

SUSAN ELIZABETH FORD

Professor Emeritus
Rutgers University
Department of Marine and Coastal Sciences
Haskin Shellfish Research Laboratory
6959 Miller Avenue
Port Norris, N.J. 08349

Phone: (757) 645-3163; (609) 785-0074 ext 4305 Fax: (609) 785-1544
e mail susan@hsrl.rutgers.edu

Education

Carleton College, Northfield, MN, 1960-62
Rutgers University, New Brunswick, NJ, B.A. (Zoology) 1978
Duke University, Durham, NC, Ph.D. (Zoology) 1984

Positions Held

1966-78 Laboratory Technician, Department of Oyster Culture, Rutgers University
1978-81 Teaching Assistant, Department of Zoology, Duke University
1980 Assistant in charge of laboratories and guest lecturer, Cell Biology
1981 Guest lecturer, General Biology
1980 Cocos Foundation Fellow, Department of Zoology, Duke University
1983-84 Adjunct Instructor, Department of Oyster Culture, Rutgers University
1984-90 Assistant Research Professor, Dept. of Oyster Culture, Rutgers University
1990-97 Associate Research Professor, Dept. of Marine and Coastal Sciences, Rutgers University
1995-2002 Adjunct Associate Professor of Pathology, Dept. of Pathobiology, School of Veterinary
Medicine, University of Pennsylvania
1997-2002 Research Professor, Dept. of Marine and Coastal Sciences, Rutgers University
2014 - Adjunct Professor, School of Marine Science, College of William and Mary

Membership in Graduate Programs

Ecology Graduate Program, Rutgers University
Environmental Sciences Graduate Program, Rutgers University

Research Interests

Invertebrate pathology/parasitology; genetics and mechanisms of resistance to pathogens; comparative physiology/biochemistry; physiological ecology of estuarine organisms; growth characteristics of molluscs.

Honors and Awards

1960 Abby Aldrich Rockefeller Scholarship
1970 Thurlow C. Nelson Award, National Shellfisheries Assoc.
1980 Cocos Foundation Fellow, Duke University
1996 Italian National Research Council short-term visiting Fellowship
2004 David Wallace Award, National Shellfisheries Association
2012 Honored Life Member Award, National Shellfisheries Association

Memberships and Service in Professional Societies

American Society of Zoologists
Public Affairs Committee 1988-1990
National Shellfisheries Association
Program Committee (1982-1985)
Honorary Membership/Awards Committee (1990, 1996), Chair (1993-94)
Newsletter Editor (1984-1986)
Historian (2005-2009)
Co-Chair, Publications Committee (2005-present)
Society for Invertebrate Pathology
Membership Committee (1986-1988)
Nominations Committee (1987-1988)

Editorial Boards

Editorial Board, JOURNAL OF SHELLFISH RESEARCH (1991-2011)
Editorial Board, JOURNAL OF INVERTEBRATE PATHOLOGY (1985-1988; 2003-2007)
Associate Editor, JOURNAL OF INVERTEBRATE PATHOLOGY (2008-present)
Review Editor, DISEASES OF AQUATIC ORGANISMS (1994-present)

Publications

- Haskin, H.H. and S.E. Ford. 1979. Development of resistance to *Minchinia nelsoni* (MSX) mortality in laboratory-reared and native oyster stocks in Delaware Bay. *Mar. Fish. Rev.* 41(1-2):54-63.
- Dillaman, R.M. and S.E. Ford. 1982. Measurement of calcium carbonate deposition in molluscs by controlled etching of radioactively labelled shells. *Mar. Biol.* 66:133-143.
- Ford, S.E. and H.H. Haskin. 1982. History and epizootiology of *Haplosporidium nelsoni* (MSX), an oyster pathogen in Delaware Bay, 1957-1980. *J. Invertebr. Pathol.* 40:118-141.
- Haskin, H.H. and S.E. Ford. 1982. *Haplosporidium nelsoni* on Delaware Bay seed oyster beds: a host-parasite relationship along a salinity gradient. *J. Invertebr. Pathol.* 40:388-405.
- Haskin, H.H. and S.E. Ford. 1983. Quantitative effects of MSX disease (*Haplosporidium nelsoni*) on production of the New Jersey oyster beds in Delaware Bay, U.S.A. (Invited Paper, C.M. 1983 /Gen:7/ Mini-Symp.) International Council for the Exploration of the Sea, Goteborg, Sweden. 21pp.
- Ford, S. E. 1985. Chronic infections of *Haplosporidium nelsoni* (MSX) in Delaware Bay oysters. *J. Invertebr. Pathol.* 45:94-107.
- Ford, S.E. 1985. Effects of salinity on survival of the parasite *Haplosporidium nelsoni* (MSX) in oysters. *J. Shellfish Res.* Vol. 5(2):85-90.
- Ford, S.E. 1986. Comparison of hemolymph proteins from resistant and susceptible oysters, *Crassostrea virginica* exposed to the pathogen *Haplosporidium nelsoni* (MSX). *J. Invertebr. Pathol.* 47:283-294.
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- Ford, S.E. and H.H. Haskin. 1987. Infection and mortality patterns in strains of oysters *Crassostrea virginica* selected for resistance to the parasite *Haplosporidium nelsoni* (MSX). *J. Parasitol.* 73:368-376.
- Haskin, H.H. and S.E. Ford. 1987. Breeding for disease resistance in molluscs. In *Selection, Hybridization and Genetic Engineering in Aquaculture*. (K. Tiews, ed.) Heenemann Verlagsgesellschaft, Berlin. p. 431-441.
- Ford, S.E. 1987. Host-Parasite Interactions: Summary. In *Marine Bivalve Pathology: Abstracts from a Joint U.S. Spain Seminar* (W.S. Fisher and A.J. Figueras, eds). pp.61-68. University of Maryland Sea Grant Publication, College Park.
- Ford, S.E. and H.H. Haskin. 1988. Comparison of in vitro salinity tolerance of the oyster parasite *Haplosporidium nelsoni* (MSX) and hemocytes from the host, *Crassostrea virginica*. *Comp. Biochem. and Physiol.* 90A:183-187.
- Ford, S.E. and S.A. Kanaley. 1988. An evaluation of hemolymph diagnosis for detection of the oyster parasite *Haplosporidium nelsoni* (MSX). *J. Shellfish Research* 7:11-18.
- Ford, S.E. and A.J. Figueras. 1988. Effects of sublethal infection by the parasite *Haplosporidium nelsoni* (MSX) on gametogenesis, spawning, and sex ratios of oysters in Delaware Bay, USA. *Diseases of Aquatic Organisms* 4:121-133.

- Barber, B.J., S.E. Ford, and H.H. Haskin. 1988. Effects of the parasite MSX (*Haplosporidium nelsoni*) on oyster (*Crassostrea virginica*) energy metabolism. I. Condition index and relative fecundity. *J. Shellfish Research* 7:25-31.
- Ford, S.E. 1988. Host parasite interactions in strains of oyster selected for resistance to *Haplosporidium nelsoni* (MSX): a case study of resistance to a natural pathogen. In: Disease Processes in Marine Bivalve Molluscs (W.S. Fisher, ed) American Fisheries Society Special Publication No. 18:206-224.
- Ford, S.E. and H.H. Haskin. 1988. Management strategies for MSX (*Haplosporidium nelsoni*) disease in oysters. In: Disease Processes in Marine Bivalve Molluscs (W.S. Fisher, ed) American Fisheries Society Special Publication No. 18:249-256.
- Fisher, W.S. and S.E. Ford. 1988. Flow cytometry: A tool for cell research. In: Disease Processes in Marine Bivalve Molluscs (W.S. Fisher, ed) American Fisheries Society Special Publication No. 18:286-291.
- Barber, B.J., S.E. Ford, and H.H. Haskin. 1988. Effects of the parasite MSX (*Haplosporidium nelsoni*) on oyster (*Crassostrea virginica*) energy metabolism. II. Biochemical composition. *Comp. Biochem. Physiol.* 91A:603-608.
- Scro, R.A. and S.E. Ford. 1990. An electron microscope study of disease progression in the oyster *Crassostrea virginica* infected with the protozoan parasite *Haplosporidium nelsoni* (MSX). In: Pathology in Marine Science, pp. 229-254 (F.O. Perkins and T.C. Cheng, Eds.) Academic Press.
- Ford, S.E., A.J. Figueras, and H.H. Haskin. 1990. Influence of selective breeding, geographic origin, and disease on gametogenesis and sex ratios of oysters, *Crassostrea virginica*, exposed to the parasite *Haplosporidium nelsoni* (MSX). *Aquaculture* 87:285-301.
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- Ford, S.E., S.A. Kanaley, M. Ferris, and K.A. Ashton-Alcox. 1990. "Panning", a technique for enrichment of the parasite *Haplosporidium nelsoni* (MSX) from hemolymph of infected oysters *J. Invertebr. Pathol.* 56:347-352.
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- Ford, S. E., S. A. Kanaley, and D. T. J. Littlewood. 1993. Cellular responses of oysters infected with *Haplosporidium nelsoni*: Changes in circulating and tissue-infiltrating hemocytes. *J. Invertebr. Pathol.* 61:49-58.
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- Hoffman, E., J. Klinck, D. Bushek, S. Ford, X. Guo, E. Powell, D. Haidvogel, J. Wilkin. 2009. Understanding disease resistance in estuarine populations and response to climate change. Delaware Estuary Science & Environmental Summit 2009. January 12-14, 2009, Cape May, New Jersey.
- Bushek, D., S. Ford, X. Guo, I. Burt, B. Landau, C. Milbury, E. Scarpa, and L. Zhang. 2009. Field and laboratory studies to understand disease resistance in the Delaware bay oysters and response to climate change. Delaware Estuary Science & Environmental Summit 2009. January 12-14, 2009, Cape May, New Jersey.
- Scarpa, E.E., S. Ford, W. Saidel , X. Guo and D. Bushek. 2009. Ciliate Xenomas in *Crassostrea virginica* from Great Bay, New Hampshire. J. Shellfish Res. 28(3):727.
- Zhang, L., X. Guo, D. Bushek and S. Ford. 2009. Mapping quantitative trait loci conferring Dermo resistance in the eastern oyster *Crassostrea virginica*. J. Shellfish Res. 28(3):740.
- Hoffman, E., J. Klinck, D. Bushek, S. Ford, X. Guo, E. Powell, D. Haidvogel, J. Wilkin, and D. Hedgecock. 2009. Understanding disease resistance in estuarine populations and response to climate change. J. Shellfish Res. 28(3):704.

- Bushek, D. S. Ford, I. Burt, B. Landau and E. Scarpa. 2009. Understanding the basis of oyster disease refugia in Delaware Bay. *J. Shellfish Res.* 28(3):686.
- Bushek, D. and S. Ford. 2009. PCR Disease Diagnostics: Promising Correct Results or Potentially Confounding Research. *J. Shellfish Res.* 28(3):686.
- Ford, S. E. 2010. Diseases outbreaks in the marine environment: how do we assess the impact of climate change? *ClimECO2. Oceans, Marine Ecosystems, and Society facing Climate Change- A multidisciplinary approach - An international Summer School co-organized by IUEM, IMBER and Europôle Mer, Brest, France, 23-27 August 2010*
- Bricelj, M., S. Ford, S. MacQuarrie, C. Lambert, A. Barbou, V. Trainer and C. Paillard. 2010. The Manila clam *Tapes philippinarum*: a new model species to investigate the genetic basis of resistance to paralytic shellfish toxins? 14 International Conference and Harmful Algae, Hersonissos, Crete, on 1-5 November 2010
- Kraeuter, J. N. , S. Ford, D. Bushek, W.C. Walton, D.C. Murphy, G. Flimlin and G. Mathis. 2010. Northeastern Aquaculture Conference and Expo. Plymouth, MA, Dec. 1-3, 2010.
- Bushek, D., S. Ford, I. Burt, E. Scarpa and B. Landau. 2010. MSX and Dermo diseases in Delaware Bay oysters: the role of disease refugia. Northeastern Aquaculture Conference and Expo. Plymouth, MA, Dec. 1-3, 2010.
- Guo, X., C. Milbury, L. Zhang, Y. Wang, D. Bushek and S. Ford. 2011. Genetic structure of eastern oyster populations in Delaware Bay. Delaware Estuary Summit. January 30-February 2, 2011. Cape May, New Jersey.
- Powell, E.N., J. M. Klinck, X. Guo, E.E. Hofmann, S. Ford and D. Bushek. 2011. Can oysters develop resistance to Dermo disease in the field: evaluation using a gene-based population dynamics model. Delaware Estuary Summit. January 30-February 2, 2011. Cape May, New Jersey.
- Bushek, D., S. Ford, I. Burt, E. Scarpa, B. Landau. 2011. MSX and Dermo diseases in Delaware Bay oysters: the role of disease refugia. Delaware Estuary Summit. January 30-February 2, 2011. Cape May, New Jersey.
- Hofmann, E.E., D. Bushek, S. Ford, X. Guo, E. Powell, D. Haidvogel, J. Wilkin and J. Klinck. 2011. Understanding how disease and environment combine to structure resistance in estuarine populations. Delaware Estuary Summit. January 30-February 2, 2011. Cape May, New Jersey.
- Wang, Z., D. Bushek, S. Ford, E. Powell, D. Haidvogel. 2011. Inter-annual variability in circulation and water properties in Delaware Bay and its relationship to disease prevalence. Delaware Estuary Summit. January 30-February 2, 2011. Cape May, New Jersey.
- Bushek, D., I. Burt, E. Scarpa and S. Ford. 2012. The short-term impacts of Hurricane Irene and TS Lee on oyster disease in Delaware Bay. Atlantic Estuarine Society Meeting. March 9-10, 2012. Cape May, New Jersey.
- Bushek, D. S. Ford, X. Guo, D. Munroe, E. Powell, D. Haidvogel, J. Wilkin, J. Levin, J. Klinck and E. Hofmann. 2013. Development of a theoretical basis for modeling disease processes in marine invertebrates. Aquaculture 2013. Nashville, Tennessee, February 20-25, 2013.
- Bao, Y., S. Ford, D. Bushek, X. Guo. 2011. Genetic analysis of *Haplosporidium nelsoni* from four U.S. populations with internal transcribed spacer sequences. *J. Shellfish Res.* (30):485.
- Hofmann, E.E., J. M. Klinck, D. Bushek, S. E. Ford, X. Guo, E. N. Powell, D. B. Haidvogel, J. Wilkin. 2011. Delaware Bay Ecology of Infectious Disease Project Overview and Results. *J. Shellfish Res.* (30):516.
- Powell, E.N., J. M. Klinck, X. Guo, E. E. Hofmann, S. Ford, D. Bushek. 2011. Can oysters develop resistance to dermo disease: evaluation using a gene-based population dynamics model. *J. Shellfish Res.* (30):544.
- Wang, Z., D. Haidvogel, J. Wilkin, D. Bushek, S. Ford, E. Powell. 2011. Inter-annual variability in circulation and water properties in Delaware Bay and their relationship to disease prevalence. *J. Shellfish Res.* (30):562.
- Guo, X., C. Milbury, Y. Wang, Y. He, L. Zhang, D. Bushek, S. Ford. 2012. Genetic structure of eastern oyster populations in Delaware Bay and selection by diseases. *J. Shellfish Res.* 292.
- Hofmann, E., D. Bushek, S. Ford, X. Guo, D. Munroe, E. Powell, D. Haidvogel, J. Wilkin, J. Levin and J. Klinck. 2013. Development of a theoretical basis for modeling disease processes in marine invertebrates. Delaware Estuary Summit. January 27-February 1, 2013. Cape May, New Jersey.
- D. Bushek, S. Ford, X. Guo, D. Munroe, E. Powell, D. Haidvogel, J. Wilkin, J. Levin, J. Klinck and E. Hofmann. 2013. Development of a theoretical basis for modeling disease processes in marine invertebrates. Coastal & Estuarine Research Federation, November 3-7, 2013, San Diego, California.

Major Technical Reports

- Ford, S. E. and H. H. Haskin. 1986. Delaware Bay Oyster Research Program 1984-1986. Report to the New Jersey Department of Environmental Protection. 133 p. + Appendices.
- Ford, S. E. and S. A. Kanaley. 1989. Development of an Enzyme-linked Immunosorbent Assay (ELISA) for Detection of the Oyster Parasite *Haplosporidium nelsoni* (MSX). 37 p. + Appendices.
- Ford, S. E. and W. J. Canzonier. 1992. Identification of oyster broodstock conditioning parameters that minimize inhibition of gametogenesis by Dermo disease. Report to the New Jersey Fisheries and Aquaculture Technology Extension Center. 11 p.
- Ford, S. E. 1994. Unexplained mortalities of hatchery-reared oysters, *Crassostrea virginica*, in the Northeast: a followup study. Report to the Northeastern Regional Aquaculture Center, March 1994. 26 p. + Appendices.
- Ford, S. E., G. T. Taylor, M-J. Lee, M. Bricelj, and J. Grochowski. 1994. The Role of Bacteria and Microalgae in Unexplained Juvenile Oyster Mortalities. Report to the Northeastern Regional Aquaculture Center, October 1994. 21 p. + Appendices.
- Fegley, S.R., S.E. Ford, J.N. Kraeuter and D.R. Jones. 1994. Relative Effects of Harvest Pressure and Disease Mortality on Eastern Oyster Population Dynamics in Delaware Bay. Rutgers, The State University of New Jersey. Final Report to NOAA, NMFS Oyster Disease Research Program. August 4, 1994.
- Ford, S. E., R. Smolowitz, D. Brousseau, and J. Baglivo. 1999. Current and Potential Effects of Dermo and Other Diseases on Cultured Oysters in the Northeast: Information for Animal Health Management. Report to the Northeastern Regional Aquaculture Center, June 15, 1999. 78 p, including figs and tables.

Course Lectures Given

Marine Biological Laboratory, Woods Hole, Aquavet II - 1990-2004
 Darling Marine Center, U. of Maine, Shellfish Mariculture Techniques - 1991
 Horn Point Environmental Laboratory, U. of Maryland - Oyster Culture Workshop - 1991
 State University of New York, Stony Brook - Graduate Aquaculture Course - 1994
 University of the Basque Country, Bilbao, Spain - Graduate course in Histology of aquatic animals - 2007
 "Reclam the Bay" - Annual lecture on oysters for 30-40 volunteers - 2000-2012
 Université de Basse Normandie - Graduate students in biological sciences - 2012

Courses Taught

"Curso internacional sobre enfermedades del ostion" (International Course on Diseases of Oysters), Tabasco, Mexico, December 6-11, 1993.
 Topics in Aquaculture (with S.K. Allen) Haskin Shellfish Research Laboratory, 2-week Rutgers Intersession course, January 1994 (9 students), 1996 (9 students)
 Topics in Aquaculture (with X. Guo) Haskin Shellfish Research Laboratory, 2-week Rutgers Intersession course, January 1998 (9 students), 2000 (7 students)
 "L'effet de l'environnement sur l'interaction hôte-parasite" to graduate students at the Université de Bretagne Occidentale, November 20-24, 2000., with C. Paillard

Grant Support

Internal

Biochemical and Immunological Studies of *Haplosporidium nelsoni*. Rutgers Research Council, 1984-85, \$2,100.
 Mechanisms of Disease Resistance in Oysters. Rutgers Research Council, 1985-86, \$2,000.
 Development of an Enzyme-Linked Immunosorbent Assay (ELISA) for Detection of the Oyster Parasite *Haplosporidium nelsoni* (MSX). N.J. Center for Technology Extension in Fisheries and Aquaculture, 1985-86, \$32,500.
 Genetic Factors Associated with Growth Rate and Disease Resistance in Oysters. N.J. Center for Technology Extension in Fisheries and Aquaculture, 1985-86, \$11,500. (Principal Investigator with Robert Vrijenhoek).
 Studies of Dermo Disease in New Jersey. NJ Fisheries and Technology Extension Center, 1990-91, \$4,500.

Identification of oyster broodstock conditioning parameters that minimize inhibition of gametogenesis by Dermo disease. NJ Fisheries and Technology Extension Center, 1991-92, \$5,000.

External

- Studies of MSX Disease in Delaware Bay. NJDEP, 1984-85, \$10,000. (co-Principal Investigator with Harold Haskin).
- Improving Survival of Upper Seed Bed Oysters Planted on Leased Grounds of Delaware Bay. NJDEP, 1984-85, \$30,000. (co-Principal Investigator with Harold Haskin).
- Rehabilitation of the Natural Seed Oyster Beds of Delaware Bay. NJDEP, 1984-85, \$30,000. (co-Principal Investigator with Harold Haskin).
- Supplement to MSX Research and Oyster Production Studies in Delaware Bay. NJDEP, 1984-85, \$60,000. (co-Principal Investigator with Harold Haskin).
- Delaware Bay Oyster Research Project. NJDEP, 1985-86, \$130,000.
- Development of an Enzyme-Linked Immunosorbent Assay (ELISA) for Detection of the Oyster Parasite *Haplosporidium nelsoni* (MSX). Sea Grant, 1986-87, \$19,000.
- Development and Evaluation of MSX-Resistant Oyster Strains. NJDEP, 1986-87, \$28,500. (additional funds from NJ Fisheries and Aquaculture TEX Center).
- Development of an Enzyme-Linked Immunosorbent Assay (ELISA) for Detection of the Oyster Parasite *Haplosporidium nelsoni* (MSX). Sea Grant, 1987-88, \$21,000 (additional funds from TEX Center).
- Genetic Factors Associated with Disease Resistance and Growth Rates in Oysters. Sea Grant, 1987-88, \$19,100 (additional funds from TEX Center) (co-Principal Investigator with R.C. Vrijenhoek)
- Development and Evaluation of MSX-Resistant Oyster Strains. NJDEP, 1987-88. \$30,000.
- Development of an Enzyme-Linked Immunosorbent Assay (ELISA) for Detection of the Oyster Parasite *Haplosporidium nelsoni* (MSX). Sea Grant, 1988-89, \$22,700.
- Genetic Factors Associated with Disease Resistance and Growth Rates in Oysters. Sea Grant, 1988-89, \$20,000 (additional funds from TEX Center) (Co-PI with R.C. Vrijenhoek)
- Monoclonal Antibodies against the Oyster Parasite *Haplosporidium nelsoni*. NJ Marine Sciences Consortium. 1987-88. \$4,000.
- Physiological Factors Associated with MSX Mortality-Resistance in Hatchery Produced Oysters, *Crassostrea virginica*. Sea Grant, 1988-1989. \$11,500.
- Development and Evaluation of MSX-Resistant Oyster Strains. NJDEP, 1988-89. \$35,000.
- Genetic Improvement of the American Oyster *Crassostrea virginica* for Commercial Culture in the Northeast. USDA Northeast Regional Aquaculture Center. 1988-1992. \$510,000.
- Nucleic Acid Probes for the Oyster Parasite *Haplosporidium nelsoni* (MSX). Sea Grant. 1989-1990. \$50,500 (Principal Investigator with Dunne Fong)
- Nucleic Acid Probes for the Oyster Parasite *Haplosporidium nelsoni* (MSX). USDA Special Research Grants in Animal Health. 1989-1992. \$37,000 (P.I. with Dunne Fong) .
- Studies of MSX in Delaware Bay: Diagnosis, Monitoring, and Life Cycle. NJDEP 1989-1990. \$22,000
- Studies on the Life Cycle of the Oyster Parasite *Haplosporidium nelsoni* (MSX). NOAA/NMFS 1991-1992. \$99,200.
- Nucleic Acid Probes for the Oyster Parasite *Haplosporidium nelsoni* (MSX). Sea Grant. 1990-1991. \$59,500 (Principal Investigator with Dunne Fong)
- Commercial Field Trials of MSX-Resistant Strains of the American Oyster *Crassostrea virginica*. USDA Northeast Regional Aquaculture Center. 1989-1995. \$130,756 (Principal Investigator with K. Rask of U. Mass. Cooperative Extension)
- Studies of *Perkinsus marinus*, cause of Dermo Disease, in New Jersey Oysters. State of New Jersey/NJAES. 1991. \$41,500.
- Unexplained Mortalities of Hatchery-reared oysters, *Crassostrea virginica*, in the Northeast: A Preliminary Study. USDA Northeast Regional Aquaculture Center. 1991. \$9,951 (co-Principal Investigator with M. Bricelj and F. Borrero, SUNY)
- Cellular Responses of American Oysters to Pathogenic Parasites. USDA National Research Initiative. 1991-1995. \$123,000.
- Unexplained Mortalities of Hatchery-reared oysters, *Crassostrea virginica*, in the Northeast: A Follow-up Study. USDA Northeast Regional Aquaculture Center & NOAA/NMFS. 1992-93. \$20,000 (co-Principal Investigator with F. Borrero, SUNY)

- Life Cycle Studies of *Haplosporidium nelsoni* (MSX): Spores and Non-Oyster Hosts. NOAA/NMFS. 1993-1994. \$122,000.
- Relative Effects of Anthropomorphic and Disease Mortality on the Population Dynamics of the American Oyster in Delaware Bay. NOAA/NMFS. 1993-1994. \$61,200. (co-Principal Investigator with S. R. Fegley and J. N. Kraeuter).
- The Role of Bacteria and Microalgae in Unexplained Juvenile Oyster Mortalities. USDA Northeastern Regional Aquaculture Center, 1993-1994. \$71,500 (co-Principal Investigator with G. Taylor and V. M. Bricelj, SUNY Stony Brook).
- Delaware Bay Oyster Research Program. NJ DEPE, 1992-93. \$30,131 (co-Principal Investigator with J. N. Kraeuter).
- Development of *Haplosporidium nelsoni* (MSX) - Specific DNA Probes for Diagnostic Applications and Life Cycle Studies. NOAA/NMFS. 1994-1995. \$117,607 (co-Principal Investigator with D. Fong and E. Burreson).
- Seasonal Tissue Distribution of *Perkinsus marinus* in Eastern Oysters. EPA. 1993-1994. \$12,250.
- Delaware Bay Oyster Research Program. NJ DEPE, 1993-94. \$30,000 (co-Principal Investigator with J. N. Kraeuter).
- Infectivity of Cultured *Perkinsus marinus*: Effects of Parasite Life Stage and Delivery Method. NOAA/NMFS. 1994-1995. \$79,500.
- The Role of Bacteria (*Vibrio* spp.) and Microalgae (*Gymnodinium sanguineum*) in Unexplained Juvenile Oyster Mortalities. USDA Northeastern Regional Aquaculture Center, 1994. \$11,000 (co-Principal Investigator with G. Taylor and V. M. Bricelj, SUNY Stony Brook).
- Effects of *in vitro* and *in vivo* passages on virulence of *Perkinsus marinus*. NOAA/NMFS. 1994-1996. \$94,553. (Principal Investigator with D. Bushek)
- Delaware Bay Oyster Research Program. NJ DEPE, 1994-95. \$30,000 (co-Principal Investigator with J. N. Kraeuter)
- Genetic Improvement of the American Oyster *Crassostrea virginica* for Commercial Culture in the Northeast. USDA Northeast Regional Aquaculture Center. Supplement. 1995. \$7,963.
- Commercial Field Trials of MSX-Resistant Strains of the American Oyster *Crassostrea virginica*. USDA Northeast Regional Aquaculture Center. Supplement. 1989-1995. \$30,022.
- Delaware Bay Oyster Research Program. NJ DEPE, 1995-96. \$30,000 (co-Principal Investigator with J. N. Kraeuter)
- Life Cycle Studies of *Haplosporidium nelsoni* (MSX) using PCR Technology .NOAA/NMFS. 1995-1996. \$165,873. (co-Principal Investigator with E. Burreson and N. Stokes, VIMS)
- Current and Potential Effects of Dermo and other Diseases on Cultured Oysters in the Northeast: Information for Animal Health Management. USDA Northeastern Regional Aquaculture Center. 1996-1998. \$266,980 (Principal Investigator with R. Smolowitz, UPA; D. Brousseau, Fairfield U; Jenny Baglivo, Boston U)
- Hard Clam Winter Mortality. USDA Northeastern Regional Aquaculture Center. 1995-1996. \$80,000 + NSF/SBIR \$55,800 (co-Investigator with J.N. Kraeuter HSRL, R. Smolowitz, UPA; D. Leavitt, WHOI; G. Crema and G. Mathis)
- Life Cycle Studies of *Haplosporidium nelsoni* (MSX) using PCR Technology. NOAA/Sea Grant. 1995-1998. \$282,731. (co-Principal Investigator with E. Burreson and N. Stokes, VIMS)
- Investigation into the Occurrence, Distribution and Severity of QPX in Feral and Cultured Hard Clams and Development of Management Methods for Infected Leases. USDA Northeastern Regional Aquaculture Center. 1997-1999. \$99,954 (co-Principal Investigator with R. Smolowitz, UPA; D. Leavitt, WHOI; R. Hillman, Battelle; G. Rivara, Cornell).
- Delaware Bay Oyster Research Program. NJ DEPE, 1996-98. \$95,000 (co-Principal Investigator with J. N. Kraeuter).
- Delaware Bay Oyster Research Program. NJ DEPE, 1998-99. \$61,398 (co-Principal Investigator with J. N. Kraeuter).
- Delaware Bay Oyster Research Program. NJ DEPE, 1999-2000. \$95,000 (co-Principal Investigator with J. N. Kraeuter and E.N. Powell).
- Influence of host genetic origin and geographic location on QPX disease in hard clams, *Mercenaria mercenaria*. NOAA/SK 1999-2001. \$212,998. (co-Investigator with L. Ragone Calvo, E. M. Burreson, R. Smolowitz, D. Leavitt, J. Kraeuter)
- Modeling the effects of climate variability on the prevalence and intensity of Dermo and MSX diseases in eastern oyster populations. NOAA/Sea Grant 1999-2001 \$229,515 (co-Investigator with E. Hofmann, E. Burreson, S. Jordan, J. Klinck, E. Powell)

Breeding and evaluation of oyster (*Crassostrea virginica*) strains selected for resistance to MSX, Dermo and JOD. NOAA/Sea Grant 1999-2001. \$251,470. (co-Principal Investigator with X. Guo and R. Smolowitz)

Delaware Bay Oyster Research Program. NJ DEPE, 2000-2001. \$95,000 (co-Principal Investigator with J. N. Kraeuter and E.N. Powell).

Scallop Mortalities in China. NOAA/Sea Grant 2000. \$8000 (co-Principal Investigator with X. Guo and F. Zhang)

Mathematical Modeling of Disease in Marine Molluscs. NSF 2001-2007. \$18,000. (co-Principal investigator with E. Powell, E. Hofmann and J. Klinck)

Breeding, Evaluation and Molecular Analysis of Oyster Strains Selected for Resistance to MSX, Dermo and JOD. NOAA/Sea Grant 2001-2003. \$254,188 (co-Principal Investigator with X. Guo and R. Smolowitz)

Delaware Bay Oyster Research Program. NJ DEPE, 2001-2002. \$95,000 (co-Principal Investigator with J. N. Kraeuter and E.N. Powell).

Identification and Mapping of Oyster Genes Involved in Host-defense Against Dermo and MSX. NOAA/Sea Grant 2003-2005. \$285,372 (Associate Investigator with, Z. Yu, X. Guo and A. Tanguy)

Production and Evaluation of All-triploid and Disease-resistant Eastern Oysters for Aquaculture. NOAA/Sea Grant 2003-2006. \$306,186 (Co-Principal Investigator with X. Guo and D. Cohen)

Other Professional Activities

Conferences and Symposia Organized

Molluscan Pathology/Mortality Conferences at Rutgers Shellfish Laboratory

1. March 28-29, 1983. 15 Attendees. Supported by National Marine Fisheries Service, Northeast Fisheries Center - \$500.
2. April 30 - May 1, 1984. 16 Attendees. Supported by National Marine Fisheries Service, Northeast Fisheries Center - \$1,000.
3. May 14-16, 1985. 20 Attendees. Supported by National Marine Fisheries Service, Northeast Fisheries Center - \$250.
4. April 2-4, 1986. 35 Attendees. Supported by National Marine Fisheries Service, Northeast Fisheries Center - \$1,800 and New Jersey Marine Sciences Consortium -\$600.

Genetics, Selection, and Breeding in Bivalve Aquaculture. National Shellfisheries Association Meeting, Halifax, NS, August 1987.

Molluscan Disease. World Mariculture Society/National Shellfisheries Association Joint Meeting, Los Angeles, CA, February 1989.

Workshop on the Life-Cycle and Transmission of *Haplosporidium nelsoni* (MSX). 20 Attendees. Haskin Shellfish Research Laboratory, March 18-19, 1992.

International Workshop on Shell Disease in Marine Invertebrates: Environment-Host-Pathogen Interactions. 40 Attendees. Universite de Bretagne Occidental, Brest, France, March, 1995. (with Christine Paillard)

Advisory Service and Other Activities

Advisory Panel, US-Spain Joint Committee Colloquium/Workshop: Effects of Diseases and Parasites on Bivalve Molluscs, 1986.

Invited testimony before US Congress on the "National Oyster Disease Research Assistance Act" January 1987.

Member, Task Force and Management Subcommittee on the Maurice, Manumuskin, Menantico, and Muskee Wild and Scenic Rivers Study. Cumberland County, NJ, 1988-1992.

Scientific Panel: Delaware Bay Resource Status and Needs. Shellfish Expert. National Estuary Program, Delaware Bay Joint Pennsylvania, Delaware, New Jersey Workshop. Philadelphia, PA. April, 1989.

Invited speaker and participant "Oyster Rehabilitation Workshop", Virginia Institute of Marine Science, September 1989.

Peer Review Panel, USDA Competitive Grants in Aquatic Animal Health, 1991.

Invited participant, "Oyster Ecology Workshop", Annapolis, MD, October 1991.

Steering Committee, Research Priorities for Aquatic Animal Health Management. United States Department of Agriculture. 1992-present

Work Group, Best Management Practices, National Aquatic Animal Health Management Program. United States Department of Agriculture. 1992-present

Invited Testimony, US Congress: "Research in Chesapeake Bay - Oyster Diseases", February, 1992.

Guest Scientist/Adviser on oyster disease problems, Centro de Investigaciones y de Estudios Avanzados del IPN, Mérida, Mexico, March 1993.

Steering Committee, National Oyster Disease Research Program, NOAA/NMFS 1993.

Advisory Board, University of Pennsylvania Programs in Aquatic Veterinary Medicine, 1992-present

US Army Corps of Engineers, Oyster Model Review Committee, 1994.

Consultant to the ABRAC (Agricultural Biotechnology Research Advisory Committee) Working Group on Aquatic Biotechnology and Environmental Safety, United States Department of Agriculture. 1994

Peer Review Panel, USDA/SBIR Grant Program, Aquaculture, 1995

Commercial Township Advisory Committee for the PSE&G Estuary Enhancement Program, 1995-present

Panel Manager, USDA/SBIR Grant Program, Aquaculture, 1995-96

External Review Committee, Dept. of Environmental Sciences, Virginia Institute of Marine Science, 1996

Guest Lecturer and Advisor on Molluscan Diseases, Provinces of Shandong, Jiangsu, and Zhejiang, People's Republic of China, September 1996

Visiting Scientist, Istituto di Biologia del Mare - CNR, Venezia, Italy, November 1996

Board of Trustees, New Jersey Nature Conservancy, 1996-2002

External Review Committee, College of Life Sciences and Agriculture, University of New Hampshire, 1997

New Jersey, Governor's Oyster Rehabilitation Task Force, 1997-1998

ICES Working Group on Parasites and Diseases of Marine Organisms, 1998 - 2012

Member, Conseil Scientifique, Institute Universitaire Européen de la Mer, Brest, France, 1999-2002

NOAA-Chinese Academy of Science Exchange Scientist and Guest Lecturer, Institute of Oceanology, Chinese Academy of Sciences, Qingdao, and National Marine Pollution Monitoring Agency, Dalian, Peoples Republic of China, August 2000.

Invited Research Scientist, Université de Bretagne Occidentale, Institute Universitaire Européen de la Mer, Brest, France, 1998-99, 2000, 2001, 2003, 2005, 2006-07, 2009

Rhode Island Sea Grant Aquaculture Grant Review Panel, June 2002

National Research Council Committee on Introduction of non-Native Oysters into Chesapeake Bay, 2002-2003

External Reviewer – IFREMER (French Research Institute for Exploitation of the Sea) MorEst (Summer Oyster Mortality) Project, 2003 - 2005.

Oyster Expert Panel, Matagorda Bay, Texas, Channel Dredging Project, 2007 – 2008.

Maryland Sea Grant Review Panel, July, 2008.

European Commission Grant Review Panel (FB7), April 2010

Scientific Advisory Panel and Invited Speaker, ClimECO2 (summer school on climate change), Institute Universitaire Européen de la Mer, Brest, France 2009-2010.

Board of Directors, BioOne (www.bioone.org), Washington, D.C. 2011 – present.

European Commission Grant Review Panel (FB7), January 2012

Chair of Excellence Invited Scientist – Université de Caen Basse Normandie, 3 months total in 2011-2013.