

Christian Che-Castaldo

IACS Postdoctoral Fellow
Stony Brook University

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Employment

- 2020 – **IACS Postdoctoral Fellow**
Institute for Advanced Computational Science, Stony Brook University, Stony Brook, NY
- 2018 – 2020 **Research Scientist**
Mount St. Helens Institute, Amboy, WA
Partnership with USFS Pacific Northwest Research Station
- 2015 – 2018 **Postdoctoral Associate**
Department of Ecology & Evolution, Stony Brook University, Stony Brook, NY
Advisor: Heather J. Lynch
- 2014 – 2015 **Postdoctoral Research Associate**
Department of Biology, University of Maryland, College Park, MD
Advisor: William F. Fagan
- 2004 – 2005 **Howard Hughes Undergraduate Research Fellow**
Department of Entomology, University of Maryland, College Park, MD
Advisor: Galen P. Dively
- 1998 – 2003 **Consultant**
Law & Economics Consulting Group, Washington, DC
- 1997 – 1998 **Associate Economist**
Triangle Economic Research Group, Durham, NC

Education

- 2005 – 2014 **University of Maryland**, College Park, MD
PhD in Behavior, Ecology, Evolution, and Systematics
Thesis: The role of wood-boring insect herbivory in mediating primary succession
Advisor: William F. Fagan
- 2003 – 2005 **University of Maryland**, College Park, MD
Post-baccalaureate coursework
- 1993 – 1997 **The College of William and Mary**, Williamsburg, VA
Bachelor of Arts in Public Policy & Environmental Studies, *cum laude*

Grants and Awards

- 2021 – 2024 NASA Biodiversity (~\$728k), *Identifying population tipping points through imagery super-resolution*, PI: H.J. Lynch, coPIs: **C. Che-Castaldo** & D. Samaras (Stony Brook University)
- 2020 – 2023 IACS Postdoctoral Fellowship (\$310k), Stony Brook University

- 2020 – 2023 NASA Interdisciplinary Research in Earth Sciences (~\$1.5m), *Antarctic marine predators in a dynamic climate*, PI: S. Jenouvrier (Woods Hole Oceanographic Institution), Subaward (~\$412k) to PI: H.J. Lynch, coPI: **C. Che-Castaldo** (Stony Brook University)
- 2018 Association of Polar Early Career Scientists Travel Grant (\$1,800)
- 2009 – 2011 NSF REU Supplementals (\$34k), *Impacts of insect herbivory on the pace and pattern of primary successional change at Mount St. Helens*, PIs: W.F. Fagan (University of Maryland) & J.G. Bishop (Washington State University). **C. Che-Castaldo** developed and wrote 100% of three supplemental proposals and served as project director and REU student mentor.
- 2011 Goldhaber Travel Award (\$500), University of Maryland
- 2007 College of Life Science Travel Award (\$300), University of Maryland
- 2007 NSF GRFP (Honorable Mention), University of Maryland
- 2005 Darwin Graduate Scholarship (\$20k), University of Maryland
- 2005 Cory Scholarship (\$1000), University of Maryland
- 2005 Howard Hughes Undergraduate Research Fellowship (\$5k), University of Maryland

Publications

— Peer-reviewed Journal Articles [Citations: 405, H index: 8, I-10 index: 8]

¹ mentored student, ² joint first authors

- J12 Schrimpf, M.B.¹, **C. Che-Castaldo**, & H.J. Lynch. 2020. Regional breeding bird assessment of the Antarctic Peninsula. *Polar Biology*, 43(2):111–122. [pdf] [DOI]
- J11 **Che-Castaldo, C.**, C.M. Crisafulli, J.G. Bishop, E.F. Zipkin, & W.F. Fagan. 2019. Disentangling herbivore impacts in primary succession by refocusing the plant stress and vigor hypotheses on phenology. *Ecological Monographs*, 89(4), e01389. [data+code] [DOI]
- J10 DiRenzo, G. V., **C. Che-Castaldo**, S.P. Saunders, E.H.C. Grant, & E.F. Zipkin. 2019. Disease-structured n-mixture models: A practical guide to model disease dynamics using count data. *Ecology and Evolution*, 9(2), 899–909. [pdf] [DOI]
- J09 Che-Castaldo, J.², **C. Che-Castaldo**², & M.C. Neel. 2018. Predictability of demographic rates based on phylogeny and biological similarity. *Conservation Biology*, 32(6), 1290–1300. [DOI]
- J08 DiRenzo, G.V., E.H.C Grant, A.V. Longo, **C. Che-Castaldo**, K.R. Zamudio, & K.R. Lips. 2018. Imperfect pathogen detection from non-invasive skin swabs biases disease inference. *Methods in Ecology & Evolution*, 9(2), 380–389. [pdf] [DOI]
- J07 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. [pdf] [DOI]
- J06 **Che-Castaldo, C.**, S. Jenouvrier, C. Youngflesh, K.T. Shoemaker, G.R.W. Humphries, P. McDowall, L. Landrum, M.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(1), 832. [data] [code] [pdf] [DOI]
- J05 DiRenzo, G.V.¹, **C. Che-Castaldo**, A. Rugenski, R. Brenes, M.R. Whiles, C.M. Pringle, S.S. Kilham, & K.R. Lips. 2017. Disassembly of a tadpole community by a multi-host fungal pathogen with limited evidence of recovery. *Ecological Applications*, 27(1), 309–320. [DOI]

- J04 Humphries, G.R.W., R. Naveen, M. Schwaller, **C. Che-Castaldo**, P. McDowall, M.B. 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. [[pdf](#)] [[DOI](#)]
- J03 **Che-Castaldo, C.**, C.M. Crisafulli, J.G. Bishop, & W.F. Fagan. 2015. What causes female bias in the secondary sex ratios of the dioecious woody shrub *Salix Sitchensis* colonizing a primary successional landscape? *American Journal of Botany*, 102(8), 1309–1322. [[pdf](#)] [[DOI](#)]
- J02 Alyokhin, A., G.P. Dively, M. Patterson, **C. Castaldo**, D. Rogers, M. Mahoney, & J. Wollam. 2007. Resistance and cross-resistance to imidacloprid and thiamethoxam in the Colorado potato beetle *Leptinotarsa decemlineata*. *Pest Management Science*, 63(1), 32–41. [[pdf](#)] [[DOI](#)]
- J01 Fernandez-Cornejo, J., & **C. Castaldo**. 1998. The diffusion of IPM techniques among fruit growers in the USA. *Journal of Production Agriculture*, 11(4), 497–506. [[DOI](#)]

White Papers

- W2 Humphries, G.R.W., R. Naveen, **C. Che-Castaldo**, & H.J. Lynch. 2021. The Mapping Application for Penguin Populations and Projected Dynamics (MAPPPD) database: A tool for helping stakeholders monitor penguin population trends in Antarctica. Report by Oceanites, Inc. submitted to the Conservation of Antarctic Marine Living Resources' Working Group on Ecosystem Monitoring and Management (CCAMLR WG-EMM).
- W1 Humphries, G.R.W., R. Naveen, **C. Che-Castaldo**, & H.J. Lynch. 2019. The Mapping Application for Penguin Populations and Projected Dynamics (MAPPPD) database: A tool for helping stakeholders monitor penguin population trends in Antarctica. Report by Oceanites, Inc. submitted to the Conservation of Antarctic Marine Living Resources' Working Group on Ecosystem Monitoring and Management (CCAMLR WG-EMM).

Media Coverage

- 2018 Why Are NASA Scientists Tracking Penguin Poop From Space?
Marshall Shepherd, *Forbes* [[link](#)]
- 2017 NASA-Funded Competition Rewards Efforts To Predict Penguin Populations
Maria-José Viñas, *NASA Earth Science News* [[link](#)]
- 2017 Penguin Droppings Are Fertile Ground for Science
Adam Voiland, *NASA Earth Observatory* [[link](#)]
- 2016 NASA Collaboration Allows Citizen Scientists to Lend a Hand in Penguin Conservation
Steve Fox, *NASA Earth Science News* [[link](#)]

R Packages

- 2021 – mappdr: MAPPPD in R
Authors: **C. Che-Castaldo** & H.J. Lynch
[\[github\]](#)
- 2019 – MCMCvis: Tools to visualize, manipulate, and summarize MCMC output
Authors: C. Youngflesh & **C. Che-Castaldo**
>50k downloads
[\[cran\]](#) [\[github\]](#)

Publicly Available Data Repositories

2016 – MAPPPD: Mapping Application for Penguin Populations and Projected Dynamics
CoPIs: H.J. Lynch & C. **Che-Castaldo**, Webmaster: G.R.W. Humphries
www.penguinmap.com

Presentations

mentored student¹

Invited Talks

- 2017 The attack dynamics and successional consequences of stem-borer herbivory on sitka willow at Mount St. Helens, Department of Ecology & Evolution Spring Colloquium, Stony Brook University, Stony Brook, NY.
- 2016 Hierarchical Bayesian modeling of continental-scale Adélie penguin occupancy and abundance, Conservation Science Department Seminar Series, Lincoln Park Zoo, Chicago, IL.

Contributed Conference Talks

- 2021 Lynch, H.J. & C. **Che-Castaldo**. Automating what can be automated, doing manually what cannot, and the wisdom to know the difference: Assembling the pieces of a multi-pronged pan-Antarctic monitoring system for penguins. Advances in remote sensing for monitoring biodiversity change: Integrating data and models across scales and technologies session of the American Geophysical Union Annual Meeting, New Orleans, LA.
- 2021 Lynch, H.J., Sen, B.¹, **Che-Castaldo, C.**, Krumhardt, K., Holland, M., Landrum, L., Long, M., LaRue, M., Talis, E.¹, Jenouvrier, S., Penguin dynamics are difficult to forecast: Can climate models help? Phenomena, observations, and synthesis (POS) Panel at US Climate Variability and Predictability Program Annual Workshop, virtual.
- 2021 **Che-Castaldo, C.**, A. Mosbrucker, C.M. Crisafulli, & C.N. Jones. How the hydrological form and function of Mount St. Helens debris avalanche ponds influences resource partitioning by colonizing amphibian species. Shallow lakes: Ecology, biogeochemistry, and human health session of the Association for the Science of Limnology and Oceanography Annual Meeting, virtual.
- 2018 **Che-Castaldo, C.**, H.J. Lynch, C. Youngflesh, & M.R. Schwaller. Range-wide Adélie 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, Davos, Switzerland.
- 2017 Bishop, J.G., W.F. Fagan, C. **Che-Castaldo**, & C.M. Crisafulli. Plant-herbivore interactions impact community dynamics in primary succession at Mount St. Helens. Ecological Society of America, Portland, OR.
- 2016 **Che-Castaldo, C.**, H.J. Lynch, S. Jenouvrier, & M.R. Schwaller. Hierarchical Bayesian modeling of continental-scale Adélie penguin occupancy and abundance. Diversity and distribution of life in Antarctica session of the Scientific Committee on Antarctic Research Open Science Conference, Kuala Lumpur, Malaysia.
- 2016 Che-Castaldo, J.P., M.C. Neel, & C. **Che-Castaldo**. Comparative demographic analysis to inform endangered species management. Demography Beyond the Population Symposium, Sheffield, UK.
- 2015 **Che-Castaldo, C.**, C.M. Crisafulli, J.G. Bishop, & W.F. Fagan. What causes female bias in the secondary sex-ratios of the dioecious woody shrub *Salix sitchensis* colonizing a primary successional landscape? Ecological Society of America, Baltimore, MD.

- 2015 Che-Castaldo, J., **C. Che-Castaldo**, & M.C. Neel. Testing the use of surrogate demographic information for endangered species management. Ecological Society of America, Baltimore, MD.
- 2012 **Che-Castaldo, C.**, C.M. Crisafulli, J.G. Bishop, & W.F. Fagan. Secondary sexual dimorphism in willow across a resource gradient: Is gender important in primary succession? Ecological Society of America, Portland, OR.
- 2010 **Che-Castaldo, C.**, E.H.C. Grant, C.M. Crisafulli, J.G. Bishop, & W.F. Fagan. Using occupancy models to investigate large-scale stem-boring insect herbivory dynamics in a primary successional landscape. Ecological Society of America, Pittsburgh, PA.
- 2005 **Che-Castaldo, C.** & G.P. Dively. Colorado potato beetle and neonicotinoid resistance management. Entomological Society of America, Harrisburg, PA.

— **Contributed Conference Posters**

- 2021 **Che-Castaldo, C.**, C.N. Jones, & C.M. Crisafulli. Hydrology of Mount St. Helens debris avalanche ponds influences the ecology of colonizing amphibian species. American Geophysical Union Annual Meeting, New Orleans, LA.
- 2021 Feng, M.L¹, S. Sherman, T. Schafer, **C. Che-Castaldo**, R. Cousin, D. Matteson & J.P. Che-Castaldo. Novel indicators of biodiversity status based on financial portfolio metrics. American Geophysical Union Annual Meeting, New Orleans, LA.
- 2013 **Che-Castaldo, C.**, C.M. Crisafulli, J.G. Bishop, & W.F. Fagan. Using multi-season occupancy models to investigate insect herbivory dynamics in a primary successional landscape. Gordon Research Conference: Plant-herbivore interactions, Ventura Beach, CA.
- 2008 **Che-Castaldo, C.**, T. Hinds, & J.G. Bishop. Local maladaptation in the aphid *Macrosiphum albifrons* to its host plant *Lupinus lepidus* var. *lobbii* in a primary successional landscape. Ecological Society of America, Milwaukee, WI.
- 2006 **Che-Castaldo, C.** & G.P. Dively. Integrating fitness costs due to insecticide resistance using matrix population models. Ecological Society of America, Memphis, TN.

Teaching Experience

- 2015 – 2020 Bayesian Modeling for Socio-Environmental Data Short Course (graduate-level)
National Socio-Environmental Synthesis Center, Annapolis, MD
Instructor, 6 short courses
I developed course materials for and co-taught with N.T. Hobbs and M. Collins an 11-day applied statistics workshop, equivalent to a full semester course in content and contact hours.
[\[course website\]](#) [\[course materials\]](#)
- 2009, 2012 BSCI708T, Theoretical Ecology (graduate-level)
University of Maryland, College Park, MD
Graduate Teaching Assistant, 2 semesters
I was responsible for all lab curriculum development and independently taught the lab section.
- 2005 – 2013 BSCI207 Organismal Biology (undergraduate-level)
University of Maryland, College Park, MD
Graduate Teaching Assistant, 4 semesters
- 2006 BSCI222 Principles of Genetics (undergraduate-level)
University of Maryland, College Park, MD
Graduate Teaching Assistant, 1 semester

Student Mentoring & Community Outreach

- 2005 – 2021 I have mentored 1 postdoctoral student, 6 graduate students, and 17 undergraduate or post-baccalaureate researchers, including 7 REU students, at Stony Brook University, University of Maryland, Washington State University, Lincoln Park Zoo, and Mount St. Helens Institute.
- 2020 – 2021 Invited guest lectures: IACS Professional Development Program, Stony Brook University
- 2012 – 2013 Public lectures: Mount St. Helens Institute public tours

Service

- 2014 – 2021 Manuscript referee: *Journal of Applied Ecology*, *Ecosphere*, *Scientific Reports*, *Diversity & Distributions*, *Nature Communications*, *Ecological Monographs*, *Journal of Animal Ecology*, *Journal of Ecology*, *Oikos*
- 2018 Grant proposal referee: NSF, ad-hoc reviewer
- 2018 Co-organizer: Software Carpentry and High Performance Computing Course
Scientific Committee on Antarctic Research Biennial Meeting, Davos, Switzerland
- 2015 External book reviewer: Hobbs, N. T. and M. B. Hooten, 2015. Bayesian models: A statistical primer for ecologists. Princeton University Press, Princeton, NJ
- 2013 Graduate student representative: Faculty search committee
Department of Biology, University of Maryland
- 2012 Co-organizer: Mount St. Helens: Lessons from 31 years of post-eruption ecological research
Ecological Society of America Field Trip, Portland, OR
- 2010 Public lecture: Mount St. Helens 30th Anniversary Science Pulse
USFS Pacific Northwest Research Station, Randle, WA

Advanced Courses and Workshops

- 2018 Ecological Forecasting Summer Course
Boston University, Boston, MA
- 2014 Bayesian Modeling for Ecological and Social Scientists Workshop
National Socio-Environmental Synthesis Center, Annapolis, MD
- 2011 Modeling Patterns and Dynamics of Species Occurrence Workshop
USGS Patuxent Wildlife Research Center, Laurel, MD
- 2010 Bayesian Population Analysis using WinBUGS Workshop
USGS Patuxent Wildlife Research Center, Laurel, MD
- 2010 LI-6400XT Portable Photosynthesis Training Course
LI-COR Biosciences, Lincoln, NE
- 2008 Introduction to Bayesian Linear Models for Ecologists Using WinBUGS
Smithsonian National Zoo, Washington, DC