

## Bering Sea FEP team invitees

December 2, 2016

The generic invitation letter and candidate CVs are attached.

1. Kerim Aydin – AFSC (ecosystem modeling)
2. Mike Dalton - AFSC (economist)
3. Diana Evans – Council (Council management)
4. Anthony Fischbach – USGS (subsistence, walrus) *awaiting confirmation*
5. Brandee Gerke – NMFS AKR (NMFS management)
6. Jim Ianelli – AFSC (pollock stock assessment, Plan Team chair)
7. Bradley Harris - UAA (habitat modeling)
8. Jo-Ann Mellish – NPRB (research, marine mammals)
9. Heather Renner - USFWS (seabirds)
10. Elizabeth (Ebett) Siddon – AFSC (ecology)
11. Ian Stewart – IPHC (halibut stock assessment)
12. Stephani Zador – AFSC (ecosystem considerations report)
13. ~~Chris Siddon – ADFG~~ *declined*

# North Pacific Fishery Management Council

Dan Hull, Chairman  
Chris Oliver, Executive Director  
Telephone (907) 271-2809  
www.npfmc.org



605 W. 4th Avenue, Suite 306  
Anchorage, AK 99501-2252  
Fax (907) 271-2817

October 31, 2016

Dear *Candidate*:

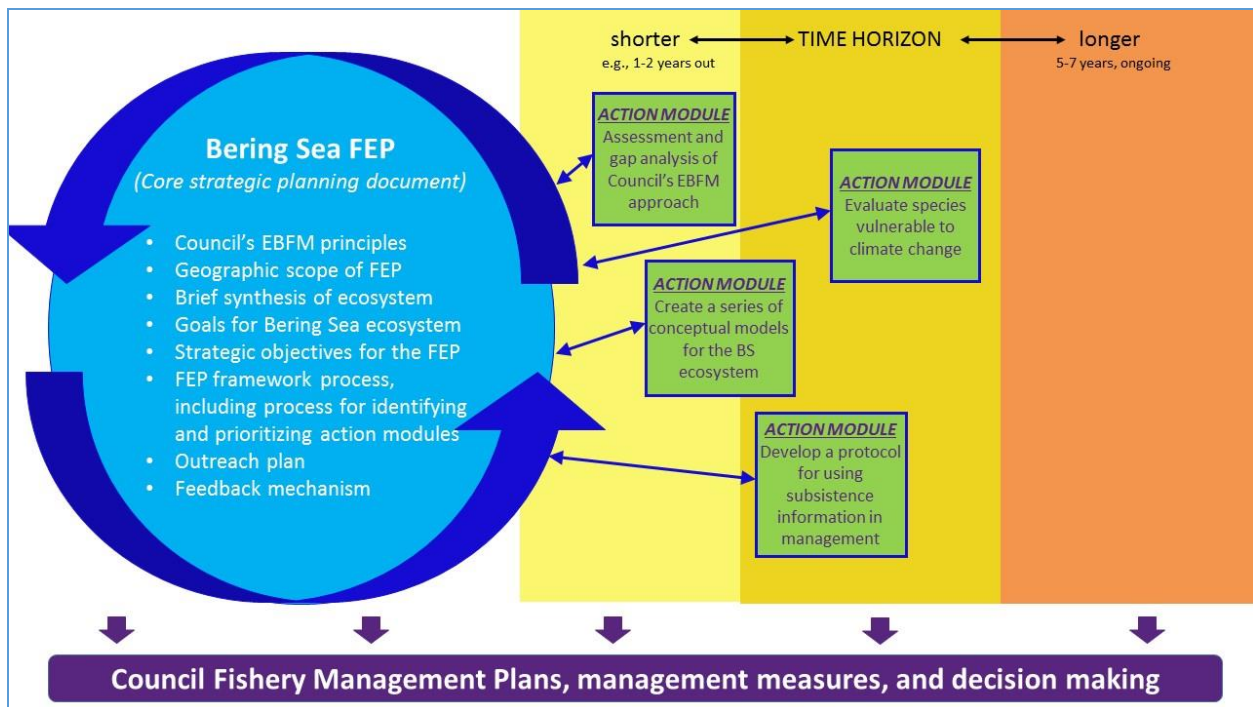
The Council has initiated development of a Fishery Ecosystem Plan (FEP) for the Bering Sea (BS). In order to help write the FEP, the Council is creating a scientific and technical Bering Sea Ecosystem Team. You have been recommended as an excellent candidate, and we invite you to join the BS Ecosystem Team.

Fisheries management in Alaska has long been recognized as being particularly responsive to ecosystem concerns. The Council has practiced an ecosystem approach for many years. The Council has acknowledged that moving toward ecosystem-based fishery management (EBFM) is a process, and as new information or tools become available, the Council has responded by improving the fishery management program. Nonetheless, while there are strong relationships between management and ecosystem science in Alaska, which are recognized worldwide as exemplary, they often remain informal. Fisheries Ecosystem Plans are a tool that can serve as a framework for continued incorporation of ecosystem goals and actions in regional management. An FEP for the Bering Sea could be used to guide policy options and associated opportunities, risks, and tradeoffs affecting FMP species and the broader Bering Sea ecosystem in a systematic manner. The Bering Sea FEP could document current procedures and best practices for EBFM, provide brief, targeted, and evolving descriptions of the interconnected physical, biological, and human/institutional Bering Sea ecosystem and through ecosystem thresholds and targets, and direct how that information can be used to guide fishery management options.

The Council has scoped out how to design a FEP for the Bering Sea (see the Council discussion paper on this topic from December 2015, at [www.npfmc.org/bsfep](http://www.npfmc.org/bsfep)). The Council has opted to develop a core FEP as a framework document, with the potential for various action modules to be developed under the framework, as time and resources allow. The core FEP would contain a series of strategic components for the FEP, as illustrated in the figure below. Action modules are specific analyses or research efforts that can be initiated within the framework of the FEP, but are projects with their own scope, tasking, and timeline. The action modules are linked directly to the FEP's strategic objectives, and the purpose and scope of each task, as well as a description of how the outcome will be used in management (e.g., whether it will lead to an FMP amendment analysis), is defined in the core FEP. In this way, the action modules will be responsive to the Council's management needs, and their outcomes will have a direct effect on the Council's decision-making process. The Council also has the flexibility to prioritize action modules, and initiate them concurrently or sequentially depending on Council needs and resource constraints. As they are completed, modules should be synthesized and evaluated in aggregate; modules should leverage other modules where possible.

The core FEP would include the Council's approved list of action modules, and a description of each one, along with its priority.

## Illustration of the relationship between the core FEP and example action modules



The primary responsibilities of the BS Ecosystem Team will be:

- 1) To develop the core FEP document, which describes EBFM principles, the BS ecosystem, FEP goals and objectives, and the FEP framework process for identifying, prioritizing, and re-evaluating action modules.
- 2) Once the FEP is developed, team members will continue to meet to discuss ongoing and upcoming action modules, and make recommendations to the Ecosystem Committee and the Council about future steps.
- 3) The FEP team will be responsible for writing up the five questions to evaluate each potential action module: a synopsis of the task, what purpose it will achieve relative to FEP objectives, how it will inform and be integrated into the Council's decisionmaking and management process, an estimate of time and staff resources to achieve, and a plan for public involvement.
- 4) Team members will also evaluate action module outcomes, and help to communicate results to the Council and adapt the FEP process as appropriate.

For the first phase, members will be asked to attend two or three meetings in order to develop the document, and will help to draft sections of the FEP document. The charge to the BS Ecosystem Team is to develop the FEP, and the team may change constituency at the end of that time. We anticipate that the process for developing the FEP will take approximately 18 months; this will be discussed and refined by the Team at the initial meeting.

- December 2016: finalize Ecosystem Team membership
- Early Jan 2017: Ecosystem Team meets to refine FEP process/intent, review existing compilation materials, determine TOC/assignments
- Feb/Apr 2017: feedback from Ecosystem Committee, SSC, Council on Ecosystem Team plan

- Feb-Sep 2017: Team works on drafting sections, synthesis
- Apr-May 2017: Team meets
- June 2017: feedback from Ecosystem Committee
- October 2017: Council reviews first draft of FEP
- Oct 2017-Mar 2018: team revises FEP
- April 2018: Council reviews final FEP

We will pay travel expenses for non-Federal employees attending the Ecosystem Team meetings, but we are not able to offer any stipendiary compensation. We anticipate the meetings will take place at the Alaska Fisheries Science Center, in Seattle, WA.

We are excited about developing a FEP for the Bering Sea, and hope that you will be available to assist us in this challenge. I should be grateful to receive your response by November 28, 2016. All appointments to the Team are subject to Council final approval, and we hope to submit the resumes of all candidates to the Council for review at their meeting in early December. Diana Evans is our staff lead on this project, and you may contact her by email, [diana.evans@noaa.gov](mailto:diana.evans@noaa.gov), or by telephone, at (907) 271-2809, with any questions.

Sincerely,

Chris Oliver  
Executive Director

cc: *Supervisor(s)*

## **KERIM Y. AYDIN.**

Alaska Fisheries Science Center, US NOAA Fisheries  
7600 Sand Point Way NE, Seattle, WA 98115 U.S.A.  
PH: (206) 526-4225  
E-mail: Kerim.Aydin@noaa.gov

## **EDUCATION**

Ph.D. (2000) Fisheries Science, University of Washington, Seattle (2000) Dissertation title:  
“Trophic Feedback and variation in Carrying Capacity of Pacific Salmon (*Oncorhynchus*  
spp.) on the High Seas of the Gulf of Alaska.”  
B.S. (1992) Mathematical Biology, Harvey Mudd College, Claremont, CA

## **RECENT EXPERIENCE**

2005-present: Supervisory Research Fishery Biologist, Resource Ecology and Ecosystem  
Modeling Program, Alaska Fisheries Science Center, U.S. NMFS, Seattle  
2005-present: Affiliate Professor, School of Aquatic and Fisheries Sciences, Univ. of Washington,  
Seattle  
2002-2005: Research Fishery Biologist, U.S. National Marine Fisheries Service, Alaska Fisheries  
Science Center, Seattle.  
1999-2002: Contractor and Postdoctoral Associate, NMFS, University of Washington, Seattle

## **PROFESSIONAL ASSOCIATIONS**

Chair, North Pacific Marine Science Organization (PICES) Task Team on Climate, Fisheries,  
and the Environment (2004-2010).  
Member, North Pacific Fisheries Management Council (NPFMC) Bering Sea and Aleutian  
Islands Groundfish Plan Team (2003-present).  
Alaska Region representative for the NOAA Integrated Ecosystem Assessment (IEA) Steering  
Committee, (2012-present).

## **SELECTED PUBLICATIONS**

Holsman, KK and **K Aydin**. 2015. Comparative methods for evaluating climate change impacts on the  
foraging ecology of Alaskan groundfish. *Mar Ecol Prog Ser* 521:217-23510.3354/ meps11102  
Holsman, KK, J Ianelli, **K Aydin**, AE Punt, EA Moffitt (in press). Comparative biological reference  
points estimated from temperature-specific multispecies and single species stock assessment models.  
*Deep Sea Res II*.  
Ianelli, J, KK Holsman, AE Punt, **K Aydin** (in press). Multi-model inference for incorporating trophic  
and climate uncertainty into stock assessment estimates of fishery biological reference points. *Deep  
Sea Res II*.  
Moffitt, E, AE Punt, KK Holsman, **KY Aydin**, JN Ianelli, I Ortiz (in press). Moving towards Ecosystem  
Based Fisheries Management: options for parameterizing multi-species harvest control rules. *Deep  
Sea Res II*.  
Buckley, T.W., I. Ortiz, S. Kotwicki, **K. Aydin**. In press. Summer diet composition of walleye pollock  
and predator-prey relationships with copepods and euphausiids in the eastern Bering Sea, 1987-2011.  
*Deep-Sea Research II*.  
Hunt, G.L. Jr., P.H. Ressler, G.A. Gibson, A. DeRobertis, **K. Aydin**, M.F.Sigler, I. Ortiz, E.J. Lessard,  
B.C. Williams, A. Pinchuk, T. Buckley. In Press. Euphausiids in the eastern Bering Sea: A  
synthesis of recent studies of euphausiid production, consumption and population control. *Deep-Sea  
Research II*, xx:xx-xx.

- Punt, A.E., I. Ortiz, **K.Y. Aydin**, G.L. Hunt Jr. F. K. Wiese. (In press; available online Apr 2015). End-to-end modeling as part of an integrated research program in the Bering Sea. *Deep-Sea Research II*, xx:xx-xx.
- Gaichas, S.K., **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.
- 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: 1490-1506.
- Gaichas, S., Skaret, G., Falk-Petersen, J., Link, J.S., Overholtz, W., Megrey, B.A., Gjøsæter, H., Stockhausen, W.T., Dommasnes, A., Friedland, K. and **Aydin, K.** 2009. A comparison of community and trophic structure in five marine ecosystems based on energy budgets and system metrics. *Progress in Oceanography* 81: 47-62.
- Aydin, K.Y.**, and F. Mueter. 2007. The Bering Sea – a dynamic food web perspective. *Deep-sea Res. II* 54: 2501–2525.
- Aydin, K.Y.**, J. Boldt., S. Gaichas, J. Ianelli, J. Jurado-Molina, I. Ortiz, J. Overland and S. Rodinov. 2006. Ecosystem Assessment of the Bering Sea/Aleutian Islands and Gulf of Alaska Management Regions. *In: Stock assessment and fishery evaluation report for the groundfish resources or the Bering Sea/Aleutian Islands regions.* North. Pac. Fish. Mgmt. Council, Anchorage, AK.
- Aydin, K.**, GA. McFarlane, JR. King, BA. Megrey, and KW. Myers. 2005. Linking oceanic food webs to coastal production and growth rates of Pacific salmon (*Oncorhynchus* spp.), using models on three scales. *Deep-sea Res, II.* 52, 757-780.
- Livingston, P.A., **Aydin, K.**, Boldt, J., Ianelli, J., and Jurado-Molina, J. 2005. A framework for ecosystem impacts assessment using an indicator approach. – *ICES Journal of Marine Science*, 62.
- Aydin, K.** 2004. Age structure or functional response? Reconciling the energetics of surplus production between single-species models and Ecosim. *Afr. J. Mar. Sci.* 26: 289-301.
- Livingston, P.L., **Aydin, K.Y.**, J. Boldt., S. Gaichas, J. Ianelli, J. Jurado-Molina, and I. Ortiz. 2003. Ecosystem Assessment of the Bering Sea/Aleutian Islands and Gulf of Alaska Management Regions. *In: Stock assessment and fishery evaluation report for the groundfish resources or the Bering Sea/Aleutian Islands regions.* North. Pac. Fish. Mgmt. Council, Anchorage, AK.
- Aydin, K.Y.**, V.V. Lapko, V.I. Radchenko, and P.A. Livingston. 2002. A comparison of the eastern and western Bering Sea shelf and slope ecosystems through the use of mass-balance food web models. *U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-130*, 78 p.
- Aydin, K.Y.**, K.W. Myers and R.V. Walker. 2000. Variation in summer distribution of the prey of Pacific salmon (*Oncorhynchus* spp.) in the offshore Gulf of Alaska in relation to oceanographic conditions, 1994-98. *North Pacific Anadromous Fish Commission Bulletin* 2: 43-54.
- Kitchell, J.F., S.P. Cox, C.J. Harvey, T.B. Johnson, D.M. Mason, K.K. Schoen, **K.Y. Aydin**, C. Bronte, M. Ebener, M. Hansen, M. Hoff, S. Schram, D. Schreiner, and C.J. Walters. 2000. Sustainability of the Lake Superior fish community: interactions in a food web context. *Ecosystems* 3: 545-560.
- McFadden, C.S. and **K.Y. Aydin**. 1996. Spatial autocorrelation analysis of small-scale genetic structure in a clonal soft coral with limited larval dispersal. *Marine Biology* 126: 215-224.

## RECENT COLLABORATIONS

Gordon Kruse, Bruce Leaman, Jane Sullivan, Lisa Busch, Victoria O’Connell, Mike Sigler, Sarah Gaichas, Kirstin Holsman, Ivonne Ortiz, Jason Link, Janet Duffy-Anderson, Anne Hollowed, Ed Farley, Ellen Yasumiishi, Troy Buckley, Ron Heinz, Franz Mueter, Stephani Zador, Todd TenBrink, George Hunt, Jim Ianelli, Martin Dorn, Jonathan Reum, Steve Barbeaux, Andre Punt, Bruce Miller, Georgina Gibson, Al Hermann, Pat Livingston.

**Michael Dalton**

Alaska Fisheries Science Center  
7600 Sand Point Way NE  
Seattle WA 98115  
Email: Michael.Dalton@noaa.gov  
Ph. 206-526-6551

**Education**

Ph.D. 1995 Economics, University of Minnesota  
B.S. 1989 Economics and Mathematics (Cum Laude), University of Minnesota

**Professional Experience**

2006- Industry Economist, Alaska Fisheries Science Center/NOAA Fisheries  
2006 Associate Professor, Division of Science and Environmental Policy, California State University Monterey Bay  
2001-05 Assistant Professor, Division of Science and Environmental Policy, California State University Monterey Bay  
1998-01 Lecturer, Division of Science and Environmental Policy, California State University Monterey Bay  
1998-99 Research Associate, Stanford University  
1995-98 Postdoctoral Research Associate, Stanford University  
1994-95 Research Assistant, University of Minnesota  
1990-94 Teaching Associate, University of Minnesota

**Service and Synergistic Activities**

Pacific Fishery Management Council Scientific and Statistical Committee (2000-2006; Chair, Economic Subcommittee),  
North Pacific Fishery Management Council Gulf of Alaska Groundfish Plan Team (2008-pres.)  
National Climate Assessment Ocean and Marine Services Technical Input Team (2012-13)  
International Atomic Energy Agency Coordinated Research Project: Ocean Acidification and the Economic Impact on Fisheries and Coastal Society (2012-16)  
Principal Investigator NPRB Bering Sea Integrated Ecosystem Research Program (2008-15)  
Principal Investigator, NOAA Ocean Acidification Program (2008-pres.)

**Graduate Student Advisor and Post-Doctoral Supervisor**

Monica Galligan (M.S., California State University Monterey Bay); Prasanth Meiyappan (Ph.D., University of Illinois Urbana-Champaign), James Murphy (Post-Doc, University of Washington)  
Dusanka Poljak (M.S., University of Washington), Suresh Sethi (Ph.D., University of Washington)

## Selected Publications

- Dalton, M. 2001. El Nino, expectations, and fishing effort in Monterey Bay, California. *Journal of Environmental Economics and Management* 42: 336-359.
- Dalton, M. and J. Lee. 2016. Alaska fisheries and global trade: king crab, *Paralithodes camtschaticus*; sockeye salmon, *Oncorhynchus nerka*, and walleye pollock, *Gadus chalcogrammus*. *Marine Fisheries Review* (In press).
- Dalton, M. and S. Ralston. 2004. The California rockfish conservation area and groundfish trawlers at Moss Landing harbor. *Marine Resource Economics* 18: 67-83.
- Meiyappan, P., M. Dalton, B.C. O'Neill, and A.K. Jain. 2014. Spatial modeling of agricultural land use change at global scale. *Ecological Modelling* 291: 152-174.
- Melnikov, N., B.C. O'Neill, and M. Dalton. 2012. Accounting for household heterogeneity in general equilibrium economic growth models. *Energy Economics* 34(5): 1475–1483.
- O'Neill, B.C., M. Dalton, R. Fuchs, L. Jiang, S. Pachauri, and K. Zigova. 2010. Global demographic trends and future carbon emissions. *Proceedings of the National Academy of Sciences of the United States* 107(41): 17521-17526.
- Ortiz, I., K. Aydin, A.J. Hermann, G.A. Gibson, A.E. Punt, F.K. Wiese, L.B. Eisner, N. Ferm, T.W. Buckley, E.A. Moffitt, J.N. Ianelli, J. Murphy, M. Dalton, W. Cheng, K. Hedstrom, N.A. Bond, E.N. Curchitser, C. Boyd. 2016. Climate to fish: Synthesizing field work, data and models in a 39-year retrospective analysis of seasonal processes on the eastern Bering Sea shelf and slope. *Deep Sea Research Part II: Topical Studies in Oceanography* (In press).
- Punt, A.E., D. Poljak, M. Dalton, and R.J. Foy. 2014. Evaluating the impact of ocean acidification on fishery yields and profits: The example of red king crab in Bristol Bay. *Ecological Modelling* 285: 39-53.
- Punt, A.E., R.J. Foy, M.G. Dalton, C. Long, and K.M. Swiney. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (*Chionoecetes bairdi*) fisheries management. *ICES Journal of Marine Science* 73: 849-864.
- Punt, A.E., M.S.M Siddeek, B. Garber-Yonts, M. Dalton, L. Rugolo, D. Stram, B. Turnock, and J. Zheng. 2012. Evaluating the impact of buffers to account for scientific uncertainty when setting TACs: Application to red king crab in Bristol Bay, Alaska. *ICES Journal of Marine Science* 69(4), 624–634.
- Sethi, S., M. Dalton, and R. Hilborn. 2012. Quantitative risk measures applied to Alaskan commercial fisheries. *Canadian Journal of Fisheries and Aquatic Sciences* 69(3): 487-498.
- Sethi, S.A., M. Dalton, R. Hilborn. 2012. Managing harvest risk with catch pooling cooperatives. *ICES Journal of Marine Science* 69:1038-1044.
- Sethi, S.A. and M. Dalton. 2012. Risk measures for natural resource management: description, simulation testing, and R code with fisheries examples. *Journal of Fish and Wildlife Management* 3(1): 150-157.
- Seung, C., M. Dalton, A. Punt, D. Poljak, and R. Foy. 2015. Economic impacts of changes in an Alaska crab fishery from ocean acidification. *Climate Change Economics* 6(4): 1550017 (35 pages).



## DIANA EVANS

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Anchorage, AK 99501

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(907) 271-2815

### EDUCATION

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MSc in Geography, King's College London, University of London, United Kingdom, 1999  
BA in Linguistics and Geography, University of California, Berkeley, 1997

### RELEVANT EXPERIENCE

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#### North Pacific Fishery Management Council

*Fishery Analyst, 2008 - present*  
*NEPA Specialist, 2002 - 2008*

Primary responsibilities include research, analysis and coordination of environmental analyses for amendments to the Fishery Management Plans for Council-managed groundfish, halibut, and crab fisheries in the Bering Sea/Aleutian Islands and Gulf of Alaska, and all related staff support for the five annual North Pacific Fishery Management Council meetings and related committee meetings (Science and Statistical Committee, Advisory Panel, Ecosystem Committee, Observer Advisory Committee, Electronic Monitoring Workgroup, Aleutian Islands Ecosystem Team). Key examples of Council work summarized below.

- **Aleutian Islands Fishery Ecosystem Plan (FEP).** Council lead for developing the 2007 Aleutian Islands FEP, and Chair of the Aleutian Islands Ecosystem Team. The team was responsible for designing the structure of the FEP within the Council's guidelines, including identifying key interactions within the AI ecosystem and developing a qualitative risk assessment and monitoring indicators.
- Staff to the Council's standing **Ecosystem Committee** from 2004-2014. Responsible for coordination of and presentations at all committee meetings, development of minutes following the meeting and conveying the committee's recommendations to the Council.
- Coordinator of the **Alaska Marine Ecosystem Forum** from 2005-2011. The forum brought together Federal and State agencies with jurisdiction over activities in marine waters to improve coordination and communication.
- **Observer and electronic monitoring issues.** Primary analyst on the Council's action to integrate electronic monitoring as part of the groundfish and halibut observer program process. Council coordinator of Observer Advisory Committee and Fixed Gear Electronic Monitoring Workgroup. Primary analyst on diverse range of analyses relating to the Observer Program and the development of electronic monitoring in Alaska.
- **Bycatch issues.** Primary environmental analyst on 2015 halibut bycatch reduction limit analysis in the Bering Sea, also previous salmon and crab bycatch reduction actions in the Gulf of Alaska.
- **Habitat issues.** Prepared the 2010 5-year review of Essential Fish Habitat report, refinements to the process for establishing habitat areas of particular concern, development of analyses for using modified trawl sweeps to reduce habitat impacts of bottom trawls.
- Analyst and Council project coordinator for the 2004 **Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS)**. Tracked Council progress on implementing the goals of the PSEIS through 2015, including preparation of a Supplemental Information Report in 2015 to evaluate new information.

**URS Corporation**

Project Manager and Environmental Analyst  
2000-2002

- Deputy Project Manager, preparation of the Groundfish Programmatic Supplemental EIS for NMFS Alaska Region.
- Assistant Project Manager for other NEPA documents, including the NMFS Pacific Islands Region Pelagics EIS and the cumulative effects section of the NMFS Alaska Region Steller Sea Lion Supplemental EIS

# Anthony Fischbach

USGS Alaska Science Center  
4210 University Drive  
Anchorage, AK 99508 USA

(907) 786-7145  
[afischbach@usgs.gov](mailto:afischbach@usgs.gov)

## Resume Purpose

Wildlife Biologist / Ecosystem Team

## Education

University of Texas at Austin, Texas Zoology:	(Fall 1991 to Spring 1994) Passed PhD qualification exam, Accepted Masters of Arts
University of Bayreuth, Germany Molecular Systematics:	(1989 through 1990) Fulbright Scholar
University of Wisconsin-Madison, Wisconsin Molecular Biology (Honors Program): Class Standing: G.P.A.: G.R.E. Biology Score:	(Fall 1985 through Spring 1989) Bachelor of Science 256/3112 (top 10%) 3.7 840 (98th %tile)

## Data Management and Analysis Skills

Database Development and Analysis	Access/SQL/Visual Basic, R
GIS Cartography and Analysis	R, ArcGIS/Python
Statistical Analysis	R

## Special Skills and Experiences

Cross cultural:	Lived 5 springs in Siberian Yu'pik walrus hunting village; 20 years' of wildlife biology work in Native Alaskan communities of the Arctic coast; Presented environmental education talks in rural Costa Rica; Volunteered 3 months in rural India; Studied one year in Germany with extensive travel in Poland
Language:	German (fluent), Spanish (moderately fluent), Russian (2 semesters)

## Work and Related Experiences

### **Wildlife Biologist GS-12**

Walrus Research Program - Alaska Science Center, USGS

(Jan. 2004 to present)

*Supervisor:* Chad Jay

*Duties:* As the assistant to the project leader, conduct Pacific walrus research; manage research databases; analyze research results, present science to user groups, the press and the public; and author peer reviewed papers

### **Wildlife Biologist GS-11**

Kodiak National Wildlife Biologist – US Fish and Wildlife Service

(Nov. 2002 to Jan 2004)

*Supervisor:* William Pyle

*Duties:* As the native mammal program leader, provide biological support for the management of native mammals by authoring native mammal sections of the Refuge plan; documenting and replicating previous wildlife biology studies; including a 4 ½ month brown bear behavior study; and initiating and coordinating a comprehensive population genetics study of brown bears on the Kodiak archipelago.

*Supervision:* Supervised one Student Career Employment Program position and acted as field supervisor of 5 employees and volunteers.

### **Zoologist GS-9**

Polar Bear Research Program - Alaska Science Center, USGS

(Dec. 2000 to Nov. 2002)

*Supervisor:* Steve Amstrup

*Duties:* As a member of a team of biologists and aviators, conduct polar bear research in the Alaskan arctic; manage research databases; analyze research results, present public talks and posters; and co-author peer reviewed papers.

### **Wildlife Biologist GS-9**

Marine Mammals Management, US Fish and Wildlife Service

(May 1998 to April 1999)

*Supervisor:* Scott Schliebe

(April 1999 to Dec 2000 - Detailed to USGS)

*Supervisor:* Steve Amstrup

*Duties:* Manage and analyze polar bear management and population data; manage GIS data, author peer reviewed publications; monitor the walrus harvest; supervise 7 contract employees in rural Alaska; instruct and supervise wildlife biologists in the use of databases

### **Biological Technician GS-7**

Marine Mammals Management, US Fish and Wildlife Service

(April 1995 to May 1998)

*Supervisors:* Scott Schliebe and Wells Stephenson

*Duties:* Monitor walrus harvest, supervising contract employees; assist on marine mammal research; manage and analyze polar bear management data and GIS

### **Nordic Ski Patroller**

South Central Alaska (1997-2002)

*Duties:* Provide emergency medical support in remote settings

### **Bat Biologist**

Thorne Bay Ranger District (August 1997, July 1998, June 1999) *Collaborator:* Steve Lewis

*Duties:* Co-lead radio-telemetry study of bat roosting habitat; supervise field assistants

### **GIS Specialist and Biologist: SCA intern**

Kenai National Wildlife Refuge

(September 1994 through March 1995)

*Supervisors:* Dr. Ed Berg

*Duties:* Manage GIS; compile wildlife data; and assist with fieldwork

## Products

### Publications (Google Scholar Metrics: 622 Citations of 33 publications)

- Beatty, W.S., Jay, C.V., Fischbach, A.S., Grebmeier, J.M., Taylor, R.L., Blanchard, A.L., and Jewett, S.C., 2016. **Space use of a dominant Arctic vertebrate: Effects of prey, sea ice, and land on Pacific walrus resource selection.** *Biological Conservation*, v. 203, p. 25-32.
- Fischbach, A., and Jay, C.V., 2016. **A strategy for recovering continuous behavioral telemetry data from Pacific walruses.** *Wildlife Society Bulletin*.
- Fischbach, A.S., Kochnev, A.A., Garlich-Miller, J.L., and Jay, C.V., 2016. **Pacific walrus coastal haulout database, 1852-2016—Background report.** U.S. Geological Survey Open-File Report 2016–1108, 27 p. doi:10.3133/ofr20161108
- Beatty, W. S., C. V. Jay, and A. S. Fischbach. 2016. **An evaluation of behavior inferences from Bayesian state-space models: A case study with the Pacific walrus.** *Marine Mammal Science* In Press doi:10.1111/mms.12332
- Noren, S. R., M. S. Udevitz, and C. V. Jay. 2016. **Sex-specific energetics of Pacific walruses (*Odobenus rosmarus divergens*) during the nursing interval.** *Physiological and Biochemical Zoology* 89(2). doi:10.1086/685454
- Noren, S. R., C. V. Jay, J. M. Burns, and A. S. Fischbach. 2015. **Rapid maturation of the muscle biochemistry that supports diving in Pacific walruses (*Odobenus rosmarus divergens*).** *Journal of Experimental Biology* 218:3319-3329. doi:10.1242/jeb.125757
- Jay, C. V., J.M. Grebmeier, A.S. Fischbach, T.L. McDonald, L.W. Cooper, F. Hornsby. 2014. **Pacific Walrus (*Odobenus rosmarus divergens*) Resource Selection in the Northern Bering Sea.** *PLoS one* 9(4):e93035. doi: 10.1371/journal.pone.0093035
- Jay, C. V., A. S. Fischbach, and A. A. Kochnev. 2012. **Walrus areas of use in the Chukchi Sea during sparse sea ice cover.** *Marine Ecology Progress Series* 468:1-13. doi: 10.3354/meps10057
- Sonsthagen, S. A., C. V. Jay, A. S. Fischbach, G. K. Sage, and S. L. Talbot. 2012. **Spatial genetic structure and asymmetrical gene flow within the Pacific walrus.** *Journal of Mammalogy* 93(6):1512-1524. doi: 10.1644/11-MAMM-A-344.1
- Jay, C. V., M. S. Udevitz, R. Kwok, A. S. Fischbach, and D. C. Douglas. 2010. **Divergent movements of walrus and sea ice in the northern Bering Sea.** *Marine Ecology Progress Series* 407:293-302.
- Speckman, S. G., V. I. Chernook, D. M. Burn, M. S. Udevitz, A. A. Kochnev, A. Vasilev, C. V. Jay, A. Lisovsky, A. S. Fischbach, and R. B. Benter. 2011. **Results and evaluation of a survey to estimate Pacific walrus population size, 2006.** *Marine Mammal Science* 27: no. doi: 10.1111/j.1748-7692.2010.00419.x (Russian version - 2.3 mb pdf)
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- Fischbach, A.S. 1994. **A Novel Method of Assessing Relative Abundance and Habitat Use: Molecular scatology**. *Bat Research News* Summer 1994.
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## Technical Presentations

- Jay, C.V., J.M. Grebmeier, A.S. Fischbach, A.W. Trites, and L.W. Cooper. 2009. Spatial correlation of walruses and bivalve prey near St. Lawrence Island in early spring. Alaska Marine Science Symposium, 19-23 January, Anchorage, Alaska. *Poster*
- Fischbach, A.S. and C.V. Jay. 2008. Pacific walrus behavior revealed through satellite telemetry. *in* Marine Mammals of the Holarctic. Marine Mammal Council, Odessa. *Poster*
- Udevitz, M.S., C.V. Jay, A.S. Fischbach, and J.L. Garlich-Miller. 2008. Accounting for bias in telemetry data on animal behavior. Annual Meeting of the Alaska Chapter of the Wildlife Society, 22-24 April, Anchorage, Alaska. *Talk*
- Kochnev, A. A., C. V. Jay, A. S. Fischbach, and S. Speckman. 2008. Terrestrial haulouts of the Pacific walruses (*Odobenus rosmarus divergens*) in Anadyr Gulf (Bering Sea), 2007. *in* Marine Mammals of the Holarctic. Marine Mammal Council, Odessa. *Poster*
- Fischbach, A.S., and C.V. Jay. 2008. A new remotely deployed radio-tag for indentifying foraging areas and behaviors of walruses. Alaska Marine Science Symposium, 20-23 January, Anchorage, Alaska. *Talk*
- Jay, C.V., A.S. Fischbach, and D.C. Douglas. 2008. Distributional response of Pacific walruses in the eastern Chukchi Sea to the extreme summer sea ice retreat in 2007. Alaska Marine Science Symposium, 20-23 January, Anchorage, Alaska. *Talk*

- Udevitz, M. S., C. V. Jay, A. S. Fischbach, and J. L. Garlich-Miller. 2007. Adjusting for telemetry bias in behavior data. Annual Meeting of the Alaska Chapter of the American Statistical Association, 24-26 July, Anchorage, Alaska. *Talk*
- Udevitz, M.S., C.V. Jay, A.S. Fischbach, and J.L. Garlich-Miller. 2006. Walrus haul-out behavior in Bering Sea ice. Paper presented at the Thirteenth Annual Conference of The Wildlife Society, 23-27 September, Anchorage, Alaska. *Talk*
- Udevitz, M.S., C.V. Jay, A.S. Fischbach, and J.L. Garlich-Miller. 2006. A generalized, linear, mixed effects model for walrus haul-out behavior on sea ice. Paper presented at the Marine Mammals of the Holarctic IV Conference, 10-14 September, Saint Petersburg, Russia. *Talk*
- Udevitz, M.S., C.V. Jay, A.S. Fischbach, and J.L. Garlich-Miller. 2006. A mixed model for walrus haul-out behavior on sea ice. Paper presented at the Annual Meeting of the Alaska Chapter of the American Statistical Association, 18-20 July, Juneau, Alaska. *Talk*
- Jay, C. V., MP Heide-Jørgensen, A, S. Fischbach, M.V. Jensen, D.F. Tessler, and A. Jensen. 2005. A Remotely Deployed Satellite Transmitter for Walruses. 11-14 January, 2005. North Atlantic Marine Mammal Commission Working Group. Denmark. *Talk*
- Jay, C. V., MP Heide-Jørgensen, A.S. Fischbach, M.V. Jensen, D.F. Tessler, and A. Jensen. 2004. A Remotely Deployed Satellite Transmitter for Walruses. Marine Mammals of the Holarctic III, 11-17 October, 2004, Ukraine. *Talk*
- Fischbach, A.S., Jay, C.V. Talbot, S.L. 2004. Pacific walrus population genetics studies. Marine Mammals of the Holarctic III, 11-17 October, 2004, Ukraine. *Talk*
- Simac, K., G.W. York, S.C. Amstrup, G.M. Durner, A.S. Fischbach, 2001. Detecting polar bear dens with forward looking infra-red imaging. 14<sup>th</sup> annual conference of the Society of Marine Mammalogy, Vancouver, B.C. *Poster*
- Fischbach, A.S. 1999. Modeling the Southern Beaufort Sea polar bear stock. Minerals Management Services Alaska OCS Region 7th Annual OCS Region Information Transfer Meeting. 19 January 1999. Anchorage. *Talk*

## **Reports**

- Jay, C. V., J.M. Grebmeier, A.S. Fischbach. 2012. Walrus Distributional and Foraging Response to Changing Ice and Benthic Conditions in the Chukchi Sea. North Pacific Research Board. Project 818 Final Report.
- Talbot, S. L., J. R. Gust, G. K. Sage, A. S. Fischbach, K. Amstrup, W. Leacock, and L. VanDaele. 2006. Genetic characterization of brown bears on the Kodiak Archipelago.
- Fischbach, A.S. and J.H. Reynolds. 2005. Brown Bear Use of the Proposed Kodiak National Wildlife Refuge O'Malley Bear Viewing Site: Analysis of 1991, 1992, 1993, 1994 and 2003 Study Year Observations. Final report to the Kodiak National Wildlife Refuge, Kodiak, Alaska.
- Amstrup, S. C., G. M. Durner, A. S. Fischbach, G. Weston York, K. S. Simac, T. S. Smith, S. T. Partridge, and D. Douglas. 2003. Polar Bear Research in the Beaufort Sea. *In* Proceedings of the Canadian Polar Bear Technical Committee. February 2003, Edmonton, Alberta

- Amstrup, S. C., G. M. Durner, A. S. Fischbach, K. Simac, and G. Weston-York. 2002. Polar bear research in the Beaufort Sea. Proceedings of the thirteenth meeting of the IUCN Polar Bear Specialists. Nuuk, Greenland, July 2002.
- Durner, G. M., S. C. Amstrup, A. S. Fischbach, G. S. York, and K. S. Simac. 2002. Polar bear research in the Beaufort Sea. *In* Proceedings of the Canadian Polar Bear Technical Committee, 9-10 Feb 2002, Iqaluit, Canada
- Schliebe, S.L, Bridges, J.B., Evans, T.J. Fischbach, A.S. Kalxdorff, S.B., and Lierheimer, L. 2000. Summary Of Polar Bear Management In Alaska 1997-2000. Report to the 13th Meeting of the IUCN Polar Bear Specialist Group, Nuuk, Greenland June 23-28, 2001.
- Schliebe, S.L., T.J. Evans, A.S. Fischbach, S.B. Kalxdorff. 2000. Summary of polar bear management in Alaska. Report to the Canadian Polar Bear Technical Committee.
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- Fischbach, A.S, Lewis, S.W. and Hooge, P. 1999. Bat roost habitat in the Tongass National Forest. Report to USDA Forest Service, Thorne Bay Ranger District.
- Dickerson, L. A.S. Fischbach, J. Snyder, W. Stephensen, and D. Burn. 1998. Walrus harvest monitor project: annual summary. U.S. Fish and Wildlife Service Marine Mammals Management.
- Dickerson, L. A.S. Fischbach, J. Snyder, H. Appassingok, and M. Mazona. 1997. 1997 Walrus harvest monitor project: annual summary. Marine Mammals Management, U.S. Fish and Wildlife Service Technical Report
- Schliebe, S.L., T.J. Evans, A.S. Fischbach, S.B. Kalxdorff. 1997. Summary of polar bear management in Alaska. Report to the Canadian Polar Bear Technical Committee.
- Dickerson, L., D. Burn, J. Garlich-Miller, M. Cody, A.S. Fischbach, M. Ungott, T. James, J. Snyder, J. Iya, M. Mazona. 1997. 1996 Walrus harvest monitor project: annual summary. Marine Mammals Management, U.S. Fish and Wildlife Service Technical Report
- Kalxdorff, S and A.S. Fischbach. 1996. Distribution and abundance of marine mammal carcasses on beaches in the Bering, Chukchi, and Beaufort Seas in July and September of 1995. Marine Mammals Management, U.S. Fish and Wildlife Service Technical Report
- Dickerson, L. D. Burn, J. Garlich-Miller, A.S. Fischbach, S. Rice, J. Boucher, and B. Howard. 1996. 1995 Walrus harvest monitor project: annual summary. Marine Mammals Management, U.S. Fish and Wildlife Service Technical Report
- Gorbics, C., A. Doroff, M. McClaren, M. Cody and A.S. Fischbach. 1995. Marine mammals aerial survey from Cape Hinchinbrook to Cape Spencer 1995. Marine Mammals Management, U.S. Fish and Wildlife Service Technical Report
- Bailey, T.N. and A.S. Fischbach. 1995. Characterization, patterns of use, and management of territories of nesting trumpeter swans on the Kenai Peninsula, Alaska, 1957-1994. Kenai National Wildlife Refuge, U.S. Fish and Wildlife Service. Technical report
- Fischbach, A.S. 1992. Report on a bat fauna survey of Nature Conservancy preserves in the Baraboo Hills, Wisconsin. *The Nature Conservancy Wisconsin Chapter*, Madison, Wisconsin

## Databases



A. S. Fischbach, A. A. Kochnev, J. L. Garlich-Miller, C. V. Jay. 2016. Pacific Walrus Coastal Haulout Database 1852-2016. doi:10.5066/F7RX994P

Durner, G.M., Fischbach, A.S., Amstrup, S.C., and Douglas, D.C., 2010, Catalogue of polar bear (*Ursus maritimus*) maternal den locations in the Beaufort Sea and neighboring regions, Alaska, 1910–2010: U.S. Geological Survey Data Series 568, 14 p.

Fischbach, A.S. and Jay, C.J. 2007. Pacific Walrus Aerial Surveys: compilation of observations 1975 – 1991. U.S. Geological Survey Alaska Science Center internal database.

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Fischbach, A.S. and D. Burn. 1995. Polar Bear Harvest Database. U.S. Fish and Wildlife Service Marine Mammals Management internal database.

**BRANDEE GERKE** (907)586-7650, Brandee.Gerke@noaa.gov

**EDUCATION**

Master's Degree in Fisheries Science, University of Alaska Fairbanks, Fairbanks, Alaska, December 2002  
Bachelor's Degree in Fisheries Science, Oregon State University, Corvallis, Oregon, June 1997

**EXPERIENCE**

*Supervisory Fishery Management Specialist, ZP-IV*  
*NOAA Fisheries, Alaska Region Sustainable Fisheries*  
*September 2014 – Present*

- Serve as the Ecosystem Branch Chief for Sustainable Fisheries.
- Supervise the successful completion of Fishery Management Plan amendments and implementing regulations.
- Ensure all Endangered Species Act (ESA) section 7 consultations are completed for North Pacific Federal fishery actions.
- Coordinate Alaska Region Ecosystem Based Fishery Management issues.
- Negotiate exempted fishing permits to allow testing of new fishing methods and gear types.

*Resource Management Specialist, ZP-IV*  
*NOAA Fisheries, Alaska Region Protected Resources*  
*August 2012 – August 2014*

- Served as the Marine Mammal and Fishery Interaction Specialist for Protected Resources.
- Led the development of an ESA Biological Opinion on effects of the Alaska Groundfish Fisheries on Steller Sea Lions.

*Fishery Management Specialist, ZP-III*  
*NOAA Fisheries, Alaska Region Sustainable Fisheries*  
*June 2008 – August 2012*

- Served as the liaison with the Alaska Fishery Science Center Fishery Monitoring and Analysis Division (FMA) for Sustainable Fisheries.
- Alaska Region lead for FMP amendment and regulations to restructure the funding and deployment system for groundfish and halibut fisheries observers in the North Pacific.
- Collaborated with the FMA, North Pacific Fishery Management Council, and Alaska Region staff to complete rulemaking and implement the new program on schedule.

*Sea Turtle Recovery Coordinator, ZP-IV*  
*NOAA Fisheries, Pacific Islands Region Protected Resources*  
*January 2005 – January 2008*

- Led the sea turtle management and conservation program for Protected Resources.
- Developed and maintained partnerships for sea turtle conservation and research with federal agency partners, Western Pacific Fishery Management Council staff, university researchers, local and national non-governmental organizations, State of Hawaii agencies, and partners in Guam, American Samoa, and the CNMI.
- Prioritized spending for sea turtle conservation and recovery activities.
- Led development of an ESA Biological Opinion on the Effects of the U.S. Tuna Purse Seine Fishery in the Western and Central Pacific Ocean on ESA-listed Sea Turtles and Marine Mammals, November 2006.
- Led development of an ESA Biological Opinion on the Effects of the Hawaii-Based Pelagic, Deep-Set Longline Fishery on ESA-listed Sea Turtles and Marine Mammals, October, 2005.

*Fishery Biologist, ZP-III*  
*NOAA Fisheries, Alaska Region Protected Resources*  
*June 2001 – June 2004*

- Served as the Assistant Steller Sea Lion Coordinator.
- Lead marine mammal analyst for the 2004 Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement.
- Co-authored 2001 Biological Opinion and 2003 Supplement on the Effects of the Alaska Groundfish Fisheries on ESA-listed species including Steller sea lions.
- Compiled fishery data requests and provided technical support to the Steller Sea Lion Recovery Team and the North Pacific Fishery Management Council's Steller Sea Lion Mitigation Committee.
- Served as the technical monitor for NOAA's Steller sea lion research grants.

**OTHER EXPERIENCE**

- *GIS Coordinator, Cramer Fish Sciences, June 2004 – December 2004*
- *Fishery Biologist, Alaska Department of Fish and Game, June 2000 – June 2001*
- *Research Fishery Biologist, Auke Bay Lab, June 1997 – June 2000*



# FAST LABORATORY

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Website: [www.alaskafastlab.org](http://www.alaskafastlab.org)

### EDUCATION

- Ph.D. *Fisheries Oceanography*. University of Massachusetts - School of Marine Sciences. 2011  
M.Sc. *Fisheries Oceanography*. University of Massachusetts - School of Marine Sciences. 2006  
B.Sc. *Wildlife and Fisheries Science*. Texas A&M University. 1999

### PROFESSIONAL EMPLOYMENT

#### *Primary Appointments*

- 2011 - Present *Director*, Fisheries, Aquatic Science & Technology (FAST) Lab, Alaska Pacific University  
2011 - Present *Associate Professor*, Alaska Pacific University  
2012 - Present *Adjunct Professor*, School of Marine Sciences, University of Massachusetts

### PROFESSIONAL SERVICE

- 2014 - Present *Member*: Scientific and Statistical Committee, North Pacific Fisheries Management Council  
2013 - Present *Member*: Working Group on Scallop Assessment, International Council for Exploration of the Sea  
2013 - Present *Member*: Working Group on Fishing Technology and Fish Behavior, International Council for Exploration of the Sea / Food and Agriculture Organization

### PEER-REVIEWED PUBLICATIONS

- Nimick A.M., and **Harris B.P.** *In Press*. Essential Fish Habitat Regulation in the United States: Lessons for High Latitudes? *The Yearbook of Polar Law* Vol. 8
- Neises, V., Cornick, L., **Harris, B.P.**, and Zelig, J. 2017. Examining the Metabolic Cost of Otariid Foraging Under Varying Conditions. *Journal of Experimental Marine Biology and Ecology*. 486: 352–357
- Stokesbury, K.D.E., O'Keefe, C.E. and **Harris, B.P.** 2016. Fisheries - sea scallop (*Placopecten magellanicus*). In: Shumway, S., ed. *Scallops: Biology, Ecology and Aquaculture*. Elsevier Press. 3rd Edition
- Verna, D. and **Harris, B.P.** 2016. Review of United States ballast water management policy and associated implications for Alaska. *Marine Policy*. 70: 13-21
- Verna, D.E., **Harris, B.P.**, Holzer, K.K., and Minton, M.S. 2016. Ballast-borne marine invasive species: exploring the risk to coastal Alaska, USA. *Management of Biological Invasions*. 7(2): 199–211
- Kaiser M.J., Hilborn R., Jennings S., Amaroso R., Andersen M., Balliet K., Barratt E., Bergstad O.A., Bishop S., Bostrom J.L., Boyd C., Bruce E.A., Burden M., Carey C., Clermont J., Collie J.S., Delahunty A., Dixon J., Eayrs S., Edwards N., Fujita R., Gauvin J., Gleason M., **Harris B.P.**, He P., Hiddink J.G., Hughes K.M., Inostroza M., Kenny A., Kritzer J., Kuntzsch V., Lasta M., Lopez I., Loveridge C., Lynch D., Masters J., Mazor T., McConnaughey R.A., Moenne M., Neat F., Nimick A.M., Olsen A., Parker D., Parma A., Penney C., Pierce D., Pitcher R., Pol M., Richardson E., Rijnsdorp A.D., Rilatt S., Rodmell D.P., Rose C., Sethi S.A., Short K., Suuronen P., Taylor E., Wallace S., Webb L., Wickham E., Wilding S.R., Wilson A., Winger P., and Sutherland W.J. 2015. Prioritisation of

- knowledge needs to achieve best practices for bottom-trawling in relation to seabed habitats. *Fish and Fisheries*. 17(3): 637–663
- Grabowski, J. H., Bachman, M., Demarest, C., Eayrs, S., **Harris, B.P.**, Malkoski, V., Packer, D., and Stevenson, D. 2014. Assessing the vulnerability of marine benthos to fishing gear impacts. *Reviews in Fisheries Science*. 22(2): 142–155
- Harris, B.P.**, Cowles, G. W., and Stokesbury, K.D.E. 2012. Surficial sediment stability on Georges Bank in the Great South Channel and on eastern Nantucket Shoals. *Continental Shelf Research* 49(2012): 65–72
- McGuire, C.J. and **Harris, B.P.** 2012. Systems thinking applied to U.S. federal fisheries management: Law and policy considerations. *Natural Resources & Environment*, 26(3): 3 – 6
- Stokesbury, K.D.E., Baker, E.P., **Harris, B.P.**, and Rheault, R.B. 2011. Environmental impacts related to mechanical harvest of cultured shellfish. In: Shumway, S., ed. *Shellfish Aquaculture and the Environment*. Wiley-Blackwell. Pp 247 – 263
- Stokesbury, K.D.E., Carey, J.D., **Harris, B.P.**, and O'Keefe, C.E. 2011. Discard mortality played a major role in the loss of 10 billion juvenile scallops in the Mid-Atlantic Bight: Reply to Hart & Shank (2011). *Marine Ecology Progress Series*. 43: 299-302
- Stokesbury, K.D.E., Carey, J.D., **Harris, B.P.**, and O'Keefe, C.E. 2011. Incidental fishing mortality may be responsible for the death of ten billion juvenile sea scallops in the mid-Atlantic. *Marine Ecology Progress Series*. 425: 167-173
- Adams, C.F., **Harris, B.P.**, Marino II, M.C., and Stokesbury, K.D.E. 2010. Quantifying sea scallop bed diameter on Georges Bank with geostatistics. *Fisheries Research* 106(3): 460–467
- Harris, B.P.** and Stokesbury K.D.E. 2010. The spatial structure of local surficial sediment characteristics on Georges Bank, USA. *Continental Shelf Research* 30(17): 1840–1853
- McGuire, C.J. and **Harris, B.P.** 2010. Some *back-ended* legal and political issues in United States fisheries management. *Journal of Politics and Law*. 3(2): 52-62
- Stokesbury, K.D.E., **Harris, B.P.**, Carey J.D., and O'Keefe C.E. 2010. High juvenile sea scallop (*Placopecten magellanicus*) densities on banks and ledges in the Central Gulf of Maine. *Journal of Shellfish Research*. 29(2): 369-372
- Stokesbury, K.D.E., **Harris, B.P.**, and Marino II, M.C. 2010. Using technology to forward fisheries science: the sea scallop example. In: Baxter, J.M., and Galbraith C.A., (Eds.), *Species Management: Challenges and Solutions for the 21st Century*. Scottish Natural Heritage
- Jacobson, L.D, Stokesbury, K.D.E., Allard, M.A., Chute, A., **Harris, B.P.**, Hart, D. Jaffarian, T., Marino II, M.C., Nogueira, J.I., and Rago, P. 2010. Quantification, effects and stock assessment modeling approaches for measurement errors in body size data from sea scallops (*Placopecten magellanicus*). *Fishery Bulletin*. 108(2): 233–247
- Tian, R.C., Chen, C.S., Stokesbury, K.D.E., Rothschild, B.J., Cowles, G., Xu, Q.C., **Harris, B.P.**, and Marino, M.C. 2009. Dispersal and settlement of sea scallop larvae spawned in the fishery closed areas on Georges Bank. *ICES Journal of Marine Science*. 66(10):2155-2164
- Tian, R.C., Chen, C.S., Stokesbury, K.D.E., Rothschild, B.J., Cowles, G., Xu, Q.C., **Harris, B.P.**, and Marino, M.C. 2009. Sensitivity analysis of sea scallop (*Placopecten magellanicus*) larvae trajectories to hydrodynamic model configuration on Georges Bank and adjacent coastal regions. *Fisheries Oceanography*. 18(3): 173–184
- Stokesbury, K.D.E., **Harris, B.P.**, and Marino II M. C. 2009. Astonishment, stupefaction, and a naturalist's approach to ecosystem-based fisheries studies. In R.J. Beamish and B.J. Rothschild (eds.), *The Future of Fisheries Science in North America*, Fish & Fisheries Series 31, Springer Science + Business Media B.V. 2009
- Tian, R.C., Chen, C., Stokesbury, K.D.E., Rothschild, B.J., Cowles, G.C., Xu, Q., Hu, S., **Harris, B.P.**, and Marino II, M.C. 2009. Modeling the connectivity between sea scallop populations in the Middle Atlantic Bight and over Georges Bank. *Marine Ecology Progress Series*. 380: 147-160
- McGuire, C.J. and **Harris, B.P.** 2008. Rights-based fisheries and ecosystem-based management: Maybe scientists and fishermen know the way? *American Bar Association - Marine Resources*. 12(1):18

- Harris, B.P.** and McGuire, C.J. 2008. Operational issues in U.S. fisheries management: What are some of the major scientific, political and legal hurdles to implementing ecosystem-based management? American Bar Association - Marine Resources. 11(2): 5 – 6
- Adams, C.F., **Harris, B.P.**, and Stokesbury, K.D.E. 2008. Geostatistical comparison of two independent video surveys of sea scallop abundance in the Elephant Trunk Closed Area, USA. ICES Journal of Marine Science. 65(6): 995-1003
- Stokesbury, K.D.E., **Harris, B.P.**, Marino II, M.C., and Nogueira, J.I. 2007. Sea scallop mass mortality in a marine protected area. Marine Ecology Progress Series. 349: 151-158
- Harris, B.P.** and Stokesbury, K.D.E. 2006. Shell growth of sea scallops (*Placopecten magellanicus* Gmelin, 1791) in the southern and northern Great South Channel, USA. ICES Journal of Marine Science. 63: 811-821
- Stokesbury, K.D.E., and **Harris, B.P.** 2006. Impact of a limited fishery for sea scallop (*Placopecten magellanicus*) on the epibenthic community of Georges Bank closed areas. Marine Ecology Progress Series. 307: 85-100
- Stokesbury, K.D.E., **Harris, B.P.**, Marino II, M.C. and Nogueira, J.I. 2004 Estimation of sea scallop abundance using a video survey in off-shore USA waters. Journal of Shellfish Research. 23:33-44

### **CURRENT GRADUATE STUDENTS**

- K. Bockelman* - Assessment of the benthic community inside and outside the Red King Crab Savings Area.
- B. King* - Exploring methods to directly monitor trawl ground gear sea bed contact.
- B. Richie* - Impacts of diet on groundfish growth and fitness.
- A. Kroska* - Investigating halibut stress physiology.
- J. Ashline* - Identification of Juvenile Coho Salmon overwintering habitat selection and dispersal strategies.
- M. Baldwin-Schaeffer* - Assessing the impacts of offshore mining on Norton Sound Red King Crab.
- V. Batter* - Weathervane scallop species distribution modelling.
- T. Blackmon* - A Habitat-based Pacific razor clam stock assessment.
- J. Hagan* - Assessing the accuracy and uncertainty of Landsat derived stream temperatures for use in Chinook salmon habitat assessments on the Anchor River, Alaska.
- L. Junge* - Assessment of habitat information to improve the Aleutian Island Pacific cod stock assessment.
- A. Nimick* - Modeling fishing effects on EFH: What is *more than minimal and not temporary*?
- S. Sitkiewicz* - Impacts of the parasite *Ichthyophonus* on groundfish growth and fitness.
- J. Stone* - Assessment of Eastern Bering Sea juvenile Chinook salmon stock origin and the role of diet in growth and fitness.
- S. Zagorski* - Benthic impacts of raised groundgear for the Eastern Bering Sea pollock fishery.

### **PAST GRADUATE STUDENTS**

- C. Provost* - Deepsea skate (*Bathyraja abyssicola*) size at age and maturity.
- C. Grenier* - Quantifying *Ichthyophonus hoferi* prevalence and intensity in Pacific halibut (*Hippoglossus stenolepis*) in Cook Inlet, Alaska.
- S. Larsen* - Triploid Induction of Hatchery Chinook Salmon (*Oncorhynchus tshawytscha*).
- J. Mumm* - A bathymetry-based habitat model for predicting Yelloweye Rockfish (*Sebastes ruberrimus*) distributions on the Outer Coast of Alaska's Kenai Peninsula.
- C. Simpson* - "Smart Fishing in the Bering Sea" curriculum development and evaluation.
- S. Simpson* - Spatiotemporal assessment of Nushagak river salmon upstream migration with DIDSON sonar.
- D. Verna* - Ballast water management and associated risk of invasive species in coastal Alaska.
- S. Webster* - Size-at-age and diet composition of Pacific halibut (*Hippoglossus stenolepis*) in Cook Inlet, Alaska.

# CURRICULUM VITAE

## James N. Ianelli

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### (a) Education

Humboldt State University  
University of Washington

Fisheries (minor in statistics)  
Fisheries

BSc 1983  
PhD 1993

### (b) Appointments

1991 - present Fisheries Research Biologist, Alaska Fisheries Science Center,  
1998 - present Affiliate Professor, University of Washington,  
1986 - 1988 Fisheries Research Scientist, South Pacific Commission  
1984 - 1986 Lab Director, Achotines Marine Laboratory, IATTC, Panama  
1981 - 1982 Associate Scientist, IATTC, San Diego and Japan  
1979 - 1981 Fisheries Experimental Officer, (1977-1980) South Pacific  
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### (c) Selected publications

- Thomas L. Rutecki & J. N. Ianelli (2016) Feasibility of Tagging Walleye Pollock Captured with Hook and Line using External Tags, *Marine and Coastal Fisheries*, 8:1, 374-381, DOI: 10.1080/19425120.2016.1167794
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- Holsman, K. K., Ianelli, J., Aydin, K., Punt, A. E., & Moffitt, E. A. (2015). A comparison of fisheries biological reference points estimated from temperature-specific multi-species and single-species climate-enhanced stock assessment models. *Deep Sea Research Part II: Topical Studies in Oceanography*.
- Ianelli, J.N. and D.L. Stram. (2014). Estimating impacts of the pollock fishery bycatch on western Alaska Chinook salmon. *ICES Journal of Marine Science*
- Kotwicki, S., Horne, J. K., Punt, A. E., & Ianelli, J. N. (2015). Factors affecting the availability of walleye pollock to acoustic and bottom trawl survey gear. *ICES Journal of Marine Science*, 72(5), 1425–1439. doi:10.1093/icesjms/fsv011
- Guenneugues, P., & Ianelli, J. (2014). *Surimi Resources and Market*. In: *Surimi and Surimi Seafood*. 3rd edition. Edited by Jae Park. Taylor and Francis, Boca Raton FL. 635p.
- Hillary, R. M., Preece, A. L., Davies, C. R., Kurota, H., Sakai, O., Itoh, T., Parma, A., Ianelli, J.N., Branch, T. (2015). A scientific alternative to moratoria for rebuilding depleted international tuna stocks. *Fish and Fisheries*, n/a–n/a. doi:10.1111/faf.12121
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- Kotwicki, S., Ianelli, J., and Punt, A. 2014. Correcting density-dependent effects in abundance estimates from bottom-trawl surveys. *ICES Journal of Marine science*. <http://icesjms.oxfordjournals.org/content/early/2014/01/09/icesjms.fst208.short>
- Barbeaux, S. J., J. K. Horne, and J. N. Ianelli. 2014. A novel approach for estimating location and scale specific fishing exploitation rates of eastern Bering Sea walleye pollock (*Theragra chalcogramma*). *Fisheries Research* 153: 69-82. Available online 3 February 2014 (<http://dx.doi.org/10.1016/j.fishres.2014.01.004>)
- Hulson, P. F., Quinn, T.J., Hanselman, D. H., & Ianelli, J. N. 2013. Spatial modeling of Bering Sea walleye pollock with integrated age-structured assessment models in a changing environment. *Canadian Journal of Fisheries and Aquatic Sciences*, 15(July), 1–15. dx.doi.org/10.1139/cjfas-2013-0020
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- Miller, T., Skalski, J., & Ianelli, J. (2007). Optimizing a stratified sampling design when faced with multiple objectives. *ICES Journal of Marine Science*, 64(1), 97–109.
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- Butterworth, D. S., Ianelli, J. N. and R. Hilborn. 2003. A statistical model for stock assessment of southern bluefin tuna with temporal changes in selectivity. *Afr. J. mar. Sci.* 25: 331-361.

#### **(d) Synergistic activities**

- 1995 - present North Pacific Fishery Management Council’s Gulf of Alaska groundfish Plan Team (formal review panel for groundfish stock assessments). Nominated as chair and have served in that capacity since 2003.
- 2000 - present Science advisor to the Commission for the Conservation of Southern Bluefin Tuna, Robert Kennedy, Director. Serve on panel of external experts on stock assessment and management for this regional fisheries management authority.
- 2010 – present Chair of the Scientific Committee for the South Pacific Regional Fisheries Management Organization. This has involved coordinating a complex stock assessment and management of Chilean jack mackerel resource.
- 2012 – present Member of advisory panel for the Center on the advancement of population assessment methods (CAPAM) jointly coordinated by the Southwest fisheries science center and the Inter-American tropical tuna commission (IATTC).
- 2014-present Co-chair of the Science Review Board for the International Halibut Commission

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Post-docs supervised or graduate student committees: Ernst, Billy; Kinzey, Douglas; Kotwicki, Spies, Ingrid; Magnusson, Arni; McGilliard, Carey, M.; Moffit, Elizabeth; Ono, Kotaro, Whitten, Athol; Woillez, Mathieu; Webber, Darcy,



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**EXPERIENCE** | **SENIOR PROGRAM MANAGER** NORTH PACIFIC RESEARCH BOARD  
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**RESEARCH PROFESSOR** UNIVERSITY OF ALASKA FAIRBANKS  
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ASSOCIATE SEP 2007-JUN 2015  
ASSISTANT SEP 2001-AUG 2007

**POSTDOCTORAL RESEARCHER** TEXAS INSTITUTE OF OCEANOGRAPHY  
AUG 1999-AUG 2001

**EDUCATION** | **DALHOUSIE UNIVERSITY**, HALIFAX, NOVA SCOTIA CANADA  
DOCTOR OF PHILOSOPHY 1995-1999  
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**PUBLICATIONS** | Castellini M, **Mellish J**, eds. (2016) Marine Mammal Physiology: Requisites for ocean living. CRC Press, Boca Raton, FL. 356 pp.

Shuert C, **Mellish J** (2016) Size, mass and occurrence of gastroliths in juvenile Steller sea lions. *Journal of Mammalogy* gyv211.

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**Mellish J**, Hindle A, Skinner J, Horning M (2015) Heat loss in air of an Antarctic marine mammal, the Weddell seal. *Journal of Comparative Physiology B* 185: 143-152.

Rea L, Christ A, Hayden A, Stegall V, Farley S, Stricker C, **Mellish J**, Maniscalco J, Waite J, Burkanov V (2015) Age- specific vibrissae growth rates: a tool for determining the timing of ecologically important events in Steller sea lions. *Marine Mammal Science* 31: 1213-1233.

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Calkins D, Atkinson S, **Mellish J**, Waite J, Carpenter J (2013) The pollock paradox: Juvenile Steller sea lions experience rapid growth on pollock diets in fall and spring. *Journal of Experimental Marine Biology and Ecology* 441: 55-61.

**Mellish J**, Nienaber J, Polasek L, Horning M (2013) Beneath the surface: Profiling blubber depth in pinnipeds with infrared imaging. *Journal of Thermal Biology* 38: 10-13.

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Horning M, Haulena M, Tuomi P, **Mellish J** (2008) Intraperitoneal implantation of life-long telemetry transmitters in sea lions. *BMC Veterinary Research* 4: 51. doi:10.1186/1746-6148-4-51.

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Goldstein T, Stephens C, Jang S, Conrad P, Fields C, Dunn J, **Mellish J** (2007) Longitudinal health and disease monitoring in juvenile Steller sea lions

(*Eumetopias jubatus*) in Alaska in temporary captivity compared with a free-ranging cohort. *Aquatic Mammals* 33: 337-348.

Thomton J, **Mellish J** (2007) Haptoglobin concentrations in free-range and temporarily captive juvenile Steller sea lions. *Journal of Wildlife Diseases* 43: 258-261.

Waite J, Schrader W, **Mellish J**, Horning M (2007) Three-dimensional photogrammetry as a tool for assessing morphometrics and estimating body mass of Steller sea lions. *Canadian Journal of Fisheries and Aquatic Sciences* 64: 296-303.

**Mellish J**, Thomton J, Horning M (2007) Physiological and behavioral response to intra-abdominal transmitter implantation in Steller sea lions. *Journal of Experimental Marine Biology and Ecology* 351: 283-293.

**Mellish J**, Hennen D, Thomton J, Petrauskas L, Atkinson S, Calkins D (2007) Physiological response to hot-branding in juvenile Steller sea lions. *Wildlife Research* 34: 43-47.

**Mellish J**, Horning M, York A (2007) Seasonal and spatial blubber depth changes in captive harbor seals (*Phoca vitulina*) and Steller's sea lions (*Eumetopias jubatus*). *Journal of Mammalogy* 88: 408-411.

**Mellish J**, Calkins D, Christen D, Horning M, Rea L, Atkinson S (2006) Temporary captivity as a research tool: Comprehensive study of wild pinnipeds under controlled conditions. *Aquatic Mammals* 32: 58-65.

**Mellish J**, Iverson S (2005) Postpartum dynamics of reproductive hormones in grey and hooded seals. *Marine Mammal Science* 21: 162-168.

**Mellish J**, Tuomi P, Horning M (2004) Assessment of ultrasound imaging as a non-invasive measure of blubber thickness in pinnipeds. *Journal of Zoo and Wildlife Medicine* 35: 116-118.

**Mellish J**, Loughlin T (2003) Lipoprotein lipase in lactating and neonatal northern fur seals: exploring physiological management of energetic conflicts. *Comparative Biochemistry and Physiology Part A* 134: 147-156.

**Mellish J**, Iverson S (2001) Blood metabolites as indicators of nutrients utilization in fasting, lactating phocid seals: does depletion of nutrient reserves terminate lactation? *Canadian Journal of Zoology* 79: 303-311.

**Mellish J**, Iverson S, Bowen D (2000) Metabolic compensation during high energy output in fasting, lactating grey seals (*Halichoerus grypus*): metabolic ceilings revisited. *Proceedings of the Royal Society of London, Biological Sciences* 267: 1245-1251.

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**Mellish J, Iverson S, Bowen D, Hammill M (1999)** Fat transfer and energetics during lactation in the hooded seal: the roles of tissue lipoprotein lipase in milk fat secretion and pup blubber deposition. *Journal of Comparative Physiology B* 169: 377-390.

**FUNDING** | 2013-2016. North Pacific Research Board (\$305,745) Reproduction, survival and depredation of Steller sea lions from the declining western Aleutian Islands in relation to the stable eastern Gulf of Alaska region – Phase 2.

2013-2015. Pollock Conservation Cooperative Research Center (\$214,655) Reproduction, survival and depredation of Steller sea lions from the declining western Aleutian Islands in relation to the stable eastern Gulf of Alaska region – Phase 2.

2011-2015. National Science Foundation, Polar Programs (\$712,395) Thermoregulation in free-living Antarctic seals: the missing link in ecological modeling.

2002-2011. Alaska SeaLife Center, Federal appropriation via NOAA (\$506,000) Physiology of polar pinnipeds.

2010-2013. North Pacific Research Board (\$342,955) The impact of predation on juvenile survival and population recovery of Steller sea lions in Prince William Sound.

2008-2010. Pollock Conservation Cooperative Research Center (\$17,775) Making our mark: Assessment of the behavioral and physiological effects of long-term tracking methods in Steller sea lions.

2005-2009 National Science Foundation, Polar Programs (\$562,900) Aging in Weddell seals: proximate mechanisms of age-related changes in adaptations to breath hold hunting in an extreme environment.

2005-2009 National Science Foundation, Major Research Instrumentation (\$505,858) Development and calibration of infrared thermography in homeotherm animals.

2003-2008. Pollock Conservation Cooperative Research Center (\$58,800) Ecosystem monitoring through the subsistence harvests of the Pribilof Islands.

2002-2011. Alaska SeaLife Center, Federal appropriation via NOAA (\$1,583,040) Transient juvenile Steller sea lion project.

2001-2006 NOAA, Steller sea lion Research Initiative (\$1,056,137) Installation of a remote census and photogrammetry network.

2001-2006 NOAA, Steller sea lion Research Initiative (\$1,689,405) Satellite-linked mortality transmitters in Steller sea lions: effect of health status, foraging ability, and environmental variability on juvenile survival and production.

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Aquatic Mammals  
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Frontiers in Aquatic Physiology  
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**Education**

M.Sc., Wildlife Ecology, Cornell University, January 2000

Thesis topic: Population ecology and nesting biology of Yellow Wagtails

B.A., Biology, Colorado College, December 1994

**Relevant Work Experience**

**March 2000 – current:** Wildlife Biologist, USFWS, Alaska Maritime National Wildlife Refuge.

Current: Supervisory Wildlife Biologist

2008-2011: Bering Sea Unit Biologist

2004-2008: Alaska Peninsula Unit Biologist

2000-2004: Wildlife Biologist

Since 2011, I have served as the supervisory wildlife biologist for the Alaska Maritime NWR. This involves leading a large biological program on one of the most prestigious refuges, supervising 9 permanent biologists, and managing a \$650K budget. I also provide technical input and briefings to regional and local management. Major projects include implementing the refuge's long-term biological inventory and monitoring program on nine annual and dozens of periodic sites, supporting a marine research program with dozens of partners, and restoration projects involving introduced species eradication.

**January 1998-December 1999:** Teaching assistant, Cornell University.

**May-October 1997:** Biological Science Technician, USFWS, Yukon Delta NWR

**April-May 1997:** Field Events Coordinator, Kachemak Bay Shorebird Festival, Homer, AK. **February 1995-January 1997:** Wildlife Biologist, USFWS, Alaska Peninsula/Becharof National Wildlife Refuge.

**May-September 1994:** Biologist Trainee, USFWS, Togiak NWR, based at Cape Peirce.

**May-August 1993:** Biological Science Technician, USFWS, Kenai Fishery Resource Office.

**May-August 1992:** Biological Science Technician, USFWS, Fisheries Management Services.

**May-August 1991:** Biological Science Technician, USFWS, Fisheries Lab, Anchorage AK.

**Recent Publications**

**Renner, H.M.**, M.D. Romano, M. Renner, S. Pyare, M.I. Goldstein, and Y. Artukhin. 2015. Assessing the breeding distribution and population trends of the Aleutian tern *Onychoprion aleuticus*. *Marine Ornithology* 43: 179-187.

Paredes, R., R.A. Orben, D.D. Roby, D.B. Irons, R. Young, **H.M. Renner**, Y. Tremblay, A. Will, A.M.A. Harding and A.S. Kitaysky. 2015. Foraging ecology during nesting influences body size in a pursuit-diving seabird. *Marine Ecology Progress Series* 533: 261-276.

**Renner, H.M.**, B.A. Drummond, A. Benson and R. Paredes. 2014. Reproductive success of kittiwakes and murres in sequential stages of the nesting period: Relationships with diet and oceanography. *Deep-Sea-Research II*.

Paredes, R., R.A. Orben, R.M. Suryan, D.B. Irons, D.D. Roby, A.M.A. Harding, R.C. Young, K. Benoit-Bird, C. Ladd, **H.M. Renner**, S. Heppell, R.A. Phillips and A.S. Kitaysky. 2014. Foraging responses of black-legged kittiwakes to prolonged food shortages around colonies on the Bering Sea Shelf. *PLoS ONE* 93.

- Reynolds, J.H. and **H.M. Renner**. 2014. Using patch occupancy models to estimate area of crevice-nesting seabird colonies. *Condor* 116: 316-324.
- Harding, A.M.A., R. Paredes, R. Suryan, D. Roby, D.B. Irons, R. Orben, **H.M. Renner**, R. Young, C. Barger, I. Dorresteijn and A.S. Kitaysky. 2013. Does location really matter? An inter-colony comparison of seabirds breeding at varying distances from productive oceanographic features in the Bering Sea. *Deep-Sea Research II* 94:178-191.
- Pinchuk, A.I., K.O. Coyle, E.V. Farley and **H.M. Renner**. 2013. Emergence of the Arctic *Themisto libellula* (Amphipoda: Hyperiididae) on the southeastern Bering Sea shelf as a result of the recent cooling, and its potential impact on the pelagic food web. *ICES Journal of Marine Science*.
- Wright, S.K., G.V. Byrd, **H.M. Renner**, and A.L. SOWLS. 2013. Breeding ecology of Red-faced cormorants in the Pribilof Islands, Alaska. *Journal of Field Ornithology* 84: 49-57.
- Paredes, R., A.M.A. Harding, D.B. Irons, D.D. Roby, R.M. Suryan, R.A. Orben, **H.M. Renner**, R. Young and A.S. Kitaysky. 2012 Proximity to multiple foraging habitats enhances seabirds' resilience to local food shortages. *Marine Ecology Progress Series* 471: 253-269.
- Renner, H.M.**, F. Mueter, B.A. Drummond, J.A. Warzbok and E.H. Sinclair. 2012. Patterns of change in diets of two piscivorous seabird species during 35 years in the Pribilof Islands. *Deep-Sea Research II* 65-70:273-291.
- Renner, H.M.**, J.H. Reynolds, M.Sims and M. Renner. 2011. Evaluating the power of surface attendance counts to detect trends in crevice-nesting auklets. *Environmental Monitoring and Assessment*. 177: 665-679
- Renner, H.M.** and M. Renner. 2010. Counting the countless: estimating the size of the least auklet colony on St. George Island, Alaska. *Western Birds* 41: 168-173.
- Byrd, G.V., W.J. Sydeman, **H.M. Renner**, and S. Minobe. 2008. Responses of piscivorous seabirds at the Pribilof Islands to ocean climate. *Deep-Sea Research II* 55: 1856-1867.
- Byrd, G.V., J.A. Schmutz and **H.M. Renner**. 2008. Contrasting population trends of piscivorous seabirds in the Pribilof Islands: A 30-year perspective. *Deep-Sea Research II* 55: XXX-YYY.
- Renner, H.M.**, and B.J. McCaffery. 2008. Demography of Yellow Wagtails at Cape Romanzof, Alaska. *Wilson Journal of Ornithology* 120: 85-91.
- Renner, H.M.**, and B.J. McCaffery. 2006. Nesting biology of Yellow Wagtails at Cape Romanzof, Alaska. *Journal of Field Ornithology* 77: 250-258.
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- Benter, R.B., **H.M. Renner**, and M. Renner. 2005. First record of a Shy Albatross for Alaska. *Western Birds* 36: 135-137.
- Byrd, G.V., **H.M. Renner** and M. Renner. 2005. Distribution patterns and population trends of breeding seabirds in the Aleutian Islands. *Fisheries Oceanography* 14 (Suppl. 1): 139-159.

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During the past four years, I have collaborated with the following on proposals and papers: Yuri Artukhin (Russian Academy of Sciences), Anna-Marie Benson (USFWS), Mike Goldstein (USFS), Ann Harding (Alaska Pacific Univ.), David Irons (USFWS), Alexander Kitaysky (Univ. Alaska, Fairbanks), Kathy Kuletz (USFWS), Franz Mueter (U. Alaska, Juneau), Rosana Paredes (Oregon State Univ.), Sanjay Pyare (University of Alaska Southeast), Martin Renner (Tern Again Consulting), Joel Reynolds (USFWS), Dan Roby (Oregon State Univ.), Joel Schmutz (USGS), William Sydeman (Farallon Institute).



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Email: [Elizabeth.Siddon@noaa.gov](mailto:Elizabeth.Siddon@noaa.gov)**EDUCATION**

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- 2013     Ph.D. in Fisheries, University of Alaska Fairbanks  
*Ecology and energetics of early life stages of Walleye Pollock in the eastern Bering Sea: the role of spatial variability across climatic regimes.*
- 2005     M.S. in Fisheries, University of Alaska Fairbanks
- 2000     B.S. in Marine and Freshwater Biology, University of New Hampshire  
Magna Cum Laude; University Honors in Major

**PROFESSIONAL EMPLOYMENT**

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- April 2016 -     Research Fisheries Biologist, NOAA/Alaska Fisheries Science Center,  
Ecosystem Monitoring and Assessment (EMA) Program  
Program Lead for southeastern Bering Sea Ecosystem Assessment
- April 2014 –  
April 2016     Postdoctoral Fellow, National Research Council  
*A cross-ecosystem comparison of predator-prey dynamics with implications for predicting ecosystem-level responses to climate variability*
- 2005 – 2008     Associate Scientific Editor, *Fishery Bulletin*, NOAA/NMFS
- 2002     Research Technician, NOAA/NMFS/Northeast Fisheries Science Center
- 2001     Fisheries Observer, Ocean Technology Foundation, Northwest Atlantic
- 2001     Dive Coordinator, Cornell University, Shoals Marine Laboratory
- 2000     Aquanaut, Aquarius Undersea Laboratory, National Undersea Research Center
- 2000     Island Coordinator, Cornell University, Shoals Marine Laboratory
- 1998, 1999     Research Technician, UNC Chapel Hill, Institute of Marine Sciences  
Supervisor: Dr. Jonathan Grabowski

**TEACHING**

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- 2005 – present     Academic Teaching Staff  
Cornell University and University of New Hampshire, Shoals Marine Laboratory
- November 2011     Co-instructor, American Fisheries Society - Alaska Chapter Annual Meeting  
Short Course: Beyond Linear Models
- 2005 – 2007     Adjunct Faculty, University of Alaska Southeast  
Courses: Fundamentals of Biology I/II; Introduction to Marine Biology
- 2003 - 2004     Teaching Assistant, University of Alaska  
Courses: Marine Ecology; Introduction to Ichthyology

## PUBLICATIONS

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- Siddon, E.C.**, J.T. Duffy-Anderson, K.L. Mier, M. Busby, and L.B. Eisner. In review. Seasonal changes in assemblage structure of ichthyoplankton and juvenile fish over the eastern Bering Sea shelf in cold years. *ICES J Mar Sci*.
- Eisner, L.B., A. Pinchuk, C. Harpold, **E.C. Siddon**, K.L. Mier, D. Kimmel. In review. Seasonal, interannual, and spatial variations of zooplankton in the eastern Bering Sea during three cold years, 2008-2010. *ICES J Mar Sci*.
- Duffy-Anderson, J.T.\*, P.J. Stabeno\*, A. Andrews, L.B. Eisner, E.V. Farley, C.E. Harpold, R.A. Heintz, F. Sewall, **E.C. Siddon**, A. Spear, E. Yasumiishi. In review. Return of warm conditions in the southeastern Bering Sea: phytoplankton – fish. *PLOS ONE*. \*Lead author, additional authors listed alphabetically
- Siddon, E.C.**, L.G. DeForest, D.M. Blood, M.J. Doyle, A.C. Matarese. In press. Early life history ecology for five commercially and ecologically important fish species in the eastern and western Gulf of Alaska. *Deep-Sea Research II*.
- Heintz, R., **E.C. Siddon**, E. Farley. In press. Fall energetic condition of age-0 Walleye Pollock predicts survival and recruitment success. In Zador, S. and Siddon, E.C. (eds.), 2016. *Ecosystem Considerations 2016, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4th Ave, Suite 306, Anchorage, AK 99501*.
- Duffy-Anderson, J.T., Barbeaux, S.J., Farley, E., Heintz, R., Horne, J.K., Parker-Stetter, S.L., Petrik, C., **Siddon, E.C.**, Smart, T.I. 2016. The critical first year of life of walleye pollock (*Gadus chalcogrammus*) in the eastern Bering: Implications for recruitment and future research. *Deep-Sea Research II* 134: 283-301. \*Lead author, additional authors listed alphabetically
- Eisner, L.B., **Siddon, E.C.**, Strasburger, W.W. 2015. Spatial and temporal changes in assemblage structure of zooplankton and pelagic fish in the eastern Bering Sea across varying climate conditions. *Izvestia TINRO* 181: 141-160.
- De Forest, L., Duffy-Anderson, J.T., Heintz, R.A., Matarese, A.C., **Siddon, E.C.**, Smart, T.I., Spies, I.B. 2014. Taxonomy of the early life stages of arrowtooth flounder (*Atheresthes stomias*) and Kamchatka flounder (*A. evermanni*) in the eastern Bering Sea, with notes on distribution and condition. *Deep-Sea Research II* 109: 181-189. \*Lead author, additional authors listed alphabetically
- Siddon, E.C.**, Kristiansen, T., Mueter, F.J., Holsman, K., Heintz, R.A., and Farley, E.V. 2013. Spatial match-mismatch between juvenile fish and prey explains recruitment variability across contrasting climate conditions in the eastern Bering Sea. *PLoS ONE* 8(12): e84526. doi:10.1371/journal.pone.0084526.
- Siddon, E.C.**, Heintz, R.A., and Mueter, F.J. 2013. Conceptual model of energy allocation in walleye pollock (*Theragra chalcogramma*) from age-0 to age-1 in the southeastern Bering Sea. *Deep-Sea Research II* 94: 140-149.
- Heintz, R.A., **Siddon, E.C.**, Farley, E.V. Jr., Napp, J.M. 2013. Correlation between recruitment and fall condition of age-0 walleye pollock (*Theragra chalcogramma*) from the eastern Bering Sea under varying climate conditions. *Deep-Sea Research II* 94: 150-156.
- Smart, T.I., **Siddon, E.C.**, Duffy-Anderson, J.T. 2013. Vertical distributions of the early life stages of walleye pollock (*Theragra chalcogramma*) in the southeastern Bering Sea. *Deep-Sea Research II* 94: 201-210.
- Siddon, E.C.**, Duffy-Anderson, J.T., Mueter, F.J. 2011. Community-level response of larval fish to environmental variability in the southeastern Bering Sea. *Marine Ecology Progress Series* 426: 225-239.
- Mueter, F.J., **Siddon, E.C.**, Hunt, G.L. Jr. 2011. Climate change brings uncertain future for subarctic marine ecosystems and fisheries. Pages 329-357 in A.L. Lovecraft and H. Eicken, eds. *North by 2020: Perspectives on Alaska's Changing Social-Ecological Systems*. University of Alaska Press, Fairbanks, AK.
- Siddon, E.C.**, Siddon, C.E., Stekoll, M.S. 2008. Community level effects of *Nereocystis luetkeana* in southeastern Alaska. *Journal of Experimental Marine Biology and Ecology* 361(1): 8-15.

## **Curriculum Vitae**

Ian J. Stewart

International Pacific Halibut Commission

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### **Education:**

- Doctor of Philosophy, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, 2006 (Graduate Advisor: Dr. Ray Hilborn)
  - National Sea Grant/National Marine Fisheries Service Joint Graduate Fellowship in Population Dynamics, 2001-2004
- Master of Science, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA, 2001
- Bachelor of Arts, Dartmouth College, Hanover, NH, 1996

### **Experience:**

- Quantitative Scientist, International Pacific Halibut Commission, 2012-present.
- Research Fisheries Biologist, Fishery Resource Analysis and Monitoring Division, National Marine Fisheries Service, Northwest Fisheries Science Center, 2004-2012.
  - 2009 Employee of the year (Scientific); NOAA Fisheries, Northwest Fisheries Science Center
- Teaching Assistant, University of Washington, 2001-2003
- Field Research Technician, Alaska Salmon Program, School of Aquatic and Fishery Sciences, University of Washington, 1999-2001
- Biologist, Simpson Timber Company, Shelton, WA, 1996-1999

### **Publications:**

- Stewart and Monnahan. *In press*. Implications of process error in selectivity for approaches to weighting compositional data in fisheries stock assessments. *Fisheries Research*. *xx:xx-xx*.
- Stewart, I.J., and S.J.D. Martell. 2015. Reconciling stock assessment paradigms to better inform fisheries management. *ICES Journal of Marine Science*. 72(8): 2187-2196.
- Martell, S., Stewart, I., and Sullivan, J. 2015. Implications of bycatch, discards, and size limits on reference points in the Pacific halibut fishery. *In Fisheries bycatch: Global issues and creative solutions*. G.H. Kruse, H.C. An, J. DiCosimo, C.A. Eischens, G. Gislason, S., D.N. McBride, C.S. Rose and C.E. Siddon. *Eds*. Alaska Sea Grant, University of Alaska Fairbanks.
- Stewart, I.J., and O.S. Hamel. 2014. Bootstrapping of sample sizes for length- or age-composition data used in stock assessments. *Canadian Journal of Fisheries and Aquatic Sciences* 71: 581-588.
- Stewart, I.J., and S.J.D. Martell. 2014. A historical review of selectivity approaches and retrospective patterns in the Pacific halibut stock assessment. *Fisheries Research*. 158: 40-49.
- Martell, S.J.D., and I.J. Stewart. 2014. Towards defining good practices for modeling time-varying selectivity. *Fisheries Research*. 158: 84-95.
- Thorson, J.T., I.G. Taylor, I.J. Stewart, and A.E. Punt. 2014. Rigorous meta-analysis of life history correlations by simultaneously analyzing multiple population dynamics models. *Ecological Applications* 24(2): 315-326.
- Ralston, S.J., and I.J. Stewart. 2013. Bifurcated distributions of pelagic juvenile rockfish on the U.S. west coast in 2005 and 2006. *CalCOFI Reports* 54: 1-12.
- Thorson, J.T., I.J. Stewart, I.G. Taylor, and A.E. Punt. 2013. Using a recruitment-linked multispecies stock assessment model to estimate common trends in recruitment for US West Coast groundfishes. *Marine Ecology Progress Series* 483: 245-256.

- Doherty, D.T., R. Hilborn, A.E. Punt and I.J. Stewart. 2013. Modeling co-occurring groundfish species: a simulation study on the effects of the spatial scale for setting management targets. *Canadian Journal of Fisheries and Aquatic Sciences*. 70: 49-56.
- Thorson, J.T., M.E. Clarke, I.J. Stewart and A.E. Punt. 2012. The implications of spatially varying catchability on bottom trawl surveys of fish abundance, and a proposed solution involving *in situ* underwater vehicles. *Canadian Journal of Fisheries and Aquatic Sciences*. 70: 294-306.
- Stewart, I.J., A. Hicks, I. Taylor, J.T. Thorson, C. Wetzel and S. Kupschus. 2012. A comparison of stock assessment uncertainty estimates using maximum likelihood and Bayesian methods implemented with the same model framework. *Fisheries Research*. 142: 37-46.
- Thorson, J.T., I.J. Stewart, and A.E. Punt. 2012. Development and application of an agent-based model to evaluate methods for estimating stock abundance for shoaling fishes such as Pacific rockfish (*Sebastes* spp.). *ICES Journal of Marine Science*. 69(4): 635-647.
- Keller, A. A., J. R. Wallace, B.H. Horness, O. S. Hamel, I. J. Stewart. 2012. Variations in Eastern North Pacific demersal fish biomass based on the U.S. West Coast groundfish bottom trawl survey (2003–2010). *Fishery Bulletin*. 110: 205-222.
- Getsiv-Clemons, J.E.R. W.W. Wakefield, C.E. Whitmire, I.J. Stewart. 2012. Identifying potential habitats from multibeam echosounder imagery to estimate abundance of groundfish: a case study at Heceta Bank, OR, USA. *In* P.T. Harris and E.K. Baker, *Seafloor Geomorphology as Benthic Habitat: GeoHAB Atlas of Seafloor Geomorphic Features and Benthic Habitats*, Elsevier Inc., p. 570-586.
- Hilborn, R., I.J. Stewart, T.A. Branch, and O.P. Jensen. 2011. Conservation of diversity and food security in the California Current bottom trawl fishery. *Conservation Biology*. 26: 257-266.
- Thorson, J.T., I.J. Stewart, and A.E. Punt. 2011. Accounting for fish shoals in single- and multi-species survey data using mixture distribution models. *Canadian Journal of Fisheries and Aquatic Sciences* 68: 1681-1693.
- Harms, J.H., J.R. Wallace, and I.J. Stewart. 2010. A fishery-independent estimate of recent population trend for an overfished U.S. west coast groundfish species, Bocaccio rockfish (*Sebastes paucispinis*). *Fisheries Research* 106: 298-309.
- Stewart, I.J., A. Keller, E.L. Fruh, V. Simon, and B.H. Horness. 2010. Throwing In The Towel: When Do Adverse Conditions Dictate A Weather Day During A Bottom Trawl Survey? *Fisheries Research* 102(1-2):130-140.
- Stewart, I.J., and K.R. Piner. 2007. Simulation of the estimation of ageing bias inside an integrated assessment of canary rockfish using age estimates from a bomb radiocarbon study. *Marine and Freshwater Research* 58:905-913.
- Stewart, I.J. 2007. Defining plausible migration rates based on historical tagging data: a Bayesian mark-recapture model applied to English sole (*Parophrys vetulus*). *Fishery Bulletin* 105:470-484.
- Helser, T.E., I.J. Stewart and H.-L. Lai. 2007. A Bayesian hierarchical meta-analysis of the genus *Sebastes* in the eastern Pacific ocean. *Canadian Journal of Fisheries and Aquatic Science* 64: 470-485.
- Quinn, T.P., I.J. Stewart and C.P. Boatright. 2006. Experimental evidence of homing to site of incubation by mature sockeye salmon (*Oncorhynchus nerka*). *Animal Behaviour* 72: 941-949.
- Minte-Vera, C.V., T.A. Branch, I.J. Stewart, and M.W. Dorn. 2005. Practical application of meta-analysis results: avoiding the double use of data. *Canadian Journal of Fisheries and Aquatic Sciences* 62:925-929.
- Stewart, I.J., S.M. Carlson, C.P. Boatright, G.B. Buck, and T.P. Quinn. 2004. Site fidelity of spawning sockeye salmon (*Oncorhynchus nerka* W.) in the presence and absence of olfactory cues. *Ecology of Freshwater Fish* 13:104-110.

- Stewart, I.J., T.P. Quinn, and P. Bentzen. 2003. Evidence for fine-scale natal homing among island beach spawning sockeye salmon, *Oncorhynchus nerka*. *Environmental Biology of Fishes* 67:77-85.
- Stewart, I.J., R. Hilborn, and T.P. Quinn. 2003. Coherence of observed adult sockeye salmon abundance within and among spawning habitats in the Kvichak River watershed. *Alaska Fishery Research Bulletin* 10(1):28-41.

### Documents:

- Stewart, I.J., Monnahan, C.C., and Martell, S. 2016. Assessment of the Pacific halibut stock at the end of 2015. *IPHC Report of Assessment and Research Activities 2015*. p. 188-209.
- Stewart, I.J., and Monnahan, C.C. 2016. Overview of data sources for the Pacific halibut stock assessment and related analyses. *IPHC Report of Assessment and Research Activities 2015*. p. 99-187.
- Stewart, I.J., and Martell, S.J.D. 2016. Appendix: Development of the 2015 stock assessment. *IPHC Report of Assessment and Research Activities 2015*. p. A1-A146.
- Stewart, I.J. 2016. Regulatory area harvest policy calculations and catch tables. *IPHC Report of Assessment and Research Activities 2015*. p. 220-237.
- Martell, S.J.D., Leaman, B., Stewart, I.J., Keith, S.W., Joseph, C., Keizer, A., and Culver, M. 2016. Developments in management strategy evaluation / management strategy evaluation board. *IPHC Report of Assessment and Research Activities 2015*. p. 286-312.
- Martell, S., Stewart, I., and Wor, C. 2016. Exploring index-based PSC limits for Pacific halibut. *IPHC Report of Assessment and Research Activities 2015*. P. 238-285.
- Webster, R.A., and Stewart, I.J. 2016. Setline survey-based apportionment estimates. *IPHC Report of Assessment and Research Activities 2015*. p. 210-219.
- Gilroy, H.L., and Stewart, I.J. 2016. Incidental mortality of halibut in the commercial halibut fishery (wastage). *IPHC Report of Assessment and Research Activities 2015*. p. 47-55.
- Stewart, I.J., and Martell, S. 2015. Assessment of the Pacific halibut stock at the end of 2014. *IPHC Report of Assessment and Research Activities 2014*. p. 161-180.
- Stewart, I.J. 2015. Regulatory area harvest policy calculations and catch tables. *IPHC Report of Assessment and Research Activities 2014*. p. 195-212.
- Webster, R.A., Stewart, I.J., Leaman, B.M., Sadorus, L.L., Henry, E., and Dykstra, C.L. 2015. Setline survey expansion and complementary data sources. *IPHC Report of Assessment and Research Activities 2014*. p. 587-602.
- Stewart, I.J., Leaman, B.M., and Martell, S.J.D. 2015. Accounting for and managing all Pacific halibut removals, *IPHC Report of Assessment and Research Activities 2014*. p. 221-266.
- Stewart, I.J. 2015. Overview of data sources for the Pacific halibut stock assessment and related analyses. *IPHC Report of Assessment and Research Activities 2014*. p. 87-160.
- Sadorus, L.L., Stewart, I.J., and Kong, T. 2015. Juvenile halibut distribution and abundance in the Bering Sea and Gulf of Alaska. *IPHC Report of Assessment and Research Activities 2014*. p. 367-404.
- Monnahan, C.C., and Stewart, I.J. 2015. Evaluation of commercial logbook records: 1991-2013. *IPHC Report of Assessment and Research Activities 2014*. p. 213-220.
- Martell, S.J.D., Leaman, B.M., Keith, S.W., and Stewart, I.J. 2015. Developments in Management Strategy Evaluation/Management Strategy Advisory Board. *IPHC Report of Assessment and Research Activities 2014*. p. 277-298.
- Martell, S., Leaman, B., and Stewart, I. 2015. Developments in the Management Strategy Evaluation Process, fisheries objectives, and implications for harvest policy and decision making. *IPHC Report of Assessment and Research Activities 2014*. p. 239-260.

- Martell, S., Leaman, B., and Stewart, I. 2015. Recent developments in the IPHC Management Strategy Evaluation process and size-limit implications. IPHC Report of Assessment and Research Activities 2014. p. 299-312.
- Gilroy, H.L., and Stewart, I.J. 2015. Incidental mortality of halibut in the commercial halibut fishery (wastage). IPHC Report of Assessment and Research Activities 2014. p. 47-54.
- Forsberg, J.E., and Stewart, I.J. 2015. Re-ageing of archived otoliths from the 1920s to the 1990s. IPHC Report of Assessment and Research Activities 2014. p. 405-428.
- Keith, S., Kong, T., Sadorus, L., Stewart, I., and Williams, G. 2014. The Pacific Halibut: Biology, Fishery, and Management. IPHC Tech. Rep. No. 59. 60 p.
- Stewart, I.J. 2014. Overview of the data sources for the Pacific halibut stock assessment and related analyses. IPHC Report of Assessment and Research Activities 2013. p. 95-168.
- Stewart, I.J., and S. Martell. 2014. Assessment of the Pacific halibut stock at the end of 2013. IPHC Report of Assessment and Research Activities 2013. p. 169-196.
- Martell, S., B.M. Leaman, and I.J. Stewart. 2014. Developments in the Management Strategy Evaluation Process, fisheries objectives, and implications for harvest policy and decision making. IPHC Report of Assessment and Research Activities 2013. p. 239-260.
- Webster, R.A. and I.J. Stewart. 2014. Apportionment and regulatory area harvest calculations. IPHC Report of Assessment and Research Activities 2013. p. 197-216.
- Gilroy, H.L. and I.J. Stewart. 2014. Incidental mortality of halibut in the commercial halibut fishery (Wastage). IPHC Report of Assessment and Research Activities 2013. p. 49-56.
- Stewart, I.J., B.M. Leaman, S. Martell and R.A. Webster. 2013. Assessment of the Pacific halibut stock at the end of 2012. IPHC Report of Assessment and Research Activities 2012. p. 93-186.
- Stewart, I.J., S. Martell, R.A. Webster, R. Forrest, J. Ianelli, and B.M. Leaman. 2013. Assessment review team meeting, October 24-26, 2012. IPHC Report of Assessment and Research Activities 2012. p. 239-266.
- Webster, R.A. and I.J. Stewart. 2013. Apportionment and regulatory area harvest calculations. IPHC Report of Assessment and Research Activities 2012. p. 187-206.
- Leaman, B.M., I.J. Stewart, R.A. Webster and H.L. Gilroy. 2013. IPHC Staff harvest advice and regulatory proposals: 2013. 2013 IPHC Annual Meeting Handout. p. 114-130.
- Martell, S., I.J. Stewart and B.M. Leaman. 2013. Optimal harvest rates for Pacific halibut. IPHC Report of Assessment and Research Activities 2012. p. 207-238.
- Gilroy, H.L. and I.J. Stewart. 2013. Incidental mortality of halibut in the commercial halibut fishery (Wastage). IPHC Report of Assessment and Research Activities 2012. p. 53-60.
- Stewart, I.J., R.E. Forrest, N. Taylor, C. Grandin, A.C. Hicks, and S.J.D. Martell. 2012. Status of the Pacific hake (whiting) stock in U.S. and Canadian Waters in 2012. Document submitted to the Joint U.S.-Canada treaty for Pacific hake/whiting process. 194 p.
- Stewart, I.J., J.T. Thorson, and C. Wetzel. 2011. Status of the U.S. sablefish resource in 2011. *In* Status of the Pacific Coast Groundfish Fishery through 2011, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon. 442 p.
- Stewart, I.J., R.E. Forrest, C. Grandin, O.S. Hamel, A.C. Hicks, S.J.D. Martell, and I.G. Taylor. 2011. Status of the Pacific hake (whiting) stock in U.S. and Canadian Waters in 2011. *In* Status of the Pacific Coast Groundfish Fishery through 2011, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon. 217 p.
- Stewart, I.J. and O.S. Hamel. 2010. Stock Assessment of Pacific Hake, *Merluccius productus*, (a.k.a. Whiting) in U.S. and Canadian Waters in 2010. Pacific Fishery Management Council. Portland, Oregon. 290 p.

- Stewart, I.J., J.R. Wallace, and C. McGilliard. 2009. Status of the U.S. yelloweye rockfish resource in 2009. *In* Status of the Pacific Coast Groundfish Fishery through 2009, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon, 435 p.
- Stewart, I.J. 2009. Status of the U.S. canary rockfish resource in 2009 (Update of 2007 assessment model). *In* Status of the Pacific Coast Groundfish Fishery through 2009, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon, 115 p. + Appendices.
- Stewart, I.J. 2009. Rebuilding analysis for yelloweye rockfish based on the 2009 stock Assessment. *In* Status of the Pacific Coast Groundfish Fishery through 2009, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon, 96 p.
- Stewart, I.J. 2009. Rebuilding Analysis for Canary Rockfish Based on the 2009 Updated Stock Assessment. *In* Status of the Pacific Coast Groundfish Fishery through 2009, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon, 53 p.
- Hastie, J., Stewart, I.J. and O.S. Hamel. 2009. Distribution of Pacific hake (*Merluccius productus*) relative to the Tribal Usual and Accustomed fishing grounds off the State of Washington. Background document for the NOAA-NWR. 31 p.
- Hamel, O.S. and I.J. Stewart. 2009. Stock Assessment of Pacific Hake, *Merluccius productus*, (a.k.a. Whiting) in U.S. and Canadian Waters in 2009. *In* Status of the Pacific Coast Groundfish Fishery through 2009, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon, 246 p.
- Helser, T.E., I.J. Stewart, and O.S. Hamel. 2008. Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2008. *In* Status of the Pacific Coast Groundfish Fishery through 2008; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon, 128 p.
- Helser, T.E., I.J. Stewart, C.E. Whitmire, and B.H. Horness. 2007. Model-based estimates of abundance for 11 species from the NMFS slope surveys. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-82.
- Stewart, I.J. 2007. Rebuilding analysis for canary rockfish based on the 2007 stock assessment. *In* Status of the Pacific Coast Groundfish Fishery through 2007; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon, 47 p.
- Stewart, I.J. 2007. Status of the canary rockfish resource in 2007. *In* Status of the Pacific Coast Groundfish Fishery through 2007; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon, 362 p.
- Stewart, I.J. 2007. Updated U.S. English sole stock assessment: status of the resource in 2007. *In* Status of the Pacific Coast Groundfish Fishery through 2007; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon, 213 p.
- Helser, T., I.J. Stewart, G. Fleischer, and S. Martell. 2006. Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2006. *In* Volume 7: Status of the Pacific Coast Groundfish Fishery Through 2005, Stock Assessment and Fishery Evaluation Portland, OR: Pacific Fishery Management Council.
- Methot, R. and I.J. Stewart. 2006. Status of the U.S. canary rockfish resource in 2005. *In* Volume 6: Status of the Pacific Coast Groundfish Fishery Through 2005, Stock Assessment and Fishery Evaluation: Stock Assessments and Rebuilding Analyses Portland, OR: Pacific Fishery Management Council.

- Stewart, I.J. 2006. Stock assessment with an evaluation of structural uncertainty, and model performance applied to English sole. Ph.D. Dissertation, University of Washington, School of Aquatic and Fishery Sciences. 284 p.
- Stewart, I.J. 2005. Status of the U.S. English sole resource in 2005. Pacific Fishery Management Council, 2005 Stock assessment and STAR panel reports. 221 p.
- Helser, T.E., H.-L. Lai and I.J. Stewart. 2004. A Bayesian hierarchical meta-analysis of growth for the genus *Sebastes* in the eastern Pacific ocean. ICES CM 2004/K:21 Conference Proceedings.
- Hamel, O.S., I.J. Stewart and A.E. Punt. 2003. Status and future prospects for the Pacific ocean perch resource in waters off Washington and Oregon as assessed in 2003. *In* Volume I: Status of the Pacific Coast Groundfish Fishery through 2003; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon. 124 p.
- Punt, A.E., O.S. Hamel and I.J. Stewart. 2003. Rebuilding analysis for Pacific ocean perch for 2003. *In* Volume I: Status of the Pacific Coast Groundfish Fishery through 2003; Stock Assessment and Fishery Evaluation. Pacific Fisheries Management Council. Portland, Oregon. 27 p.
- Stewart, I.J. 2001. Population structure and patterns of historical abundance of sockeye salmon in the Kvichak River system, Bristol Bay, Alaska. M.S. Thesis. University of Washington. 56 p.

#### Software:

- Developed open-source plotting and diagnostic software for stock assessment modeling: r4ss. <https://github.com/r4ss/r4ss>
- Extensive testing and development support for Stock Synthesis (Richard Methot, NWFSC), 2004-2012.
- ScapeMCMC. R package for analysis of Bayesian model diagnostics. <http://cran.r-project.org/>

#### Workshops and Reviews:

- 2016. Invited keynote. NOAA SIS POC Workshop. 1-3 June, Seattle, Washington.
- 2016. Invited participant. NOAA Southwest Fisheries Science Center & Pacific Fishery Management Council workshop on Coastal Pelagic Species (CPS) assessments. 2-5 May, La Jolla, California.
- 2015. Co-presented a 5-day stock assessment workshop for ISMAR (Ponza, Italy) and other European scientists on: Stock Synthesis modeling software, R code for plotting, output and model diagnostics, as well as other stock assessment related topics.
- 2015. Review Panel member. National Marine Fisheries Service Stock Assessment Review (STAR) Panel Review for widow rockfish and kelp greenling. 27-31 July, Newport, Oregon.
- 2015. Invited speaker. The Fisheries Leadership and Sustainability Forum, East Coast Forum. 7-8 May, 2015, Beaufort, North Carolina.
- 2014. Review panel member. National Marine Fisheries Service Northwest Fisheries Science Center Stock assessment Programmatic Review. 10-13 June, Seattle, Washington.
- 2014. Invited participant. Albacore working group model subgroup meeting. 14-18 April, La Jolla, California.
- 2013. Review Panel member. National Marine Fisheries Service Stock Assessment Review (STAR) Panel Review for darkblotched rockfish and petrale sole. 13-17 May, Seattle, Washington.
- 2013. Center for the Advancement of Population Assessment Methodology (CAPAM) Workshop on Selectivity: theory, estimation, and application in fishery stock assessment models. 12-14 March, La Jolla, California.
- 2012. Lead organizer/instructor for workshop on conducting stock assessments using Stock Synthesis. University of Washington. 31 July-2 August, Seattle, Washington.
- 2012. Review panel member. 2012 Hoki (*Macruronus magellanicus*) stock assessment review. 4-8 June, Viña del Mar, Chile.



- 2012. NOAA Workshop on Application of Non-Linear Time Series Analysis. 17-19 April, La Jolla, California.
- 2011. Assessing vulnerability of west coast fisheries to a changing climate. 25-26 May, Seattle, Washington.
- 2011. Comparative Assessment of Visual Survey Tools Workshop, 22-23 February, Moss Landing, California.
- 2010. Review panel member. Review of yelloweye rockfish stock assessment for inside waters. Center for Science Advice Pacific, Groundfish Standing Committee, Fisheries and Oceans Canada. Pacific Regional Advisory Meeting.
- 2008. Review panel member. PSARC Recovery Potential Assessment, Fisheries and Oceans Canada. Bocaccio rockfish stock assessment review.
- 2008. Prepared and presented an introductory 4-day stock assessment workshop for the NOAA NEFSC (Woods Hole, MA) focusing on: conversion of existing models (ASAP, VPA) to SS2 modeling software, R code for plotting, output and model diagnostics, as well as many stock assessment related topics. Included a 1-hour seminar for general audience on preliminary results of an analysis of the effects of adverse weather conditions on bottom trawl survey catches.
- 2007. Prepared and presented a comprehensive 5-day stock assessment workshop for CSIRO (Australian Fisheries, Hobart, Tasmania) showcasing NWFSC research products including: SS2 modeling software, National Fisheries Toolbox user interface, R code for plotting, output and model diagnostics, as well as many other stock assessment related topics.
- 2005. Review panel member, National Marine Fisheries Service Southeast Data, Assessment and Review (SEDAR) 8.
- 2005. ICES Study Group on Age-Length Structured Models. March 14-16, Copenhagen, Denmark.

**Academic service:**

- Affiliate Associate Professor, University of Washington, School of Aquatic and Fishery Sciences. 2012-present.

*Current student committees:*

- Cole Monnahan (PhD), University of Washington, 2014-present.
- Chantell Wetzel (PhD), University of Washington, 2011-present.

*Completed student committees:*

- James Thorson (PhD, 2011), University of Washington. Also served as NOAA mentor for the NOAA/National Sea Grant Fellowship in Population Dynamics.
- Melissa Muradian (MS, 2015), University of Washington.
- Chantell Wetzel (MS, 2011), University of Washington.
- Dawn Dougherty (MS, 2009), University of Washington.

**Professional service:**

- North Pacific Fishery Management Council Scientific and Statistical Committee, 2016-present.
- NOAA Untrawlable Habitat Strategic Initiative team member. 2013-present.
- Gulf of Alaska Plan Team member, North Pacific Fishery Management Council, 2012-2016.
- NOAA National Assessment Methods Working Group, 2007-2012.
- Steering Committee member, 2012 Western Groundfish Conference.
- Steering Committee member, NOAA-NMFS National Stock Assessment Workshop 11, 2010.
- Five-Year Performance Review for Professor David Armstrong, Director of the School of Aquatic & Fishery Sciences. Prepared for: Dean Arthur Nowell, College of Ocean and Fishery Sciences, University of Washington. 2004.

**STEPHANI ZADOR**  
Research Fish Biologist

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NE, Seattle, WA 98115  
**Current phone:** Office (206) 526-4693, FAX: (206) 221-6939  
**Email:** [stephani.zador@noaa.gov](mailto:stephani.zador@noaa.gov)

**Education:**

School of Aquatic and Fishery Sciences, University of Washington, Seattle, PhD, 2007  
Advisors: Andre Punt, Julia Parrish, Bob Francis, David Ainley  
Dissertation: *Management Implications of Factors Influencing Seabird Populations*  
Wildlife Science, College of Forest Resources, University of Washington, Seattle, MS, 2001  
Biology and Environmental Studies (double major), U.C. Santa Cruz, BA, 1993

**Current research foci:**

Marine ecosystem indicators, developing ecosystem assessments, communication of ecosystem information to managers, seabirds as ecosystem indicators.

**Current activities:**

- Editor of the annual Ecosystem Considerations report to the North Pacific Fisheries Management Council.
- Co-Chair of the Steering Committee of NOAA's FATE (Fisheries and the Environment) program.
- Full-time FATE researcher at the Alaska Fisheries Science Center.
- Member of several working groups: NCEAS Coastal Gulf of Alaska Futures, EBS regional action plan development, EBS Fishery Ecosystem Plan Core Team, GOA IERP Synthesis, NOAA National Seabird Program.

**Professional experience:**

- Research Fish Biologist, NOAA Alaska Fisheries Science Center, Seattle, WA. Supervisor: Kerim Aydin. Apr 2011 – present.
- Research Scientist. JISAO, University of Washington, Seattle, WA, 2009 – 2011
- Research Associate. NOAA Alaska Fisheries Science Center, Seattle, WA. 2007 – 2009.
- Wildlife Biologist, USGS Biological Resources Division, Anchorage, Alaska. 1995 – 1999.
- Biologist, U.S. Antarctic Program, McMurdo Station, Antarctica. 1996 – 1997..
- Ornithologist, Australian Antarctic Division, Marine Science voyage, Antarctica. 1996, 1998.
- Biologist, San Francisco Bay National Wildlife Refuge, California. 1994 – 1995.
- Research assistant, Australian Antarctic Division, Davis Station, Antarctica. 1993 – 1994.

**Publications in review:**

1. **Stephani G. Zador**, Sarah K. Gaichas, Stephen Kasperski, Colette L. Ward, Rachael Blake, Natalie C. Ban, Amber Himes-Cornell, Zachary Koehn. Linking ecosystem processes to communities of practice through commercially fished species in the Gulf of Alaska.

2. **Zador, Stephani G.**, Michael F. Sigler, and John E. Joyce. The Gulf of Alaska, In: Philips and Perez-Ramirez (eds.) The Impacts of Climate Change on Fisheries and Aquaculture.
3. Clay, P., Howard, J., Griffis, R., Busch, S., Colburn, L., Himes-Cornell, A., Rumrill, S., **Zador, S.**, Ocean and Coastal Indicators: Tracking Climate-related Change across the Land-Sea Interface. On the U.S. Indicators System..
4. Sydeman, W.J., Thompson, S.A., Piatt, J.F., Garcia-Reyes, M., **Zador, S.**, Williams, J., Romano, M. Renner, H. Regionalizing Indicators for Marine Ecosystems: Bering Sea-Aleutian Island Seabirds, Climate, and Competitors.
5. Jamie C. Tam, Jason S. Link, Scott I. Large, Kelly Andrews, Kevin Friedland, Jamison Gove, Elliott Hazen, Kirstin Holsman, Isaac Kaplan, Mandy Karnauskas, Jameal Samhour, Rebecca Shuford, Nick Tomilieri, **Stephani Zador**. Comparing apples and oranges: thresholds of ecological indicators in response to environmental and anthropogenic pressures reveal common trends in multiple ecosystems. Target journal: Ecological Applications.

### Recent Publications (10 years, including Ecosystem Considerations):

1. **Zador, S.**, Holsman, K., Aydin, K., Gaichas, S., **2016**. Ecosystem Considerations in Alaska: the Value of Qualitative Assessments. ICES Journal of Marine Science. doi: 10.1093/icesjms/fsw144.
2. William J. Sydeman, John F. Piatt, Sarah Ann Thompson, Marisol García-Reyes, Scott Hatch, Mayumi Arimitsu, Leslie Slater, Jeff Williams, Nora Rojek, **Stephani Zador**, and Heather Renner. Seabird diet composition indicates temporal variability in forage fish community structure across the Alaskan North Pacific. *In press*.
3. Spencer, P.D., Holsman, K.K., **Zador, S.**, Bond, N.A., Mueter, F.J., Hollowed, A.B. and Ianelli, J.N., **2016**. Modelling spatially dependent predation mortality of eastern Bering Sea walleye pollock, and its implications for stock dynamics under future climate scenarios. ICES Journal of Marine Science: Journal du Conseil, p.fsw040.
4. Simonsen, K.A., Ressler, P.H., Rooper, C.N., **Zador, S.G.** **2016**. Spatio-temporal distribution of euphausiids: and important component to understanding ecosystem processes in the Gulf of Alaska and eastern Bering Sea. ICES Journal of Marine Science doi:10.1093/icesjms/fsv272
5. Coll, M., Shannon, L. J., Kleisner, K. M., Juan-Jordá, M. J., Bundy, A., Akoglu, A. G., Banaru, D., Boldt, J.L., Borges, M.F., Cook, A., Diallo, I., Fu, C., Fox, C., Gascuel, D., Gurney, L.J., Hattabl, T., Heymans, J.J., Jourffre, D., Knight, B.R., Kucukavsar, S., Large, S.I., Lynam, C., Machias, A., Marshall, K.N., Masski, H., Ojaveer, J., Piroddi, C., Tam, J., Thiao, D., Thiaw, M., Torres, M.A., Travers-Trolet, M., Tsagarakis, K., Tuck, I., van der Meeren, G.I., Yemane, D., **Zador, S.G.**, Shin, Y.-J. **2016**. Ecological indicators to capture the effects of fishing on biodiversity and conservation status of marine ecosystems. Ecological Indicators 60:947-962
6. **Zador, S.G.** (ed) **2015**. Ecosystem Considerations 2015, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
7. Kristin Kleisner<sup>1</sup>, Marta Coll<sup>2</sup>, Christopher P. Lynam<sup>3</sup>, Alida Bundy<sup>4</sup>, Lynne Shannon<sup>5</sup>, Yunne-Jai Shin<sup>5,6</sup>, Jennifer Boldt<sup>7</sup>, Maria F. Borges<sup>8</sup>, Ibrahima Diallo<sup>9</sup>, Clive Fox<sup>10</sup>, Didier Gascuel<sup>11</sup>, Joanna J. Heymans<sup>12</sup>, Maria J. Juan Jordá<sup>13,14</sup>, Didier Jouffre<sup>9</sup>, Scott I. Large<sup>15</sup>, Kristin N. Marshall<sup>16</sup>, Henn Ojaveer<sup>17</sup>, Chiara Piroddi<sup>18</sup>, Jorge Tam<sup>19</sup>, Maria A. Torres<sup>20</sup>,

- Morgane Travers-Trolet<sup>21</sup>, Konstantinos Tsagarakis<sup>22</sup>, Gro I. van der Meeren<sup>23</sup>, **Stephani Zador**<sup>24</sup>. 2015. Evaluating changes in marine communities that provide ecosystem services through comparative assessments of community indicators. *Ecosystem Services* 16:413-429
8. **Zador, S.G.** (ed) 2014. Ecosystem Considerations 2014, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
  9. **Zador, S.G.** (ed) 2013. Ecosystem Considerations 2013, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
  10. **Zador, S.**, Hunt, G., TenBrink, T., Aydin, K. 2013. Combined seabird indices show lagged relationships between environmental conditions and breeding activity. *Mar Eco Prog Ser* 485:245-258)
  11. Hunsicker, M.E., Ciannelli, L., Bailey, K.M., **Zador, S.**, Stige, L.C. 2013. Climate and demography dictate the strength of predator-prey overlap in a subarctic marine ecosystem. *PLoS ONE* 8(6): e66025. doi:10.1371/journal.pone.
  12. **Zador, S.G.** (ed) 2012. Ecosystem Considerations 2012, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
  13. **Zador, S.**, Aydin K., Cope, J. 2011. Fine-scale analysis of arrowtooth flounder *Atherestes stomias* catch rates reveals spatial trends in abundance. *Mar Ecol Progr Ser* 438:229-239
  14. Hunsicker, M.E., et al. (including **Zador, S.**) 2011. Functional responses and scaling in predator-prey interactions of marine fishes: contemporary issues and emerging concepts. *Ecology Letters*
  15. **Zador, S.G.** (ed) 2011. Ecosystem Considerations 2011, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
  16. **Zador, S.G.** and Gaichas, S.K. (eds) 2010. Ecosystem Considerations 2010, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 605 W 4<sup>th</sup> Ave, Suite 306, Anchorage, AK 99501
  17. **Zador, S.**, Parrish, J., Punt, A., 2009. Factors influencing subcolony colonization and persistence in a colonial seabird, the common murre *Uria aalge*. *Mar Ecol Progr Ser* 376:283-293.
  18. **Zador, S.G.**, Parrish, J.K., Punt, A.E., Burke, J.L., Fitzgerald, S.F., 2008. Determining spatial and temporal overlap of an endangered seabird with a large commercial trawl fishery. *Endangered Species Research* 5:103-115.
  19. **Zador, S.G.**, Punt, A.E., Parrish, J.K., 2008. Population impacts of endangered short-tailed albatross bycatch in the Alaskan trawl fishery. *Biological Conservation* 141:872-882
  20. **Zador, S.G.**, J.F. Piatt, A.E. Punt. 2006. Balancing predation and egg harvest in a colonial seabird: A simulation model. *Ecological Modelling*. 195: 318-326.

#### **Selected Recent Presentations:**

- 7 presentations to Fisheries Management Council bodies in FY 15.
- “The use of ecosystem indicators in management: North Pacific perspectives”. Invited presentation at Pew symposium at the American Fisheries Society, Portland, OR 2015
- “Using ecosystem indicators to track effects of recent warm conditions in Alaska”. FATE annual science meeting, La Jolla, CA 2016

- Ecosystem-based management in Alaska: the role of seabirds as indicators of ecosystem change”. Invited Plenary Speaker, Pacific Seabird Group, Juneau, AK 2014.

### **Funded Proposals**

- FATE 16-05. Duffy-Anderson, Koslow, Brodeur, McClatchie, Zador, Bograd. Ichthyoplankton metrics as fishery-independent indicators of ecosystem change along the US west coast from California to Alaska.
- FATE 16-01. Litzow, Hunsicker, Zador. An early warning index for abrupt change in Northeast Pacific Ecosystems
- NPRB GOAIERP Synthesis. Ormseth, et al. Zador (collaborator). Gulf of Alaska Integrated Ecosystem Research Project (GOAIERP) Synthesis.
- FATE 14-05. Aydin, Ortiz, Zador. Evaluating ecosystem indicator performance under climate change..
- FATE13-06. Zador, Holsman. Refining a marine ecosystem index for Alaska: developing reference points for ecosystem based management and integrated ecosystem assessment.
- NPRB 1213 Seabirds as indicators of forage fish stocks and marine ecosystems in Alaska. Piatt, Sydeman, Renner, (Irons, Hatch, Zador, Gelatt – collaborators).
- NPRB 1208 Developing a euphausiid biomass time series for the central Gulf of Alaska continental shelf to understand fish-zooplankton interactions and ecosystem conditions. Ressler, Dorn, Zador (collaborators).
- FATE 10-01. Aydin, Gaichas, Zador. A top predator index for the Bering Sea.

**Awards, scholarships, and fellowships:** National Research Council fellowship, 2007; Best student paper, Pacific Seabird Group, 2006; John G. Peterson Scholarship and H. Mason Keeler Endowment for Excellence, UW 2006; Egtvedt Scholarship, University of Washington, 2 years; Xi Sigma Pi honorary society, College of Forest Resources, University of Washington, 2000; National Science Foundation Graduate Fellowship Honorable Mention, 1998, 1999.

**Reviewer:** Marine Ecology Progress Series; Biology Letters; Biological Conservation; Bulletin of Marine Science; Fish and Fisheries; North Pacific Research Board; Exxon Valdez Oil Spill Trustee Council; The Condor; Endangered Species Research, Ecosystems, Puget Sound Partnership

**Collaborators in the past 48 months:** Kerim Aydin, Janet Duffy-Anderson, Shannon Fitzgerald, Sarah Gaichas, Kirstin Holsman, Mary Hunsicker, Kristin Kleisner, Olav Ormseth, Ivonne Ortiz, Patrick Ressler, Jameal Samhuri, Mike Sigler, Paul Spencer, Eric Ward (NOAA); Miriam Doyle, George Hunt (U. Washington); Bill Sydeman, Mike Litzow (Farallon Institute); John Piatt (USGS); Heather Renner (USFWS); Marta Coll (UMR MARBEC); Kirsten Simonsen (National Research Council).