

Curriculum Vitae Andrew J. Pershing

Personal

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Education

2001 Ph.D., Ecology and Evolutionary Biology, Cornell University, Ithaca, NY
1995 Sc. B., Aquatic Biology, Brown University, Providence, RI

Awards and Honors

2014 Yentsch-Schindler Early Career Award, American Society of Limnologists and Oceanographers
1996 Department of Defense National Defense Science and Engineering Graduate Fellowship
1995 Honors in Aquatic Biology, Brown University

Present Position

Chief Scientific Officer Gulf of Maine Research Institute, Portland, ME (effective January 2, 2014)

Professional Experience

2010 – 2013 Associate Professor, School of Marine Sciences, University of Maine, Orono, ME and Research Scientist, Gulf of Maine Research Institute, Portland, ME
2006 – 2010 Research Assistant Professor, School of Marine Sciences, University of Maine, Orono, ME
2003 – 2006 Assistant Professor, Department of Earth and Atmospheric Sciences and Faculty of Computing and Information Science, Cornell University, Ithaca, NY
2002 – 2003 Research Associate, Department of Earth & Atmospheric Sciences, Cornell University, Ithaca, NY
2001 - 2002 Post-Doctoral Associate, Dr. Charles H. Greene, Ocean Resources & Ecosystems Program, Cornell University, Ithaca, NY
1999 - 2001 Graduate Research Assistant, Dr. Charles H. Greene, Ocean Resources & Ecosystems Program, Cornell University, Ithaca, NY
1995 - 1996 Graduate Research Assistant, Dr. Charles H. Greene, Ocean Resources & Ecosystems Program, Cornell University, Ithaca, NY

- 1994 Summer Intern, Cornell Biological Research Station, Oneida Lake, Bridgeport, NY
- 1992,1993 Undergraduate Research Assistant, Dr. Richard A. Wahle, Darling Marine Center, Walpole, ME
- Undergraduate Volunteer, Dr. Steve D. Gaines, Brown University, Providence, RI

Research Cruise Experience

- 1998 OC334 Cruise to the Gulf of Maine, Survey of the deep basins in the Gulf of Maine
- 1996 AL0607 Cruise to Georges Bank, GLOBEC Broadscale Sampling

Legislative Outreach

- 2012 Testimony on climate impacts on fisheries for “HR 6906 the Atlantic Fisheries Statues Reauthorization Act of 2012”U.S. House of Representatives Committee on Natural Resources Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs oversight hearing, Washington, DC, July 19, 2012

Professional Societies

- The American Geophysical Union
The Oceanography Society
The American Society of Limnologists and Oceanographers
The American Fisheries Society
The American Association for the Advancement of Science

Graduate Students

Karen Stamieszkin (Ph. D. expected 2015, UMaine), Hillary Scannell (M. S. expected 2014, UMaine), Dominic Fitzpatrick (M. S. expected 2013, UMaine), Nicholas Record (Ph. D., 2012, UMaine), Peter Stetson (M. S. 2011, UMaine), Daniel Pendleton (Ph. D. 2009, Cornell University)

Postdoctoral Scholars

Frederic Maps (2010-2011, now at Université Laval, Quebec, Canada), Sigrid Lehuta (2010-2012, now at IFREMER, Nantes, France), Carrie Byron (2010-2012, now at University of New England), Walter Golet (2010-2013, now at UMaine), Katherine Mills (2010-2013, now at UMaine)

Publications

- in prep Pershing, A. J., Annala, J. H., Eayrs, S., Kerr, L. A., Labaree, J., Mills, K. E., Runge, J. A., Sherwood, G. D., Sun, J. C., and Tallack Caporossi, S. The Gulf of Maine cod crisis: lessons and ways forward. *Frontiers in Ecology and the Environment*.
- in review Byron, C. J., Pershing, A. J., Stockwell, J. D., Xue, H., Kocik, J. Migration model of post-smolt Atlantic salmon (*Salmo salar*) in the Gulf of Maine. *Canadian Journal of Fisheries and Aquatic Sciences*.

- Pershing, A. J., Mills, K. E., Record, N. R., Stamieszkin, E., Wurtzell, K., Byron, C. J., Fitzpatrick, D., Golet, W., Koob, E. Trophic cascades are an unlikely driver of open ocean regime shifts. *Philosophical Transactions of the Royal Society London*
- in press Lehuta, S., Holland, D. S., Pershing, A. J. Investigating interconnected fisheries: A coupled model of the lobster and herring fisheries in the Gulf of Maine. *Canadian Journal of Fisheries and Aquatic Sciences*
- Maps, F., Record, N. R., Pershing, A. J. A metabolic approach to dormancy in pelagic copepods helps explaining inter- and intra-specific variability in life-history strategies. *Journal of Plankton Research*
- 2013 Bailey B. A., Pershing A. J. A Nonlinear model for predicting interannual changes in *Calanus finmarchicus* abundance in the Gulf of Maine. *Journal of Agricultural, Biological, and Environmental Statistics* 18:234-249
- Barton A. D., Pershing A.J., Litchman E., Record N.R., Edwards K.F., Finkel Z.V., Kiorboe T., Ward B.A. The biogeography of marine plankton traits. *Ecology Letters* 16:522-534
- Record N. R., Pershing A. J., Maps F. Emergent copepod communities in an adaptive trait-based model. *Ecological Modelling*. 260:11-24
- MERCINA (Greene, C. H., Meyer-Gutbrod, E., Monger, B. C., McGarry, L. P., Pershing, A. J., Belkin, I. M., Fratantoni, P. S., Mountain, D. G., Pickart, R. S., Proshutinsky, A., Ji, R., Bisagni, J. J., Hakkinen, S. M. A., Haidvogel, D. B., Wang, J., Head, E., Smith, P., Reid, P. C., and Conversi, A. Remote climate forcing of decadal-scale regime shifts in Northwest Atlantic shelf ecosystems. *Limnology and Oceanography*, 58(3), 2013, 803-816
- Mills K. E., Pershing, A. J., Brown, C. J., Chen, Y., Chiang, F., Holland, D. S., Lehuta, S., Nye, J. A., Sun, J. C., Thomas, A., Wahle, R. A. Fisheries management in a changing climate: lessons from the 2012 ocean heat wave. *Oceanography* 26(2), <http://dx.doi.org/10.5670/oceanog.2013.27>
- Mills K. E., Pershing, A. J., Sheehan, T. F., Mountain, D. G. Climate and ecosystem changes associated with North American Atlantic salmon population declines. *Global Change Biology*. doi: 10.1111/gcb.12298
- 2012 Pendleton DE, Cole TVN, Good C, Monger BC, Phillips S, Record NR, Sullivan PJ, Pershing AJ. Weekly estimates of North Atlantic right whale (*Eubalaena glacialis*) habitat quality in Cape Cod Bay and the Great South Channel. *Endangered Species Research* 18:147-161.
- Record NR, Pershing AJ, Maps F. First principles of copepod development explain a global biodiversity pattern. *Oecologia* 170:289-295
- Pershing AJ, Wahle RA, Meyers PC, Lawton P. Large-scale coherence in New England lobster settlement associated with regional weather. *Fisheries Oceanography* 21:348-362

- Maps F, Pershing AJ, Record NR. A generalized approach for simulating growth and development in diverse marine copepod species. *ICES Journal of Marine Science* 69:370-379
- Maps F, Runge JA, Leising A, Pershing AJ, Record NR, Plourde S, Pierson JJ. Modelling the timing and duration of dormancy in populations of *Calanus finmarchicus* from the Northwest Atlantic shelf. *Journal of Plankton Research* 34:36-54.
- MERCINA (Greene CH, Monger BC, McGarry LP, Connelly MD, Schnepf NR, Pershing AJ, Belkin IM, Fratantoni PS, Mountain DG, Pickart RS, Ji R, Bisagni JJ, Chen C, Hakkinen SMA, Haidvogel DB, Wiang J, Head E, Smith P, Conversi A) Recent Arctic Climate Change and Its Remote Forcing of Northwest Atlantic Shelf Ecosystems. *Oceanography* 25:208-213.
- 2010 Pershing AJ, Head, EHJ, Greene CH, Jossi JW. Pattern and scale of variability among Northwest Atlantic Shelf plankton communities. *Journal of Plankton Research* 32, 1675-1684
- Record NR, Pershing AJ, Jossi JW. Biodiversity as a dynamic variable in the Gulf of Maine continuous plankton recorder transect. *Journal of Plankton Research* 32, 1675-1684
- Pershing AJ, Christensen LB, Record NR, Sherwood GD, Stetson PB. The Impact of whaling on the ocean carbon cycle: why bigger was better. *PLoS One* 5: e12444.
- Record NR, Pershing AJ, Runge JA, Mayo CA, Monger BC. Improving ecological forecasts with genetic algorithms: an application to a copepod community model. *Journal of Marine Systems* 82, 96-110.
- Runge JA et al. (2010) Understanding climate impacts on recruitment and spatial dynamics of Atlantic cod in the Gulf of Maine: integration of observations and modeling. *Progress in Oceanography*, 87, 251-263.
- 2009 Pendleton DE, Pershing AJ, Brown MW, Mayo CA, Kenney RD, Record NR, Cole TVN Regional scale mean matters: mean copepod concentration indicates relative abundance of North Atlantic right whales. *Marine Ecology Progress Series* 378:211-225
- Pershing AJ, Record NR, Monger BC, Mayo CA, Brown MW, Cole TVN, Kenney RD, Pendleton DE, Woodard LA (2009) Model-based estimates of right whale habitat use in the Gulf of Maine. *Marine Ecology Progress Series* 378:227-243
- Pershing AJ, Record NR, Monger BC, Pendleton DE, Woodard LA (2009) Model-based estimates of *Calanus finmarchicus* abundance in the Gulf of Maine. *Marine Ecology Progress Series* 378:245-257
- Wanamaker Jr., A. D., K. J. Kreutz, B. R. Schöne, K. A. Maasch, A. J. Pershing, H W. Borns, D. S. Introne, and S. Feindell. A Late Holocene paleo-productivity record in the Gulf of Maine, USA inferred from growth

- histories of the long-lived ocean quahog (*Arctica islandica*). *International Journal of Earth Sciences* 98:19-29
- 2008 Greene, C. H. A. J. Pershing, T. M. Cronin, N. Ceci. Arctic climate change and its impacts on the ecology of the North Atlantic. *Ecology* 89:S24-S38
- Record N. R., Pershing A. J. Modeling zooplankton development using the monotonic upstream scheme for conservation laws. *Limnology and Oceanography-Methods* 6:364-372
- Witman, J. D., M. Cusson, P. Archambault, A. Pershing, and N. Mieskowska. The Relation between productivity and species diversity in temperate-Arctic marine ecosystems. *Ecology* 89:S66-S80
- 2007 Greene, C. H. and A. J. Pershing. Climate-driven changes in Arctic Ocean outflow force ecosystem regime shift in NW Atlantic. *Science*. 315:1084-1085
- 2006 Redfern, J. V., M. C. Ferguson, E. A. Becker, K. D. Hyrenbach, C. Good, J. Barlow, K. Kaschner, M. F. Baumgartner, K. A. Forney, L. T. Balance, P. Fauchald, P. Halpin, T. Hamazaki, A. J. Pershing, S. S. Qian, A. Read, S. B. Reilly, L. Torres, F. Werner. Techniques for cetacean-habitat modeling: a review. *Marine Ecology Progress Series*. 310:271-295.
- 2005 Pershing, A. J., C. H. Greene, J. W. Jossi, Loretta O'Brien, Jon K. T. Brodziak, and B. A. Bailey. Interdecadal variability in the Gulf of Maine zooplankton community with potential impacts on fish recruitment. *ICES Journal of Marine Science*. 62: 1511- 1523
2004. MERCINA Working Group (Greene, C. H., A.J. Pershing,, B. C. Monger., M. C. Benfield, E. G. Durbin, M. C. Casas). Supply-side ecology and zooplankton population dynamics in the North Atlantic. *Oceanography*. 17:60-71
- Pershing, A.J., C.H. Greene, B. Planque, and J.-M. Fromentin. The influence of climate variability on North Atlantic zooplankton populations. *In Ecological Effects of Climatic Variations in the North Atlantic*. N.C. Stenseth, G. Ottersen, J. Hurrell, and A. Belgrano, editors. Oxford University Press
- Greene, C.H., and A.J. Pershing. Climate and the conservation biology of North Atlantic right whales: the right whale at the wrong time? *Frontiers in Ecology and the Environment*. 2: 29-34.
2003. Greene, C. H., A. J. Pershing, R. D. Kenney, and J. W. Jossi. Impact of climate variability on the recovery of endangered North Atlantic right whales. *Oceanography* 16:96-101
- Barton, A.D., C.H. Greene, B.C. Monger, and A.J. Pershing. Continuous plankton recorder survey phytoplankton measurements and the North Atlantic Oscillation: interannual to multidecadal variability in the Northwest Shelf, Northeast Shelf, and Central North Atlantic Ocean. *Progress in Oceanography* 58: 337-358.

- MERCINA Working Group (Greene, C. H., A. J. Pershing, A. Conversi, B. Planque, C. Hannah, P. C. Reid, J. Jossi, D. Mountain, D. Sameoto, E. Head, M. C. Benfield, P. C. Smith, P. H. Wiebe, and T. Durbin). Trans-Atlantic responses of *Calanus finmarchicus* populations to basin-scale forcing associated with the North Atlantic Oscillation. *Progress in Oceanography* 58: 301-312.
- Greene, C.H., and A.J. Pershing. The Flip-Side of the North Atlantic Oscillation and modal shifts in Slope-Water circulation. *Limnology & Oceanography*. 48:319-322.
- 2002 Drinkwater, K. F., A. Belgrano, A. Borja, A. Conversi, M. Edwards, C. H. Greene, G. Ottersen, A. J. Pershing, and H. Walker. The Response of marine ecosystems to climate variability associated with the North Atlantic Oscillation. *In The North Atlantic Oscillation: Climatic Significance and Environmental Impact*. J. W. Hurrell, Y. Kushnir, G. Ottersen, and M. Visbeck, editors. Geophysical Monograph Series Volume 134. pp. 211-234
- 2001 MERCINA Working Group (Pershing, A. J., C.H. Greene, C. Hannah, D.G. Mountain, D. Sameoto, E. Head, J. W. Jossi, M. C. Benfield, P. C. Reid, T. G. Durbin). Oceanographic responses to climate in the Northwest Atlantic. *Oceanography*. 14:76-82.
- Pershing, A. J. Response of Large Marine Ecosystems to Climate Variability: Patterns, Processes, Concepts, and Methods. Ph. D. Dissertation, Cornell University, Ithaca, NY.
- Pershing, A. J., P. H. Wiebe, J. P. Manning, N. J. Copley. Evidence for vertical circulation cells in the well-mixed area of Georges Bank and their biological implications. *Deep-Sea Res. II*, 48, 283-310.
- 2000 Greene, C.H., and A.J. Pershing. The response of *Calanus finmarchicus* populations to climate variability in the Northwest Atlantic: Basin-scale forcing associated with the North Atlantic Oscillation (NAO). *ICES Journal of Marine Science*, 57:1536-1544.
- 1998 Greene, C. H., P. H. Wiebe, A. J. Pershing, G. Gal, J. M. Popp, N. J. Copley, T. C. Austin, A. M. Bradley, R. G. Goldsborough, J. Dawson, R. Hendershott, and S. Kaartvedt . Assessing the distribution and abundance of zooplankton: a comparison of acoustic and net-sampling methods with D-BAD MOCNESS. *Deep-Sea Res. II*, 45, 1219-1238.

Conference Presentations

- 2013 Pershing A. J., Mills, K. E., Thomas, A. C., Wahle, R. A. Impact of the 2012 Ocean Heat Wave on Fish and Fisheries, Poster presentation at ICES Annual Science Meeting, September 22-26, Reykjavik, Iceland
- Mills, K. E., Pershing A. J., Sun, J. C. Supporting fisheries management under climate change: lessons from the 2012 ocean heat wave. Oral presentation at ICES Annual Science Meeting, September 22-26, Reykjavik, Iceland

- Pershing A. J., Mills, K. E., Impact of temperature changes on cod in the northwest Atlantic and projections for the future. Oral presentation at the ICES Gadoid Symposium, October 15-18, St. Andrews, NB.
- 2012 Pershing, A. J. Using climate variability to diagnose how marine ecosystems work and how they will change. Keynote lecture at Regional Association for Research on the Gulf of Maine Annual Meeting. Portsmouth, NH, October 9, 2012
- Pershing, A. J., W. Golet, N. R. Record. Complex linkages between herring abundance and body size and predator populations in the Gulf of Maine. American Fisheries Society Annual Meeting, August 20-24, Minneapolis, MN
- Pershing, A. J., N. R. Record, F. Maps, J. Carpenter. A Computational approach to copepod biogeography. AGU/ASLO/TOS Ocean Sciences Meeting, February 20-14, Salt Lake City, UT
- 2011 Record N. R., A. J. Pershing. Biodiversity dynamics in the Gulf of Maine pelagic zooplankton community. ASLO Annual Meeting, February 14-18, San Juan, Puerto Rico
- 2010 Pershing A. J. The Response of copepod communities to enhanced stratification. IMBER IMBIZO II Workshop, November 10-14 Crete, Greece.
- Pershing A. J. Impact of climate change on whales (and vice versa). AGU/ASLO/TOS Ocean Sciences Meeting, February 21-26, Portland, OR
- 2009 Pershing A. J. Predicting right whale distributions from space. NASA Joint Workshop on Biodiversity, Terrestrial Ecology and Related Applied Sciences. May 6-8, New York, NY
- Pershing A. J. Science in the ocean: finding, counting, and studying whales. National Science Teacher Association Annual Meeting, March 18-22, New Orleans, LA.
- Pershing A. J., C. H. Greene, E. Head. Response of Northwest Atlantic plankton communities to freshwater anomalies. GLOBEC Open Science Meeting, June 22-26, Victoria, BC Canada
- Pershing A. J., N. Record, D. Pendleton, B. Monger, C. Mayo, C. Chen. Towards operational estimates of copepod abundance and right whale distributions. RARGOM Gulf of Maine Symposium, October 5-9, St. Andrews, NB Canada
- Pershing A. J., The Impact of whales and whaling on atmospheric carbon dioxide concentrations. Society of Marine Mammalogists Biennial Meeting, October 12-16, Quebec, Canada
- Pershing A. J., D. Pendleton, N. Record, C. Mayo, C. Good, R. Leeney, T. Cole, B. Monger, C. Chen. Operational estimates of right whale habitat quality in Cape Cod Bay. Right Whale Consortium Meeting, November 17-18, New Bedford, MA.

- 2008 Pendleton D., A. J. Pershing, P. Sullivan, N. Record. Near realtime species distribution modeling of right whales in the Gulf of Maine. North Atlantic Right Whale Consortium Meeting, November 5-6, New Bedford, MA
- Pershing A. J. Influence of advection on *Calanus finmarchicus* abundance across multiple scales. Ecosystem Studies of Sub-Arctic Shelves Annual Meeting. September 15-17, Halifax, NS Canada
- Pershing A. J. Predicting right whale distributions from space. NASA Joint Workshop on Biodiversity, Terrestrial Ecology and Related Applied Sciences. April 28-May 2, College Park, MD
- Pershing, A J; Greene, C H; Head, E H Coherent response of Northwest Atlantic Shelf ecosystems to decadal climate variability. AGU/ASLO Ocean Sciences Meeting, March 2-7, Orlando, FL
- 2007 Pershing A. J. Model-based synthesis of environmental data for endangered species management. American Association for the Advancement of Science Annual Meeting. February 15-19, San Francisco, CA
- 2006 Pershing A. J. Towards an operational system to identify aggregations of foraging right whales using satellite data and models. Poster presentation NASA Joint Workshop on Biodiversity, Terrestrial Ecology and Related Applied Sciences. August 21-25, College Park, MD
- Pershing A. J. Towards an operational system to identify aggregations of foraging right whales using satellite data and models. North Atlantic Right Whale Consortium Meeting, November 7-8, New Bedford, MA
- Pershing A. J. Remote forcing of marine ecosystem dynamics in the Gulf of Maine. Oral presentation at the North Atlantic Fisheries Organization Symposium on Environmental and Ecosystem Histories in the Northwest Atlantic, September 13-15, Halifax, NS Canada
- Pershing A. J. Evidence for bottom-up forcing of a regime shift in the NW Atlantic with implications for fisheries and endangered species. Oral presentation at the AGU/ASLO Ocean Sciences Meeting, February 20-24, Honolulu, HI.
- 2005 Pershing A. J. Response of NW Atlantic Shelf Ecosystems to basin-scale climate forcing. Poster presentation at the Gordon Research Conference on Coastal Ocean Circulation. June 5-10, New London, NH.
- 2004 Pershing A. J., B. C. Monger, C. Mayo, M. Bessinger, and J. Runge. Forecasting right whale distributions using satellite data: preliminary results and future plans. Oral presentation at the Right Whale Consortium Meeting, November 3-4, New Bedford, MA.
- Pershing, A. J., B. A. Bailey, L. O'Brien, J. K. T. Bordziak, C. H. Greene, and J. Jossi. Climate-based assessment and forecasting for ecosystems in the Gulf of Maine. Oral presentation at ICES Symposium on the Influence of Climate Change on North Atlantic Fish Stocks. May 11-14, Bergen, Norway.

- Pershing, A. J., B. A. Bailey, and C. H. Greene. Climate-based assessment and forecasting for ecosystems in the Gulf of Maine. Oral presentation at ASLO-TOS Ocean Research Conference. February 15-20, Honolulu, HI.
- 2003 Pershing, A. J. A Simple system for biological data assimilation: preliminary results and future plans. Poster presentation at Gordon Research Conference on Coastal Ocean Modeling. June 22-27, New London, NH.
- 2002 Pershing, A. J. and C. H. Greene. 2002. Climate, copepods, and calves: predicting physical and biological responses to climate variability in the NW Atlantic. Invited presentation at the AGU/ASLO Ocean Sciences Meeting, February 11-14, Honolulu, HI.
- 2001 Pershing, A. J. and C. H. Greene. 2001. Climate, copepods, and calves: linking right whale reproduction to physical and biological conditions in the NW Atlantic. Oral presentation at the Right Whale Consortium Meeting, October 25-26, Boston, MA.
- 2000 Pershing, A. J. 2000. Evaluating mechanisms linking *Calanus finmarchicus* variability on the NW Atlantic Shelf to NAO-Induced Changes in the Slope Water Sea. Poster presented at AGU Chapman Conference on the North Atlantic Oscillation, November 28 –December 1, Orense, Spain.
- Pershing, A. J. and C. H. Greene. 2000. Long-term patterns in the abundance of *Calanus finmarchicus* in the Gulf of Maine associated with regional climate. Oral presentation at the Right Whale Consortium Meeting, October 26-27, Boston, MA.
- Pershing, A. J. and C. H. Greene. 2000. Impact of climate variability on the hydrography and ecology of the Northwest Atlantic Shelf. Invited presentation at the ASLO Aquatic Sciences Meeting. June 5-9, Copenhagen, Denmark.
- Greene C. H., and A. J. Pershing (presenter). 2000. The response of shelf ecosystems to climate variability in the northwest Atlantic: basin-scale forcing associated with the North Atlantic Oscillation. Oral presentation at the AGU/ASLO Ocean Sciences Meeting, January 24-28, San Antonio, TX.
- 1999 Pershing, A. J., 1999. MPquoddy: a portable, parallel, finite-element hydrodynamic model. Poster presented at the Gordon Research Conference on Coastal Ocean Modeling. June 20-25, New London, NH.
- 1997 Pershing, A. J., P. H. Wiebe, and N. J. Copley. 1997. Evidence for vertical circulation cells in the well-mixed region on Georges Bank. Poster presented at the ICES Annual Science Conference. September 25 – October 3, Baltimore, MD.

Invited Lectures

- 2013 The Science of forecasting. Gulf of Maine Research Institute Science Cafe, Portland, ME, May 2, 2013

- 2012 How will climate change impact the Northwest Atlantic? Climate Change Institute, University of Maine, Orono ME, November 30, 2012
- From physics to fish: how bottom up processes structure marine ecosystems in the NW Atlantic. Biodiversity Research Institute, Gorham, ME, April 13, 2012
- From physics to fish: how bottom up processes structure marine ecosystems in the NW Atlantic. University of Massachusetts Boston, Boston, MA, April 11, 2012
- Climate impacts on NW Atlantic Shelf ecosystems from physics to fish. University of New England, Biddeford, ME, March 6.
- 2011 Finding whales in a changing ocean. Maine Maritime Academy. Castine, ME, September 19.
- Understanding climate change and the climate change debate. Claremont Inn, Southwest Harbor, ME, August 4.
- Understanding climate change and the climate change debate. Gulf of Maine Research Institute, Portland, ME, February 10.
- 2010 An Investigation into the role of whales and large fish in the ocean carbon cycle. University of Maine, Orono, ME. April 2.
- 2009 Towards dynamic real-time predictions of zooplankton and whale distributions in the Gulf of Maine. Louisiana State University, Baton Rouge, LA. March 18.
- The Impact of Climate Change on Whales...and vice versa. Southern Maine Community College, South Portland, ME, February 24.
- From weather to whales: Connections between climate, plankton, and right whales in the Gulf of Maine. Marine Environment Research Institute, Blue Hill, ME, January 15.
- 2008 The Biology of Climate Change: The Big and the Small. Gulf of Maine Research Institute, Portland, ME, September 25.
- Operational zooplankton models: Applications for right whale conservation and ocean understanding. SUNY Stony Brook, Stony Brook, NY, April 18.
- Predicting right whale distributions from space. COSEE Teaching Workshop, University of New Hampshire, Durham, NH. July 8.
- 2007 From weather to whales: Combining oceanography and ecology to understand and manage endangered right whales in the Gulf of Maine. Presented at Bates College, September 24.
- Right whale, wrong time? A whale's eye view of the changing Gulf of Maine. Presented at Shoals Marine Lab on August 7.
- Right whale, wrong time? A whale's eye view of the changing Gulf of Maine. Presented at the Sandy Bay Yacht Club on July 12.

- Right whale, wrong time? A whale's eye view of the changing Gulf of Maine. Presented at the Gulf of Maine Research Institute's "Sea State 2.0" Seminar Series, on April 12.
- Climate impacts on the Gulf of Maine. Presented at the Maine Fishermen's Forum, Rockland, ME on March 3.
- 2006 Right whale, wrong time? A Whale's eye view of the Gulf of Maine. Presented at the Gulf of Maine Research Institute, Portland, ME, September 14.
- Right whale, wrong time? A Whale's eye view of the Gulf of Maine. Presented at the Proutts Neck Yacht Club, Proutts Neck, ME, July 26.
- Right whale, wrong time? Saving the whales one byte at a time. Presented at the Museum of the Earth's "Natural History at Noon" seminar series, Ithaca, NY, March 4.
- 2005 Describing the past and predicting the future of the Gulf of Maine ecosystem. Presented at the Virginia Institute of Marine Science December 8.
- Describing the past and predicting the future of the Gulf of Maine ecosystem. Presented at the University of Maine, Orono, ME, November 22.
- Describing the past and predicting the future of the Gulf of Maine ecosystem. Presented at the Gulf of Maine Research Institute, Portland, ME, November 21.
- Climate, copepods, and calves: Enhancing ecosystem-based management through observing system data. Presented at the Gulf of Maine Ocean Observing System Board of Directors Meeting, Portland, ME, June 22.
- Right Whales, Wrong Time? Ecosystem Variability in the Gulf of Maine and the Fate of the Northern Right Whale. Presented at Brown University, Providence, RI on March 14.
- Right Whales, Wrong Time? Ecosystem Variability in the Gulf of Maine and the Fate of the Northern Right Whale. Presented at the University of Rhode Island Graduate School of Oceanography, Narragansett, RI on March 7.
- Response of the Gulf of Maine to North Atlantic Climate. Presented at the Maine Fishermen's Forum, Rockland, ME on March 5.
- The fate of the Northern right whale in a changing environment. Presented at the University of Southern Maine, Portland ME. February 11.
- 2004 Zooplankton informatics: using operational oceanography to save the whales. Presented at the Monterey Aquarium Research Institute, Moss Landing, CA. August 4.

Ecosystem variability and the northern right whale: Saving the whales, one byte at a time. Presented at the University of Maine, Orono, ME. March 22.

2003 Building knowledge from oceanographic data: formal approaches to observational science. Presented at Bodega Marine Laboratory, Bodega Bay, CA and the University of California at Davis, Davis, CA. 18 and 20 November.

Formal approaches to operational oceanography: examples from the Gulf of Maine. Presented at the Bigelow Laboratory for Ocean Science, Boothbay Harbor, ME. October 13.

2002. Responses of Marine Ecosystems to Climate Variability and change. Presented at Cornell University, Ithaca, NY. September 19.

Grants and Contracts

Pending Funding Agency: NOAA
Title: Using the American Lobster Settlement Index and Environmental Indicators to Forecast Lobster Fishery Recruitment
Principal Investigators: Wahle, R. A., Pershing, A. J., Jacobson, L.
Award Amount: \$\$136,930
Project Duration: June 1, 2014—May 31, 2016

Current Funding Agency: National Science Foundation
Title: Coastal SEES (Track 2), Collaborative Research: Resilience and Adaptation of a Coastal Ecological-Economic System in Response to Increasing Temperature
Principal Investigators: Pershing, A. J. , Mills, K. E., Chen, Y., Wahle, R. A., Thomas, A., Nye, J., Sun, J., Chiang, F., and Holland, D.
Award Amount: \$1,185,026
Project Duration: September 1, 2013—August 31, 2017 Funding Agency:

Funding Agency: Lenfest Ocean Foundation
Title: Body Size and Resiliency: Are Bigger Fish Better?
Principal Investigators: Pershing, A. J., G. D. Sherwood, W. Golet.
Award Amount: \$215,000
Project Duration: August 1, 2011—July 31, 2014

Funding Agency: NOAA through CINAR
Title: Impact of oceanographic changes on Atlantic salmon survival in the Northwest Atlantic
Principal Investigators: Pershing, A. J., D. G. Mountain, H. Xue, J. Stockwell.
Award Amount: \$396,940
Project Duration: August 1, 2010—July 31, 2013

Funding Agency: NOAA/NSF CAMEO
Title: Using interdecadal comparisons to understand trade-offs between abundance and condition in fishery ecosystems

Principal Investigators: Pershing, A. J., J. A. Runge, G. D. Sherwood, J. Stockwell, J. Hare, M. Lutcavage, W. Golet, R. Tian.
Award Amount: \$482,761
Project Duration: July 1, 2010—June 30, 2013

Funding Agency: National Science Foundation
Title: Understanding copepod life-history and diversity using a next-generation zooplankton model
Principal Investigators: Pershing, A. J. and F. Maps
Award Amount: \$490,670
Project Duration: March 1, 2010—February 28, 2013

Past Funding Agency: National Science Foundation
Title: Collaborative Research: Direct and Indirect Coupling of Fisheries Through Economic, Regulatory, Environmental, and Ecological Linkages.
Principal Investigators: Holland, D., Y. Chen, J. Grabowski, G. Herrera, L. Incze, , A. J. Pershing J. Runge, G. Sherwood
Award Amount: \$383,851 (U. Maine)
Project Duration: September 1, 2007—August 31, 2012

Funding Agency: Maine Department of Marine Resources
Title: Abundance and distribution of *Calanus finmarchicus* in Maine coastal waters
Principal Investigators: Runge, J. A. and A. J. Pershing
Award Amount: \$106,394
Project Duration: July 1, 2008—June 30, 2009

Funding Agency: National Science Foundation
Title: Collaborative Research: Life histories of species in the genus *Calanus* in the North Atlantic and North Pacific Oceans and responses to climate forcings
Principal Investigators: J. Runge, D. G. Kimmel, J. J. Pierson, A. J. Pershing
Award Amount: \$278,168 (U. Maine)
Project Duration: September 1, 2008—August 31, 2011

Funding Agency: Maine Oil Spill Advisory Committee
Title: Shore-based Photogrammetry of Surface Oceanography for Oil Spill Mitigation
Principal Investigators: Pershing, A. J., N. Record, A. Thomas
Award Amount: \$85,197
Project Duration: February 1, 2008—January 31, 2010

Funding Agency: National Aeronautics and Space Administration
Title: Lobster settlement forecasting in the Gulf of Maine
Principal Investigators: Thomas, A., A. J. Pershing, H. Xue, Y. Chen, R. Wahle

Award Amount: \$777,230
Project Duration: March 1, 2008 - February 28, 2010

Funding Agency: National Aeronautics and Space Administration
Title: Predicting Right Whale Distributions from Space: An Operational System for Marine Ecosystem Modeling
Principal Investigators: Pershing, A. J., B. C. Monger, S. Mayo, C. W. Clark, J. Gehrke, C. Chen.
Award Amount: \$777,230
Project Duration: April 1, 2007 - March 31, 2009

Funding Agency: National Aeronautics and Space Administration
Title: Predicting Right Whale Distributions from Space: An Operational System for Marine Ecosystem Modeling
Principal Investigators: Pershing, A. J., B. C. Monger, S. Mayo, C. W. Clark, J. Gehrke, C. Chen.
Award Amount: \$330,000
Project Duration: January 15, 2006 - January 14, 2007

Funding Agency: National Science Foundation
Title: US-GLOBEC: NWA/Georges Bank - Marine Ecosystem Responses to Climate-Associated Remote Forcing from the Labrador Sea
Principal Investigators: Greene, C. H., A. J. Pershing
Award Amount: \$251,420
Project Duration: October 1, 2005—September 30, 2007

Funding Agency: National Oceanic and Atmospheric Administration, Right Whale Grants Program
Title: An Operational System to Estimate Right Whale Feeding Areas From Satellite Data
Principal Investigators: Pershing, A. J., B. C. Monger, S. Mayo, M. Brown, J. Runge
Award Amount: \$341,559
Project Duration: September 1, 2003 - August 31, 2006 (extended by one year)

Funding Agency: National Science Foundation
Title: ITR: A Computational Framework for Observational Science: Data Assimilation Methods and their Application for Understanding North Atlantic Zooplankton Dynamics
Principal Investigators: Pershing, A. J.,
Award Amount: \$478,532
Project Duration: September 1, 2003 - August 31, 2008

Funding Agency: National Oceanic and Atmospheric Administration, Coastal Ocean Program
Title: SYNTHESIS: Climate-Based Forecasts Of The Gulf Of Maine Ecosystem

Principal Investigators: Pershing, A. J., C. H. Greene, B. A. Bailey, Jon K. T. Brodziak, Loretta O'Brien, and J. W. Jossi.

Award Amount: \$350,546

Project Duration: September 1, 2002 - August 31, 2004

Funding Agency: National Oceanic and Atmospheric Administration,
Coastal Services Center

Title: A Regional Association Project to Observe Ocean Climate in the Gulf of Maine in Support of Marine Resource Management: A Sentinel Buoy in the Northeast Channel with Predictive Tools for Shrimp Stocks and Marine Mammals

Principal Investigators: GoMOOS (A. J., Pershing, Cornell representative)

Award Amount: \$31,803 (Cornell Subcontract)

Project Duration: October 1, 2003 - September 30, 2004

Funding Agency: Northeast Consortium (NOAA)

Principal Investigators: Pershing, A. J., C. H. Greene, and B. C. Monger.

Title: Right whales, *Calanus* and climate: understanding the distribution and abundance of right whales relative to their prey.

Award Amount: \$210,756

Project Duration: June 1, 2001 - May 31, 2003.

Funding Agency: Department of Defense

Title: National Defense Science and Engineering
Predoctoral Fellowship

Principal Investigators: Pershing, A. J., and C. H. Greene

Project Duration: August 1, 1996 – July 31, 1999

Award Amount: \$86,352

Workshops and Panels

- 2010 US GLOBEC Pan-Regional Synthesis Workshop on Arctic Climate Influences on North Atlantic Ecosystems. Portland, OR. February 20-21.
- 2009 Gulf of Maine Area Expert Group on Upper Trophic-Level Predators. Portland, ME. February 17-18
- Island Institute Climate Change Science Advisory Panel. Rockland, ME. January 15.
- 2008 Predicting Right Whale Distributions from Space. NOAA Workshop to Identify and Assess Technologies to Reduce Ship Strikes of Large Whales. Providence, RI. July 8-10
- Ecosystem Based Management: a scientist's perspective. Marine Resource Education Program, York Harbor, ME. February 7.
- 2007 NASA Applied Science Grant Review Panel. October 10-11, Greenbelt, MD
- University of Southern Maine Center for Law and Innovation's 'Climate Change in the Northwest Atlantic' Workshop. April 26-27, Portland, ME

- 2006 NOAA National Workshop on Passive Acoustics. April 11-13. Woods Hole, MA
- NOAA Fisheries Protected Species Stock Assessment Improvement Plan Tier III Workshop. March 7-10. Silver Spring, MD
- 2005 Regional Association for Research in the Gulf of Maine (RARGOM): Modeling Related to the Regional Observing System in the Gulf of Maine, July 6-7. Ogunquit, ME
- CORONA: Coordinating Research on the North Atlantic, July 20-23, Roscoff, France.
- Coastal circulation modeling around New England, March 6, Rockport, ME.
- 2004 CAFÉ: Climate-Based Assessment and Forecasting for Ecosystems in the Gulf of Maine. December 14-15, Boston, MA. (Organizer)
- SERDP Marine Mammal Modeling Experts' Workshop. June 7-9, Durham, NC
- Right Whale Foraging Ecology and Management Working Group. April 16, Woods Hole, MA.
- 2003 Environmental Controls on the Population Dynamics of Northern Shrimp in the Gulf of Maine and Gulf of St. Lawrence. December 12, Portland, ME
- Bioacoustic Oceanography Summer Course, Friday Harbor Laboratories, July 28-August 1, Friday Harbor, WA. (Instructor for visualization and data processing)
- CORONA: Coordinating Research on the North Atlantic, August 10-13, Reykjavik, Iceland. (Member of Scientific Steering Committee)
- CAFÉ: Climate-Based Assessment and Forecasting for Ecosystems in the Gulf of Maine. June 5-6, Woods Hole, MA. (Organizer)
- GoMOOS Working Group on Zooplankton Monitoring in the Gulf of Maine. April 16-17, Boston, MA.
- 2002 CORONA: Coordinating Research on the North Atlantic. Shoals Marine Laboratory, August 20-23, Appledore Island, ME. (Member of Scientific Steering Committee)
- NATO Advances Summer Institute on Data Assimilation for the Earth System. May 19-31, Aquafredda, Italy.
- GLOBEC: Response of Large Marine Ecosystems to Climate Variability (NAO/PDO). February 15-17, Honokaa, HI.,.
- 2001 Norwest Atlantic Ecosystems (NORWATE) Meeting. June 20-22, Halifax, NS Canada.,.
- 1999 NASA Summer School for High-Performance Computing in the Earth and Space Sciences; July 12-30, Goddard Space Flight Center, Greenbelt, MD.,.

- 1998 GLOBEC Scientific Investigators Workshop; University of New Hampshire, Durham, NH.
Bioacoustical Oceanography Workshop V; University of New Hampshire, Durham, NH.
- 1996 GLOBEC Scientific Investigators Workshop; University of New Hampshire, Durham, NH.
Cornell Theory Center Workshop on Parallel Programming the IBM SP2 Using MPI; Cornell University, Ithaca, NY.
Bioacoustical Oceanography Workshop III; University of California, Santa Cruz, Santa Cruz, CA.
- 1995 Bioacoustical Oceanography Workshop II; University of California, Santa Cruz, Santa Cruz, CA.

Teaching Experience

- 2007-2013 School of Marine Sciences 354: *Thinking About the Ocean: A Question-based Approach to Learning Marine Science*, University of Maine, Orono ME, Instructor
- 2006 Earth and Atmospheric Science 494: *Theories and Models of Marine Ecosystems*, Cornell University, Ithaca NY, Instructor.
- 2004-2006 Earth and Atmospheric Science 150/ Computing and Information Science 122: *Application of FORTRAN in the Earth and Atmospheric Sciences*, Cornell University, Ithaca NY, Instructor.
- 2002-2005 Cornell Freshman Reading Project, Cornell University, Ithaca, NY, Facilitator
- 2001-2005 Computer Science 401: *Applied Scientific Computing with MATLAB*, Cornell University, Ithaca NY, Instructor.
Computer Science 402: *Scientific Visualization with MATLAB*, Cornell University, Ithaca NY, Instructor.
- 2002-2003 Computer Science 403: *Development of Scientific Computing Programs*, Cornell University, Ithaca NY, Instructor.
Computer Science 404: *Survey and Use of Software Libraries for Scientific Computing*, Cornell University, Ithaca NY, Instructor.
- 2000 Geological Sciences 204: *Advanced Oceanography Laboratory*, Cornell University, Ithaca NY, Teaching Assistant.
- 1997 Soil, Crop, and Atmospheric Sciences 331: *Climate Dynamics*, Cornell University, Ithaca NY, Teaching Assistant.
- 1996 Geological Sciences 104: *Introduction to Oceanography*, Cornell University, Ithaca NY, Teaching Assistant.
- 1995 Biology 20: *Foundations of Living Systems*, Brown University, Providence, RI, Teaching Assistant.

1992, 1994 Biology 19a: *The Life of Birds*, Brown University, Providence RI,
Teaching Assistant.