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Qualifications

- 2006 Ph.D. in Aquatic and Fisheries Science, Univ. of Washington, School of Aquat. & Fish. Sci., Seattle, WA
Dissertation: Development and application of ecosystem models to support fishery sustainability: A case study for the Gulf of Alaska.
- 1997 M.S. in Marine Science, College of William & Mary, School of Marine Science, Gloucester Point, VA
Thesis: Age and growth of Spanish mackerel, *Scomberomorus maculatus*, in Chesapeake Bay
- 1991 B.A. "w/Distinction" in English Literature, Swarthmore College, Swarthmore, PA

Peer-Reviewed Publications

- Gaichas, S. K., Link, J.S., and Hare, J.A. 2014.** A risk-based approach to evaluating northeast US fish community vulnerability to climate change. – ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu048.
- Gaichas, S.K., C. Reiss, and M. Koen-Alonso. 2014.** Ecosystem Based Management in high latitude ecosystems. Chapter 10, p. 277-324 in *The Sea, Volume 16: Marine Ecosystem Based Management*. Harvard U. Press.
- Ruzicka, J.J., J.H. Steele, **S.K. Gaichas**, T. Ballerini, D.J. Gifford, R.D. Brodeur, and E.E. Hofmann. **2013.** Analysis of energy flow in US GLOBEC ecosystems using end-to-end models. *Oceanography* 26(4):82–97, <http://dx.doi.org/10.5670/oceanog.2013.77>.
- Ruzicka, J., J. Steele, T. Ballerini, **S. Gaichas**, and D. Ainley. **2013.** Dividing up the pie: whales, fish, and man as competitors. *Progress in Oceanography* 116: 207-219.
- Gaichas, S.K., G. Odell, K.Y. Aydin, and R.C. Francis. 2012.** Beyond the defaults: functional response parameter space and ecosystem-level fishing thresholds in dynamic food web model simulations. *Can. J. Fish. Aquat. Sci.* 69: 2077-2094.
- Gaichas, S.K., R. Gamble, M. Fogarty, H. Benoit, T. Essington, C. Fu, M Koen-Alonso, J. Link. 2012.** Assembly Rules for Aggregate-Species Production Models: Simulations in Support of Management Strategy Evaluation. *Mar. Ecol. Prog. Ser.* 459: 275–292.
- Fu, C., **S. Gaichas**, J.S. Link, A. Bundy, J. Boldt, A.M. Cook, R. Gamble, K. Rong Utne, H. Liu, and K.D. Friedland. **2012.** The relative importance of fishing, trophodynamic and environmental drivers on a series of marine ecosystems. *Mar. Ecol. Prog. Ser.* 459: 169–184.
- Link, J.S., **S.K. Gaichas**, T.J. Miller, T. Essington, A. Bundy, J. Boldt, K.F. Drinkwater, and E. Moksness. **2012.** A Synthesis of Lessons Learned from Comparing of Fisheries Production in 15 Northern Hemisphere Ecosystems: Emergent Fundamental Features. *Mar. Ecol. Prog. Ser.* 459: 293–302.
- Pranovi, F., J. Link, C. Fu, A.M. Cook, H. Liu, **S. Gaichas**, K. Friedland, K. Rong Utne, H. Benoit. **2012.** Trophic level determinants of biomass accumulation in marine ecosystems. *Mar. Ecol. Prog. Ser.* 459: 185–201.
- Link, J.S., T. Ihde, C. Harvey, **S. Gaichas**, J. Field, J. Brodziak, H. Townsend, and R. Peterman. **2012.** Dealing with uncertainty in ecosystem models: the paradox of use for living marine resource management. *Prog. Oceanog.* 102: 102-114.
- Gaichas, S.K., K.Y. Aydin, and R.C. Francis. 2011.** What drives dynamics in the Gulf of Alaska? Integrating hypotheses of species, fishing, and climate relationships using ecosystem modeling. *Can. J. Fish. Aquat. Sci.* 68:1553-1578.

- Salomon, A.K., **S.K. Gaichas**, O. Jensen, V.N. Agostini, N.A. Sloan, J. Rice, T. McClanahan, R. Fujita, M. Ruckelshaus, P. Levin, N.K. Dulvy, and E.A. Babcock. **2011**. Bridging the divide between fisheries and marine conservation science. *Bulletin of Marine Science* 87(2):251–274.
- Hunsicker, M.E., L. Ciannelli, K.M. Bailey, J.A. Buckel, J. W. White, J.S. Link, T.E. Essington, **S. Gaichas**, T. Anderson, R.D. Brodeur, K. Chan, K. Chen, G. Englund, K.A. Frank, V. Freitas, M. Hixon, T. Hurst, D. Johnson, J.F. Kitchell, D. Reese, G.A. Rose, H. Sjodin, W.J. Sydeman, H. van der Veer, K. Vollset, S. Zador. **2011**. Functional responses and scaling in marine predator-prey interactions: contemporary issues and emerging concepts. *Ecol. Letters*. 14(12):1288-1299.
- Gaichas, S.K.**, K.Y. Aydin, and R.C. Francis. **2010**. Using food web model results to inform stock assessment estimates of mortality and production for ecosystem based fisheries management. *Can. J. Fish. Aquat. Sci.* 67:1493-1506.
- Salomon, A.K., **S.K. Gaichas**, N.T. Shears, J.E. Smith, E.M.P. Madin, and S.D. Gaines. **2010**. Key Features and Context Dependence of Fishery-Induced Trophic Cascades. *Conservation Biology* 24(2):382-394.
- Reuter, R.F., E. Conners, J. DiCosimo, **S. Gaichas**, O. Ormseth and T. Tenbrink. **2010**. Managing non-target, data-poor species using catch limits: lessons from the Alaskan groundfish fishery. *Fish. Manage. Ecol.* 17:323-335.
- Gaichas, S.**, G. Skaret, J. Falk-Petersen, J.S. Link, W. Overholtz, B.A. Megrey, H. Gjoesaeter, W. Stockhausen, A. Dommasnes, K. Friedland, and K. Aydin. **2009**. A comparison of community and trophic structure in five marine ecosystems based on energy budgets and system metrics. *Prog. Oceanogr.* 81: 47–62.
- Link, J.S., W. Stockhausen, G. Skaret, W. Overholtz, B.A. Megrey, H. Gjøsæter, **S. Gaichas**, A. Dommasnes, J. Falk-Petersen, J. Kane, F. Mueter, K. Friedland and J. Hare. **2009**. A comparison of biological trends from four marine ecosystems: synchronies, differences, and commonalities. *Prog. Oceanogr.* 81:29-46.
- Megrey, B.A., J.A. Hare, W.T. Stockhausen, A. Dommasnes, H. Gjøsæter, W. Overholtz, **S. Gaichas**, G. Skaret, J. Falk-Petersen, J.S. Link, K. Friedland. **2009**. A cross-ecosystem comparison of spatial and temporal patterns of covariation in the recruitment of functionally analogous fish stocks. *Prog. Oceanogr.* 81:63-92.
- Gaichas, S.K.** and R.C. Francis. **2008**. Network models for ecosystem-based fishery analysis: A review of concepts and application to the Gulf of Alaska marine food web. *Can. J. Fish. Aquat. Sci.* 65: 1965-1982.
- Gaichas, S.K.** **2008**. A context for ecosystem based management: developing concepts of ecosystems and sustainability. *Marine Policy* 32: 393–401.
- Gburski, C.M., **S.K. Gaichas**, and D. K. Kimura, **2007**. Age and growth of big skate (*Raja binoculata*) and longnose skate (*R. rhina*) in the Gulf of Alaska. *Environ. Biol. Fish.* 80:337-349.
- Spies, I. B., **S. Gaichas**, D. E. Stevenson, J. W. Orr and M. F. Canino, **2006**. DNA-based identification of Alaska skates (*Amblyraja*, *Bathyraja* and *Raja*: Rajidae) using cytochrome c oxidase subunit I (cox1) variation. *J. Fish Biol.* 69 (Suppl. B):283–292.
- Barbeaux, S.J., **S.K. Gaichas**, J.N. Ianelli, and M.W. Dorn, **2005**. Evaluation of Biological Sampling Protocols for At-Sea Groundfish Observers in Alaska. *Alaska Fishery Research Bulletin* Vol. 11, no. 2, pp. 82-101.
- Karp, W.A., C.S. Rose, J.R. Gauvin, **S.K. Gaichas**, M.W. Dorn, and G.D. Stauffer, **2001**. Government-industry cooperative fisheries research in the North Pacific under the MSFCMA. *Mar. Fish. Rev.* 63(1): 40-46.
- Dorn, M., **S. Gaichas**, S. Fitzgerald, and S. Bibb, **1999**. Measuring total catch at sea: use of a motion-compensated flow scale to evaluate observer volumetric methods. *N. Am. J. Fish. Mgt.* 19(4):999-1016.
- Scientific Presentations:** Speaker at regional, national, and international professional meetings (AFS, ASLO, Conservation Biology, ESA, GLOBEC, IMCC, World Fisheries Congress) 1995-present. Invited scientific speaker for public lecture series, teacher workshops, and university courses and departmental seminars.

Technical Memoranda and Reference Documents

- Lucey, S. and **S. Gaichas**. **In review**. Fish Communities. Section in Fogarty, M. (ed.), Ecosystem Status Report for the Northeast US. Shelf (Web publication)
- Link, J. S., T.F. Ihde, H. Townsend, K. Osgood, M. Schirripa, D. Kobayashi, **S. Gaichas**, J. Field, P. Levin, K. Aydin, G. Watters, and C. Harvey (editors). **2010**. Report of the 2nd National Ecosystem Modeling Workshop (NEMoW II): Bridging The Credibility Gap – Dealing With Uncertainty In Ecosystem Models. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-102, 72 p.
- Conners, M.E., J. Cahalan, **S. Gaichas**, W.A. Karp, T. Loomis, and J. Watson. **2009**. Sampling for estimation of catch composition in Bering Sea trawl fisheries. NOAA Tech. Memo. NMFS-AFSC-199, 42 p.
- Aydin, K., **S. Gaichas**, I. Ortiz, D. Kinzey, and N. Friday. **2007**. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-178, 298 p.
- Gaichas, S.K.**, and J.C. Field, **2003**. Comparative modeling approaches for exploited marine ecosystems in the North Pacific: what are these models good for? In Mace, P.M. (ed.), Proceedings of the seventh NMFS National Stock Assessment Workshop, (Re)building Sustainable Fisheries and Marine Ecosystems. NOAA Tech. Memo NMFS-F/SPO-62.

Fishery Management Council Documents

- In prep: Forage Fish White Paper, MAFMC, with Rich Seagraves and Ed Houde.
- In prep: State of the Ecosystem Report, with Mike Fogarty.
- November 2010: Lead author, Bering Sea Ecosystem Assessment, and Ecosystem Considerations SAFE co-editor: <http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf>
- October 2010: GOA Crab Protection Closures Environmental Assessment, contributed ecosystem effects analysis in section 4: http://www.fakr.noaa.gov/npfmc/current_issues/bycatch/GOACrab.pdf
- September 2010: Ecosystem Considerations SAFE editor (while S. Zador is on leave): ftp://ftp.afsc.noaa.gov/afsc/public/Plan_Team/ecosystem.pdf
- November 2009: Ecosystem Assessment coauthor: <http://www.afsc.noaa.gov/refm/docs/2009/ecosystem.pdf>
- September 2008: Arctic Fishery Management Plan Environmental Analysis; contributed Arctic Ecosystem Description, Chapter 8, Section 1: http://www.fakr.noaa.gov/analyses/arctic/ArcticFMP_EA1108.pdf
- December 2007: Aleutian Islands Fishery Ecosystem Plan; Ecosystem Plan Team member, contributed food web analyses: http://www.fakr.noaa.gov/npfmc/current_issues/ecosystem/AIFEPbrochure1207.pdf

Experience

Research Fishery Biologist Ecosystem Assessment

NOAA/NMFS Northeast Fisheries Sci. Center, Woods Hole, MA
September 2011 - present

Contribute to integrated ecosystem assessments of the Northeast U.S. continental shelf by analyzing research survey, fishery, oceanographic, and economic data, and by developing and testing multispecies assessment models. Conduct research on ecosystem based management reference points balancing multiple objectives, and on fisheries as complex adaptive systems. Provide results in peer-reviewed literature and to the New England and Mid-Atlantic Fishery Management Councils. Participate in research surveys at sea.

Research Fishery Biologist
Ecosystem Modeling

NOAA/NMFS Alaska Fisheries Science Center, Seattle, WA
June 2006 – September 2011

Established an ecosystem context for fishery management through analysis of food web, fishery, and research survey data combined with ecosystem modeling. Evaluated the cumulative effects of fishing, climate change, and other factors on the marine ecosystem and species within it. Conducted independent research on ecosystem level indicators and thresholds and provided results in peer-reviewed literature and to the North Pacific Fishery Management Council. Participated in research surveys at sea.

Research Fishery Biologist
Stock Assessment

NOAA/NMFS Alaska Fisheries Science Center, Seattle, WA
November 1998 – June 2006

Assessed the condition of commercially exploited fish stocks through analysis of fishery and research survey data combined with population dynamics modeling. Evaluated the effects of fishing on non-target species and the marine ecosystem. Conducted Ph.D. research. Attended 2001 Complex Systems Summer School, Santa Fe Institute, Santa Fe NM. Participated in research surveys at sea.

Stock assessments: 1999 Gulf of Alaska (GOA) and 2000 – 2004 Bering Sea Aleutian Islands (BSAI) "Other species" (all species of skates, sharks, sculpins, octopi, and squids), 2000-2005 BSAI squids, 2005 BSAI skates, 2003-2005 GOA skates, 2000-2005 GOA Thornyheads, and 2006 GOA squids.

Working Group Participant

NCEAS (National Center for Ecological Analysis and Synthesis)
December 2001-December 2004

Primary analyst and author for the Gulf of Alaska ecosystem model, one of five models compared during the project "Models of Alternative Management Policies for Marine Ecosystems." Constructed model, conducted fitting experiments and tested multiple hypotheses regarding ecosystem structure and function. Model comparisons will be used to provide ecosystem based fishery management advice.

Research Fishery Biologist
Observer Program

NOAA/NMFS Alaska Fisheries Science Center, Seattle, WA
March 1997-October 1998

Conducted statistical analyses of fishery observer data, evaluated present and proposed data collection methods through directed research, and examined uses of observer data in multiple fisheries resource management and stock assessment applications.

Current Involvement in Research, Science, and Management Organizations

- Member of the Ecosystem Based Fishery Management Plan Development Team for the Mid Atlantic (2013-present), and New England Fishery Management Council (2012-present).
- Co-Chair of the ICES Working Group on North Atlantic Regional Seas (2012-present), which will develop ecosystem indicators and integrated ecosystem assessments for Canadian and U.S. marine ecosystems.
- Member of the ICES Working Group on Multispecies Assessment Methods (2011-present), which reviews and contributes to multispecies and ecosystem modeling progress across the ICES regions (the North Sea, Baltic Sea, Bay of Biscay, Mediterranean, Iceland, Barents/Norwegian Seas, and eastern USA).
- Guest lecturer: Worcester Polytechnic Institute Research Experience for Undergraduates in Applied Mathematics, June 2014; WHOI Fisheries Oceanography Course, April 2014, Rutgers Ecology and Evolution Dept. Seminar, March 2013, SMAST Fisheries Oceanography Dept. Seminar, February 2012.
- Advisory partner in the European Commission's MYFISH project (2012-present), which will define alternative approaches to Maximum Sustainable Yield which include ecological, social, and economic dimensions.

- External reviewer for the Canada Maritimes Region Ecosystem Research Initiative (March 2012).
- Member of the Aleutian Islands Fishery Ecosystem Plan Team (2007-2011) and the Gulf of Alaska Fishery Management Plan Team (2000-2011) for North Pacific Fishery Management Council. Co-authored the Aleutian Islands Fishery Ecosystem Plan (2007) and regularly co-authored the Stock Assessment and Fishery Evaluation introduction and summary for the Gulf of Alaska. Authored Ecosystem Description and contributed analyses for management alternatives for the Arctic Fishery Management Plan (2009).
- Co-organizer of the Bering Sea Ecosystem Synthesis Team (2010), a multi-disciplinary group charged with identifying important ecosystem indicators for fishery management and writing an eastern Bering Sea ecosystem assessment for the North Pacific Fishery Management Council.
- Invited participant in PICES FUTURE workshop on Ecosystem Indicators, April 2011 in Honolulu, HI. Presented "Uncertainty in ecosystem indicators: known knowns, known unknowns, and unknown unknowns."
- Co-organizer of the Comparative Analysis of Marine Ecosystem Organization (CAMEO) Stock Production Modeling Workshop II in Woods Hole, MA, May 2011. Presented results at the International Marine Conservation Congress in Victoria BC (May 15, 2011) at the Ecosystem Studies of Subarctic Seas Open Science Meeting (May 24, 2011), and at the World Fisheries Congress in Edinburgh, Scotland (May 2012). Coauthor on multiple resulting publications in a Marine Ecology Progress Series Theme Section.
- Participant in three CAMEO workshops in 2010: Role of predator-prey interactions in marine ecosystem organization in Corvallis, OR, March 2010; End to end modeling workshop in Woods Hole, MA, April 2010; and Stock production model fitting workshop in Woods Hole MA, May 2010.
- Co-PI on modeling portion of the North Pacific Research Board's GOA Integrated Ecosystem Research Plan.
- Investigator with 22 others on the interdisciplinary "Collaborative Research: GLOBEC Pan-Regional Synthesis: End-to-end Energy Budgets in US-GLOBEC Regions" project comparing four marine ecosystems in the Southern Ocean, in the Pacific off Alaska and the U.S. West Coast, and in the Atlantic off the U.S East Coast (2008-2011).
- Co-organizer of the symposium "Bridging the gap between fisheries and marine conservation to advance ecosystem-based management", for the Society for Conservation Biology's International Marine Conservation Conference (IMCC) in May 2009. Coauthor on resulting manuscript.
- Invited participant in Asia-Pacific Economic Cooperation International workshop on developing a network for deep sea research in Lima, Peru (2007). Presented information on North Pacific ecosystems, fisheries, and management, and helped develop a preliminary framework for an information-sharing network.
- Invited participant in Society for Conservation Biology symposium on ecosystem consequences of fishing in Port Elizabeth, South Africa (2007) and coauthor on a related review publication.
- Participant in the Marine Ecosystems of Norway and the U.S. (MENU) workshop in Bergen, Norway (2007). Compared energy budget models and trophic network attributes for five high-latitude marine ecosystems, presented results at 2007 ICES and PICES meetings, and collaborated on three publications.
- Co-organized "Ecosystem modeling applications in fishery management" symposium at the 2007 American Fisheries Society annual meeting.
- Regular participant in Alaska Fisheries Science Center scientific education and outreach activities, including Pacific Science Center programs, Minorities in Marine Science Undergraduate Program presentations, elementary, secondary, and college educator workshops, internship application review and placement.

