

## Katharine L. Gerst

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### Education

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- 2011      PhD, Ecology and Evolutionary Biology, University of Arizona, advisor: Dr. Larry Venable;  
Dissertation: *The Influence of Biogeography and Mating System on the Ecology of Desert Annual Plants*
- 2001      B.S., Ecology, Behavior, and Evolution University of California, Los Angeles;  
Magna cum laude, Phi Beta Kappa, College Honors
- 1999      University of California study abroad program in Tropical Biology, Monteverde, Costa Rica

### Professional Experience

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**Associate Research Scientist and Data Product Coordinator:** Phenology data product research & coordination; stakeholder engagement. USA National Phenology Network and School of Natural Resources and the Environment, University of Arizona (2013-present)

**Assistant Research Scientist:** Liaison to the California Phenology Project. USA National Phenology Network and School of Natural Resources and the Environment, University of Arizona (2011-2013)

**Graduate Research Assistant:** Linking long term community and population dynamics to ecophysiological traits in desert annual plants. University of Arizona (2004-2005)

**Tropical Plant Research Associate:** Hemi-epiphytic aroid diversity, distribution and physiology (La Selva Biological Station, Costa Rica), UCLA (2003-2004)

**Invasive Species Research Associate:** Salt cedar biology, Albany, CA. UC Davis/USDA (2001-2002)

**Seasonal Ecological Field Assistant:** UCLA/USGS fire ecology study (2001), UC Berkeley alpine sagebrush ecology study (2002), and UCLA invasive riparian plant ecology study (2003)

**Field Supervisor and Internship Coordinator:** University of California White Mountain Research Station, Bishop CA (2001, 2002)

### Peer-Reviewed Publications

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Elmendorf, S, TM Crimmins, **KL Gerst**, J Weltzin. In revision. Time to branch out? Application of survival models in plant phenology. *Agricultural and Forest Meteorology*.

Crimmins, TM, **KL Gerst**, D Huerta, R Marsh, EE Posthumus, A Rosemartin, J Switzer, J Weltzin, L Coop, N Dietscher, D Herms, S. Limbu, RT Trotter, & M Whitmore. In press. Short-term Forecasts of Pest Insect Activity Inform Management Activities. *Annals of the Entomological Society of America*.

**Gerst, KL**, A Rosemartin, EE Posthumus, TM Crimmins, & L Barnett. In Press. Successes and challenges along a spectrum of stakeholder engagement. *2018 Madrean Conference Proceedings*.

Renzi, JJ, WD Peachey, & **KL Gerst**. 2019. A decade of flowering phenology of the keystone saguaro cactus (*Carnegiea gigantea*, Cactaceae). *American Journal of Botany* 106 (2).

Crimmins TM, MA Crimmins, **KL Gerst**, AH Rosemartin & JF Weltzin. 2017. USA National Phenology Network's volunteer-contributed observations yield predictive models of phenological transitions. *PLoS ONE* 12(8): e0182919.

**Gerst, KL**, N Rossington, & SJ Mazer. 2017. Phenological responsiveness to climate differs among four species of *Quercus* in North America. *Journal of Ecology* doi:10.1111/1365-2745.12774

**Gerst, KL**, & DL Venable. 2017. Phenology mediates reproductive success in the desert annual *Chylismia brevipes*. *Mojave National Preserve Science Newsletter, Spring*.

Monahan, B, AH Rosemartin, **KL Gerst**, NA Fisichelli, T Ault, MD Schwartz, JE Gross, and JF Weltzin. 2016. Climate change is advancing spring onset across the US national park system. *Ecosphere* 7(10)

Mehdipoor H, R Zurita-Milla, A Rosemartin, **KL Gerst**, & JF Weltzin. 2015. Developing a Workflow to Identify Inconsistencies in Volunteered Geographic Information: A Phenological Case Study. *PLoS ONE* 10(10): e0140811

**Gerst, KL**, JL Kellermann, CAF Enquist, AH Rosemartin, & E Denny. 2015. Estimating the onset of spring from a complex phenology database: Trade-offs across geographic scales. *International Journal of Biometeorology*

Mazer, SJ, **KL Gerst**, ER Matthews, & A Evenden. 2015. Species-specific phenological responses to winter temperature and precipitation in a water-limited ecosystem. *Ecosphere* 6(6)

Denny, E, **KL Gerst**, AJ Miller-Rushing, GL Tierney, TM Crimmins, CAF. Enquist, P Guertin, AH Rosemartin, MD Schwartz, KA Thomas & JF Weltzin. 2014. Standardized phenology monitoring methods to track plant and animal activity for science and resource management applications. *International Journal of Biometeorology*

Enquist, CAF, JL Kellermann, **KL Gerst**, & AJ Miller-Rushing. 2014. Phenology research for natural resource management in the United States. *International Journal of Biometeorology*

Rosemartin, AH, TM Crimmins, CAF Enquist, **KL Gerst**, JL Kellermann, EE Posthumus, JF Weltzin, EG Denny, P Guertin, & L Marsh. 2013. Phenological data resources to inform natural resource conservation. *Biological Conservation*

Haggerty, BP, ER Matthews, **KL Gerst**, AG Evenden, & SJ Mazer. 2013. The California Phenology Project: Tracking Plant Responses to Climate Change. *Madroño* 60: 1-3

Barron-Gafford, GA, AL Angert, DL Venable, **KL Gerst**, AP Tyler, & TE Huxman. 2013. Photosynthetic temperature responses of co-occurring desert winter annuals with contrasting resource-use efficiencies and different temporal patterns of resource utilization may allow for species coexistence. *Journal of Arid Environments* 91: 95-103

**Gerst, KL**, AL Angert, & DL Venable. 2011. The effect of geographic range position on demographic variability in annual plants. *Journal of Ecology* 99: 591-599

Villegas, JC, CT Morrison, **KL Gerst**, CR Beal, JC Espelata, and M. Adamson. 2010. Impact of an ecohydrology classroom activity on middle school students' understanding of evapotranspiration. *Journal of Natural Resources and Life Science Education* 39: 150-156

Huxman TE, GA Barron-Gafford, **KL Gerst**, AL Angert, AP Tyler, & DL Venable. 2008. Photosynthetic resource-use efficiency and demographic variability in desert annual plants. *Ecology* 89:1554-1563

Angert AL, TE Huxman, GA Barron-Gafford, **KL Gerst**, & DL Venable 2007. Linking growth strategies to long-term population dynamics in a guild of desert annuals. *Journal of Ecology* 95: 321-331

#### **Publications in Preparation**

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**KL Gerst**, TM Crimmins, E Posthumus, A Rosemartin & M Schwartz. Spring indices as a proxy for deciduous tree phenology.

**Gerst, KL**, & DL Venable. Interannual variability in pollinator and herbivore effects on reproduction in selfing and outcrossing desert annual plants.

Rundel, PW, **KL Gerst**, & ML Sharifi. Ecology and ecophysiology of rosulate aroid epiphytes in a Costa Rican lowland rainforest.

#### **Reports**

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Rosemartin, A, EG Denny, **KL Gerst**, RL Marsh, EE Posthumus, TM Crimmins, & JF Weltzin. 2018. USA National Phenology Network observational data documentation: U.S. Geological Survey Open-File Report 2018-1060, 24 p., <https://doi.org/10.3133/ofr20181060> (peer-reviewed)

Crimmins, TM, Marsh, RL, Switzer, JR, Crimmins, MA, **Gerst, KL**, Rosemartin, AH, and Weltzin, JF. 2017. USA National Phenology Network gridded products documentation: U.S. Geological Survey Open-File Report 2017-1003, 27 p., <https://doi.org/10.3133/ofr20171003>. (peer-reviewed)

USA-NPN National Coordinating Office. 2016. USA National Phenology Network Phenology Model Workshop Report. USA-NPN Programmatic Series 2016-002. [www.usanpn.org](http://www.usanpn.org) (lead co-author)

**Gerst, KL**, AH Rosemartin, EG Denny, CAF. Enquist, RL Marsh, DJP Moore, TM Crimmins & JF Weltzin. 2015. USA National Phenology Network data product development framework and data product catalog, v 1.0. USA-NPN Technical Series 2015-001. [www.usanpn.org](http://www.usanpn.org)

Matthews, ER, **KL Gerst**, SJ Mazer, C Brigham, A Evenden, A Forrestel, B Haggerty, S Haultain, J Hoines, S Samuels, and F Villalba. 2014. California Phenology Project (CPP) Plant Phenological Monitoring Protocol, Version 1. *Natural Resource Report NPS/PWRO/NRR—2014/763*. National Park Service, Fort Collins, Colorado (*peer-reviewed*)

Matthews, ER, **KL Gerst**, SJ Mazer, C Brigham, A Evenden, A Forrestel, B Haggerty, S Haultain, J Hoines, S Samuels, and F Villalba. 2013. California Phenology Project: Report on pilot phase activities, 2010-2013. *Natural Resource Report NPS/PWRO/NRR—2013/743*. National Park Service, Fort Collins, Colorado (*peer-reviewed*)

Tierney, G., B. Mitchell, A. Miller-Rushing, J. Katz, E. Denny, C. Brauer, T. Donovan, A. D. Richardson, M. Toomey, A. Kozlowski, J. Weltzin, **K. Gerst**, E. Sharron, O. Sonnentag, F. Dieffenbach. 2013. Phenology monitoring protocol: Northeast Temperate Network. *Natural Resource Report NPS/NETN//NRR—2013/681*. National Park Service, Fort Collins, Colorado (*peer-reviewed*)

Czech, B, S Covington, TM Crimmins, JA Ericson, C Flather, M Gale, **KL Gerst**, M Higgins, M Kaib, E Marino, T Moran, J Morton, N Niemuth, H Peckett, D Savignano, L Saperstein, S Skorupa, E Wagener, B Wilen, & B Wolfe. 2014. Planning for climate change on the National Wildlife Refuge System. Washington, DC: U.S. Fish and Wildlife Service, National Wildlife Refuge System

Kellermann, JL, TM Crimmins, EG Denny, CAF Enquist, **KL Gerst**, AH Rosemartin, & JF Weltzin. 2013. Nature's Notebook: 2012 State of the Data. USA-NPN Technical Series 2013-001. [www.usanpn.org](http://www.usanpn.org)

USA-NPN National Coordinating Office. 2012. Identifying and prioritizing data products and tools for use in science, management, and decision making. Research Coordination Network workshop report. USA-NPN Programmatic Series 2012-002. [www.usanpn.org](http://www.usanpn.org). (*lead co-author*)

## **Presentations**

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Ecological Forecasting Initiative, 2019. "Collaboration to develop actionable phenology forecast products".

American Geophysical Union, 2018. "10 years of scientific advancements made possible by the USA National Phenology Network."

Land Surface Phenology Validation working group, 2018. "Data products for calibration and validation of Earth observation data products"

Southwest Restoration Ecology annual meeting, 2018. "Phenology Information and Tools for Restoration in the Southwest."

Botanical Society of America Annual Conference, 2018: "Advances in the Delivery of Observation Data and Forecasts from the USA National Phenology Network" (invited)

Biodiversity and Management of the Madrean Archipelago Conference, 2018, "Successes and challenges along a spectrum of stakeholder engagement"

Earth Science Information Partners, 2018. "Forecasting invasive species for natural resource planning and risk assessment"

US Forest Service, Regional Inventory & Monitoring Coordinators meeting webinar, 2017: ““USA National Phenology Network: Data, products and tools for monitoring and management” (invited)

US Forest Service, Region 9 Climate Coordinator webinar, 2017: “USA National Phenology Network: Data, products and tools for monitoring and management” (invited)

Ecological Society of America Meeting, 2017: “Advances in the delivery of organismal observation data from the USA National Phenology Network”

US Geological Survey, Tucson AZ, 2017: “The USA National Phenology Network: A framework for delivery of national-scale data products” (invited)

American Geophysical Union, 2016: “Phenology observations collected by citizen scientists inform science and decision-making”

National Park Service Inventory and Monitoring Service webinar series, 2016: “Gridded phenology maps for natural resource planning” (invited webinar)

USA-NPN Phenology model workshop, 2016: “USA-NPN phenology data products and resources”

American Geophysical Union, 2015: “Implementation of quality assurance and quality control measures in the National Phenology Database” (poster)

US Forest Service Northwoods Climate Monitoring Workshop, 2015: “The USA-NPN: Phenology data and applications” (invited)

Ecological Society of America Meeting, 2015: “Data products to support assessment and forecasting of phenology on multiple spatiotemporal scales” (poster)

US Department of Agriculture Big Data Workshop, 2015: “Phenology data products, delivery, and visualization” (invited)

American Geophysical Union, 2014: “Phenology data products to support assessment and forecasting of phenology on multiple spatiotemporal scales” (oral)

Ecological Society of America Meeting, 2014: “Estimating the onset of spring from a complex phenology database: Trade-offs across geographic scales” (poster)

USA-NPN USGS program review, 2013: “Providing support for research and engagement at the National Park Service”

George Wright Society Conference, 2013: “The California Phenology Project: A Case Study of PPSR” (oral)

California Desert Research Symposium, 2012: “Reproductive ecology of selfing and outcrossing desert annual plants” (oral)

Ecological Society of America Meeting, 2012: "Implementing a regional phenology network: the California Phenology Project" (oral)

Ecological Society of America Meeting, 2010: "The effect of pollen limitation and resource availability on reproduction in selfing and outcrossing annuals" (poster)

Noon seminar, Ecology and Evolutionary Biology, University of Arizona, 2010: "Inter-annual variability in plant and pollinator phenology"

Ecological Society of America Meeting, 2009: "Timing of reproduction in outcrossing and selfing desert annual plants: the role of pollinators and herbivores" (oral)

Noon seminar, Ecology and Evolutionary Biology, University of Arizona, Spring 2009: "How pollinators, herbivores, and mating system mediate reproductive success in annual plants"

Ecological Society of America Meeting and Pollination conference, 2008: "Resource limitation and allocation in selfing and outcrossing desert annual plants" (poster)

NSF GK-12 conference, Washington DC, 2008: "Reproductive ecology of selfing and outcrossing *Camissonia*" (poster)

Noon seminar, Ecology and Evolutionary Biology, University of Arizona, 2007: "Resource allocation in selfing and outcrossing desert annual plants"

Noon seminar, Ecology and Evolutionary Biology, University of Arizona, 2007: "Reproductive consequences of female biased sex ratios at the range margin in *Bursera microphylla*"

Ecological Society of America Meeting, 2006: "Mating system evolution in *Bursera microphylla* (Burseraceae)" (oral)

## **Teaching and Outreach**

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Advisor for undergraduate independent study honors course, University of Arizona School of Natural Resources and the Environment (2016-2017).

Guest lecturer, University of Arizona, for the following courses: Climate Change Adaptation (2016), Conservation Biology (2004-07), Environmental Biology (2005-07)

Graduate Associate in Education and Outreach for Biosphere 2 (2008-09)

Teaching Assistant, University of Arizona for the following courses: Conservation Biology (2004-2006), Natural History of the Southwest (2007), and Ecology (2009)

Guest lecturer for Desert Flora lecture series at the Desert Institute, CSU San Bernardino (2010)

BioME NSF GK-12 fellow, developed and taught science curriculum in 3<sup>rd</sup>-5<sup>th</sup> grade classrooms in Tucson Unified School District (2007-2008)

## **Service and Leadership**

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Mentor for the NASA Space Grant internship program (2015-2019)

Member, NEON Terrestrial Plant Diversity and Phenology Technical Working Group (2017-present)

Committee member, Academic Program Review (APR), U of Arizona Ecology and Evolutionary Biology Department (2017)

Organizer, Phenology model workshop, Tucson Arizona (2016)

Co-convener, phenology sessions at American Geophysical Union Fall Meeting (2015)

Co-organizer, phenology panel discussion at George Wright Society meeting (2015)

Frequent manuscript reviewer for *American Journal of Botany*, *Annals of Botany*, *Ecosphere*, *Great Plains Research*, *International Journal of Plant Sciences*, *Journal of Ecology*, *International Journal of Biometeorology*, *Landscape Ecology*, *New Phytologist*, and *Plant Ecology*

Mentor for PlantingScience.org, Botanical Society of America (2007-present)

Proposal reviewer: Netherlands e-Science Center (2012)

USGS FPS reviewer (2011)

Content expert for middle school science teacher training for units in Ecology and Biodiversity, Tucson Unified School District (2009)

## **Grants, Awards and Honors**

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Co-Investigator, NASA grant, "Advanced Phenology Information System" \$147K to the U of A (2017-2019)

Co-Investigator, NASA grant, "A multi-scale satellite-based indicator of climate change impacts on land-surface phenology" \$75,293 to the U of A (2016-2019)

Collaborator, NSF grant "Mechanisms of malleability and resilience of flowering responses to current and future variability in seasonal cues in a geographically-widespread species" \$37,146 to the U of A (2016-2019)

"Climate Champion" (USGS Environmental Achievement Award), as a team member of the USA-NPN National Coordinating Office (2016)

"Healthy Workplace Award" (American Psychological Association), as a team member of the USA-NPN National Coordinating Office (2015)

Marshall Foundation Dissertation Fellowship, University of Arizona (2009-2010)

California Desert Research Fund, Community Foundation, \$3300 (2008), \$3800 (2009)

University of Arizona College of Science Service Award Nomination (2009)

Garden Club of America Desert Studies Grant \$4000 (2008)

McGinnies Scholarship in Arid Land Studies, University of Arizona, \$1000 (2008)

Travel Award, Plant Population Ecology section of Ecological Society of America, \$295 (2008)

Biodiversity Travel Grant, University of Arizona, \$2029 (2008)

BioME NSF GK-12 Teaching Fellowship, \$30,000 (2007-2008)

Graduate student representative, Ecology and Evolutionary Biology, University of Arizona (2007)

Cactus and Succulent Society of America Research Grant, \$1450 (2006)

Graduate Student and Professional Council Travel Award, University of Arizona, \$400 (2006, 2009)

Honorable Mention, NSF Graduate Research Fellowship Program (2006)

Rabbi Maurice T. Galpert Memorial Scholarship, Pasadena Jewish Temple and Center, \$2000 (2005)

Lucretia B. Hamilton Scholarship, University of Arizona, \$500 (2005)

### **Professional Membership**

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Ecological Society of America (2005-present)

Botanical Society of America (2005-present)

American Geophysical Union (2014-present)

### **Languages**

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Working proficiency in Spanish