Dr. Darren Michael Gillis

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Education

B.Sc. (Hon.)	Dalhousie University	1982
M.Sc.	McGill University	1985
Ph.D.	Simon Fraser University	1993

Field of Research

Broadly defined as *fisheries dynamics,* I am concerned with the impact of the interplay between fishing activities and realized catch on fishery assessments. This involves the theoretical and empirical studies of vessel and fish movements, vessel interactions, species targeting, and information exchange. It requires statistical and simulation models employing likelihood, Bayesian methods, network theory and other developing quantitative methods. I also develop quantitative analyses to examine the biology of commercially and culturally important fishes. This NSERC funded work involves collaborations within Manitoba, in the Canadian Arctic and Atlantic, and in Europe.

Description of Publications

Within *fisheries dynamics* my publications focus on the application of behavioural ecology theory to patterns and biases in catch rates and fishery assessments, for example, the implications of vessel movements in response to local success are examined in:

Gillis, D.M., 2003. Ideal free distributions in fleet dynamics: a behavioral perspective on vessel movement in fisheries analysis. Canadian Journal of Zoology, 81(2), pp.177-187.

Gillis, D.M. and van der Lee, A., 2012. Advancing the application of the ideal free distribution to spatial models of fishing effort: the isodar approach. Canadian Journal of Fisheries and Aquatic Sciences, 69(10), pp.1610-1620.

Gillis, D.M., Koscielny, J. and Blanz, B., 2024. Maximum sustainable yield as a reference point in the presence of fishing effort that follows an ideal free distribution. Natural Resource Modeling, 37(1), p.e12390.

More generally, my publications provide methods to *glean additional, relevant fishery information* from the underutilized data of commercial fishery assessments:

Gillis, D.M. and Showell, M.A., 2002. Risk and information use in two competing fleets: Russian and Cuban exploitation of silver hake (*Merluccius bilinearis*). Canadian Journal of Fisheries and Aquatic Sciences, 59(8), pp.1275-1286.

Gillis, D.M., Rijnsdorp, A.D. and Poos, J.J., 2008. Behavioral inferences from the statistical distribution of commercial catch: patterns of targeting in the landings of the Dutch beam trawler fleet. Canadian Journal of Fisheries and Aquatic Sciences, 65(1), pp.27-37.

Gillis, D.M., Rijnsdorp, A.D. and Poos, J.J., 2021. Association networks in the Dutch offshore beam trawl fleet: their predictors and relationship to vessel performance. Canadian Journal of Fisheries and Aquatic Sciences, 78(7), pp.924-942.

Additionally, I have worked with students and colleagues to both advance my core research interests and to quantitatively support more general fish biology and movement studies relevant to fish harvest:

Charles, C., Blanchfield, P.J. and Gillis, D.M., 2017. Site fidelity of escaped rainbow trout to an experimental freshwater aquaculture facility and habitat overlap with native fish fauna. Aquaculture Environment Interactions, 9, pp.415-428.

Aljafary, M., Gillis, D.M. and Comeau, P., 2019. Is catch proportional to nominal effort? Conceptual, fleet dynamic, and statistical considerations in catch standardization. Canadian Journal of Fisheries and Aquatic Sciences, 76(12), pp.2332-2342.

Munaweera, I., Muthukumarana, S., Gillis, D.M., Watkinson, D.A., Charles, C. and Enders, E.C., 2021. Assessing movement patterns using Bayesian state space models on Lake Winnipeg walleye. Canadian Journal of Fisheries and Aquatic Sciences, 78(10), pp.1407-1421.

A complete list of my collaborations and contributions can be found on my website (see above) and my Google Scholar site: https://scholar.google.com/citations?user=KvwfFhkAAAAJ

Teaching History

Over the past 30 years I have taught Introductory Ecology, Population Ecology, Field Ecology, Fish Biology, Fisheries and Wildlife analysis, and Ecology Consulting at an undergraduate level. I have taught graduate level biostatistics and critical thinking courses. I have also given workshops in the use of current quantitative methods (R language use) in fisheries analysis and stock assessment to the government and the private sector researchers.

Distinguished Service

In addition to regular subject matter reviews, I hold a unique role as Consulting Editor (for statistical methodology) with the Canadian Journal of Zoology. I have been invited to consult on fishery issues regionally, nationally, and internationally, including the *Lake Winnipeg Quota Review Taskforce* (Province of Manitoba), *Better Understanding of Fisher Behavior for Improved Policies: Use of Agent-Based Models* (2015, Ocean Conservancy, Washington DC), and the review of stock assessment practices in the European flatfish fisheries in the *WKFLAT 2010 Workshop* (International Council for the Exploration of the Sea, Copenhagen, Denmark), as well as various Canadian fishery assessments.