

Stephan B. Munch

Ecology, Evolution, and Behavior and Applied Mathematics
University of California
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Education

- 2002 Ph.D. Coastal Oceanography, State University of New York at Stony Brook
Dissertation: Evolution of growth rate in *Menidia menidia*: bioenergetics, life history theory, and implications for management.
- 1997 M.S. Marine Sciences, State University of New York at Stony Brook
Thesis: Recruitment dynamics of bluefish, *Pomatomus saltatrix* on the continental shelf from Cape Hatteras to Cape Cod, 1973-1995.
- 1993 B.S. Biology and B.A. Art Studio, *magna cum laude*, State University of New York at Binghamton

Employment

- 2010-present Fisheries Ecologist, Fisheries Ecology Division, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, Santa Cruz, CA
- 2009-2010 Associate Professor, School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY
- 2005-2009 Assistant Professor, School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY
- 2002-2005 Post-doctoral research fellow, Center for Stock Assessment Research, UC Santa Cruz, Santa Cruz, CA
- 1999-2001 Consultant in ecological risk assessment.
Applied Biomathematics, Setauket, NY

Affiliations and Extracurricular Service

- 2015-present Editor, Ecology Letters
- 2014-2105 Pew panel on climate change and conservation
- 2013-present Eulachon Recovery Team, NW Regional Office, NOAA Fisheries
- 2011-present Adjunct Assoc. Prof., Ecology and Evolutionary Biology, UCSC
- 2010-present Adjunct Assoc. Prof., School of Marine and Atmospheric Sciences, SBU
- 2006-present Program Faculty, Department of Ecology and Evolution, SBU
- 2009-2010 Ecosystem modeler, Lenfest Forage Fish Task Force
- 2006-2008 Multi-species Technical Committee , ASMFC
- 2005-2007 Marine Protected Areas Science Integration Panel, NOAA
- 2007-2009 Advisory Board, Consortium for Interdisciplinary Environmental Research, SBU

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Awards and Grants

- 2021 Transparent ML: Unpacking the black box and incorporating mechanism. NOAA High Performance Computing Incubator. \$101,245.
- 2020 Model-free forecasting and management; an application to Gulf shrimp fisheries. Lenfest Oceans Program. \$83,329.
- 2019 A dynamical systems / machine learning hybrid for predicting and mitigating ecological extremes. NOAA High Performance Computing Incubator. \$91,303.
- 2018 Collaborative Research: Flexibility and robustness of attack and evasion: reverse-engineering the mechanisms of behavioral control (NSF IOS. \$297,201. w/ A. Hein, B. Martin)
- 2018 Scaling up approximate dynamic programming for multi-species management. NOAA High Performance Computing Incubator. \$89, 241.
- 2018 Gaussian process machine learning for ecosystem modeling. NOAA High Performance Computing Incubator. \$89, 241
- 2017 Development and testing of a new data-limited assessment approach. NOAA:AIM \$60,000
- 2016 A meta-analysis of climate-driven changes in vital rates. FATE \$151,000
- 2015 Model-free conservation and management. Lenfest Oceans Program. \$150,000
- 2013 Towards model-free management. NOAA:AIM \$100,000
- 2012 Bayesian nonlinear forecasting for assessing stocks and ecosystems. NOAA:AIM. \$100,000
- 2012 PEW Fellowship in Marine Conservation. Climate-driven changes in demography: predicting conservation impacts. \$150,000
- 2011 Beyond maternal effects: Transgenerational plasticity in thermal performance. NSF Bio. Oc. \$610,000
- 2007 Collaborative research on Bayesian semiparametric population dynamics modeling. NSF DEB \$168,572
- 2007 Restoration strategies for Great South Bay. New York Dept. of State. \$325,000 (w/ R. Cerrato, D. Lonsdale, G. Lopez, M. Frisk, C. Gobler, R. Wilson, C. Flagg, J. Collier, B. Peterson)
- 2007 An ecosystem model of Long Island Sound. New York Dept. of Env. Cons. \$190,000 (w/ M. Frisk)
- 2007 Multi-species survey of Great South Bay. New York Dept. of Env. Cons. \$75,000 (w/ M. Frisk)
- 2007 Effects of powerplant entrainment on fish populations. Tamarind Foundation \$450,000 (w/ C. Gobler)
- 2007 Quantitative evaluation of marsh restoration activities. The Nature Conservancy \$30,000.
- 2006 The balance of selection on growth trajectories in marine fishes. NSF Biological Oceanography \$449,343
- 2006 Synoptic assessment of bluefish recruitment from Florida to Massachusetts. NOAA Bluefish along the Atlantic coast \$90,000 (w/ D. Conover)

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Invited Lectures

- 2020 Equation-free prediction, inference and control for complex ecological dynamics. UCSC, EEB
- 2019 Managing without models: Equation-free prediction, inference and control of ecological dynamics, MIT.
- 2018 Model-free Ecosystem management. Applied Math UCSC, Santa Cruz
- 2018 Ecological complexity and Ecosystem management. CFOS, U. Alaska, Fairbanks
- 2018 Transgenerational thermal plasticity. Eawag, U. Zurich, Switzerland
- 2017 Recruitment in marine fishes: methods, ideas and insights. Keynote address, ICES, Ft. Lauderdale
- 2016 Model-free Ecosystem Management. Stanford
- 2015 Bayesian time-delay embedding. National Taiwan University
- 2015 Model-free approaches to management. NWFSC, Seattle
- 2015 Hierarchical Bayesian approaches to time delay embedding. RSMAS, Miami
- 2015 Ecological Applications of Gaussian Processes. Applied Mathematics, UC Santa Cruz
- 2014 Transgenerational thermal plasticity. Department of Biology. UC Riverside
- 2014 Can we manage without models? Fisheries Centre, University of British Columbia.
- 2014 Transgenerational thermal plasticity. Department of Biology. Simon Fraser University.
- 2014 Ecosystem-based management. Kelp Forest and Sea Otter working group. Hakai Institute.
- 2012 Predicting demographic impacts of climate change. PEW Marine Fellows meeting, Panama
- 2012 Toward Model-free ecosystem management. Western Society of Naturalists, Seaside, CA
- 2009 Latitudinal clines in growth and lifespan. Scripps Institute for Oceanography, UC San Diego.
- 2008 Latitudinal clines in growth and lifespan. Department of Ecology & Evolutionary Biology. Yale University.
- 2008 Selection on and evolution of growth trajectories in a marine fish. University of Massachusetts, Amherst.
- 2007 Semi-parametric Bayesian Approaches to Population Dynamics. University of Washington.
- 2007 Selection on and evolution of growth trajectories in a marine fish. University of Washington.
- 2006 Evolution of latitudinal clines in somatic growth in a marine fish: Theory and data. Ohio State University.
- 2006 Latitude and longevity: a review across taxa. Evolutionary demography workshop, Max Planck Institute for Aging Research, Rostock, Germany.
- 2006 Dealing with uncertainty in fisheries management. California and the World's Ocean, Long Beach, Ca.
- 2005 Evolutionary demography of compensatory growth. UVA symposium on evolutionary demography. Charlottesville, Va.
- 2004 Nonparametric Bayesian analysis of stock-recruit data. Hatfield Marine Science Center, Newport, OR
- 2003 Darwinian fishery science: evolution of decreased yield and other unintended effects in an experimental fishery. Environmental Studies Seminar Series, UC Santa Cruz

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Courses Taught

Lecture

Mathematics for Marine Sciences
An Introduction to Ecological Modeling
Likelihood and Bayesian Data Analysis
Stochastic Processes and State-space Models

Seminar

Current Topics in Mathematical Biology
Quantitative Genetics
Life history Evolution
Bioeconomics
Statistical tools in ecology
Ecological time series
Metabolic theory and Maximum Entropy
Nonlinear dynamics
Eco-evolutionary dynamics
Spatio-temporal statistical modeling

Mentoring

Graduate students advised

Charles Perretti (MS, 2010), Kestrel Perez (PhD, 2010), Masatoshi Sugeno (PhD, 2012), Jorge Velasquez (PhD, 2012), Jin Gao (PhD, 2012), Santiago Salinas (PhD, 2012), Mark Solowski (PhD, 2015), Simon Brown (PhD, UCSC), JoAnne Siskidis (MS, 2017), Shanee Stopnitzky (UCSC), Mathew Heiner (PhD 2019), Bethany Johnson (UCSC), Bryan Garcia (UCSC).

As reader

Michael Erickson (MS, 2007), Melissa Ou (MS, 2007), Christopher Jensen (PhD, 2007), Lora Clarke (PhD, 2007), Anand Patil (PhD, 2007), Eliza Woo (PhD, 2008), Joy Smith (MS, 2009), Doug Sigourney (PhD, 2010), Joseph LaChance (PhD, 2010), Tara Duffy (PhD, 2010), Lyndie Hice (PhD, 2010), Zosia Turek (PhD, 2011), J. Khai Tran (PhD, 2011), Stephen Sabatino (PhD, 2012), Leone Brown (PhD, 2012), Daniel Moen (PhD, 2012), Xia Hua (PhD 2013), Maria DeYoreo (UCSC, 2014), Charles Perretti (SIO, 2014), Dongming Yang (PhD, 2014), Jordan Ruybal (UCSC), Kate Langwing (UCSC, 2015), Ethan Deyle (UCSD, 2015), Robert Richardson (UCSC, 2015), Daniella Bartoletti (UCSC, 2015), David Fryxell (UCSC 2018), Nicole Kinlock (SBU 2020), Chunyi Zhao (UCSC, Statistics) Emily Donham (UCSC, EEB), Laurie Perino (SBU), Teresa Jacobson (UCSC, Statistics), Victoria Quennessen (OSU), Urmi Poddar (SBU)

Post doctoral scholars

Tara Dolan, Chenghan Tsai, Tanya Rogers, Antoine Brias, Juan Arriaza-Lopez, Who-Seung Lee, Valerie Poynor, Carl Boettiger, Santiago Salinas, Adrian Jordaan

Undergraduate research students

Kenneth Gee, Aditi Maheshwari (REU), Keerthi Krishnan, Anais Muro, Julia Einsweilier, Mason Emery, Dylan Meeks, Anisa Rizo, John La Bonte, Daniel Chicchon, Lindsay Cullen, Steven Johnson, Max Monson, Hanna Knotter, Emily Parker, Kendall Pawlowski, Youngrog Lee, Katherine Schmidt, Allison Webster, Darien Rivera, Ariel Boyer, Kailey Gullickson, Brittany Portulano, Rebecca White, Wayne Brown, Madeline Whitman, Eliseo Nevarez, Caelan Noyes, Torrey Gorra, Cristina Spina, Ellie Miller, Haley Murray, Ariel Hunter, Michelle Gorbaty, Justin Grimm-Greenblatt, Leeann Latta, Winston Martinez, Olumide Babalola, Marie Whyte, Landau Buissireth, Gaurav Mandal, Helen Cheng, Maria Madsen, Susan Sackman, Kristin Onsgaard, Shanon Montanino, Amanda Roy, Benson Liang, Long Ng, Brenden Van Slyke, Stacey Assael, Alison Yee, Richard Parker (REU), Quentin Agren (REU), Sebastian Halpern (REU), Ben Sherman (REU), Jasmine Rajbandhary (REU), Christopher Ketch (REU), Emily Matkiewicz (REU), Shaina Villalobos (REU), Julia Portman (REU), Kristen Sheldon (REU), Raphaela Goncalves Bueno (REU).

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Publications

TL Rogers, SB Munch, SD Stewart, EP Palkovacs, A Giron-Nava (2020) Trophic control changes with season and nutrient loading in lakes. **Ecology Letters** 23:1287-1297.

K. B. Oke, C. J. Cunningham, P. A. H. Westley, M. L. Baskett, S. M. Carlson, J. Clark, A. P. Hendry, V. A. Karatayev, N. W. Kendall, J. Kibele, H. K. Kindsvater, K. M. Kobayashi, B. Lewis, S. Munch, J. D. Reynolds, G. K. Vick, and E. P. Palkovacs . (2020). Recent declines in salmon body size impact ecosystems and fisheries. **Nature Communications** 11:4155

Giron-Nava, A., G. Sugihara, S.B. Munch, A. Johnson, E. Deyle, C. James, E. Saberski, O. Aburto-Oropeza. (2020). Circularity in fisheries data weakens real world prediction. Scientific Reports. **Sci. Rep.** 10, 6977

Munch, S.B., Brias, A., Sugihara, G. and Rogers, T.L. (2020). Frequently asked questions about nonlinear dynamics and empirical dynamic modelling. **ICES Journal of Marine Science**, 77(4), pp.1463-1479.

Rogers, TL and SB Munch (2020). Hidden similarities in the dynamics of a weakly synchronous marine metapopulation. **PNAS** 117: 479-485.

Lee, W. S., Salinas, S., Lee, Y. R., Siskidis, J. A., Mangel, M., & Munch, S. B. (2020). Thermal transgenerational effects remain after two generations. **Ecology and Evolution**, 10:11296–11303.

Therkildsen, NO, AP Wilder, DO Conover, SB Munch, H Baumann, S Palumbi (2019) Contrasting genomic shifts underlie parallel phenotypic evolution in response to fishing **Science** 365: 487-490.

Heiner, M., SB Munch, A Kottas (2019) Structured priors for sparse probability vectors with application to model selection in Markov chains. **Statistics and Computing**,29: 1077-1093.

Gao, J and SB Munch (2019) A function-valued trait approach to estimating the genetic basis of size at age and its potential role in fisheries-induced evolution. **Evol. Appl.** 12:964-976.

Pennekamp, F, AC Iles, J Garland, G Brennan, U Brose, U Gaedke, U Jacob, P Kratina, B Matthews, SB Munch, M Novak, GM Palamara, BC Rall, B Rosenbaum, A Tabi, C Ward, R Williams, H Ye, OL Petchey (2019) The intrinsic predictability of ecological time series and its potential to guide forecasting **Ecol. Monogr.** 89:e01359.

Salinas, S, SE Irvine, CL Schertzing, SQ Golden, SB Munch (2019) Trait variation in extreme thermal environments under constant and fluctuating temperatures. **Phil. Trans. Roy. Soc. B** 374: 20180177.

Goos, J. M., Swain, C. J., Munch, S. B. and Walsh, M. R. (2019), Maternal diet and age alter direct and indirect relationships between life history traits across multiple generations. **Funct Ecol.** 33 (3), 491-502

Martin, BT, Munch, SB, and Hein, AM (2018) Reverse-engineering ecological theory from data. **Proc. R. Soc. B** 285:20180422

Munch, SB, A. Giron-Nava, G. Sugihara (2018) Nonlinear dynamics and noise in fisheries recruitment: A global meta-analysis. **Fish and Fisheries.** 19: 964-973.

Pennekamp, F., A. Iles, J. Garland, G. Brennan, U. Brose, U. Gaedke, U. Jacob, P. Kratina, B. Matthews, SB Munch, M. Novak, G. M. Palamara, B. Rall, B. Rosenbaum, A. Tabi, C. Ward, R.

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Williams, H. Ye, O. Petchey. (2018). The intrinsic predictability of ecological time series and its potential to guide forecasting. **bioRxiv**, 350017.

Mumby, PJ, JN Sanchirico, K Broad, MW Beck, P Tyedmers, M Morikawa, TA Okey, LB Crowder, EA Fulton, D Kelso, JA Kleypas, SB Munch, P Glynn, K Matthews, J Lubchenco (2017) Avoiding a crisis of motivation for ocean management under global environmental change. **Global Change Biol.** 2017: 1–14

Poynor, V and SB Munch (2017) Combining functional data with hierarchical Gaussian process models. **Environ. Ecol. Stat.** 24:175–199

Thorson, J.T., Munch, S.B. and Swain, D.P. (2017). Estimating partial regulation in spatiotemporal models of community dynamics. **Ecology**, 98:1277-1289.

Lee, WS, M Mangel, SB Munch (2017) Developmental order of a secondary sexual trait reflects gonadal development in male sheepshead minnows (*Cyprinodon variegatus*) **Evol. Ecol. Res.** 18: 531-538

Thorson, J.T., Munch, S.B., Cope, J.M. and Gao, J., (2017). Predicting life history parameters for all fishes worldwide. **Ecol. Appl.** 27: 2262-2276

Munch, S. B., Poynor, V., & Arriaza, J. L. (2017). Circumventing structural uncertainty: A Bayesian perspective on nonlinear forecasting for ecology. **Ecol. Comp.** 32:134-143

Cameron, H., Monro, K., Malerba, M., Munch, S. and Marshall, D. (2016). Why do larger mothers produce larger offspring? A test of classic theory. **Ecology**, 97: 3452-3459.

Vincenzi, S, AJ Crivelli, S Munch, HJ Skaug, and M Mangel. (2016). Trade-offs between accuracy and interpretability in von Bertalanffy random-effects models of growth. **Ecol. Appl.** 26:1535-1552

Walsh, MR; Broyles, W; Beston, SM; Munch, SB (2016) Predator-driven brain size evolution in natural populations of Trinidadian killifish (*Rivulus hartii*) **Proc. R. Soc. B.** 283:20161075.

Deyle, E.R., May, R.M., Munch, S.B. and Sugihara, G., (2016), Tracking and forecasting ecosystem interactions in real time. **Proc. R. Soc. B** 283: 20152258

Walsh, MR, T Castoe, J Holmes, M Packer, K Biles, M Walsh, SB Munch, and D Post. (2016). Local adaptation in transgenerational responses to predators **Proc. R. Soc. B** 283: 20152271

Perretti, CT; Munch, SB; Fogarty, MJ; Sugihara, G; (2015) Global evidence for non-random dynamics in fish recruitment. arXiv:1509.01434. .

Velásquez-Tibatá, J., Graham, C.H. and Munch, S.B., (2016). Using measurement error models to account for georeferencing error in species distribution models. **Ecography.** 39:305-316

Walsh, MR , F Cooley, K Biles, and SB Munch. (2015). Predator-induced phenotypic plasticity within-and across-generations: a challenge for theory? **Proc. R. Soc. B** 282:20142205 ...

Roberts, K.J., Colle, B.A., Georgas, N. and Munch, S.B., (2015). A Regression-based approach for cool-season storm surge predictions along the New York/New Jersey coast. **J. Appl. Meteor. Clim.** 54: 1773-1791

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- Boettiger, C., M. Mangel, and SB Munch. (2015).. Avoiding tipping points in fisheries management through Gaussian process dynamic programming. **Proc. Roy. Soc. B**: 282: 20141631.
- Perez, KO and SB Munch. (2015). Sustained costs of growth and the trajectory of recovery. **Func. Ecol.** 29:393-403
- Gao, J. and S.B. Munch. (2015). Does reproductive investment decrease telomere length in *Menidia menidia*? **PLoS One** e0125674.
- Perretti, C.T. and Munch, S.B., (2015). On estimating the reliability of ecological forecasts. **J.Theor. Biol.**,372, pp.211-216.
- Thorson, JT, JN Ianelli, SB Munch, K Ono, PD Spencer, and R Vinbrooke. (2015). Spatial delay-difference models for estimating spatiotemporal variation in juvenile production and population abundance. **Can. J.Fish.Aquat.Sci.** 72:1897-1915
- Salinas, S. and Munch, S.B., (2015). Where should I send it? Optimizing the submission decision process. **PLoS One**, 10(1) e0115451
- Essington, TE, and Munch, SB. (2014). Trade-offs between supportive and provisioning ecosystem services of forage species in marine food webs. **Ecol. Appl.** 24: 1543-1557.
- Perretti, CT, SB Munch, and G Sugihara. 2014. Reply to Hartig and Dormann: The true model myth. **PNAS** 110: E3976-E3977
- Salinas, S and SB Munch. 2014. Phenotypic complexity: integrated responses of life-history characters to multiple environmental factors. **Evol. Ecol. Res.** 16: 267-284
- Vincenzi, S., Mangel, M., Crivelli, A.J., Munch, S.B., Skaug, H. 2014. Determining individual variation in growth and its implications for life history and population processes using the empirical Bayes method. **PLoS Comp. Biol.** 10: e1003828.
- Thorson, J.T., K. Ono, and S.B. Munch 2014. A Bayesian approach to identifying and compensating for model misspecification in population models. **Ecology.** 95:329-341.
- Salinas, S., S.C. Brown, M. Mangel, and S.B. Munch 2013. Non-genetic effects and changing environments. **Non-genetic Inheritance** 1:38-50
- Perretti, C.T., S.B. Munch, and G. Sugihara. 2013. Model-free forecasting outperforms the correct mechanistic model for simulated and experimental data. **PNAS** 110: 5253–5257.
- Deyle, E.R., M. Fogarty, C.Hsieh, L. Kaufman, A.D. MacCall, S.B. Munch, C.T. Perretti, H. Ye, and G. Sugihara. 2013. Predicting climate effects on Pacific sardine. **PNAS** 110: 6430-6435.
- Shelton, AO., W.H. Satterthwaite, M.P Beakes, S.B. Munch, S.M. Sogard, and M.Mangel. 2013. Separating intrinsic and environmental contributions to growth and their population consequences. **Am.Nat.** 181: 799-814.
- Sugeno, M and SB Munch 2013. A semiparametric Bayesian method for detecting Allee effects. **Ecology** 94: 1196-1204.
- Gao, J. and S.B. Munch. 2013. Genetic and maternal variation in early growth in the Atlantic silverside *Menidia menidia*. **Mar. Ecol. Prog. Ser.** 485:211-222.

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- Shelton, A.O., D. Kinzey, C. Reiss, S.B. Munch, G. Watters, and M. Mangel. 2013. Among-year variation in growth of Antarctic krill *Euphausia superba* based on length-frequency data. **Mar. Ecol. Prog. Ser.** 481: 53-67.
- Perretti, C.T., G. Sugihara, and S.B. Munch. 2013. Nonparametric forecasting outperforms parametric methods for a simulated multispecies system. **Ecology** 94: 794-800.
- Sugeno, M. and Munch SB. 2013. A semiparametric Bayesian approach to estimating maximum reproductive rates at low population sizes. **Ecol. Appl.** 23:699-709
- Perez, KO and SB Munch. 2013. Validating back-calculation models using population data. **Trans. Am. Fish. Soc.** 142:82-94
- Sugihara, G., R. May, H. Ye, C. Hsieh, E. Deyle, M. Fogarty, and S.B. Munch. 2012. Detecting causality in complex ecosystems. **Science** 338:496-500
- Salinas, S. and S.B. Munch. 2012. Thermal legacies: transgenerational effects of temperature on growth in a vertebrate. **Ecol. Lett.** 15:159–163.
- Hice LA, TA Duffy, SB Munch and DO Conover 2012. Spatial scale and divergent patterns of variation in adapted traits in the ocean. **Ecol. Lett.** 15: 568-575.
- Pikitch, E. Rountos, K.J., Essington, T.E., Santora, C., Pauly, D., Watson, R., Sumaila, U.R., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Heppell, S.S., Houde, E.D., Mangel, M., Plaganyi, E., Sainsbury, K., Steneck, R.S., Geers, T.M., Gownaris, N., and Munch, S.B. 2012. The global contribution of forage fish to marine fisheries and ecosystems. **Fish and Fisheries** 15:43-64.
- Perretti, C. T., and S. B. Munch. 2012. Regime shift indicators fail under noise levels commonly observed in ecological systems. **Ecol. Appl.** 22:1772–1779.
- Salinas,S., K.O. Perez, T.A. Duffy, S.J. Sabatino, L.A. Hice, S.B. Munch, and D.O. Conover. 2012. The response of correlated traits following cessation of fishery-induced selection. **Evol. Appl.** 5: 657–663
- Sigourney, D.B., S.B. Munch, and B.H. Letcher. 2012. Combining a Bayesian nonparametric method with a hierarchical framework to estimate individual and temporal variation in growth. **Ecol. Mod.** 247: 125-134.
- Hurst, T. P., Munch, S. B., & Lavelle, K. A. 2012. Thermal reaction norms for growth vary among cohorts of Pacific cod (*Gadus macrocephalus*). **Mar. Biol.** 1-11.
- Fronczyk, K, A Kottas, and SB Munch 2012. Flexible modeling for stock-recruitment relationships using Bayesian nonparametric mixtures. **Env. Ecol. Stat.** 19:183-204.
- Shelton, A.O., S.B. Munch, D. Keith, M. Mangel. 2012. Maternal age, fecundity, egg quality, and recruitment: linking stock structure to recruitment using an age-structured Ricker model. **Can. J. Fish. Aquat. Sci.** 69: 1631-1641,
- Sugihara, G., J. Beddington, C.H. Hsieh, E. Deyle, M. Fogarty, R. Hewitt, A. Hollowed, R.M. May, S.B. Munch, C. Perretti, A. Rosenberg, S. Sandin, H. Ye. 2011. Are exploited fish populations stable? **PNAS**: 108: E1224-E1225
- Clarke, L.M., S.B. Munch, S.R. Thorrold, and D.O. Conover 2010. High connectivity among locally adapted populations of a marine fish (*Menidia menidia*). **Ecology** 91: 3526-3537

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Perez, K.O. and Munch, S.B. 2010. Extreme selection in the early lives of fishes. **Evolution**. 64:2450-2457

Marshall, D.J., Heppell, S.S., Munch, S.B., and Warner, R.R. 2010. The relationship between maternal phenotype and offspring quality: Do older mothers really produce the best offspring? **Ecology** 91: 2862-2873.

Munch, S.B. and S. Salinas 2009. Latitudinal variation in lifespan within species is explained by the metabolic theory of ecology. **PNAS** 106: 13860-13864.

Conover, D.O., S.A. Arnott, and S.B. Munch. 2009. Reversal of evolutionary downsizing caused by selective harvest of large fish. **Proc. Roy. Soc. B.** 276:2015-202

Munch, S.B. and A. Kottas 2009. A Bayesian modeling approach for determining productivity regimes and their characteristics. **Ecol. Appl.** 19:527-537

Clarke, L.M., Walther, B.D., Munch, S.B., Thorrold, S.R., and Conover, D.O. 2009. Chemical signatures in the otoliths of a coastal marine fish, *Menidia menidia*, from the northeastern United States: spatial and temporal differences. **Mar. Ecol. Prog. Ser.** 384:261-271.

Munch, S.B. and L. Clarke 2008. A Bayesian approach to identifying mixtures from otolith chemistry data. **Can. J. Fish. Aquat. Sci.** 65: 2742-2751.

Vogel, E. R. , S. B. Munch, and C. H. Janson. 2007. Understanding escalated aggression over food resources in white-faced capuchin monkeys. **Anim. Beh.** 74:71-80.

Conover, D.O. and S.B. Munch. 2007 Faith, evolution, and the burden of proof. **Fisheries** 32: 90-91.

Munch, S.B. and M. Mangel 2006. Evaluation of mortality trajectories in evolutionary demography. **PNAS** 103: 16604-16607.

D.O. Conover, L.M. Clarke, S.B. Munch, and G.N. Wagner 2006. Spatial and temporal scales of adaptive divergence in marine fishes and the implications for conservation. **J. Fish. Biol.** 69 (suppl. C): 21-47.

Walsh, M.R., S.B. Munch, S. Chiba, and D.O. Conover. 2006. Maladaptive changes in multiple traits caused by fishing: impediments to population recovery. **Ecol. Lett.** 9:142-148

Munch, S.B., T. Kottas and M. Mangel. 2005. Bayesian non-parametric analysis of stock-recruitment relationships. **Can. J. Fish. Aquat. Sci.**, 62:1808-1821

Mangel, M. and S.B. Munch 2005. A life-history perspective on short- and long-term consequences of growth compensation. **Am. Nat.** 166 (6): E155-E176.

Munch, S.B., M.L. Snover, G. Watters, M. Mangel. 2005. A unified treatment of top-down and bottom-up control of reproduction in populations. **Ecol. Lett.** 8: 691-695

Munch, S.B., M. Walsh, and D.O. Conover. 2005. Harvest selection, genetic correlations, and recruitment: one less thing to worry about? **Can. J. Fish. Aquat. Sci.** 62:802-810.

Conover, D.O., S.A. Arnott, M.R. Walsh, and S. B. Munch. 2005. Darwinian Fishery Science: lessons from the Atlantic silverside. **Can. J. Fish. Aquat. Sci.**, 62:730-737.

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Munch, S.B. and D.O. Conover. 2004. Non-linear growth cost in *Menidia menidia*: theory and empirical evidence. **Evolution** 58:661-664.

Munch, S.B. and D.O. Conover. 2003. Rapid growth results in increased susceptibility to predation in *Menidia menidia*. **Evolution**. 57: 2119-2127.

Munch, S.B., Mangel, M., Conover, D.O. 2003. Quantifying natural selection on body size from field data with an application to winter mortality in *Menidia menidia*. **Ecology** 84: 2168-2177.

Conover, D.O., T. Gilmore, S.B.Munch 2003. Estimating the relative contribution of spring and summer-spawned cohorts to the Atlantic coast bluefish stock. **Trans.Am.Fish.Soc.** 132: 1117-1124.

Conover, D.O. and S.B. Munch 2002. Sustaining fisheries yields over evolutionary time scales. **Science**. 297:94-96.

Munch, S.B. and D.O. Conover 2002. Accounting for local physiological adaptation in bioenergetic models: testing hypotheses for growth rate evolution by virtual transplant experiments. **Can.J.Fish.Aquat.Sci.** 59:393-403.

Dunning, D., Q. Ross, S.B. Munch, and L.R. Ginzburg 2002. Measurement error affects risk estimates for recruitment to the Hudson River stock of striped bass. **The Scientific World**. 2(S1):238-253.

Munch, S.B. and D.O. Conover 2001. Recruitment dynamics of bluefish, *Pomatomus saltatrix* from Cape Hatteras to Cape Cod, 1973-1995. **ICES J. Mar. Sci.** 57:393-402.