

# Joe Morris Fox

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## Educational Experience

- B.S. Biology/Marine Biology, 1978, Texas State University, San Marcos, Texas
- PhD, Wildlife and Fisheries Sciences, 1992, Texas A&M University-College Station, College Station, Texas

## Professional Appointments

- Executive Director, Palacios Marine Agricultural Research, Inc. (2021)
- Chair of Marine Resource Development, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University-Corpus Christi (2018)
- Jointly-appointment Professor/Research Scientist, TAMUCC/Texas A&M AgriLife Research (September 1, 2017. Texas A&M AgriLife Research ended 2020)
- Chair, Department of Life Sciences, Texas A&M University-Corpus Christi, Corpus Christi, Texas (September 1, 2012- August 31, 2015)
- Professor (tenured) of Marine Biology, Fisheries and Mariculture, Texas A&M University-Corpus Christi, Corpus Christi, Texas (2006-current)
- Advisory Panel, Gulf Coast Marine Life Center, Destin, Florida (November, 2014-present).
- Adjunct Graduate Faculty, Texas A&M University-College Station, College Station, Texas (2004-present)
- Ruth Campbell Professor of Marine Biology (2007-2011)
- Visiting Graduate Faculty Member, TAMU-K, Kingsville, Texas (2003-2005)
- Technical Director, Sahlman Seafoods of Nicaragua, Managua, Nicaragua (1996-1998)
- Assistant Professor, The University of Mobile, San Marcos, Nicaragua (1997-1998)
- Technical Director, The Ladex Corporation, Miami, Florida (1989-1995)
- Visiting Research Scientist, Texas Agricultural Experiment Station, Port Aransas, Texas (1995)
- Technical Director, Water Management, Inc., Singapore (1987-1989)
- Subproject Manager, Development Alternatives, Inc., Indonesia (1985-1987)
- Research Associate, Texas Agricultural Experiment Station, Corpus Christi, Texas (1981-1982)

- Research Technician, University of Texas Marine Science Institute Artificial Upwelling Project, U.S. Virgin Islands (1979-1980)

### **Teaching Experience (24 years)**

- A total of 24 years' experience in teaching at two universities, in the areas of aquaculture, environmental science and biology.
- Has prepared and taught the following courses at TAMUCC:
  - Biogeochemistry (ESCI-5314), two sections
  - Aquatic System Design (MARI-5432), six sections
  - Aquatic Animal Nutrition (MARI-5314), 17 sections
  - Aquatic Disease and Parasitology (MARI-515), nine sections
  - Aquaculture Economics/Aquaculture Project Planning (MARI/FAMA-5322), 14 sections
  - Chemistry of Natural Waters (MARI-5421), 10 sections
  - Introductory Environmental Science (ESCI-1401), seven sections
  - Environmental Biology (BIOL-3443) two sections)
  - Crustacean Biology and Culture (BIOL-5590), one section
  - Marine Biology (BIOL-3472), two sections
- Has prepared and taught the following courses at University of Mobile (Alabama):
  - Applied Aquacultural Engineering
  - Agriculture/Aquaculture Project Planning and Development
  - Aquatic Food Processing and Product Quality Control
  - Production Economics in Agriculture
  - Culture of Penaeid Shrimp
  - Introduction to Agribusiness System
  - Aquaculture Nutrition

### **Graduate Student Service (73 committees: 67 matriculated, 4 in-progress)**

- Ph.D. Marine Biology (TAMUCC)
  - Chair
    - I. Jones/McLellan (graduated)
  - Co-chair
    - J. Francis (graduated)
    - A. Bandalon (graduated)
  - Member
    - B. Froeschke (graduated)
    - C. Yu (changed program)
- Ph.D. Coastal and Marine Systems Science
  - Member
    - A. Lima (in progress)
- Ph.D. Wildlife and Fisheries Sciences (TAMU-College Station)
  - Member, graduated
    - R. Gandy, A. Siccardi, D. Sanchez,

- Member
  - C. de Cruz (2017-2019)
- M.S. Fisheries and Mariculture (TAMUCC)
  - Chair/co-Chair (graduated)
    - J. Cohen, S. Bonnot, A. Baker, L. Busch, H. Magaña, Smith, D. Sanchez, R. Robinson, N. Kureshy, T. Gray, K. Williams, S. Walker, A. Siccardi, S. Copeland, K. Copeland, T. Oberding, J. Francis, J. Fricker, C. Robinson, S. Hanson, E. Roman, J. Mishra, M. Wilson, A. Simmons, J. Brister, M. Harisanto, R. Robinson, C. Hairgrove, E. Almeida, L. Adams, S. Maza-Gomez, R. Battle, S. Merryman, R. Gamez, G. Sutton, M. Bolger, M. Syphus, A. McArdle, H. Grand, J. Gilbert, A. Fincannon, I. McLellan, Brown, G. Cottingham, J. Sifones,
  - Member (graduated)
    - G. Hitzfelder, M. Rabinovich, J. Moeckel, B. Lingenfelter, V. King, N. Huysman, B. Norris, J. Mitchell, M. Gury, A. Chorazyczewski, B. Pearson
  - Chair/Co-Chair (in progress)
    - R. Rubino, R. Klose
  - Member (in-progress)
    - J. Castanier
- M.S. Biology (TAMUCC)
  - Member (graduated)
    - S. Fagan, E. Williamson, A. Anderson, J. Gardner, K. Klootwyck, G. Ramirez, R. Sealy, M. Savage
- M.S. Environmental Science (TAMUCC)
  - Member (graduated)
    - T. Wauhob
- M.S. Agriculture (TAMUK)
  - Member (graduated)
    - Felix Craff

### **International-level Service**

- Alert Bay Marine Research Society/"Namgis First Nation site visit (fisheries and mariculture), Alert Bay, BC, Canada. Mission to develop fisheries and human health program with 'Namgis First Nation, Alert Bay, BC (July, 2017)
- MOU, collaborative agreement with University of Highland and Islands/Scottish Association of Marine Science, 2016
- Alert Bay Research Society, British Columbia, Canada (initial meetings to develop MOU), 2016
- MOU, TAMUCC and University of Ambon (Indonesia), 2012
- Aquaculture consultant, 1980-present, >20 countries
- Economic development via aquaculture of Chiapas, Mexico (w/Roberto Pardo)
- Speaker, Texas Sea Grant Shrimp Farming Short Course (~24 years, annually)

- Organization of the U.S. Japanese Natural Resources Panel, Harte Research Institute, Texas A&M University-Corpus Christi (2010)
- Site visit, Palau Coral Research Center, Palau Community College (2011)
- International Chamber of Commerce (2011) – meeting with participants from various countries regarding biofuel development
- Site visit, Bogor University (Indonesia) Fisheries Department
- Meeting with members of Catholic University (Chile), 2012
- Fisheries articulation meeting, Bali, Indonesia (2012-2013)

### **National-level Service**

- Member, East Coast Shellfish Growers' Association, Feb 2019 – present.
- Member, Oysters South, Feb 2019-present
- Member of webinar panel discussion on oysters as part of Gulf of Mexico Sea Grant Oil Spill Program, July 27, 2020
- Attended Oyster South Conference in Wilmington, North Carolina, Feb. 20-22, 2020
- Attended Northeast Aquaculture Conference & Exposition, Boston, MA., Jan, 6-8.
- DOE-BETO Carbon Capture Workshop. Attendee. May 21-22, 2017. Orlando, Florida
- Member, Advisory Panel for Gulf Coast Marine Life Center (Destin, FL)
- Chair, U.S. Aquaculture Society Student Award Committee (2001-2003)
- Panel, USDA Challenge Grants Program (Washington DC) (2002)
- Representative CEIA Program (Washington, DC) (2002)
- Delegate, American Association of Hispanic in Education (San Antonio, Texas) (2006)

### **University-level Service**

- Meeting/social with various members of College of Arts and Humanities regarding common research themes, HRI/COAH, Dec. 2019
- Member, University Faculty P/T Grievance Committee (2016- present)
- Member, NSF-MRI Review Committee (2017-2018)
- Member, University Graduate Enrollment Committee (2013-present)
- Member, Research Hurricane Preparedness Committee (2011 – present)
- Member, College of Graduate Studies Recruitment Committee (2014- present)
- Member, Harte Research Institute Building Committee (2004)
- Member, Diversity Committee
- Member, University Faculty Enhancement Committee
- Member, Eisenhower Grant Awards Committee (2001)

### **College-level Service**

- UAS Field Day, USDA-HSI Program; AgriLife Research & Extension Center, Robstown, Texas
- Member, College P/T Committee (2016-present)

- Vegetable Field Day, Texas A&M AgriLife Research & Extension Center, Weslaco, Texas; May 11, 2017.
- Member, Life Sciences Research/Engineering Building Planning Committee (2014-2015)
- Member, Assessment Coordinator Search (2014)
- Evaluation of Center for Aquaculture Technologies (2014) for MOA with COSE
- Member, Modular Building Committee (2012)
- Chair, College Promotion and Tenure Committee (2009-2011)
- Member, College Promotion and Tenure Committee (2007-2008)
- Space Usage Director, HRI (2009 -2010)
- Director, Seawater Systems, HRI (2005-2010)
- Chair, College Research Enhancement Committee (2005-2006)
- Chair, Workload Release Committee (2005-2006)
- Chair, Safety Committee, University of Mobile, San Marcos, Nicaragua (1997-1998)
- Member, Student Grievance Committee, University of Mobile, San Marcos, Nicaragua (1997-1998)

#### **Department-level Service**

- Chair, Search Committee for new Fisheries and Mariculture Program hire (2019)
- Chair, Promotion and Tenure Committee (2016-present)
- Member, LSCI Leadership Council (2016-present)
- Chair, Department of Life Sciences (2011- 2015)
- Chair, Aquaculturist Search (2014)
- Chair, Fisheries Economist Search (2014)
- Chair, Larval Fisheries Search (2014)
- Strategic Planning Meeting with Consultant (2014)
- Island Days (2000, 2002, 2003, 2014, 2015, 2016)
- Member, Policy Advisory Committee, Coastal and Marine Systems Science (2010-2011)
- Chair, MARB Physiologist Search Committee, LSCI (2011)
- Member, FAMA Professional Assistant Professor Search Committee, LSCI (2010)
- Chair, Department of Life Sciences Promotion and Tenure Committee (2009-2011)
- Chair, 3<sup>rd</sup>-Year Promotion and Tenure Committee (2009-2011).
- Member, Environmental Science Graduate Acceptance Committee (2005)
- Member, Physiologist Search Committee (2004-2005)
- Member, Biologist Search Committee (2004-2005)
- Member, Mariculture Program Review (2004)
- Member, Environmental Science Undergraduate Review Committee (200?)
- Chair Internship (under Grady Price-Blount, 2003)
- Member, Faculty Workload Committee (2002)
- Member, Mariculture Graduate Review Committee (SACS) (2002)

- Member, Biology Undergraduate Review Committee (2001)
- Member, Biology Undergraduate Program SACS Review Committee (2000)
- Member, Chemistry Search Committee (2000)
- Judge, Coastal Bend Science Fair (1999, 2000)
- Organization Committee and Judge, National Ocean Science Bowl (1999)
- Advisor, Undergraduate Environmental Science majors (1999-2003)
- Advisor, Undergraduate Biology majors (1999-2003)
- Member, Eisenhower Grant Funding Committee (1999)
- Member, Biology/Pre-professional Search Committee (1999)
- Member, Mariculture Program Graduate Admissions Committee (1998-present)

### **Community-level Service**

- Advisor to North Beach Task Force Development Project (2019-present)
- Presentation on oyster farming to Coastal Bend Bays and Estuaries Program
- Numerous presentations to local and Texas-regional civic groups regarding oyster aquaculture (CBBEP, CCA, Rotary Club, various County Commissioner groups)
- "An introduction to Aquaponics: The production of fish and vegetables in a soil-less environment." Workshop held at the Texas A&M AgriLife Research and Extension Service Center in Weslaco, Texas, November 7, 2014.
- Member, Water Shore Advisory Committee (2004- 2005)
- University Outreach Program (2000-2001)
- Monitor, National Ocean Science Bowl (2000)
- Judge, Coastal Bend Science Fair (2001)

### **Service to Industry/Discipline**

- Worked with others at HRI to develop certification by USDA for TAMUCC to receive funds from Agricultural Research Organizations (AROs).
- Working Group Texas Parks & Wildlife developing rules/regulations for Commercial Oyster Mariculture in Texas
- Chair, Oyster Aquaculture Task Force, Texas (appointed by Rep. Todd Hunter)
- Several meetings over past three years with TGLO, TPWD, CCA, Texas Restaurant Association, state legislators, oyster fishing industry, navigation districts, shoreline commissions, county governments to promote oyster aquaculture in Texas.
- Advisory Committee, Gulf Coast Marine Life Center, Destin, FL (2014-present)
- Reviewer, Journal of the World Aquaculture Society, Aquaculture (2002-2008)
- Chair, Student Funding Committee, World Aquaculture Society (2002-2004)
- Panel Member, USDA Challenge Grants (2002)

### **Research Interests**

#### Current Projects:

- Development of Palacios Marine Agriculture Research, an ARO established by the Ed Rachal Foundation. Initial project is construction of an oyster hatchery for

production of eyed larvae, seed oysters, and spat on shell for conservation and aquaculture purposes in Palacios, Texas.

- Establishment of Oyster Resource and Recovery Center for Texas coast, facility to be funded by Restore Act Bucket One (project in review by Texas Restore Act Council of Trustees). Currently reviewing draft contract from TCEQ and working on design of facility in North Beach, Corpus Christi.
- Federal Fisheries Disaster Relief Funding project for pilot oyster farm in Matagorda Bay. Project to compare different strains of local oysters and provide guidance to TPWD in development of pertinent regulations.
- Texas Sea Grant project for Development of a Siting Tool for Sustainable Oyster Aquaculture in Texas. Project to create an aquaculture suitability index (ASI) and capacity model resulting in synoptic mapping of a model bay to illustrate areas of high potential success in oyster farming.
- Biofouling study using a small research oyster cage operation in Copano Bay. Study funded by Ed Rachal Foundation. Project addresses issues such as stocking density, method of cleaning cages, and frequency of cleaning.
- Impacts of oyster farming on adjacent seagrass colonies in Copano Bay. Study funded by Ed Rachal Foundation. Project addresses issues such as impacts on extent of coverage, sediment loading, and seagrass health.

Has research interests in the following areas:

- Oyster aquaculture
- Aquatic animal nutrition:
  - use of algae biomass and lipid-extracted algae as nutrient sources
  - essential amino acid requirement of marine penaeid shrimp
  - use of biofloc as a nutrient source for marine penaeid shrimp
  - use of extrinsic enzymes (phytase, mannanase, etc.) to improve aquatic animal nutrition
  - feeding strategies and bioenergetics of marine finfish
  - chemoattraction of shrimp, urchins, lionfish
  - development of artificial micro-feeds for larval penaeid shrimp
- Algae biofuels/biomass:
  - nutrient recycling
  - design and management of advanced biomass culture systems
  - use of algae turf scrubbers for nutrient assimilation and bioremediation
- Environmental physiology:
  - ocean acidification (urchins, red drum, spotted seatrout)
  - morphometrics of red drum
  - effect of anthropogenic noise on physiological and nutritional stress of red drum and spotted seatrout
  - effect of salinity on essential amino acid requirement
- Disease/genetics
  - level of infection, active infection of vectors and general etiology of catastrophic diseases (e.g., Taura Syndrome Virus Disease, necrotizing hepatopancreatitis) of cultured marine penaeid shrimp
  - depuration of *Crassostrea virginica* against *Vibrio vulnificus* using probiotic bacteria;

- Other
  - effect of environmental factors on flavor response of shrimp

### **Extramural Collaborations**

Currently collaborating in research with the following institutions: Texas A&M System (James Abbey, Ron Lacewell, Rick Mertin), Texas A&M University-College Station (Gatlin, DeWitt, Heyman, Davis), Texas AgriLife Research (Landivar, Lawrence, Samocha, Richardson, Fernandez, Foster, Patnaik, Castille; Jifon, Romero, Anciso, McCutchen, Avant, Muntean, Lund); Center for Coastal Studies (Paul Zimba, Kim Withers, James Simons); University of Texas Marine Science Institute (Holt, Villareal); Texas A&M Sea Grant (Balboa, Cummins, Miget); Texas Parks and Wildlife (Robinson, Vega, Walker, Juan, Adami), Auburn University, (Davis, Walton), University of Arizona (Lightner), University of Florida (Lawrence), University of Alabama-Birmingham (Watts), Tufts University (Alcivar-Warren), Louisiana State University (Caprio, Stickle), Nicholls State University (Benson, Kilgen, Lee), Clarkson University (Bonner, Fuller), University of Texas Marine Science Institute (Holt, Dunton), University of Southern Maine (Levine), University of South Florida (Lawrence), University of W. Florida (Pomory), Mote Marine Laboratory (Wetzel, Robinson), Nature Conservancy (Brenner), Poultry Science, TAMUCS (Caldwell), NOAA (James Morris, Ken Riley), Harbor Branch (Hanusak), Louisiana Fish and Wildlife (Supan), University of E. Louisiana (Zappi), Sandia National Laboratory (Pate, Lane, Wu, Davis), Lawrence Livermore National Laboratory (Mayali), Sapphire Energy (Behnke), Scottish Association for Marine Science (Collier, Stanley).

### **Related Professional Skills**

Substantial experience in the following disciplines: analytical instrumentation (HPLC, CN analyzer, ICP, GC, bomb calorimeter), design and construction of aquatic animal research systems, feed formulation, mass culture of marine micro- and macroalgae; sensory evaluation of flavor in shrimp; HACCP (seafood processing plants), antagonism/sensitivity testing of bacteria, computer-aided design (CAD), construction and management of aquaculture hatcheries, processing plants, and farms; web-site design; fluency in Spanish and conversant in Indonesian and Portuguese.

### **Publications**

- Fox, J.** and P. Zimba. 2018. Microalgal minerals and trace elements. In; *Microalgae in health and disease prevention*, Levine, I. and Fleurence, J., Eds. Academic Press. 368 pages.
- Fincannon, A., Vega, R., Gatlin, D., **Fox, J.** and B. Sterba-Boatwright. Effects of stocking density and feed rate on the growth of hatchery-reared juvenile spotted seatrout, *Cynoscion nebulosus*. In review (Aquaculture).
- Sanchez, D.R., **Fox, J.M.**, Gatlin, D.M. and A.L. Lawrence. 2014. Dietary effect of fish oil and soybean lecithin on growth and survival of juvenile *Litopenaeus*



- vannamei* in the presence or absence of phytoplankton in an indoor system. *Aquaculture Research*, 45: 1367-1379.
- Sanchez, D.R., **Fox, J.M.**, Gatlin, D. And A.L. Lawrence. 2012. Dietary effect of fish oil and soybean lecithin on growth and survival of juvenile *Litopenaeus vannamei* in the presence or absence of phytoplankton in an indoor system. *Aquaculture Research*, 1-13.
- Spiga, I. Fox, J. and R. Benson. 2012. Potential effects of long-term exposure to boat noise on the growth, survival, and nutrient retention in juvenile fish. In: *The Effect of Noise on Aquatic Life.*, A.N. Popper and A. Hawkins (eds.). Springer Science+Business Media, New York, New York, pgs 251-253.
- Spiga, I. **Fox, J.** and R. Benson. 2012. Effects of short-and long-term exposure to boat noise on cortisol levels in juvenile fish. In: *The Effect of Noise on Aquatic Life.*, A.N. Popper and A. Hawkins (eds.). Springer Science+Business Media, New York, New York, pgs 251-253.
- Fox, J.M.**, Hume, M., Davis, D.A. and A.L. Lawrence. 2011. Evaluation of methionine supplements and their use in grain-based feeds for *Litopenaeus vannamei*. *Journal of the World Aquaculture Society*, 42(5): 676-686.
- Sanchez, D.R., **Fox, J.M.**, Lawrence, A.L. and D. Gatlin III. 2011. Dietary effect of squid and fish meals on growth and survival of Pacific white shrimp *Litopenaeus vannamei* in the presence or absence of phytoplankton in an indoor tank system. *J. Aquaculture Nutrition* 1-11 (early view: doi:10.1111/j.1365-2109.2011.02997.x.)
- Fox J.**, Lawrence, A.L., Patnaik, S., Forster, I., Ju, Z. and W. Dominy. 2010a. Methionine requirements estimated for white shrimp. *Global Aquaculture Advocate* 13(2):29-30.
- Fox, J.**, Lawrence, A., Patnaik, S., Forster, I., Ju, Z. and W Dominy. 2010b. Estimation of feed level of methionine by *Litopenaeus vannamei* (Boone) using covalently-attached and crystalline sources in low-protein semi-purified diets. In Cruz-Suarez, D Ricque-Marie, M Tapia-Salazar, MG Nieto-Lopez, DA Villarreal-Cavazos, J Gamboa-Delgado (eds.) *Proceedings of the X Simposio Internacional de Nutricion Acuicola*, Monterrey, Mexico. pp 233-250
- Powell, M.L. Jones, W.T., Gibbs, V.K., Hammer, H.S., Lawrence, J.M., **Fox, J.**, Lawrence, A.L. and S.A. Watts (2010). Dietary copper affects survival, growth and reproduction in the sea urchin *Lytechinus variegatus*. *Journal of Shellfish Research* 29(4): 1043-1049.
- Jones, W.T., Powell, M. L., Gibbs, V.K., Hammer, H.S., Watts, S.A., Lawrence, J.M., **Fox, J.M.**, and A.L. Lawrence. 2010. The effect of dietary selenium on weight gain and gonad production in the sea urchin, *Lytechinus variegatus*. *Journal of the World Aquaculture Society* 41(5): 675-686.
- Fox, J.M.**, and Lawrence, A.L. 2009. Evaluation of in vitro apparent protein digestibility by shrimp using gut enzyme extracts. *Journal of the World Aquaculture Society* 40(3): 325-336.
- Spiga, I., **Fox, J.M.** and R. Benson. 2011. Effects of short- and long-term exposure to boat noise on cortisol levels in juvenile fish. In: *The effects of noise on life*, J. Popper and A. Hawkins, Eds. *Advances in experimental medicine and biology. Proceedings, 4<sup>th</sup> Annual International Conference on Bioacoustics*. Cork, Ireland. 880 pp.

- Spiga, I., **Fox, J.M.** and R. Benson. 2011. Potential effects of long-term exposure to boat noise on the growth, survival, and nutrient retention in juvenile fish. In: The effects of noise on life, J. Popper and A. Hawkins, Eds. Advances in experimental medicine and biology. Proceedings, 4<sup>th</sup> Annual International Conference on Bioacoustics. Cork, Ireland. 880 pp.
- Deng D.F., Ju, Z.Y., Dominy, W., Lawrence, A.L., Patnaik S., and **J.M. Fox**. 2010. Methionine supplement form affects feed leaching but not shrimp growth. *Global Aquaculture Advocate* 13(4): 40-41.
- Fox, J.M.**, Lawrence, A.L. and Chan, E.L. 2009. Tail muscle free amino acid concentration of Pacific white shrimp, *Litopenaeus vannamei* fed protein bound versus crystalline amino acids 40(2): 171-181.
- Fox, J.M.** and Lawrence, A.L. 2008. A review of the methodology used for determination of apparent nutrient digestibility in marine penaeid shrimp. In: Manual of methodologies for determination of in vivo and in vitro digestibility of ingredients and diets for shrimp (Eds: L.E. Cruz-Suarez, H.V. Colmenares, M.T. Salazar, M.G. Nieto-Lopez, D.A. Villareal-Cavazos, D. Ricque-Marie. Universidad Autonoma de Nuevo Leon, Monterrey, Nuevo Leon, Mexico (ISBN 978-607-433-020-5, pp 1-17.
- Fox, J.M.**, Davis, D.A., Lawrence, A.L. 2007. Methionine, sulfur-containing amino acids: Limiting nutrients in commercial formulations? *Global Aquaculture Advocate* March/April, 2007: 74-77.
- Gandy, R.L., Samocha, T.M., Masser, M.P., **Fox, J.M.**, Ali, A.S., Gatlin III, D.M., Speed, M., Walker, S.J., Hawkins, D.L., Hicks, D.W., Lawrence, A.L., Brister, J.E. 2007. The effect of unilateral eyestalk ablation and diet on the reproductive performance of wild-caught *Farfantepenaeus aztecus* (Ives, 1891) using a closed recirculating maturation system. *Aquaculture Research* 38(6):580-587.
- Walker, S.J., Hawkins, D.L., Hicks, D.W., Lawrence, A.L., Brister, J.E., **Fox, J.M.**, Bray, W.A. The effects of experimental protocol in biasing feeding behavior in Pacific white shrimp, *Litopenaeus vannamei*: an extension of the Bradley-Terry model. *Journal of Shellfish Research* (submitted for publication).
- Fox, J.M.**, Davis, D.A., Humes, M., and A.L. Lawrence. 2006. Current status of amino acid requirement research with marine penaeid shrimp. *Avances en Nutricion Acuicola VIII, Simposio Internacional de Nutricion Acuicola*. Noviembre 15-17, Mazatlan, Sinaloa, Mexico, pp.
- Siccardi, A.J., Lawrence, A.L., Gatlin III, D., **Fox, J.M.**, Perez-Velasquez, M., and M. Gonzalez-Felix. 2006. Digestibilidad aparente de proteina, energia y materia seca de ingredientes utilizados en alimentos balanceados para el camaron blanco del Pacifico *Litopenaeus vannamei*. *Avances en Nutricion Acuicola VIII, Simposio Internacional de Nutricion Acuicola*. Noviembre 15-17, Mazatlan, Sinaloa, Mexico, pp. 213-237.
- Siccardi, A.J., Lawrence, A.L., Gatlin III, D., **Fox, J.M.**, Perez-Velasquez, M., and M. Gonzalez-Felix. 2006. Requerimientos de proteina y energia digerible para crecimiento y mantenimiento de subadultos de *Litopenaeus vannamei*. *Avances en Nutricion Acuicola VIII, Simposio Internacional de Nutricion Acuicola*. Noviembre 15-17, Mazatlan, Sinaloa, Mexico, pp. 238-281.

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- Fox, J.M.**, Lawrence, A.L., 2004. Protein: energy ratio: research in penaeid shrimp nutrition. *Global Aquaculture Advocate*, 7(4):74-75.
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- Fox, J.M.**, Lawrence, A.L., Smith, F., 2004. Development of a fishmeal substitute-feed for growth and survival of *Litopenaeus vannamei*. *Proceedings of Avances en Nutrición Acuícola VII*, November 16-19, Hermosillo, Mexico.
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- Fox, J.M.**, Li-Chan, E., and Lawrence, A.L., 1995. Carbodiimide-mediated covalent attachment of lysine to wheat gluten and its apparent digestibility by penaeid shrimp. *J. Food Agric. Biochem.* 43:733-737.
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- Treece, G.D. and **Fox, J.M.**, 1993. Design, operation and training manual for an intensive culture shrimp hatchery. Texas A&M Sea Grant College Program Publication TAMU-SG- 93-505, 187 pp.
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### **Patents/Licenses**

Multi-dimensional Algal Growth Surfaces, Systems, and Uses Thereof. Provisional Patent No.: 62/578,025. (2018)

### **Presentations/Conference Abstracts (since 2001)**

Various oyster aquaculture-related presentations to conservation and civic/local governmental groups (e.g., CCA, CBBEP, Rachal Foundation, etc.).

- Fox, J.M.**, Jones, I., Siccardi III, A., and LeBlanc, A. Preliminary evaluation of Feedkind Aqua Protein™ as a protein source in diets fed to juvenile *Litopenaeus vannamei*. *Aquaculture America*. Paris Hotel, Las Vegas, Nevada. February 19-22, 2018.
- Mitchell, J., Scarpa, J., **Fox, J.**, Huysman, N., and Pate, R. Optimization of algal turf scrubbers for large-scale superintensive aquaculture. *Aquaculture America*. Paris Hotel, Las Vegas, Nevada. February 19-22, 2018.

- Fox, J.**, Scarpa, J. Oyster resource and recovery center - Palacios, Texas, Coastal Conservation Association, Houston, Texas, April, 2017.
- Siccardi III, A., Mitchell, J.M., Huysman, N.D., Davis, R.W., Pate, R.C., **Fox, J.M.**, Scarpa, J., Richardson, C.M., Croakett, J.K., and Calahan, S. 2017. Optimization of algal turf scrubbers for biomass production and nutrient utilization. Electronic conference proceedings (abstract) presented at the Algal Biomass Summit, Salt Lake City, Utah, October, 2017.
- Jones-McClellan, I.C., Siccardi III, A.J., Gatlin II, D.M., **Fox, J.M.**, Huysman, N., Jones, C.W. Evaluation of marine microalgae biomass for protein replacement in aquaculture feeds. Annual meeting of the World Aquaculture Society (Aquaculture America 2017). San Antonio, TX. February 19-22, 2017
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- Fox, J.M.**, Siccardi, A.J., and D.M. Gatlin. 2017. Roadmap to use of marine microalgae in aquaculture feeds. U.S. Aquaculture Society-Aquaculture America, February 3-6, San Antonio Marriott Riverwalk Hotel, San Antonio, Texas
- Fox, J.M.** 2016. Joe Fox - Research Experience, Interests. Global Sustainability Workshop. Oban, Scotland, United Kingdom. September 21-23, 2016.
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Methodology for evaluating chemoattractants used in commercial diets for marine penaeid shrimp. World Aquaculture Society Meeting, San Diego, California, January-27-30, 2001.

**Fox, J.M.**, Williams, K., Mott, J., Samocha, T.Z. 2001. Project report on depuration of oysters against *Vibrio vulnificus* using probiotic bacteria. Texas Aquaculture Association meeting. South Padre Island, Texas, February 20-23.

### **Professional Affiliations**

- World Aquaculture Society
- The Nature Conservancy
- Aquacultural Engineering Society
- National Shellfisheries Association
- Coastal Conservation Association

### **Research Awards (currently funded, pending, completed)**

#### Currently Funded:

- PMAR oyster hatchery management contract. Funded by Palacios Marine Agriculture Research to construct and operate an oyster hatchery in Palacios, Texas. (**Fox, PD**). ~\$1,200,000. (2020 – present)
- Rebuilding the Texas Oyster Fishery after Harvey. Federal Fisheries Disaster Declaration Funding (NOAA/State of Texas). On-going 2019. (**Fox, PD**) \$750,000.
- Chancellor's Research Initiative (CRI). TAMUCC/Texas A&M AgriLife Research. **Fox, Recipient**. \$900,000 plus academic/agency contribution (total = \$2,300,000). (2017 – present)
- Development of a Siting Tool for Sustainable Oyster Aquaculture in Texas. Texas Sea Grant. **Fox PD** (Pending until Mar 1, 2020, \$330,000).
- Evaluation of Oyster Aquaculture as a New Coastal Industry for Texas-Part 2. Ed Rachal Foundation. **Fox PD** (\$104,000). (2018 – present)
- Experiential training in use of unmanned aerial systems (UAS) for agriculture applications. USDA-NIFA (HSI). **Fox, PD**. \$995,829. July 1, 2016 - June 30, 2020.

#### Pending funding:

- The Texas Oyster Resource and Recovery Center. RESTORE Act (Bucket 1). **Fox, PD**. \$6,600,000 (project being reviewed by U.S. Treasury, funding in Spring, 2020).
- Exceptional Item: Developing coastal economic and physical resilience through sustainable aquaculture. TAMUCC-Harte Research Institute (2022-2023). Approved by TAMUS, \$2M per year, \$4M per biennium.
- Identified funding for construction of training facility for Workforce Development as part of Bucket 1 funding (above). Facility to be constructed and

outfitted by the Ed Rachal Foundation at ~\$7M. This will occur in conjunction with Bucket 1 funding this year.

- Developing HRI project to advise LAN Engineers on construction of islands and breakwaters offshore from North Beach, Corpus Christi. This is a \$35M project.

Funding-completed:

- Bacterial-algal interactions controlling carbon cycling in bioenergy-producing communities. DOE-OBER Program, Lawrence Livermore National Laboratory. J. Pett-Ridge, PI. 2014-2017. \$1,500,000 (**Fox and Zimba Co-PI** share \$210,000).
- Integrated algal turf scrubber (ATS) aquaculture system: a sustainable, cost-effective solution to meet alternative energy and biomass needs. A. Siccardi, PD (**Fox, Co-PI**). \$95,000. May 23, 2016 - May 22, 2017.
- Leaching florfenicol from commercial aquaculture feeds. Merck Chemical Company. **Joe M. Fox, PI**. 2013, \$37,000. In-progress.
- Evaluation of two sources of methionine feeding at low-feeding-rate. Evonik Degussa (Germany). **Joe M. Fox, Co-PI**. 2013. Sub-award \$14,000. Completed.
- Building the basis for the improvement of microalgae oil production efficiency through quantification and model integration of fundamental biological and physiological processes. Sun Grant Initiative-Southeast Region. **Joe. M. Fox, Co-PI**. Carlos Fernandez, Principal Investigator. 2011-2013. \$160,000. Completed.
- Emerging Technology Funds - State of Texas. Algae biofuels research. Pass-through funding from Texas AgriLife Research. **Joe M. Fox, Co-PI**. 2010 – 2011. \$18,000. Completed.
- Determining methionine requirement in shrimp using novella sources of methionine. Research contract with Evonik Degussa (Germany). **Joe M. Fox, PI**. 2010-2011. \$47,000. Completed.
- Characterization of leaching of Aquaflor™ (florquinone) in shrimp feeds. Intervet (Schering-Plough). **Joe M. Fox, P.I.** 2011. \$14,000 (completed)
- Acquisition of equipment for development of local species of microalgae for production of biofuels. NSF-MRI R<sup>2</sup>. **Joe M. Fox, P.I.**; Co-PIs Zimba, P., Mott, J., Lehman, R., Strychar, K. 11/1/09 - 8/31/12, \$547,905. Completed.
- Shell Bank: An oyster shell recycling program for the Texas Coastal Bend. State of Texas General Land Office, Coastal Management Program. \$166,626; PI (J. Pollack, PI, Co-PI Fox, **J.M. Fox**).
- Shell Bank: an oyster shell reclamation, storage and recycling program for oyster reef restoration. State of Texas General Land Office, Coastal Management Program, PI Paul Montagna, Co-PIs Beseres-Pollack, J., Fox, J. 3/1/2009 - 8/31/2010, \$162,455.
- Purchase of an amino acid analyzer for research and education. National Science Foundation Major Research Instrumentation Grants Program. **Joe M. Fox**(Principal Investigator); September 1, 2006 - August 31, 2009. \$105,000.
- Evaluation of probiotic molecules for induction of immune response in marine penaeid shrimp. GTC Nutrition, Inc. **Joe M. Fox**, August, 2008 - August, 2009. \$30,000.

- Effect of anthropogenic noise on stress in marine finfish, Texas Research Development Fund, **Joe M. Fox** and Robert Benson (Co-Principal Investigators), 2008, \$34,000.
- Ruth Campbell Fellowship in Marine Biology, **Joe M. Fox** (PI). 2007-2011, \$120,000. Research on methionine requirement in marine penaeid shrimp.
- Novus International, Inc. **Joe M. Fox**, August 2005 - August 2006, \$10,000. Replacement of fish meal in shrimp feeds: I. Determination of methionine requirement by shrimp offered zero fish meal feeds, **Joe M. Fox** (Principal Investigator),
- Texas Research Development Fund, February, 2005 - August, 2005, \$24,374. Daily digestible protein and energy requirements of marine penaeid shrimp, **Joe M. Fox** (Principal Investigator)
- Texas Research Development Fund, March, 2004 -August, 2004, \$20,000. Survey of Taura Syndrome Virus (TSV) in aquaculture ponds and other natural sources in South Texas. USDA/APHIS, January - December, 2005. **Joe M. Fox**, Addison L. Lawrence and Patrick Larkin, \$50,188.
- Chemoattraction in marine penaeid shrimp. Applied Food Biotechnology, Inc. 2000-2005. **Joe M. Fox** and A.L. Lawrence (\$100,000).
- Improved availability of phosphorus in grain-based aquatic feeds via use of phytase. Faculty Enhancement Grant, TAMUCC, **Joe M. Fox**, September 2004 – August, 2004. \$9,820.
- Effect of phytase on increased bioavailability of phosphorus to shrimp in soybean-based feeds. University Faculty Enhancement Grant, **Joe M. Fox**, Sept 2001 - Aug 2002, \$8,900.
- An Experiential Model Enhancing Minorities Interests in Aquaculture. USDA HIS-EGP, Sept 2000 - Oct 2002, **Joe M. Fox** and D.A. McKee, \$161,313.
- Gulf Oyster Industry Initiative evaluation of probiotic bacteria in depuration of oysters against *Vibrio vulnificus*. National Sea Grant. **Joe M. Fox**, Joanna B. Mott and Tzachi M. Samocha., Sept 1999 - Aug 2001, \$165,136.
- Continued optimization of biosecure high density culture of penaeid shrimp. TAMU-CC Faculty Enhancement Grant, **Joe M. Fox** and Tzachi M. Samocha. Sept 1999 - Aug 2000, \$8,640.
- Evaluation of larval rearing methodologies for the blue crab, *Callinectes sapidus*. College of Science and Technology (TAMU-CC) Faculty Enhancement Grant. **Joe M. Fox**, Sept 1999 - August, 2000, \$2,000.
- A proposal to establish a database from commercial scale shellfish depuration plants for the development of a national consumer protection plan, **Joe M. Fox** (Co-principal investigator). National Marine Fisheries Service/Saltonstall-Kennedy Program, FY 1988, (\$129,520).

## References

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