Michael J. Malick

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Professional Experience

Current — Research Fish Biologist, NOAA Fisheries, Northwest Fisheries Science Center, Manchester, WA

2017–19 — NRC Postdoctoral Research Fellow, NOAA Fisheries, Seattle, WA.

2008–09 — Research Associate, University of Alaska Fairbanks, School of Fisheries and Ocean Sciences, Juneau, AK.

Education

2010–17 — Ph.D. Simon Fraser University, Burnaby, BC
Thesis: Multi-scale environmental forcing of Pacific salmon population dynamics (PDF)
Advisors: Sean Cox and Randall Peterman

2006–08 — M.Sc. University of Alaska Fairbanks, Juneau, AK
Thesis: Variable effects of biological and environmental processes on coho salmon marine survival in Southeast Alaska (PDF)
Advisor: Milo D. Adkison

2002–06 — B.Sc. Mansfield University, *summa cum laude*, Mansfield, PA
Senior Thesis: The influence of climatological factors on the migration timing of sockeye salmon into freshwater
Independent Research: Chemical and biological study of the Tioga River

Publications

2020 — **Malick, M.J.**, S.A. Siedlecki, E.L. Norton, I.C. Kaplan, M.A. Haltuch, M.E. Hunsicker, S.L. Parker-Stetter, K.N. Marshall, A.M. Berger, A.J. Hermann, N.A. Bond, and S. Gauthier. 2020. Environmentally driven seasonal forecasts of Pacific hake distribution. Frontiers in Marine Science 7:578490. https://doi.org/10.3389/fmars.2020.578490 (PDF).

2020 — Litzow, M.A., **M.J. Malick**, N.A. Bond, C.J. Cunningham, J.L. Gosselin, and E.J. Ward. 2020. Quantifying a novel climate through changes in PDO-climate and PDO-salmon relationships. Geophysical Research Letters 47:16 e2020GL087972. https://doi.org/10.1029/2020GL087972.

2020 — Connors, B.*, **M.J. Malick***, G.T. Ruggerone*, P. Rand, M. Adkison, J.R. Irvine, R. Campbell, K. Gorman. 2020. Climate and competition influence sockeye salmon population dynamics across the Northeast Pacific Ocean. Canadian Journal of Fisheries and Aquatic Sciences 77:943–949. https://doi.org/10.1139/cjfas-2019-0422 (PDF, **Authors contributed equally*).

2020 **Malick, M.J.**, M. Hunsicker, M. Haltuch, S. Parker-Stetter, A. Berger, K. Marshall. 2020. Relationships between temperature and Pacific hake distribution vary across latitude and life-history stage. Marine Ecology Progress Series 639:185-–197. https://doi.org/10.3354/meps13286.

2020 **Malick, M.J.** 2020. Time-varying relationships between ocean conditions and sockeye salmon productivity. Fisheries Oceanography 29:265–275 https://doi.org/10.1111/fog.12469.

2017 **Malick, M.J.**, M.B. Rutherford, and S.P. Cox. 2017. Confronting challenges to integrating Pacific salmon into ecosystem-based management policies. Marine Policy 85:123–132 https://doi.org/10.1016/j.marpol.2017.08.028.

2017 **Malick, M.J.**, S.P. Cox, F.J. Mueter, B. Dorner, and R.M. Peterman. 2017. Effects of the North Pacific Current on the productivity of 163 Pacific salmon stocks. Fisheries Oceanography 26:268–281 https://doi.org/10.1111/fog.12190 (PDF).

2016 **Malick, M.J.** and S.P. Cox. 2016. Regional-scale declines in productivity of pink and chum salmon stocks in western North America. PLoS ONE 11:e0146009 https://doi.org/10.1371/journal.pone.0146009 (PDF).

2015 **Malick, M.J.**, S.P. Cox, R.M. Peterman, T.C. Wainwright, and W.T. Peterson. 2015. Accounting for multiple pathways in the connections among climate variability, ocean processes, and coho salmon recruitment in the Northern California Current. Canadian Journal of Fisheries and Aquatic Sciences 72:1552–1564 https://doi.org/10.1139/cjfas-2014-0509.

2015 **Malick, M.J.**, S.P. Cox, F.J. Mueter, and R.M. Peterman. 2015. Linking phytoplankton phenology to salmon productivity along a north-south gradient in the Northeast Pacific Ocean. Canadian Journal of Fisheries and Aquatic Sciences 72:697–708 https://doi.org/10.1139/cjfas-2014-0298.

2011 **Malick, M.J.**, L.J. Haldorson, J.J. Piccolo, and J.L. Boldt. 2011. Growth and survival in relation to body size of juvenile pink salmon in the Northern Gulf of Alaska. Marine and Coastal Fisheries 3:261–270 https://doi.org/10.1080/19425120.2011.593467 (PDF).

2009 **Malick, M.J.**, M.D. Adkison, and A.C. Wertheimer. 2009. Variable effects of biological and environmental processes on coho salmon marine survival in Southeast Alaska. Transactions of the American Fisheries Society 138:846–860 https://doi.org/10.1577/T08-177.1 (PDF).

Awards and Scholarships

2020 NOAA Northwest Fisheries Science Center Internal Research Grant

2018 National Research Council Postdoctoral Research Fellowship Award

2016 Best Poster Presentation, PICES Annual Meeting, San Diego, CA, Fisheries Science Section (Poster)

2015 Best Student Presentation, AFS National Meeting, Portland, OR, Honorable Mention (Slides, Extended abstract)

2014–15 Ph.D. Graduate Fellowship, Simon Fraser University

2012–13 Ph.D. Graduate Fellowship, Simon Fraser University

2012–13 President's Ph.D. Scholarship, Simon Fraser University

2010–11 C.D. Nelson Memorial Graduate Scholarship

2005–06 Certificate of Recognition for Academic Achievement in Biology

2005–06 Stanley Henry Nauman Scholarship for Academic Excellence in Fisheries

2003–04 Certificate of Accomplishment for Grantsmanship

Invited and Conference Presentations

2020 **Malick, M.J.** Time-varying relationships between ocean conditions and sockeye salmon productivity. American Fisheries Society Annual Meeting. Held virtually. September 15, 2020 (Slides).

2020 **Malick, M.J.**, M. Hunsicker, M. Haltuch, S. Parker-Stetter, I. Kaplan, A. Berger, K. Marshall, R. Brodeur, S. Siedlecki, N. Bond, A. Hermann, E. Norton, and S. Gauthier. Environmentally driven forecasts of Pacific hake distribution. Pacific Whiting Scientific Review Group annual meeting, Seattle, Washington, February 27, 2019 (Slides).

2019 **Malick, M.J.**, M. Hunsicker, M. Haltuch, S. Parker-Stetter, I. Kaplan, A. Berger, S. Siedlecki, N. Bond, A. Hermann, and, E. Norton. Skill and uncertainty of environmentally driven forecasts of Pacific hake distribution. PICES Annual Meeting, Victoria, BC. October 22, 2019 (Slides).

2019 **Malick, M.J.**, M. Hunsicker, M. Haltuch, S. Parker-Stetter, I. Kaplan, A. Berger, K. Marshall, R. Brodeur, S. Siedlecki, N. Bond, A. Hermann, E. Norton, and J. Newton. Distribution of Pacific hake in a variable environment. Pacific Whiting Scientific Review Group annual meeting, Victoria, British Columbia, February 20, 2019 (Slides).

2018 **Malick, M.J.**, M. Hunsicker, M. Haltuch, S. Parker-Stetter, I. Kaplan, A. Berger, K. Marshall, R. Brodeur, S. Siedlecki, N. Bond, A. Hermann, E. Norton, and J. Newton. Seasonal forecasting of Pacific hake distribution in the California Current. International Symposium on the Effects of Climate Change on the World's Oceans, Washington, D.C. June 7, 2018 (Slides).

2017 **Malick, M.J.** Multi-scale environmental forcing of Pacific salmon population dynamics. Ph.D. thesis defense. School of Resource and Environmental Management, Simon Fraser University, Burnaby, BC. May 16, 2017 (Slides).

2016 **Malick, M.J.**, S.P. Cox, F.J. Mueter, B. Dorner, and R.M. Peterman. Effects of the North Pacific Current on productivity of 163 Pacific salmon stocks. Poster. PICES Annual Meeting, San Diego, CA. November 15, 2016 (Poster).

2016 **Malick, M.J.** Environmental drivers of spatial and temporal variability in Pacific salmon productivity. Resource & Environmental Management Departmental Seminar, Simon Fraser University, Burnaby, BC. March 7, 2016 (Slides).

2015 **Malick, M.J.**, S.P. Cox, F.J. Mueter, and R.M. Peterman. Linking phytoplankton phenology to pink salmon productivity along a north-south gradient. American Fisheries Society Annual Meeting, Portland, OR. August 17, 2015 (Slides, Extended abstract).

2014 **Malick, M.J.**, R.M. Peterman, and S.P. Cox. Stock-recruitment data sets for wild North American pink and chum salmon stocks. International Salmon Data Workshop, Seattle, WA. September 9, 2014.

2014 **Malick, M.J.**, S.P. Cox, F.J. Mueter, and R.M. Peterman. North-south differences in the effects of the initiation date of the spring bloom on pink salmon survival. Salmon Ocean Ecology Annual Meeting, Santa Cruz, CA. March 14, 2014.

2013 **Malick, M.J.**, S.P. Cox, R.M. Peterman, W.T. Peterson, and T.C. Wainwright. Using Bayesian networks to link climate variability, ocean processes, and coho salmon marine survival. North Pacific Anadromous Fish Commission Workshop, Honolulu, HI. April 26, 2013.

2013 **Malick, M.J.** Modeling causal networks to link climate variability, ocean processes, and Pacific salmon population dynamics. IDEAS Symposium, Simon Fraser University, Burnaby, BC. January 19, 2013.

2012 **Malick, M.J**. Timing of the spring bloom in the Northeast Pacific. IDEAS Symposium, Simon Fraser University, Burnaby, BC. January 7, 2012.

2009 **Malick, M.J.**, L. Haldorson, and J.J. Piccolo. Feeding intensity, diet, and survival in relation to body size of juvenile pink salmon. Alaska Chapter American Fisheries Society Annual Meeting, Fairbanks, AK. November 4, 2009.

2009 **Malick, M.J.** What comes after a fisheries undergraduate degree? Mansfield University Special Seminar, Mansfield, PA. October 14, 2009.

2009 **Malick, M.J.**, L. Haldorson, and J.J. Piccolo. Characterizing habitat specific size, condition, and growth of juvenile pink salmon in the Northern Gulf of Alaska. Salmon Ocean Ecology Annual Meeting, Juneau, AK. April 7, 2009.

2009 **Malick, M.J.**, M.D. Adkison, and A.C. Wertheimer. Variable effects of biological and environmental processes on coho salmon marine survival in Southeast Alaska. Salmon Ocean Ecology Annual Meeting, Juneau, AK. April 7, 2009.

2008 **Malick, M.J.** Variable effects of hatchery pink and chum salmon on coho salmon marine survival in Southeast Alaska. University of Alaska Chapter (Juneau Subunit) of the American Fisheries Society, Annual Meeting, Juneau, AK. April 14, 2008.

2007 **Malick, M.J.**, M.D. Adkison, and A.C. Wertheimer. The influence of physical and biological factors on coho salmon marine survival in Southeast Alaska. Alaska Chapter American Fisheries Society Annual Meeting, Ketchikan, AK. November 15, 2007.

2004 **Malick, M.J.**, C. Oppel, R. Sweater, and G. Carson. Chemical and biological study of the Tioga River. Poster. Pennsylvania Academy of Science Annual Meeting, Pittsburgh, PA. March 26, 2004.

Media Coverage

2020 Disentangling the Effects of Competition and a Warming Ocean on Sockeye Salmon across the Northeast Pacific by NCEAS. May 27, 2020 (Article).

2017 Impacts of the North Pacific Current on Salmon Productivity. Research Spotlight on salmon-net.org. December 27, 2017 (Article).

2015 Warming Coastal Ocean Temperatures May Lead To Negative Effect For Salmon Recruitment. The Columbia Basin Bulletin. October 9, 2015.

2015 Study Details How Timing Of Phytoplankton Blooms off Alaska, B.C. Tied To Salmon Productivity. The Columbia Basin Bulletin. February 6, 2015.

Teaching Experience

2016 *Guest Lecture:* Designing Publication Quality Graphics in R. Guest lecture in Simulation Modelling in Natural Resource Management (REM-612), Simon Fraser University (2 hours).

2015 *Instructor:* Designing Publication Quality Graphics in R, Simon Fraser University – A tutorial on designing and creating publication figures in R. Tutorial materials are available on github.

2014 *Teaching Assistant:* Risk Assessment and Decision Analysis for Management of Natural Resources (REM-625), Simon Fraser University. Developed and led computer labs, graded assignments, and organized reading discussions.

2013 *Instructor:* Introduction to R for Data Analysis, Simon Fraser University – A two day course that covered the fundamentals of the R programming language.

2013 *Instructor:* Introduction to R, NOAA Northwest Fisheries Science Center – A two day course that covered the fundamentals of the R programming language.

2012 *Instructor:* Introduction to R, Simon Fraser University – An 11 week voluntary course that covered the fundamentals of the R programming language.

Working Groups and Workshops

2018 Workshop on spatio-temporal modelling to derive indices of abundance from scientific surveys. Led by James Thorson and Curry Cunningham. Seattle, WA, USA.

2017 NCEAS (National Center for Ecological Analysis and Synthesis, Santa Barbara, CA) working group on *State of Alaska's Salmon and People: Interacting effects of ocean climate and at-sea competition on Alaskan salmon* (website).

2017 Centre for Ecological and Evolutionary Synthesis workshop on *Natural mortality in fish populations during early life stages (NAMOR)*, Oslo, Norway.

Certifications & Services

2017–19 Graduate supervisory committee for Jessica Gill, Simon Fraser University, Master's of Resource Management. Successfully completed degree.

2007–16 American Fisheries Society Associate Professional

2007–08 *Secretary:* AFS Student Subunit, University of Alaska Fairbanks

Reviewer Global Change Biology, Fish and Fisheries, Progress in Oceanography, Ecosphere, Canadian Journal of Fisheries and Aquatic Sciences, Marine Ecology Progress Series, Transactions of the American Fisheries Society, North American Journal of Fisheries Management, North Pacific Anadromous Fish Commission

Software

2019 r-ersst: An R package for downloading and processing NOAA ERSST data

2015 r-jagstools: An R package to conveniently run JAGS in parallel from R

2015 r-codatools: An R package to extend MCMC diagnostics

2014 r-chroma: An R package for creating consistent color palettes using the HCL color space

Published Data Sets

2015 *North American pink and chum salmon spawner-recruit database.* Publicly released July 2015. The database contains stock-recruitment data for 46 pink and 53 chum salmon stocks throughout their North American ranges (Available: https://dx.doi.org/10.5281/zenodo.20354).

Field Experience

2007–08 *Fisheries Contractor:* National Atmospheric and Oceanic Administration, Little Port Walter, AK. Duties included salmon collection, recovery of coded wire tags, and salmon weir maintenance.

2006 *Fisheries Technician:* Wyoming Game & Fish Department, Laramie, WY. Duties included fish sampling using backpack electro-fishing, raft electro-fishing, seines, gillnets, trap nets, and trammel nets, habitat mapping, and rotenone treatments.

2004 *Volunteer Fisheries Technician:* United States Fish and Wildlife Service, King Salmon, AK. Duties included remote field camp and salmon weir construction and maintenance, daily salmon counts both manually and using underwater motion detection cameras.