson).
- 2005- "Juvenile salmon habitat utilization in the Northern California Current – Synthesis and Prediction" US GLOBEC/NOAA Coastal Ocean Program (with Casillas, Batchelder, Peterson, Jacobson, and Rau).
- 2005- "New methods for detection of fish populations and mapping of fish habitat" National Oceanographic Partnership Program (with Churnside, Benoit-Bird, Horne, and Brown).
- 2006- "Columbia River Basin juvenile salmonids: survival and growth in the Columbia River Plume and northern California Current" Bonneville Power Administration (with Casillas 16 other principal investigators)

### **Papers Presented at Scientific Meetings** (First Author Presentations Only)

1978- Fish predation on oil-contaminated prey from the region of the Argo Merchant oil spill. (with R.W. Langton) Northeast Fish. Center Research Meetings, Woods Hole, MA (published abstract).

1981- Food habits of several shelf rockfish species. Western Groundfish Conference, Glenden, OR (published abstract).

1982- Diet overlap and variations in feeding in some sympatric shelf rockfish species.

Western Society of Naturalists, Long Beach, CA (published abstract).

1983- Gastric evacuation rates of black rockfish and their application to daily ration and food consumption estimates. Western Groundfish Conference, Monterey, CA (published abstract).

1983- Food habits of salmon collected in the Gulf of Alaska. (with W.G. Pearcy) Oceanography and Fisheries of the Bering Sea and Gulf of Alaska, Seward, AK.

1984- The 1983 Oregon El Niño story. (with W.G. Pearcy) American Fisheries Society, Warm Springs, OR (published abstract).

1984- Abundance and distribution patterns of ichthyoplankton in the upwelling zone off Oregon during anomalous El Niño conditions. (with D.M. Gadomski and W.G. Pearcy) Int. Symp. Early Life History of Fishes, Vancouver, B.C. (published abstract).

1984- Trophic interactions among juvenile salmonids and other pelagic fishes in coastal waters off Oregon and Washington. (with W.G. Pearcy and H.V. Lorz) Gutshop 1984, Monterey, CA (published abstract).

1985- A distributional analysis of some pelagic nekton off Oregon and Washington (with W.G. Pearcy). Western Groundfish Conference, Union, WA (published abstract).

1985- A review of the zoogeography and trophic ecology of epipelagic fishes in the northern North Pacific. Biology of Nekton of the Subarctic Pacific, Honolulu, HI (published proceedings).

1986- Community and trophic structure of coastal pelagic nekton off Oregon and Washington. Western Society of Naturalists, Monterey, CA (published abstract).

1988- Feeding of juvenile salmon in the ocean: the importance of neuston. Western Society of Naturalists, San Francisco, CA (published abstract).

1988- Intraspecific variation in migratory behavior of marine animals (with T.P. Quinn). American Society of Zoologists, San Francisco, CA (published abstract).

1990- Effects of environmental variability on species composition and trophic interactions in the pelagic ecosystem off Washington and Oregon. Ocean Sciences Meeting, ASLO, New Orleans, LA (published abstract, EOS 71(2):183).

1990- Egg cannibalism by spawning adult walleye pollock in the Gulf of Alaska (poster with K.M. Bailey and S. Kim). Ocean Sciences Meeting, ASLO, New Orleans, LA (published abstract, EOS 71(2):93).

1990- Are juvenile salmon food limited in the sea? Ocean and Estuaries Workshop, American Fisheries Society, Arcata, CA (invited speaker, published paper in proceedings).

1991- Factors related to variations in feeding intensity of juvenile coho and chinook salmon.

Western Division, American Fisheries Society, Bozeman, MT.

1992- Interdecadal variations in zooplankton biomass in the subarctic Pacific Ocean. American Society of Limnology and Oceanography annual meeting, Santa Fe, NM (invited paper, published abstract).

1992- Predation on walleye pollock eggs and larvae by crustacean invertebrate predators in the Western Gulf of Alaska. American Society of Limnology and Oceanography annual meeting, Santa Fe, NM (poster, published abstract with K.M. Bailey, N. Merati and M.M. Yoklavich).

1992- The importance of various spatial and temporal scales in the interaction of juvenile salmon and the marine environment. Workshop on the Growth, Distribution and Mortality of Juvenile Pacific Salmon in Coastal Waters, Sidney, B.C.

1992- Interdecadal variability in pelagic nekton biomass in the Central Subarctic Domain of the northeast Pacific Ocean. International Symposium on Climate Change and Northern Fish Populations, Victoria, B.C. (paper, poster, published abstract with D. Ware).

1992- Vertical and horizontal distribution of ichthyoplankton in the northern Gulf of Alaska. California Cooperative Oceanic and Fisheries Investigations Conference, Monterey, CA (with W.C. Rugen and M. Doyle).

1993- Use of acoustics to detect mesoscale biophysical features in the ocean. The Oceanography Society Meeting, Seattle, WA (poster with five other authors)

1993- The use of immunochemical techniques to assess invertebrate predation on early life stages of marine fishes. The Oceanography Society Meeting, Seattle, WA (poster with N. Merati and G. Theilacker)

1993- Interdecadal variability in the distribution of epipelagic nekton in the Central Subarctic Domain of the Northeast Pacific Ocean. PICES Workshop on Subarctic Pacific, Nemuro, Japan.

1994- Interdecadal variability in pelagic nekton biomass in the Central Subarctic Domain of the Northeast Pacific. ASLO/AGU Meeting, San Diego (Invited poster).

1994- Predation on the early life stages of marine fishes: a case study on walleye pollock in the Gulf of Alaska. International Workshop on Survival Strategies in Early Life Stages, Yokohama, Japan (Invited talk with K. Bailey).

1994- Summer distributions and associations of early life stages of the dominant marine fishes in the Western Gulf of Alaska. PICES Annual Meeting, Nemuro, Japan (poster with M. Busby and M. Wilson).

1995- Mesoscale aggregation patterns of juvenile walleye pollock in the Western Gulf of Alaska. ICES International Symposium on Fisheries and Plankton Acoustics. Aberdeen, Scotland (poster with M. Wilson).

1995- Interannual variations in zooplankton biomass in the Gulf of Alaska and covariations with California Current zooplankton. California Cooperative Oceanic and Fisheries Investigations Conference, Lake Arrowhead, CA (invited symposium speaker).

1996- *In situ* observations of the habitat characteristics of fishes and invertebrates in the Bering Sea. West. Groundfish Conference, Newport, OR (published abstract).

1996- Using acoustics to examine age-0 walleye pollock distribution and diel behavior patterns in the Gulf of Alaska and Bering Sea. Western Groundfish Conference, Newport, OR (poster, published abstract).

1996- Feeding ecology of juvenile salmon in coastal waters of Oregon and Washington and implications for early ocean survival. Estuarine and Ocean Survival of Pacific Salmonids Workshop. Newport, OR (invited paper).

1996- Interannual variations in zooplankton biomass in the Gulf of Alaska and covariations with California Current zooplankton biomass. PICES Annual Meeting, Nanaimo, BC (invited symposium speaker with B. Frost, S. Hare, R. Francis, and J. Ingraham).

1996- Distribution of juvenile pollock relative to frontal structure near the Pribilof Islands, Bering Sea. PICES Annual Meeting, Nanaimo, BC. (with M. Wilson, P. Stabeno, J. Napp, and J. Schumacher- Recipient of Best Paper Award).

1996- *In situ* observations of the association between juvenile fishes and scyphomedusae in the Bering Sea. International Symposium on the Role of Forage Fishes in Marine Ecosystems, Anchorage, AK (poster).

1996- Distribution of juvenile pollock relative to frontal structure near the Pribilof Islands, Bering Sea. International Symposium on the Role of Forage Fishes in Marine Ecosystems, Anchorage, AK (with M. Wilson, P. Stabeno, J. Napp, and S. Salo).

1996- Prey selection and food consumption by age-0 walleye pollock in nearshore waters of the Gulf of Alaska. International Symposium on the Role of Forage Fishes in Marine Ecosystems, Anchorage, AK (poster, with L. Ciannelli).

1997- Spatial and temporal variability in feeding and condition of age-0 walleye pollock in frontal regions of the Bering Sea. ICES Recruitment Symposium, Baltimore, MD (with M. Wilson and L. Ciannelli).

1997- Epipelagic nekton of the North Pacific Subarctic and Transition Zones. PICES Annual Meeting, Pusan, Korea. (invited symposium talk with S. McKinnell, K. Nagasawa, W. Percy, V. Radchenko, and S. Takagi).

1998- *In situ* observations of habitat dependencies of fish in the Bering Sea. Western Groundfish Conference, Pacific Grove, CA (poster).

1998- Substantial increase of Bering Sea jellyfish in the 1990s; possible links to climate. PACLIM Conference, Catalina Island, CA (poster with Walters and Overland).

1998- Fronts and Fish: Interannual and regional differences in frontal structure and effects on pollock and their prey. Oceanography Society/IOC Meeting, Paris, France (poster with Doyle, Napp, Stabeno, Salo, and Wilson).

1998- Evidence for a recent increase in jellyfish in the Bering Sea, with possible links to climate change. Oceanography Society/IOC Meeting, Paris, France (poster with Mills, Overland, and Walters).

1998 - The role of pre-recruit walleye pollock in the Bering Sea and North Pacific Ecosystems. GLOBEC International Marine Science Symposium on Ecosystem Dynamics, Mutsu City, Japan (keynote speaker).

1998- A NMFS Strategic Plan for estuarine and ocean research on Pacific Salmon. Salmon Summit, Seattle, WA.

1998- Retrospective data analysis in the U.S. GLOBEC Northeast Pacific Program. PICES Annual Meeting, Fairbanks, Alaska (Invited talk with Strub, Schwing, Ohman, and Batchelder).

1998- Forage fishes in the Bering Sea: Distribution, species associations, and biomass trends. REX workshop on Small Pelagics, Fairbanks, Alaska (with Wilson, Walters, and Melnikov).

1998- Fronts and Fish: Interannual and regional differences in frontal structure and effects on pollock and their prey. PICES Annual Meeting, Fairbanks, Alaska (poster with Doyle, Napp, Stabeno, Salo, and Wilson).

1998- Evidence for a recent increase in jellyfish in the Bering Sea, with possible links to climate change. PICES Annual Meeting, Fairbanks, Alaska (poster with Mills, Overland, and Walters).

1999- Bioenergetics of age-0 walleye pollock in a frontal structure of the Bering Sea. ASLO Aquatic Sciences Meeting, Santa Fe, NM. (with Ciannelli).

1999- Diel vertical migration, feeding selectivity, and prey distribution of juvenile walleye pollock at a productive frontal region in the Bering Sea. ASLO Aquatic Sciences Meeting, Santa Fe, NM. (with R. Schabetsberger and J. Napp).

1999- Has the carrying capacity of the North Pacific changed in recent decades? Workshop on Ocean-Climate Change and Variability in Fish Recruitment. Anchorage, AK (with W. Pearcy and K. Aydin).

1999- Spatial variations in the ichthyoplankton of the Northeast Pacific Ocean. California Cooperative Oceanic Fisheries Investigations Meeting, La Jolla, CA (poster with Doyle, Mier

and Busby).

1999 - Interdecadal variations in the pelagic nekton community in the northern California Current Region in relation to physical oceanographic conditions. California Cooperative Oceanic Fisheries Investigations Meeting, La Jolla, CA (with Emmett).

2000 - Ecosystem impacts of a massive jellyfish bloom in the Bering Sea. Beyond El Nino Symposium, La Jolla, CA (poster with Aydin, Napp, and Sugisaki).

2000 - Ecosystem impacts of a massive jellyfish bloom in the Bering Sea. (Invited talk at symposium entitled "Marine Ecological Studies in the Bering Sea and eastern North Pacific" in Sydney BC with Aydin, Napp, and Sugisaki).

2000 - Synthesis of fish and plankton data near the Pribilof Islands. (Poster for "International Symposium on Advanced Techniques of Sampling Gear and Acoustical Surveys for Estimation of Fish Abundance and Behavior" held in Hakodate, Japan with Swartzman, Napp and Winter).

2000 - An east-west comparison of the coastal epipelagic nekton of the North Pacific Ocean. (Invited talk for PICES Symposium, Hakodate, Japan with Fisher, Ueno, Percy and Nagasawa).

2000 - Ecosystem impacts of a massive jellyfish bloom in the Bering Sea. (Talk at PICES Annual meeting, Hakodate, Japan with Sugisaki, Aydin, and Napp).

2000 - Research conducted by the United States on the early ocean life history of Pacific salmon. (Invited talk at NPAFC/PICES international workshop on "Factors affecting production of juvenile salmon: Comparative studies on juvenile salmon ecology between the East and West North Pacific Ocean", Tokyo, Japan, with Helle).

2001 - Spatial and temporal variability in juvenile salmon feeding in relation to prey availability and oceanographic conditions. (Talk at international workshop on Juvenile Salmon Marine in Marine Ecosystems, Nanaimo, BC, Canada).

2001 - Micronekton studies the North Pacific. (Talk at PICES/CoML international workshop on Impact of Climate Variability on Observation and Prediction of Ecosystem Biodiversity Changes in the North Pacific, Honolulu, HI).

2001- Dramatic increases in jellyfish biomass in the Bering Sea: Causes and effects on the ecosystem. (Invited talk at 2<sup>nd</sup> Symposium on Marine Conservation Biology, San Francisco, with Sugisaki and Hunt).

2001- Mesoscale and fine-scale distribution of juvenile salmon and associated biota off Oregon and northern California (Poster at PICES Annual Meeting, Victoria, Canada, with Casillas, Emmett, Fisher, Noskov and Teel).

2001 – Climate, ocean conditions, and the survival of salmon. (Invited talk at GLOBEC meeting, Seattle, with Casillas and Haldorson).



2002 – Distribution, growth, origin, trophic and species associations of juvenile salmonids in the northern California Current. (Talk presented at Salmon Ocean Ecology Meeting, Santa Cruz, CA, with Casillas, Fisher, Miller, Noskov, and Teel).

2002 – Nekton of the northern California Current system. (Invited talk presented at workshop on “Pelagic Predators, Prey, and Processes: The Scientific Basis for Offshore Marine Reserves, Santa Cruz, CA, with Emmett).

2002 – Distribution, growth, origin, trophic and species associations of juvenile salmonids in the northern California Current. (Talk presented at ASLO/AGU Ocean Sciences Meeting, Honolulu, with Casillas, Fisher, Miller, Emmett, and Teel).

2002 -- Abundance and distribution patterns of nekton and micronekton in the Northern California Current Transition Zone. (Invited talk presented at PICES Symposium on North Pacific Transitional Areas, La Paz, Mexico, with Pearcy and Ralston).

2002 -- An east-west comparison of the Transition Zone coastal pelagic nekton of the North Pacific Ocean. (Talk presented at PICES Symposium on North Pacific Transitional Areas, La Paz, Mexico, with Fisher, Ueno, Pearcy and Nagasawa).

2002 – Are hydrographic fronts important for juvenile salmon? (Talk presented at Larval Fish Conference, Bergen, Norway, with De Robertis, Morgan, Schabetsberger, and Emmett).

2002 – Community structure of pelagic nekton and neuston in the California Current in relation to oceanographic conditions. (Poster at 2<sup>nd</sup> GLOBEC Open Science Meeting and PICES Annual Meeting, Qingdao, China with Miller, Reese, and Emmett).

2003 – Interannual and spatial variability in feeding habits of juvenile salmon in the Columbia River Plume in relation to zooplankton availability. (Talk presented at Salmon Ocean Ecology Meeting, Newport, OR with Schabetsberger and Morgan).

2003 – Cross-shelf variability in hydrography, zooplankton and Chinook salmon diets in relation to the Columbia River Plume. (Invited talk presented at PICES Annual Meeting in Seoul, Korea, with Morgan).

2004 – Species composition and community structure of pelagic nekton off Oregon and Washington under variable oceanographic conditions. (Talk presented at AGU Ocean Sciences Meeting, Portland, OR, with Fisher, Emmett, Morgan, and Casillas).

2004 – Using community structure of pelagic nekton as an indicator of ecosystem response to changing oceanographic conditions. (Poster presented at Quantitative Ecosystem Indicators for Fisheries Management Symposium in Paris France; with Fisher, Morgan, Casillas and Emmett).

2004 – Ecological linkages among plankton, salmon and other pelagic fishes. (Invited talk presented at the Western Juan de Fuca Ecosystem Symposium in Sidney, B.C., Canada).

2004 – Interannual and interdecadal variability in juvenile salmon diets in relation to environmental changes in the northern California Current. (Poster presented at PICES Annual Meeting in Honolulu, HI; with Daly, Schabetsberger, and Mier).

2004 – Sardines in the ecosystem of the Pacific Northwest. (Invited talk presented at the Sardine Symposium in La Jolla, CA; with Emmett, Miller, Pool, Bentley, and Krutzikowsky).

2005 – Ichthyoplankton indicators for the Pacific Northwest. FATE Annual Meeting, Seattle (Talk with Emmett and Peterson).

2005 – Regional comparisons of juvenile salmon feeding ecology in coastal marine waters off the West Coast of North America. American Fisheries Society Annual Meeting, Anchorage, AK (Talk with Daly, Armstrong, Miller, Norton, Sturdevant, Thiess, Trudel, and Weitkamp).

2005 – Lessons from the U.S. Global Ocean Ecosystems Dynamics Northeast Pacific Program: Ocean observations for informing management. American Fisheries Society Annual Meeting, Anchorage, AK (Invited talk with Batchelder).

2005 – Pelagic nekton as indicators of ecosystem response to changing oceanographic conditions in the northern California Current. Climate and Fisheries: Impacts, Uncertainty and Responses of Ecosystems and Communities, Victoria, BC. (Invited talk with Emmett).

2005 – Interannual and interdecadal variability in juvenile coho salmon diets in relation to environmental changes in the Northern California Current. Climate and Fisheries: Impacts, Uncertainty and Responses of Ecosystems and Communities, Victoria, BC. (Invited talk with Daly, Schabetsberger and Mier).

2006 – Trophic connectivity in the northern California Current: Insights from diet and stable isotope analysis. AGU/ASLO Ocean Sciences Meeting, Honolulu, HI (Talk with Miller and Rau).

2006 – The rise and fall of jellyfish in the Bering Sea in relation to climatic regime shifts. PICES/GLOBEC Symposium on Climate variability and ecosystem impacts on the North Pacific, Honolulu, HI (Talk with Decker, Ciannelli, Purcell, Bond, Stabeno, Acuna, and Hunt).

2006 – Ichthyoplankton-based indices of climate and ecosystem change in a coastal upwelling zone off Oregon. Annual Larval Fish Conference, Lake Placid, NY (Talk with Soulen, Emmett, Peterson, Parnel, Auth and Emerson).

2006 – Micronekton and their importance in the northern California Current Ecosystem. PICES Annual Meeting, Yokohama, Japan (Invited talk).

2006 – Spatial overlap and trophic interactions between fish and large jellyfish in the northern California Current. PICES Annual Meeting, Yokohama, Japan (Talk with Suchman, Reese,

Miller, Ruzicka, and Daly).

2006 – Ocean ecology of juvenile salmon in Western North America: Regional comparisons. US GLOBEC Pan-Regional Synthesis Workshop, Boulder, Colorado. (Invited talk).

2006 – Do jellyfish have the potential to negatively affect pelagic fishes in upwelling regions? CalCOFI Annual Meeting, Pacific Grove, CA. (Invited symposium talk, with Ruzicka, Suchman, Reese, Miller, Daly and Wainwright).

2007 – Regional comparisons of juvenile salmon ocean ecology: Insights and lessons learned. 9<sup>th</sup> Annual Salmon Ocean Ecology Meeting, Newport, OR (with Orsi and Fisher).

2007 – Abundance and diversity of coastal fish larvae as indicators of recent changes in ocean and climate conditions in the Oregon upwelling zone. PICES Annual Meeting, Victoria, Canada (Talk with Peterson, Auth, Soulen, Parnel, and Emerson).

2007 – The Columbia River plume as an ecotone and habitat for juvenile Chinook salmon. PICES Annual Meeting, Victoria, Canada (Poster with Morgan).

2007 – Spatial and temporal variations in albacore habitat in the Northeast Pacific using remotely-sensed environmental data. PICES Annual Meeting, Victoria, Canada (Poster with Howell, Polovina, Ciannelli, Percy, Laurs, and Childers).

2007 – The role of forage fishes in the pelagic food web of the California Current. Forage Species, Food Webs, and Marine Ecosystem Management Symposium, San Francisco, CA (Invited talk).

2008 – Spatial and temporal variations in albacore habitat in the Northeast Pacific using remotely-sensed environmental data. Ocean Sciences Meeting, Orlando, Florida (Talk with Howell, Polovina, Ciannelli, Percy, Laurs, and Childers).

2008 – Trophic habits of juvenile coho and Chinook salmon after recent migration into coastal waters: a critical period? 10<sup>th</sup> Annual Salmon Ocean Ecology Meeting, Nanaimo, BC, Canada (Talk with Daly).

2008 – The Columbia River plume as an ecotone and habitat for juvenile Chinook salmon. 10<sup>th</sup> Annual Salmon Ocean Ecology Meeting, Nanaimo, BC, Canada (Poster with Morgan).