Sean Charles Anderson

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Education

2011–14 Ph.D. Candidate, Simon Fraser University, Burnaby, Canada
Supervisors: Dr. Nicholas K. Dulvy and Dr. Andrew B. Cooper
Canadian Fulbright Scholar to the University of Washington in 2012–13

2010 M.Sc. Biology, Dalhousie University, Halifax, Canada
Thesis title: Trends, drivers, and ecosystem effects of expanding global invertebrate fisheries. Supervisor: Dr. Heike K. Lotze. (PDF)
Canadian Governor General's Academic Gold Medal for the top-ranked Master's Natural Sciences and Engineering thesis at Dalhousie University in 2010

2004–07 B.Sc. (Hons.) Environmental Science, Dalhousie University, Halifax, Canada
Thesis title: How sustainable are emerging low-trophic level fisheries on the Scotian Shelf? Supervisors: Dr. Heike K. Lotze and Dr. Ransom A. Myers. (PDF)
First Class Honours & Environmental Programmes Honour Society Medal

2001–03 B.Sc. Candidate (Hons.) Kinesiology, University of Waterloo, Waterloo, Canada Transferred to Dalhousie University in 2004.

Publications

2014 **Anderson, S.C.**, J.W. Moore, M.M. McClure, N.K. Dulvy, A.B. Cooper. Portfolio conservation of metapopulations under climate change. In press at Ecological Applications.

2014 Farmer, R.G., M.L. Leonard, J.E.M. Flemming, **S.C. Anderson**. Observer aging and long-term avian survey data quality. Ecology and Evolution. 4(12): 2563–2576. http://doi.org/10.1002/ece3.1101 (PDF). National Geographic news story.

2014 **Anderson, S.C.**, C.C. Monnahan, K.F. Johnson, K. Ono, J.L. Valero. ss3sim: An R package for fisheries stock assessment simulation with Stock Synthesis. PLOS ONE. 9(4): e92725. http://doi.org/10.1371/journal.pone.0092725 (PDF).

2014 Johnson, K.F., C.C. Monnahan, C.R. McGilliard, K.A. Vert-pre, **S.C. Anderson**, C.J. Cunningham, F. Hurtado-Ferro, R.R. Licandeo, M.L. Muradian, K. Ono, C.S. Szuwalski, J.L. Valero, A.R. Whitten, A.E. Punt. Time-varying natural mortality in fisheries stock assessment models: identifying a default approach. ICES Journal of Marine Science. In press. http://doi.org/10.1093/icesjms/fsu055 (PDF).

2014 Ono, K., R. Licandeo, M.L. Muradian, C.J. Cunningham, **S.C. Anderson**, F. Hurtado-Ferro, K.F. Johnson, C.R. McGilliard, C.C. Monnahan, C.S. Szuwalski, J.L. Valero, K.A. Vert-pre, A.R. Whitten, A.E. Punt. The importance of length and age composition data in statistical catch-at-age models for marine species. ICES Journal of Marine Science. In press. http://doi.org/10.1093/icesjms/fsu007 (PDF).

2014 O'Regan, S.M., W.J. Palen, **S.C. Anderson**. Climate warming mediates negative impacts of rapid pond drying for three amphibian species. Ecology. 95(4): 845–855. http://doi.org/10.1890/13-0916.1 (PDF). Cover Article.

2013 Favaro, B., D.C. Braun, E. . Research Derby: A pressure cooker for creative collaborative science. Ideas in Ecology and Evolution. Ideas in Ecology and Evolution. 6: 40–46. http://doi.org/10.4033/iee.2013.6.9.n (PDF).

2013 **Anderson, S.C.**, A.B. Cooper, N.K. Dulvy. Ecological prophets: Quantifying metapopulation portfolio effects. Methods in Ecology and Evolution. 4(10): 971–981. http://doi.org/10.1111/2041-210X.12093 (PDF).

2013 Artelle, K.A., **S.C. Anderson**, A.B. Cooper, P.C. Paquet, J.D. Reynolds, C.T. Darimont. Confronting uncertainty in wildlife management: performance of grizzly bear management. PLOS ONE. 8(11): e78041. http://doi.org/10.1371/journal.pone.0078041 (PDF).

2013 Phillis, C.C., S.M. O'Regan, S.J. Green, J.E. Bruce, **S.C. Anderson**, J.N. Linton, E.R. Derby, B. Favaro. Multiple pathways to conservation success. Conservation Letters. 6(2): 98–106. http://doi.org/10.1111/j.1755-263X.2012.00294.x (PDF).

2012 Harnik, P.G., H.K. Lotze, **S.C. Anderson**, Z.V. Finkel, S. Finnegan, D.R. Lindberg, L.H. Liow, R. Lockwood, C.R. McClain, J.L. McGuire, A. O'Dea, J.M. Pandolfi, C. Simpson, D.P. Tittensor. Extinctions in ancient and modern seas. Trends in Ecology and Evolution. 27(11): 608–617. http://doi.org/10.1016/j.tree.2012.07.010 (PDF).

2012 **Anderson, S.C.**, T.A. Branch, D. Ricard, H.K. Lotze. Assessing global marine fishery status with a revised dynamic catch-based method and stock-assessment reference points. ICES Journal of Marine Science. 69(8): 1491–1500. http://doi.org/10.1093/icesjms/fss105 (PDF).

2011 **Anderson, S.C.**, R.G. Farmer, F. Ferretti, A.L.S. Houde, J.A. Hutchings. Correlates of vertebrate extinction risk in Canada. BioScience. 61(7): 538–549. http://doi.org/10.1525/bio.2011.61.7.8 (PDF).

2011 **Anderson, S.C.**, J.M. Flemming, R. Watson, H.K. Lotze. Serial exploitation of global sea cucumber fisheries. Fish and Fisheries. 12(3): 317–339. http://doi.org/10.1111/j.1467-2979.2010.00397.x (PDF). Featured in Science.

2011 Boudreau, S.A., **S.C. Anderson**, B. Worm. Top-down interactions and temperature control of snow crab abundance in the northwest Atlantic Ocean. Marine Ecology Progress Series. 429: 169–183. http://doi.org/10.3354/meps09081 (PDF).

2011 **Anderson, S.C.**, J.M. Flemming, R. Watson, H.K. Lotze. Rapid Global Expansion of Invertebrate Fisheries: Trends, Drivers, and Ecosystem Effects. PLOS ONE. 6(3): e14735. http://doi.org/10.1371/journal.pone.0014735 (PDF).

2008 **Anderson, S.C.**, H.K. Lotze, N.L. Shackell. Evaluating the knowledge base for expanding low-trophic-level fisheries in Atlantic Canada. Canadian Journal of Fisheries and Aquatic Sciences. 65(12): 2553–2571. http://doi.org/10.1139/F08-156 (PDF). Eighth most-read CJFAS article in 2008.

Manuscripts in review

2014 Finnegan, S., **S.C. Anderson**, P.G. Harnik, C. Simpson, D.P. Tittensor, J.E. Byrnes, Z.V. Finkel, D.R. Lindberg, L.H. Liow, R. Lockwood, H.K. Lotze, C.M. McClain, J.L. McGuire, A. O'Dea, J.M. Pandolfi. Paleontological baselines for evaluating extinction risk in the modern oceans. In review.

2014 Boudreau, S.A., **S.C. Anderson**, B. Worm. Top-down and bottom-up forces interact at thermal range extremes on American lobster. In review.

2014 Trebilco, R., N.K. Dulvy, **S.C. Anderson**, A.K. Salomon. The paradox of inverted biomass pyramids in kelp forest fish communities. In review.

2014 Hurtado-Ferro, F., C.S. Szuwalski, J.L. Valero, **S.C. Anderson**, C.J. Cunningham, K.F. Johnson, R.R. Licandeo, C.R. McGilliard, C.C. Monahan, M.L. Muradian, K. Ono, K.A. Vert-Pre, A.R. Whitten, A.E. Punt. Looking in the rear-view mirror: bias and retrospective patterns in integrated, age-structured stock assessment models. In review.

Awards and scholarships

2014 Garfield Weston Foundation / BC Packers Ltd. Graduate Fellowship in Marine Sciences

2014 Graduate Fellowship (two semesters), Simon Fraser University

2012–13 Canadian Fulbright Scholar award to the University of Washington in 2012–13

2011 Canadian Governor General's Academic Gold Medal for the top-ranked Master's Natural Sciences and Engineering thesis at Dalhousie University in 2010

2011–14 Provost Prize of Distinction, Simon Fraser University

2011–14 Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship (Doctoral)

2007–10 Faculty Research Grant Scholarship, Dalhousie University

2007–09 Graduate Studies Scholarship, Dalhousie University

2007 Environmental Programmes Honour Society Medal, Dalhousie University

Software

2014 **Anderson, S.C.**, J.W. Moore, M.M McClure, N.K. Dulvy, A.B. Cooper. metafolio: Metapopulation simulations for conserving salmon through portfolio optimization. http://cran.r-project.org/package=metafolio

2013 **Anderson, S.C.**, C.C. Monnahan, K.F. Johnson, K. Ono, J.L. Valero, C.J Cunningham, F. Hurtado-Ferro, R. Licandeo, C.R. McGilliard, C.S. Szuwalski, K.A. Vert-pre, A.R. Whitten. ss3sim: Fisheries stock assessment simulation testing with Stock Synthesis. http://cran.r-project.org/package=ss3sim

2013 **Anderson, S.C.**, A.B. Cooper, N.K. Dulvy. ecofolio: Tools to quantify metapopulation portfolio effects. https://github.com/seananderson/ecofolio

Invited talks and conference presentations

2013 **Anderson, S.C.**, A.B. Cooper, N.K. Dulvy. False prophets: The challenges of quantifying ecological portfolios (slides), Quantitative Seminar, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, United States.

2012 **Anderson, S.C.**, A.B. Cooper, N.K. Dulvy. False prophets: The ecological portfolio effect overestimates the benefit of diversity. Branch Lab, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, United States.

2012 **Anderson, S.C.**, A.B. Cooper, N.K. Dulvy. Metapopulation dynamics and the generality of the ecological portfolio effect. Les Ecologistes Departmental Seminar, Simon Fraser University, Burnaby, BC, Canada.

2010 **Anderson, S.C.** The rise of invertebrates, the fall of sea cucumbers, and the risk of maturing late. Earth2Ocean Research Group, Simon Fraser University, Burnaby, BC, Canada.

2009 **Anderson, S.C.**, J. Mills Flemming, R. Watson, H.K. Lotze. Ecosystem impacts of the global expansion of invertebrate fisheries. International Oceans Past II Conference *Multidisciplinary Perspectives on the History and Future of Marine Animal Populations*. Vancouver, BC, Canada.

2009 **Anderson, S.C.**, J. Mills Flemming, R. Watson, H.K. Lotze. Global invertebrate fisheries: trends and consequences. NCEAS (National Center for Ecological Analysis and Synthesis) Working Group *Finding Common Ground in Marine Conservation and Management*. Santa Barbara, CA, USA.

2009 **Anderson, S.C.**, H.K. Lotze, N.L. Shackell. Evaluating the knowledge base for expanding low-trophic level fisheries in Atlantic Canada. Harvest Fisheries Seminar Series. Bedford Institute of Oceanography, Fisheries and Oceans, Dartmouth, NS, Canada.

2008 **Anderson, S.C.**, H.K. Lotze, N.L. Shackell. Evaluating the knowledge base for expanding low-trophic level fisheries in Atlantic Canada. Departmental Seminar, Biology Department, Dalhousie University, Canada.

Teaching

2013–14 Organizer of Stats Beerz — a statistical help group attended by graduate students and postdocs primarily in the Earth to Oceans research group, but also the wider SFU Biology and Geography Departments, and the School of Resource and Environmental Management (REM).

2014 Developed self-directed lecture and exercises on ggplot2 for FISH 554: Beautiful graphics in R, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, United States.
https://github.com/seananderson/ggplot2-FISH554

2013 Two-part workshop on data manipulation for Stats Beerz and Earth to Oceans groups at Simon Fraser University with approximately 25 participants. An introduction to plyr, advanced concepts with plyr and function debugging, and an introduction to dplyr.
https://github.com/seananderson/plyr-statsbeerz

2013 Instructor for BISC-888-1: Data Wrangling and Visualization in R, a graduate-level course at Simon Fraser University, Burnaby, BC, Canada with approximately 20 participants. Co-developed curriculum and developed/delivered lectures, exercises, notes, and assignments for three of six two-hour classes.
https://github.com/seananderson/datawranglR (see classes 03, 04, 05)

2012 Introduction to ggplot2. (notes, slides) Lecture for FISH 507H: Beautiful Graphics in R, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, United States

2012 Workshop on the R package plyr. (notes, slides, examples) Branch Lab, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, United States

2011 Multipanel plotting in R with base graphics. (notes, slides). Earth2Ocean Research Group, Simon Fraser University, Burnaby, BC, Canada.

2011 A brief introduction to R. (notes, workshop code). Earth2Ocean Research Group, Simon Fraser University, Burnaby, BC, Canada.

2011 Workshop on the R package plyr (notes, slides). Earth2Ocean Research Group, Simon Fraser University, Burnaby, BC, Canada.

2007–08 Teaching Assistant, Organismal Biology and Ecology, Dalhousie University, two semesters (BIOL 1021).

2007–08 Teaching Assistant, Marine Mammology, Dalhousie University (BIOL 4060).

Contract employment

2013 Co-developed a set of maps showing trends in global fisheries status for the front page of ramlegacy.org, the RAM Legacy Stock Assessment Database (for Dr. Ray Hilborn).

2011–12 Database management for the project *Global Shark Abundance Baselines* (Hopkins Marine Station, Stanford University, CA, United States) with F. Micheli, F. Ferretti, N.K. Dulvy, H.K. Lotze, and B. Worm.

2010 Assessment of Arctic surfclam on Banquereau Bank using industry collected data for Clearwater Seafoods, Bedford, NS, Canada.

2010 Modelling length-frequency distribution changes of Atlantic halibut for NAFO Divisions 4VWX5Z and 3NOP for Dr. K. Trzcinski, Population Ecology Division, Bedford Institute of Oceanography, Fisheries and Oceans, Dartmouth, NS, Canada.

Working groups and workshops

2011–13 NESCent (National Evolutionary Synthesis Center, Durham, NC) Working Group *Determinants of Extinction in Ancient and Modern Seas* led by Paul Harnik, Seth Finnegan, and Rowan Lockwood. (URL)

2010 Atlantic Halibut Assessment Science Peer Review Meeting, Fisheries and Oceans, Dartmouth, NS, Canada.

2007–09 NCEAS (National Center for Ecological Analysis and Synthesis, Santa Barbara, CA) Distributed Graduate Seminar, in association with the Working Group *Finding Common Ground in Marine Conservation and Management* led by Ray Hilborn and Boris Worm. (URL)

2008 Workshop on Canadian Science and Management Strategies for Sea Cucumber (*Cucumaria frondosa*), Fisheries and Oceans, Dartmouth, NS, Canada (work presented *in absentia*).

2007 Workshop on Canadian Science and Management Strategies for Atlantic Hagfish, Fisheries and Oceans, Dartmouth, NS, Canada. (URL)

Reviews

Reviewer for Science, Ecology, Conservation Biology, Fish and Fisheries, International Journal of Tropical Biology and Conservation, Journal of Environmental Management, Endangered Species Research, Aquatic Conservation