

Heather Joan Lynch

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Education

Harvard University Cambridge, MA Ph.D. Organismic and Evolutionary Biology Thesis: Spatiotemporal dynamics of insect-fire interactions	Jan. 2003-Nov. 2006
Harvard University Cambridge, MA A.M. Physics	March 2004
Princeton University Princeton, NJ A.B. Physics (<i>summa cum laude</i>) with certificate in Materials Science Engineering	May 2000

Employment

Associate Professor (Ecology & Evolution) Joint Faculty of the Institute for Advanced Computational Science	Stony Brook University	Sept. 2016 – 2017 –
Affiliated Faculty of the Institute for AI-Driven Discovery and Innovation (2018 –) Affiliated Faculty of the School of Marine and Atmospheric Sciences (2013 –) Affiliated Faculty in the Department of Applied Math and Statistics (2018 –) Affiliated Faculty of the Institute for Advanced Computational Science (2014 –2017)		
Data Science Advisor, ProPublica (2018 –)		
Assistant Professor (Ecology & Evolution)	Stony Brook University	Aug. 2011 – 2016
Research Associate (Applied Math and Statistics)	University of California, Santa Cruz	Dec. 2010 – July 2011
Assistant Research Scientist (Biology) Senior Research Fellow	University of Maryland, College Park Oceanites, Inc.	Feb. 2008 – July 2011
Postdoctoral Research Associate (Biology)	University of Maryland, College Park	Nov. 2006 – Feb. 2008

Grants & Awards

2019-2020: (PI) Pew Foundation “Chinstrap status assessment, 2019-2020” (Total budget: \$48,200)

2019-2020: (co-PI) State University of New York Conversations in the Disciplines “Interpretable Artificial Intelligence: Across the Disciplines” (Total budget: \$2,600) (co-PIs: Jeffrey Heinz [Lead], Il Memming Park, Christian Luhmann, Stony Brook University)

2019: (PI) National Geographic AI for Earth “Coupling AI with predictive modeling for real-time tracking of Antarctic penguin populations” (Total budget: \$95,696) (co-PI: Dimitris Samaras, Stony Brook University)

2018: (PI) Alfred P. Sloan Foundation “The Ecological Forecasting Initiative: An Interdisciplinary Conference” (Total budget: \$50,000) (Additional PIs: Michael Dietze, Boston University)

2017-2020: (PI) NSF EarthCube “Collaborative Research: ICEBERG: Imagery Cyberinfrastructure and Extensible Building-Blocks to Enhance Research in the Geosciences” (Total budget: \$1,815,860; Stony Brook University budget \$632,179) (Lead PI: Heather Lynch; Additional PIs: Shantenu Jha [Rutgers], Vena Chu [UC Santa Barbara], Mark Salvatore [Northern Arizona University], Michael Willis [UC Boulder])

2016-2020: (co-PI) NSF NRT-DESE “Interdisciplinary Graduate Training to Understand and Inform Decision Processes Using Advanced Spatial Data Analysis and Visualization” (\$2,993,930) (Lead PI: Robert Harrison; Additional PIs: Minghua Zhang, Arie E. Kaufman, Liliana Davalos Alvarez)

2015-2017: (PI) NSF EarthCube “Collaborative Research: Research Coordination Network for High-Performance Distributed Computing in the Polar Sciences” (Total budget \$300,000; Stony Brook University budget \$27,326) (Lead PI: Shantenu Jha [Rutgers]; Additional PIs: Lynn Yarmey [Colorado] and Jaroslaw Nabrzyski [Notre Dame])

2015-2016: (PI) Brookhaven National Lab/Stony Brook University SEED Grant 2015: “Three-dimensional structure and function for ecological monitoring using unmanned-aerial systems and computer vision” (Total budget \$41,561; Stony Brook University budget \$33,552) (Co-I: Shawn Serbin, Brookhaven National Lab)

2015-2018: (PI) NASA ROSES Program Element A.36 Earth Science Applications Phase II award (No. NNX14AC32G): “Bayesian Data-Model Synthesis for Biological Conservation in Antarctica” (Total budget \$630,651; Stony Brook University budget \$395,475) (Co-I: Mathew Schwaller NASA Goddard)

2014-2017: (PI) NSF Office of Polar Programs (No. 1341440): “Phytoplankton Phenology in the Antarctic: Drivers, Patterns, and Implications for the Adélie Penguin” (Collaborative proposal with Woods Hole Oceanographic Institution, University of Alaska Fairbanks, and the National Snow and Ice Data Center; Total budget \$938,950; Stony Brook University budget \$108,017)

2014-2016: (Collaborator) Dalio Explore Fund: The Danger Islands Expedition: A Multi-scale Study of Remote Penguin Supercolonies (\$419,804)

2014: Block scholarship from the National Outdoor Leadership School to support four Ph.D. students taking a summer course in glacier mountaineering (\$8,000)

2014: (PI) NASA ROSES Program Element A.36 Earth Science Applications Phase I award (No. NNX14AC32G): “Bayesian Data-Model Synthesis for Biological Conservation in Antarctica” (Total budget \$170,605; Stony Brook University budget \$113,120) (Co-I: Mathew Schwaller NASA Goddard)

2013-2018: (PI) NSF CAREER Award in Office of Polar Programs & Geography and Spatial Sciences (No. 1255058): “The use of quantitative geography to predict population tipping points for colonial seabirds” (\$782,840)

2013: (PI) UK Foreign and Commonwealth Office British Antarctic Territory for “Improving estimates of penguin abundance and trends in the British Antarctic Territory for the benefit of conservation and fisheries management” (\$41,317)

2012: Travel award to attend the 2012 Scientific Committee for Antarctic Research (SCAR) Open Science Conference in Portland, Oregon (\$1,000)

2008-2013: (Co-PI) NSF Award in Office of Polar Programs (No. 0739515) for “Multispecies, Multiscale Investigations of Longterm Changes in Penguin and Seabird Populations on the Antarctic Peninsula” (\$476,608)

2010: (PI) Mia J. Tegner Memorial Research Grant in Marine Environmental Sciences (\$10,000)

Honors & Distinctions

2019 Blavatnik Laureate for Young Scientists in the category of Life Sciences, administered by the New York Academy of Sciences (\$250,000 unrestricted prize)

2014 Ecological Society of America Early Career Fellow

2006 Certificate of Distinction in Teaching (Harvard University)

2005 Interdisciplinary Graduate Education and Research Training Fellow (Biomechanics)

2005 Howard T. Fisher Prize for Excellence in GIS

2000 American Physical Society Leroy Apker Award for “A Kondo Box: Coulomb Blockade and the Kondo Effect in Iron-doped Copper Nanoparticles” (awarded to the best undergraduate physics thesis from a Ph.D. granting institution in the United States)

2000 Allen Goodrich Shenstone Prize for outstanding work in experimental physics/Princeton University

2000 Lucent Technologies Graduate Research Program for Women Fellowship (accepted; 2000-2004)

2000 National Science Foundation Graduate Research Fellowship

2000 National Defence Science and Engineering Graduate Fellowship

2000 Phi Beta Kappa

2000 Sigma Xi

Press Coverage and Media Appearances

Film

- “The Penguin Counters” (2017)

Television

- Nature’s Strangest Mysteries: Solved (Season 1, Episode 3) *Animal Planet* (May 18, 2019)
- BBC News interview (April 25, 2019)
- “Antarctic penguins have existed for 60 million years. Can they survive climate change?” *PBS Newshour* (April 3, 2019)
- CBS News interview (March 8, 2018)
- CTV News interview (March 5, 2018)
- “Counting penguins: What penguins in Antarctica might be telling us about climate change” *NBC’s Sunday Night with Meghan Kelly* (June 25, 2017)

Radio

- “Antarctica needs humans to protect it. It also need humans to stay away. What’s a potential visitor to do?” *WPRI’s The World* (June 11, 2018)
- “Should tourists go to Antarctica?” *WHYY’s The Pulse* (February 22, 2018)
- *BBC5* radio interview (November 2, 2016)

Print (partial list)

- Climate Change? “Meh,” Say Gentoo Penguins *Scientific American* (July 25, 2019)
- Interview *New York Times* Kids section (April 28, 2019)
- “Holy Tuxedo! It’s a Penguin-palooza!” *Discover Magazine* (December 2018) [Featured as one of the top science stories of 2018]
- “The Big Meltdown” *National Geographic* (November 2018) [Provided extensive scientific guidance for the story, as well as data used in the article’s maps and graphics.]
- “Counting penguins isn’t black and white” *Wall Street Journal* (November 3, 2018)
- “There’s a penguin colony so large you can see it from space” *New York Post* (March 5, 2018)
- “A Supercolony of Penguins Has Been Found Near Antarctica” *New York Times* (March 5, 2018)
- “Secret Penguin Supercolony Discovered on Danger Islands” *Popular Mechanics* (March 3, 2018)
- “The Secret Is Out: Scientists Spot Penguin ‘Super-Colony’ in Antarctica” *Wall Street Journal* (March 3, 2018)
- “Penguin supercolony spotted from space” *BBC* (March 3, 2018)
- “Penguin City” *National Geographic Kids* (January 2017)
- “Antarctica’s penguins could be decimated by climate change” *Washington Post* (June 30, 2016)
- “As Antarctic ice shrinks from climate change, will Adélie penguins disappear?” *Christian Science Monitor* (June 29, 2016)
- “Should tourists be banned from Antarctica?” *BBC News* (January 11, 2015)
- “One, Two, 3.79 million: How many penguins are there?” *Audubon Magazine* (August 21, 2014)
- “Adélie penguin census shows seabirds are thriving” *Wall Street Journal* (July 10, 2014)
- “Why some penguins thrive in climate change” *ABCNews* (July 7, 2014)
- “Emperor penguins may be moving due to climate change, study finds” *CBSNews* (June 24, 2014)
- “Breeding penguins vanishing from Antarctic island” *NBCNews* (September 4, 2012)
- “March of the tourists” *Mother Jones* (July/August 2008)

Expert Workshops & Working Groups

EarthCube Early Career Strategic Visioning Workshop (Carnegie Institution for Science, Washington, D.C., October 16-17, 2012)

Working Group (John Wesley Powell Center for Analysis and Synthesis, Fort Collins, CO, July 2012 – July 2014) / Topic: Modeling species response to environmental change: development of integrated, scalable Bayesian models of population persistence

Expert Workshop (National Socio-Environmental Synthesis Center, Annapolis, MD, July 2012) / Topic: Visualization Technologies to Support Research on Human - Environment Interactions

Expert Workshop (Galapagos Islands, June 2012) / Topic: Leveraging citizen science for conservation and management of the Galapagos Islands

Expert Workshop (Dessau, Germany, May 2012) / Topic: Census of penguins by remote sensing

Professional Service

Co-Organizer of the Ecological Forecasting Initiative 2019 Conference (May 13-15, 2019 in Washington, DC)

NASA Biological Diversity and Ecological Forecasting Working Group (2018-)

Organized Software Carpentry and HPC course for Polar 2018 Conference (Davos, Switzerland, June 16-18, 2018)

NASA Ames Research Center Non-Advocate Review Panel (2018)

Organized Software Carpentry course and Polar Science Hackathon (Stony Brook University, August 1-4, 2017)

Organized the Polar Science Hackathon at XSEDE17 (Miami, Florida, July 18-21, 2016)

Organized the Polar+Cyberinfrastructure Expert Workshop (Polar Geospatial Center, St. Paul, Minnesota, June 2-3, 2016)

Editorial Board for Scientific Reports (2016-2017)

Delegate for the Antarctic and Southern Ocean Coalition (ASOC) at the XXXVII Antarctic Treaty Consultative Meeting in Brasilia, Brazil (April 2014).

Faculty member, Population Ecology Section, Faculty of 1000 (2011-2015)

Book review consultant for the Quarterly Review of Biology (2011-2015)

Science and Operations Committee (2018- ongoing) of the University of Minnesota's Polar Geospatial Center (Committee Chair)

Science and Operations Committee (2011-2013) of the University of Minnesota's Polar Geospatial Center

Steering Group of the Commission for the Conservation of Antarctic Marine Living Resources' (CCAMLR) Krill Predator Workshop held June 16-20, 2008 in Hobart, Australia.

Reviewer for American Naturalist, Animal Conservation, Auk, Biological Conservation, Biodiversity and Conservation, CCAMLR Science, Diversity, Diversity and Distributions, Ecography, Ecological Applications, Ecology, Ecology & Evolution, Environmental Management, Global Change Biology, Journal of Field Ornithology, Landscape Ecology, Limnology and Oceanography, Marine Biodiversity Records, Marine Ecology Progress Series, Marine Policy, Methods in Ecology and Evolution, Nature Climate Change, PLoS ONE, Polar Biology, Polar Research, Population Ecology, Quarternary Science Reviews, Remote Sensing of Environment, and the Wilson Journal of Ornithology.

Proposal reviewer for the National Science Foundation's Office of Polar Programs in 2011, 2013, 2015, and 2018.

Proposal reviewer for the Deutsche Forschungsgemeinschaft (German Research Foundation) in 2013.

Proposal reviewer for the Einstein International Postdoctoral Fellowship for Junior Research groups (Germany) in 2019.

University Service

College of Arts and Sciences Departmental Self-Assessment Review Panel (Spring 2018)

Research Computing Committee (Spring 2018)

Ad hoc committee to streamline PTC processes (Spring 2018)

Streamlining Research Productivity (Procurement sub-committee) (Spring 2017)

AA/EEO Committee (Fall 2016)

Member of the Coordinating Committee for the School of Marine and Atmospheric Sciences' (SoMAS) M.A. in Marine and Conservation Policy (2013-2015).

Outreach, Public Lectures, and Community Service

Public presentation and panel discussion: National Geographic Explorer's Festival 2019 (June 11, 2019)

Judge for the North Fork TV Festival Script Competition (2019)

Public lecture: "How many Adélie penguins are there? And other mysteries solved by satellites". Cary Institute for Ecosystem Studies (February 8, 2019)

Public lecture: "How many Adélie penguins are there? And other mysteries solved by satellites". Stony Brook University Library STEM Speaker Series (September 18, 2018)

Public lecture: "The who, how, what, and where of life as a penguin: How studying both captive and wild populations of penguins in redefining normal". Linnean Society of New York (April 11, 2017)

Public lecture: "Antarctic penguins: What we know, how we know it, and what the future might hold". Aquarium of the Pacific (March 17, 2015)

Panel member: "Exploring Antarctica". Bruce Museum, Greenwich, CT (January 11, 2015)

Public lecture: "Penguins on the move". Jefferson's Ferry Retirement Community (January 6, 2015)

Public lecture: "Vocal communication among gentoo penguins and its role in new colony formation". Kansas City Zoo (November 21, 2013)

Co-taught a workshop on "Grant Writing" for the Association of Polar Early Career Scientists (APECS) Bristol, UK (August 31, 2013)

Seminar for the Simons Fellows summer students, Stony Brook University (July 30, 2013 & July 15, 2014)

Keynote speaker: Student research symposium Bellport High School, Brookhaven, NY (June 4, 2013)

Co-organizer of Polar Climate Change Research: A Workshop for Educators, a 1 day workshop for middle and high school science educators on polar science and technology. Wang Center, Stony Brook University (April 11, 2012)

Public lecture: "Penguins: Sentinels of climate change". Stony Brook University Living World Lecture Series (March 23, 2012)

Teaching Experience

Biometry (BEE 552)	Spring 2012-2018
Statistics and Data Analysis (BIO 211)	Fall 2013
Graduate seminar (BEE 693)	Spring 2014
Bayesian Statistics and Data Analysis (BEE 569)	Fall 2014, 2017
Antarctica's Heroic Age of Exploration (SSO 102)	Spring 2017

Mentoring & Advising

Ph.D. students advised (11):

- (1) Paula Casanovas (co-advised by Dr. William Fagan, graduated April 2013)
Title: "Novel approaches to studying biodiversity in remote areas: Distribution of lichens and penguins across the Antarctic Peninsula"
- (2) Philip McDowall (graduated May 2018)
Title: "Spatial dynamics of *Pygoscelis* penguin coloniality"
- (3) Casey Youngflesh (graduated December 2018)
Title: "Ecological change in the Southern Ocean – Insights from Antarctic seabirds"
- (4) Catherine Foley (graduated May 2019)
Title: "Long-term human impacts on sub-Antarctic ecosystems and mesopredator abundance"
- (5) Maureen Lynch (graduated May 2019)
Title: "Gentoo penguin behavioral ecology: Vocalizations, aggression, and stress within the colony"
- (6) Michael Schrimpf
- (7) Alex Borowicz (co-advised by Dr. Lesley Thorne)
- (8) Bento Goncalves
- (9) Rachael Herman
- (10) Emma Talis (Applied Math and Statistics)
- (11) Michael Wethington

M.S. students advised (1):

- (1) Noah Strycker (SoMAS)

Ph.D. student committees (13):

- (1) Michael McCann (E&E; graduated 2015)
- (2) Antonin Machac (E&E; graduated 2015)
- (3) Emily Rollinson (E&E; graduated 2016)
- (4) Benjamin Weinstein (E&E; graduated 2016)
- (5) Cecilia O'Leary (SoMAS; graduated 2018)
- (6) Sam Urmy (SoMAS; graduated 2017)
- (7) Jesse Wolfhagan (Stony Brook Anthropology)
- (8) Bilgecan Sen (E&E)
- (9) Lisa Prowant (E&E)
- (10) Kristjan Mets (E&E)
- (11) Jannet Vu (E&E)
- (12) Julia Stepanuk (E&E)
- (13) Yousef El-Laham (Electrical and Computer Engineering)

Additional thesis committees: Breann Ross (Hofstra University; MS thesis committee)

Ecology & Evolution M.A. students advised (4)

High school students advised (7):

- (1) Ryan Burke (Earl L. Vandermeulen High School; current attending Brown University) Summer 2013: "Using camera trap methods to study the reproductive success of penguins"
- (2) Will Engellenner (Smithtown East High School; current attending Northwestern University) Summer 2013: "A 15-year longitudinal study of the impact of marine ecotourism on Antarctic penguin populations"
- (3) Caroline Biondo (Earl L. Vandermeulen High School; currently attending the University of Virginia) Summer 2014: "Are stone stealing dynamics in a penguin colony consistent with predictions from game theory?"
- (4) Erin Burke (Earl L. Vandermeulen High School; currently attending Claremont McKenna College) Summer 2016: "Seabird life-history trade-offs and climate change resilience"
- (5) Reid Biondo (Earl L. Vandermeulen High School; currently attending the University of Virginia) Summer 2016 and 2017: "King- penguin population dynamics"
- (6) Andrea Dahl (Olathe North, Kansas City; currently attending Stanford University) Summer 2016: "Behavioral acoustics of gentoo penguins in captivity"
- (7) Sandeepna Eranki (Smithtown East High School) Summer 2018: "Egg laying contagion among Gentoo penguins"

Additional Academic Experience/Training

2014: National Socio-Environmental Synthesis Center (SESYNC) Summer Computational Institute

2006: Summer Institute at Duke University's Center on Global Change: Uncertainty and Variability in Ecological Inference, Forecasting, and Decision Making

2005: ENR-423: Regional Ecosystem Management: Science, Policy and Law

- Seminar course taught by William Clark and Jody Freeman at the J.F.K. School of Public Policy

2005: Park City Mathematics Institute graduate summer school in Mathematical Biology

Publications & Lectures

★ Indicates a Ph.D. student under my supervision, ✱ Indicates a postdoc or staff researcher under my supervision

Refereed Journals

- (66) ★Borowicz, A., ★H. Le, G. Humphries, G. Nehls, C. Höschle, V. Kosarev, and **H.J. Lynch**. 2019. Aerial-trained deep learning networks for surveying cetaceans from satellite imagery. *PLoS ONE* 14(10): e0212532.
- (65) ★Foley, C.M. and **H.J. Lynch**. 2019. Estimating the pre-exploitation population size of a historically harvested marine mammal. *In press at Conservation Biology*.
- (64) ★McDowall, P., and **H.J. Lynch**. 2019. When the "selfish herd" becomes the "frozen herd": Spatial dynamics and population persistence in a colonial seabird. *Ecology* 100(10): c02823.
- (63) ★Lynch, M.A., ★C. Youngflesh, N.H. Agha, M.A. Ottinger, and **H.J. Lynch**. 2019. No correlation found between tourism and the stress hormone measures in gentoo penguins on the Antarctic Peninsula. *Polar Biology* 42: 1299-1306.

- (62) ★Humphries, G.R.W., ★C. Che-Castaldo, P. J. Bull, G. Lipstein, A. Ravia, B. Carrión, T. Bolton, A. Ganguly, **H. J. Lynch**. 2018. Predicting the future is hard and other lessons from a population time series data science competition. *Ecological Informatics* 48: 1-11.
- (61) Schwaller, M.R., **H.J. Lynch**, A. Tarroux, and B. Prehn. 2018. A continent-wide search for Antarctic petrel breeding sites with satellite remote sensing. *Remote Sensing of Environment* 210: 444-451.
- (60) ★Borowicz, A., ★P. McDowall, ★C. Youngflesh, T. Sayre-McCord, G. Clucas, ★R. Herman, S. Forrest, M. Rider, M. Schwaller, T. Hart, S. Jenouvrier, M.J. Polito, H. Singh, and **H.J. Lynch**. 2018. Multi-modal survey of Adélie penguin mega-colonies reveals the Danger Islands as a seabird hotspot. *Scientific Reports* 3926. [#59 for Altmetric's Top 100 Stories for 2018]
- (59) ★Foley, C.M., T. Hart, and **H.J. Lynch**. 2018. King penguin populations increase on South Georgia but explanations remain elusive. *Polar Biology* 41(6): 1111-1122.
- (58) ★Schrimpf, M., R. Naveen, and **H.J. Lynch**. 2018. Population status of the Antarctic Shag (*Phalacrocorax [atriceps] bransfieldensis*). *Antarctic Science* 30(3): 151-159.
- (57) ★Youngflesh, C., S. Jenouvrier, J.T. Hinke, L. DuBois, J. St. Leger, W.Z. Trivelpiece, S.G. Trivelpiece, and **H.J. Lynch**. 2018. Rethinking 'normal': The role of stochasticity in the phenology of a synchronously breeding seabird. *Journal of Animal Ecology* 87(3): 682-690.
- (56) ★Che-Castaldo, C., S. Jenouvrier, ★C. Youngflesh, K. Shoemaker, ★G. Humphries, ★P. McDowall, L. Landrum, M. Holland, Y. Li, R. Ji, **H.J. Lynch**. 2017. Pan-Antarctic analysis aggregating spatial estimates of Adélie penguin abundance reveals robust dynamics despite stochastic noise. *Nature Communications* 8: 832.
- (55) ★Lynch, M.A., and **H.J. Lynch**. 2017. Variation in the ecstatic display call of the Gentoo Penguin (*Pygoscelis papua*) across regional geographic scales. *Auk* 134(4): 894-902.
- (54) ★McDowall, P., and **H.J. Lynch**. 2017. The importance of topographically correct null models for analyzing ecological point processes. *Ecology* 98: 1764-1770.
- (53) Chown, S.L., M.A. McGeoch, A. Terauds, C. Le Bohec, C. van Klaveren-Impagliazzo, J. Whittington, C. Brooks, S. Butchart, B.W.T Coetzee, B. Collen, P. Convey, K.J. Gaston, N. Gilbert, M. Gill, R. Höft, S. Johnston, M.C. Kennicutt II, H. Kriesell, Y. Le Maho, **H.J. Lynch**, M. Palomares, R. Puig-Marcó, P. Stoett. 2017. Antarctica and the Strategic Plan for Biodiversity 2011–2020. *PLoS Biology* 15(3): e2001656.
- (52) ★Humphries G.R.W., ★C. Che-Castaldo, R. Naveen, M. Schwaller, ★P. McDowall, ★M Schrimpf, **H.J. Lynch**. 2017. Mapping Application for Penguin Populations and Projected Dynamics (MAPPPD): Data and tools for dynamic management and decision support. *Polar Record* 53(2): 160-166.
- (51) ★Foley, C., ★M. Lynch, L. H. Thorne, and **H.J. Lynch**. 2017. Listing foreign species under the Endangered Species Act: A Primer for Conservation Biologists? *BioScience* 67(7): 627-637.
- (50) ★Youngflesh, C., S. Jenouvrier, Y. Li, R. Ji, D. G. Ainley, G. Ballard, C. Barbraud, K. Delord, K. M. Dugger, L. M. Emmerson, W. R. Fraser, J. T. Hinke, P. O'B. Lyver, S. Olmastroni, C. J. Southwell, S. G.

- Trivelpiece, W. Z. Trivelpiece, **H. J. Lynch**. 2017. Circumpolar analysis of the Adélie Penguin reveals the importance of environmental variability in phenological mismatch. *Ecology* 98(4): 940-951.
- (49) ★McDowall, P., and **H.J. Lynch**. 2017. Ultra-fine spatially-integrated mapping of habitat and occupancy using Structure-from-Motion. *PLoS ONE* 12(1): e0166773.
- (48) ★Lynch, M., ★C. Foley, L. H. Thorne, and **H. J. Lynch**. 2016. Improving the use of biological data in Antarctic management. *Antarctic Science* 28(6): 425-431.
- (47) Cimino, M.A., **H. J. Lynch**, V.S. Saba, and M.J. Oliver. 2016. Asymmetric response of Adélie penguins to Antarctic climate change. *Scientific Reports* 6:28785.
- (46) ★Witharana, C., and **H.J. Lynch**. 2016. An object-based image analysis approach for detecting penguin guano from very high spatial resolution satellite images. *Remote Sensing* 8(5): 375.
- (45) **Lynch, H.J.**, R. White, R. Naveen, A.D. Black, M.S. Meixler, and W.F. Fagan. 2016. In stark contrast to widespread declines along the Scotia Arc, a survey of the South Sandwich Islands finds a robust seabird community. *Polar Biology* 39: 1615-1625.
- (44) ★Witharana, C., M.A. LaRue, and **H.J. Lynch**. 2016. Benchmarking of data fusion algorithms in support of earth observation based Antarctic wildlife monitoring. *ISPRS Journal of Photogrammetry and Remote Sensing* 113: 124-143.
- (43) Levy, H., G. Clucas, A. Rogers, A.D. Leaché, K. Ciborowski, M. Polito, **H.J. Lynch**, M. Dunn, and T. Hart. 2016. Population structure and phylogeography of the Gentoo Penguin (*Pygoscelis papua*) across the Scotia Arc. *Ecology and Evolution* 6(6): 1834-1853.
- (42) ★Bender, N., K. Crosbie, and **H.J. Lynch**. 2016. Spatial patterns of tour ship traffic in the Antarctic Peninsula region: A twenty-year re-analysis. *Antarctic Science* 28(3): 194-203.
- (41) Trathan, P.N., **H.J. Lynch**, and W. Fraser. 2015. Changes in penguin distribution over the Antarctic Peninsula and Scotia Arc. Emerging Issues summary for the Antarctic Environments Portal [Peer reviewed, online only].
- (40) ★Casanovas, P.V., R. Naveen, S. Forrest, J. Poncet, **H.J. Lynch**. 2015. A comprehensive coastal seabird survey maps out the front lines of ecological change on the Western Antarctic Peninsula. *Polar Biology* 38:927-940.
- (39) LaRue, M., G. Kooyman, **H.J. Lynch**, and P. Fretwell. 2015. Emigration in emperor penguins: Implications for interpretation of long-term studies. *Ecography* 38:114-120.
- (38) Trathan, P. N., P. García-Borboroglu, D. Boersma, C.-A. Bost, R. J. M. Crawford, G. T. Crossin, R. J. Cuthbert, P. Dann, L. S. Davis, S. De la Puente, U. Ellenberg, **H.J. Lynch**, T. Mattern, K. Pütz, P. J. Seddon, W. Trivelpiece, B. Wienecke. 2015. Pollution, habitat loss, fishing, and climate change as critical threats to penguins. *Conservation Biology* 29(1): 31-41.
- (37) **Lynch, H. J.**, and M.R. Schwaller. 2014. Multi-sensor cross validation of Adélie penguin detection and abundance estimation. *PLoS ONE* 9(11): e113301.

- (36) **Lynch, H.J.**, J. Thorson, O. Shelton. 2014. Dealing with under- and over-dispersed count data in life history, spatial, and community ecology. *Ecology* 95(11): 3173-3180.
- (35) **Lynch, H.J.**, and M.A. LaRue. 2014. First global survey of Adélie penguin populations. *The Auk* 131(4): 457-466.
- (34) ★Casanovas, P.V., **H.J. Lynch**, and W.F. Fagan. 2014. Using citizen science to estimate lichen diversity. *Biological Conservation* 171: 1-8.
- (33) LaRue, M.A., **H.J. Lynch**, P. Lyver, K. Barton, D.G. Ainley, A.M. Pollard, W. Fraser, G. Ballard. 2014. Establishing a method to estimate Adélie penguin populations using remotely-sensed imagery. *Polar Biology* 37: 507-517.
- (32) Zipkin, E.F., J.T. Thorson, K. See, **H. J. Lynch**, E.H.C. Grant, Y. Kanno, R.B. Chandler, B.H. Letcher, J.A. Royle. 2014. Modeling structured population dynamics using data from unmarked individuals. *Ecology* 95: 22-29.
- (31) **Lynch, H.J.**, M. Rhainds, J. Calabrese, S. Cantrell, C. Cosner, and W.F. Fagan. 2014. How climate extremes - not means - define a species' geographic range boundary via a demographic tipping point. *Ecological Monographs* 84:131-149.
- (30) **Lynch, H.J.**, R. Naveen, ★P.V. Casanovas. 2013. Antarctic Site Inventory breeding bird survey data 1994/95-2012/13. *Ecology (Data Paper)* 94(11): 2653.
- (29) Fagan, W.F., Y. Pearson, E.A. Larsen, **H.J. Lynch**, J. Turner, H. Staver, A. Noble, S. Bewick, and E.E. Goldberg. 2013. Phylogenetic prediction of the maximum *per capita* rate of population growth. *Proceedings of the Royal Society B* 280: 20130523.
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Popular Writing and Published Correspondence

Dietze, M., and **H.J. Lynch**. 2019. Forecasting a bright future for ecology. Guest editorial for *Frontiers in Ecology and the Environment* 17(1): 3.

★Youngflesh, C., and **H.J. Lynch**. 2017. Black-swan events: Population crashes or temporary emigration? *PNAS* <https://doi.org/10.1073/pnas.1713621114>.

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Papers written on behalf of the United States and other countries for Antarctic Treaty Consultative Meetings

- Naveen, R., and **H.J. Lynch**. 2016. Report of Oceanites, Inc., Information Paper submitted by SCAR to the XXXIX Antarctic Treaty Consultative Meeting in Santiago, Chile.
- Naveen, R., ★N. Bender, and **H. Lynch**. 2016. Patterns of tourism in the Antarctic Peninsula region: A 20-year re-analysis., Information Paper submitted by the United States and IAATO to the XXXIX Antarctic Treaty Consultative Meeting in Santiago, Chile.
- Naveen, R., ★C. Foley, and **H. Lynch**. 2015. A methodology to assess site sensitivity at visitor sites: Progress report, Information Paper submitted by Australia, New Zealand, Norway, the United Kingdom, and the United States to the XXXVIII Antarctic Treaty Consultative Meeting in Sofia, Bulgaria.
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- Naveen, R., **H.J. Lynch**, and W. Fagan. 2011. Antarctic Site Inventory: 1994-2011, Information Paper submitted by the United States to the XXXIV Antarctic Treaty Consultative Meeting in Buenos Aires, Argentina.
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Papers written for the Commission for the Conservation of Antarctic Marine Living Resources' Working Group on Ecosystem Monitoring and Management (CCAMLR WG-EMM)

Naveen, R., G. Humphries, and **H.J. Lynch**. 2016. Mapping Application for Penguin Populations and Projected Dynamics (MAPPPD). CCAMLR-XXXV/BG/15.

Naveen, R., G. Humphries, and **H.J. Lynch**. 2016. Report to CCAMLR by Oceanites, Inc. CCAMLR-XXXV/BG/16.

Lynch, H.J., and M.A. LaRue. 2014. First global survey of Adélie penguin populations. CCAMLR WG-EMM-14/P05.

Lynch, H.J., and M. Schwaller. 2013. Bayesian data-model synthesis for biological conservation and management in Antarctica. CCAMLR WG-EMM-13/26.

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Trathan, P.N., **H. Lynch**, C. Southwell, P.T. Fretwell, G. Watters, and N. Ratcliffe. 2012. Extending ecological monitoring to underpin the development of feedback management approaches for the Antarctic krill fishery. CCAMLR WG-EMM-12/04.

Southwell, C., J. Forcada, M. Goebel, J. Hinke, **H. Lynch**, P. Lyver, J. McKinlay, N. Ratcliffe, D. Ramm, K. Reid, C. Reiss, W. Trivelpiece, S. Trivelpiece, and P. Trathan. 2009. Update on progress in inter-sessional work from the Predator Survey workshop. CCAMLR WG-EMM-09/39.

Trivelpiece, S., W. Trivelpiece, **H. Lynch**, D. Ramm, J. McKinlay, R. Naveen, P. Trathan, and C. Southwell. 2008. Preliminary estimation of penguin breeding abundance at spatial scales of relevance to CCAMLR: Incorporating uncertainty in count data. CCAMLR WG-EMM-08/53.

Trivelpiece, S.G., W.F. Fagan, **H. J. Lynch**, W.Z. Trivelpiece, and R. Naveen. 2008. Timing of clutch initiation in *Pygoscelis* penguins on the Antarctic Peninsula: Towards an improved understanding of off-peak census correction factors. WG-EMM-PSW-08/15.

Invited Talks & Department Seminars

H.J. Lynch. 2019. "Adventures in mathematical biology inspired by a bird's eye view of penguin colonies in Antarctica". Mathematical Biology Seminar, University of Utah (March 27, 2019)

- H.J. Lynch.** 2019. “How many Adélie penguins are there? (and other mysteries solved by satellites)”. Department of Ecology, Evolution, and Natural Resources Seminar, Rutgers University (March 7, 2019)
- H.J. Lynch.** 2017. “How many Adélie penguins are there? (and other mysteries solved by satellites)”. Department of Natural Resources and the Environment Seminar, University of Connecticut (September 12, 2017)
- H.J. Lynch.** 2017. “Spatiotemporal dynamics of Antarctic penguin populations”. NASA Icesat2 Team (May 22, 2017)
- H.J. Lynch.** 2016. “Spatiotemporal dynamics of Antarctic penguin populations”. Department of Biology Seminar, Hofstra University (March 18, 2016).
- H.J. Lynch.** 2015. “Spatial ecology in the era of high-resolution satellite imagery: Linking pattern and process to understand population tipping points for Antarctic penguins”. Ecology & Evolutionary Biology Colloquium, University of California, Santa Cruz (February 18, 2015).
- H.J. Lynch.** 2014. “Spatial ecology in the era of high-resolution satellite imagery: Linking pattern and process to understand population tipping points for Antarctic penguins”. Ecology, Evolution, & Environmental Biology Colloquium, Columbia University (September 9, 2014).
- H.J. Lynch.** 2014. “Data fusion modelling approaches for tracking Adélie penguin abundance, distribution, and demography”. Morss Colloquium, Woods Hole Oceanographic Institute (May 5, 2014).
- H.J. Lynch.** 2013. “How many Adélie penguins are there? (and other mysteries solved by satellites)”. Stony Brook Southampton Lecture Series 2013 (November 1, 2013).
- H.J. Lynch.** 2013. “Thinking big and thinking small: How satellites are revolutionizing penguin ecology”. Biology Department seminar at Woods Hole Oceanographic Institute.
- H.J. Lynch.** 2013. “A sea change in seabird research: How emerging geospatial technologies are radically changing the study of spatial ecology in the Antarctic”. Departmental seminar at the University of Massachusetts, Amherst.
- H.J. Lynch.** 2013. “Climate change winners and losers: Penguin population dynamics on the Antarctic Peninsula”. Departmental seminar at the School of Marine and Atmospheric Sciences, Stony Brook University.
- H.J. Lynch.** 2012. “Automated classification of Antarctic penguin colonies in satellite imagery”. Social-Environmental Synthesis Center Workshop on Data Visualization, Annapolis, MD.
- H.J. Lynch.** 2010. “Climate change winners and losers: Penguin population dynamics on the Antarctic Peninsula”. Departmental seminar at the University of Maryland, College Park.
- H.J. Lynch.** 2010. “Climate change winners and losers: Penguin population dynamics on the Antarctic Peninsula”. Seminar at the University of California, Santa Cruz.
- H.J. Lynch, E.H.C. Grant, R. Muneeppeerakul, I. Rodriguez-Iturbe, and W.F. Fagan.** 2009. “India’s Inter Basin Water Transfer project: The impact of network manipulation on freshwater fish communities”. Organized Oral Session 16-7 of ESA Annual Conference 2009.

H.J. Lynch. 2005. "Spatiotemporal dynamics of insect-fire interactions". Seminar at the University of Colorado, Boulder.

H. Lynch. 2001. "A Kondo box: Coulomb blockade and the Kondo effect in iron-doped copper nanoparticles". Invited Talk in Session J1 of APS March Meeting 2001.

Contributed Talks

★C. Foley and **H.J. Lynch.** 2018. "Estimating the pre-exploitation population size of Antarctic fur seals (*Arctocephalus gazella*) in South Georgia." Population dynamics and regulation session at Ecological Society of America Annual Meeting 2018.

★B. Goncalves, **H.J. Lynch.** 2018. "Monitoring pack-ice seals from space with deep learning." Using satellite imagery to study wildlife ecology in polar regions session at the Scientific Committee on Antarctic Research Biennial Meeting 2018.

★C. Youngflesh, S. Jenouvrier, **H.J. Lynch.** 2018. "Divergent trends, unsynchronized community dynamics and extreme years – the challenge in finding effective ecological proxies." Population dynamics and regulation session at Ecological Society of America Annual Meeting.

★C. Youngflesh, S. Jenouvrier, **H.J. Lynch.** 2018. "Divergent trends and unsynchronized dynamics – the challenge in finding effective ecological proxies." Life distribution and responses to environmental changes in Polar ecosystems session at the Scientific Committee on Antarctic Research Biennial Meeting 2018.

★M. A. Lynch, ★C. Youngflesh, N. Agha, M. A. Ottinger and **H. J. Lynch.** 2018. "Variation in hormonal stress levels in gentoo penguins (*Pygoscelis papua*) in relation to tourist visitation on the Antarctic Peninsula". Physiology I Contributed Oral Session of the Ecological Society of America Annual Meeting 2018.

★C. Che-Castaldo, **H.J. Lynch,** ★C. Youngflesh, and M.R. Schwaller. 2018. "Range-wide Adelie penguin abundance from 30 years of Landsat satellite imagery". Satellite-based Remote Sensing of Wildlife Session of the Scientific Committee on Antarctic Research Biennial Meeting 2018.

H.J. Lynch. 2018. "Real-time population forecasts for Antarctic management". Ecological Society of America Annual Conference 2018.

★P. McDowall and **H.J. Lynch.** 2014. "High-resolution terrestrial habitat models for *Pygoscelis* Penguins". Diversity and Connectivity in Antarctica & Spatial Analysis of Antarctic Biodiversity Session of the Scientific Committee on Antarctic Research Biennial Meeting 2014.

H.J. Lynch. 2014. "Data fusion modelling approaches for tracking Adélie penguin abundance and distribution". Remote Sensing of the Antarctic Environment Session of the Scientific Committee on Antarctic Research Biennial Meeting 2014.

H.J. Lynch and M.A. LaRue. 2013. "Emerging geospatial technologies for studying penguin biogeography". 8th International Penguin Conference, Bristol, UK.

- H.J. Lynch.** 2012. “Detection, differentiation, and abundance estimation of penguin species by high-resolution satellite imagery”. Birds and Marine Mammals Session of the Scientific Committee on Antarctic Research Biennial Meeting 2012.
- H.J. Lynch.** 2010. “Climate change winners and losers: Penguin population dynamics on the Antarctic Peninsula”. 7th International Penguin Conference, Boston, MA.
- H.J. Lynch.** 2010. “Climate change winners and losers: Penguin population dynamics on the Antarctic Peninsula”. Organized Oral Session 33 of ESA Annual Conference 2010.
- H.J. Lynch** and P.R. Moorcroft. 2007. “The 1988 Yellowstone fires: A geospatial examination of the impact of historical insect damage on forest fire risk”. Contributed Oral Session 78-3 of ESA Annual Conference 2007.
- H.J. Lynch** and P.R. Moorcroft. 2006. “Mountain Pine Beetle Dynamics in a Spatially-Explicit Heterogeneous Landscape”. Contributed Oral Session 91 of ESA Annual Conference 2006.
- H.J. Lynch,** Paul R. Moorcroft., Roy A. Renkin, and Robert L. Crabtree. 2005. “Insect-fire interactions in Yellowstone National Park”. Greater Yellowstone Public Lands Conference 2005.
- H.J. Lynch** and P.R. Moorcroft. 2005. “Spatiotemporal Dynamics of Insect-Fire Interactions”. Contributed Oral Session 130 of ESA Annual Conference 2005.
- H.J. Lynch,** L. DiCarlo, L.I. Childress, N.J. Craig, M.D. Lukin, C.M. Marcus, M.P. Hanson, A.C. Gossard. 2003. “Capacitive Sensing of Localized Charge in a Double Quantum Dot System”. Session Y19 of APS March Meeting 2003.
- H.J. Lynch,** S. M. Cronenwett, C. M. Marcus, L. P. Kouwenhoven, V. Umansky. 2002. “Spin Effects and ‘0.7 Structure’ in Quantum Point Contacts”. Session F24 of APS March Meeting 2002.
- H.J. Lynch,** L. L. Sohn. 2000. “Spin Polarized Tunneling in an Iron-doped Copper Nanoparticle”. Session P28 of APS March Meeting 2000.
- C. E. Sosolik, A. C. Lavery, J. R. Hampton, **H.J. Lynch,** B.H. Cooper. 1999. “Temperature Dependent K⁺ and Ca⁺ Scattering from Cu(001)”. Session FC33 of APS March Meeting 1999.