

# **Data and Management Strategies for Recreational Fisheries with Annual Catch Limits**

## **Committee**

### **Luiz Barbieri**

#### **Chair**

Luiz Barbieri directs the Marine Fisheries Research Program for the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, based out of St. Petersburg, FL. He has an extensive background in marine fisheries science and policy and serves as a key representative on several scientific advisory panels and committees including the Atlantic States Marine Fisheries Commission, the Scientific and Statistical Committee (SSC) for the Gulf of Mexico Fishery Management Council, and as a senior advisor for the Fisheries Leadership & Sustainability Forum, Nicholas Institute for Environmental Policy Solutions at Duke University. Dr. Barbieri served as Co-Chair of the 2016 Committee on Review of Recreational Fisheries Survey Methods conducted by the National Academies of Science and is also a member of the National Academies' Gulf Research Program. He holds a Ph.D. in Marine Science (College of William & Mary, 1993), a M.Sc. in Biological Oceanography (Rio Grande University, 1986), and a B.S. in Biology (Santa Ursula University, 1982).

## **Yong Chen**

### **Member**

Yong Chen is a Professor of Fisheries Science in the School of Marine Sciences at the University of Maine in Orono, Maine, U.S.A. He received his Bachelor of Agriculture degree (1983) in fisheries science from the Ocean University of China and MS (1991) in Zoology (Fish Ecology) and PhD (1995) in Zoology (Fish Population Dynamics with a minor in statistics) degrees from the University of Toronto in Canada. He started his career as a fisheries stock assessment scientist in the New South Wales Fisheries Department in Sydney, Australia in 1995. In 1997, he was appointed Assistant Professor and Associate Chair in fisheries Conservation at Memorial University of Newfoundland. He moved to the University of Maine in 2000 and was promoted to the rank of Full Professor in 2007. Dr. Chen's research focuses primarily on fisheries population dynamics, stock assessment and management, fisheries monitoring program development, fisheries oceanography and climate change, management strategy evaluation, statistical modeling and computer simulations. Dr. Chen has authored and co-authored over 245 peer-reviewed papers in scientific journals, many technical and fish stock assessment reports, and has received over 8 millions of dollars in competitive research support for over 85 projects. He has mentored more than 50 graduate students since 1997. Dr. Chen is actively involved in community and professional service, including peer reviewer for scientific journals and funding agencies. He is currently a member of the New England Fisheries Management Council's Scientific and Statistical Committee. He is Editor-in-Chief of the Canadian Journal of Fisheries and Aquatic Sciences and the Aquaculture and Fisheries.

## **Chris Dumas**

### **Member**

Chris Dumas is a Professor of Economics at the University of North Carolina Wilmington where he has been a member of the Department of Economics and Finance and the Department of Environmental Sciences since 1997. Dr. Dumas teaches environmental economics, econometrics/statistics, ecological modeling, fisheries policy and management, non-market environmental valuation, and economic impact assessment. His research focuses on applied coastal resources management, including the economics of fisheries, beaches and beach tourism, water quality, inlet and waterway use, hurricane impacts, and saltwater aquaculture. Dr. Dumas has been a member of the Socio-Economic Panel and the Scientific and Statistical Committee of the South Atlantic Fisheries Management Council for many years. He has been a manuscript reviewer for Marine Resource Economics, Environmental and Resource Economics, Journal of Environmental Economics and Management, Coastal Management Journal, Journal of Environmental Management, Ecological Economics, Letters in Spatial and Resource Economics, and Aquaculture Economics and Management. He has been a grant proposal reviewer for NC Sea Grant, Hawaii Sea Grant, Wisconsin Sea Grant, USDA-NIFA, USGS-NIWR, NSF-SBIR, NOAA-NMFS National Marine Sanctuary Program. Dr. Dumas received dual B.S. degrees in Economics and Natural Resource Conservation from North Carolina State University in 1990, and M.S. and Ph.D. degrees in Natural Resource Economics from the University of California, Berkeley, in 1991 and 1997, respectively.

# Michelle Duval

## Member

Michelle Duval has over 20 years of diverse career experience in marine fisheries and coastal resource management at the state, interstate, and federal levels. Michelle relocated to Pennsylvania in 2018 and is currently the sole proprietor of Mellivora Consulting, providing professional consulting services on marine fisheries management and ocean resource issues to government entities and nonprofit organizations. She recently completed over ten years of service (2007-2018) with the North Carolina Division of Marine Fisheries as the Executive Assistant for Councils. In that capacity, she represented the state's interests at the Atlantic States Marine Fisheries Commission, working cooperatively with the leadership of other states to develop effective management plans for coastal fisheries. Michelle was also the state's designee on the South Atlantic Fishery Management Council, where she collaborated with commercial and recreational fishing interests, conservation organizations, and other agency representatives to address complex and controversial federal fishery management issues. She served in multiple Council leadership roles, including that of Council Chair (2015-2017) and Vice-Chair (2013-2015), and was involved in the development and implementation of a strategic plan for the snapper grouper fishery as well as the launch of the Council's Citizen Science Program. Prior to working for the State of North Carolina, Michelle spent ten years (1997-2007) at the Raleigh office of Environmental Defense Fund on a variety of state and federal fisheries management, coastal development and large-scale agricultural issues. During that time, she served as an environmental community representative on many state and federal advisory panels and negotiated stakeholder processes. Michelle received a B.S. in Biology (Honors) from the University of Michigan in 1992, and completed a Ph.D. in Zoology (marine ecology) from Duke University in 1997.

## **Steven Heeringa**

### **Member**

Steven G. Heeringa is a Senior Research Scientist and Associate Director of the Survey Research Center (SRC) at the University of Michigan Institute for Social Research (ISR). He is a member of the Faculty of the University of Michigan Program in Survey Methods and the Joint Program in Survey Methodology. He is a Fellow of the American Statistical Association and elected member of the International Statistical Institute. He is the author of many publications on statistical design and sampling methods for research in the fields of public health and the social sciences. He is the lead author of *Applied Survey Data Analysis*, 2nd Edition (Chapman & Hall, 2016), a comprehensive new text on methods for the statistical analysis of complex sample survey data. Steve has over 40 years of statistical sampling experience in the development of the SRC National Sample design, as well as research designs for ISR's major longitudinal and cross-sectional survey programs. Since 1985 Steve has collaborated extensively with scientific colleagues in the design and conduct of major studies in aging, psychiatric epidemiology and physical and mental health. He has been a teacher of survey sampling and statistical methods to U.S. and international students and has served as a sample design consultant to a wide variety of international research programs based in countries such as Russia, the Ukraine, Uzbekistan, Kazakhstan, India, Nepal, China, Egypt, Iran, the United Arab Emirates, Qatar, South Africa and Chile. Steve has served on three National Academies committees: Treatment of Group Quarters in the American Community Surveys (ACS), Evaluation of the Department of Veteran's Affairs Mental Health Treatment, and Assessment of the Department of Defense MINERVA Research Program.

## **Kai Lorenzen**

### **Member**

Kai Lorenzen is Professor of Integrative Fisheries Science at the University of Florida, where he also serves as Associate Director of the School of Forest Resources and Conservation and leader of the Fisheries and Aquatic Sciences Program. His research interests span the ecological and human dimensions of fisheries management and transdisciplinary approaches to management problem solving. Among his notable scientific contributions are models of fish population processes that are widely used in stock assessments, quantitative assessment tools and planning frameworks to support better use of hatchery programs in fisheries management, and innovative approaches to engaging stakeholders in fisheries science and management. He is a Fellow of the American Institute of Fishery Research Biologists and currently serves as vice-chair of the Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC). Dr. Lorenzen received his M.S. in Fisheries Biology with Mathematics from Kiel University (1993) and his PhD in Applied Population Biology from the University of London (1997).

## Sean P. Powers

### Member

Sean Powers was born and raised in New Orleans, LA where he attended Loyola University (BS with Honors, 1990) and the University of New Orleans (MS, 1992). He received his Ph.D. in Zoology from Texas A&M University in 1997. Following a SeaGrant John Knauss Marine Policy Fellowship at the National Science Foundation (1997-1998) and a post-doc at the University of North Carolina at Chapel Hill (1999-2002), he joined the faculty in the Department of Marine Sciences, University of South Alabama and the Dauphin Island Sea Lab (2003). In 2012, Dr. Powers was named Chair of the Department of Marine Sciences and in 2017 the Angelia and Steven Stokes Endowed Chair in Environmental Resiliency. He also holds the title of Senior Marine Scientist III and the Dauphin Island Sea Lab where his research office and lab are housed. The majority of his research is focused on demersal fishes and benthic invertebrates in coastal and estuarine systems, particularly those that support commercial and recreational fisheries. The ultimate goal of Dr. Powers' research program is to provide scientifically sound information to direct conservation and restoration efforts of marine fisheries and habitats. His research focus is at the interface of ecology, fisheries and socioeconomics. He has published over 130 peer-reviewed articles on these topics in journals including Science, Ecology, Limnology & Oceanography and Marine Ecology Progress Series. His research program has generated over 30 million dollars in extramural support from federal and state agencies including the National Science Foundation, National Marine Fisheries Service and SeaGrant. Dr. Powers currently serves on the Gulf of Mexico Fishery Management Council's Standing Science and Statistical Committee having previously served as vice-chair and chair of the Committee. He has participated in numerous stock assessments for Gulf of Mexico and South Atlantic fisheries species. During the damage assessment process after Deepwater Horizon he served as a lead Principal Investigator for the nearshore environment. He currently serves as an expert in other natural resources damage investigation for NOAA. He also serves on the board of the State of Alabama's Forever Wild, the Alabama Land Trust. Dr. Powers has served on two National Academies panels: Coastal Risk and the previous review of the Marine Recreational Information Program (MRIP).

## Steven Scyphers

### Member

Steven Scyphers is an Assistant Professor in the Department of Marine and Environmental Sciences and Affiliated Faculty in the Department of Sociology and Anthropology at Northeastern University. Dr. Scyphers' research integrates ecology and sociology to understand and develop strategies to overcome major challenges facing coastal communities. His work focuses on sustainable coastal fisheries, shoreline development, ecosystem restoration, and climate adaptation. He was awarded a Science, Engineering, and Education for Sustainability (SEES) Fellowship from the National Science Foundation. Dr. Scyphers received his BS in Marine Biology at Auburn University (2007) and his PhD in Marine Sciences at the University of South Alabama and Dauphin Island Sea Lab (2012).

## Tien-Shui Tsou

### Member

Tien-Shui “Theresa” Tsou is a lead research scientist with the Marine Fish Science Unit at the Washington Department of Fish and Wildlife. Her areas of expertise include marine fish and ecosystem science. Dr. Tsou has been published on numerous occasions and has been recognized with a number of awards and appointments including, but not limited to: receiving the Washington Department of Fish and Wildlife’s Steve Phelps Leadership in Science Award (2008); serving on the Data Committee of the Pacific Coast Recreational Fisheries Information Network (RecFIN) (2004-present); serving on the Pacific Coast Fisheries Data Committee of the Pacific Fisheries Information Network (PacFIN) (2008-present); and serving on the Pacific Fishery Management Council’s Scientific and Statistic subcommittee (2008-present). Dr. Tsou received her B.Sc. in zoology and M.Sc. in Biological Oceanography from National Taiwan University in 1986 and 1988 respectively. She received her Ph.D. in oceanography from the University of Rhode Island in 2000.

## Zhengyuan Zhu

### Member

Zhengyuan Zhu is a Professor of Statistics at Iowa State University (ISU), where he also serves as the Director of the Center for Survey Statistics Methodology. Dr. Zhu has expertise in spatial statistics, survey statistics, time series analysis, functional data analysis, and machine learning. He also has over 60 referred publications on spatial sampling design, anomaly and change detection in space and time, statistical data integration, spatio-temporal models, long range dependent processes, and applications in environmental statistics, natural resource surveys, agricultural statistics , remote sensing, and transportation statistics . He has been the Principle Investigator for the US National Resource Inventory survey (NRI) since 2013, and provided statistical and survey support for a number of large national longitudinal surveys including the 2007 , 2010, 2012, and 2015 NRI survey, the US BLM Managed Lands survey, the surveys for the Conservation Effects Assessment Project, and the 2017 U.S. Pet Ownership and Demographics Survey. Dr. Zhu's work has earned praise in the form of awards (the ISU LAS Mid-Career Achievement in Research Award in 2017 and the ISU LAS Dean's Professorship in 2019) as well as membership of the International Statistical Institute (elected in 2014). He holds a B.A. in Mathematics from the Fudan University in Shanghai, China (1997) and a Ph.D. in Statistics from the University of Chicago (2002).