Karen E. Tanner

Ph.D., Parker Lab, University of California, Santa Cruz
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EDUCATION

Ph.D. Ecology & Evolutionary Biology, with a designated emphasis in Coastal Science and Policy, University of California, Santa Cruz – 2020

B.S. Biology, Mills College, Oakland, CA, with Highest Honors – 2012

B.S. Art, James Madison University, Harrisonburg, VA, with Great Honor – 1994

RESEARCH EXPERIENCE

Research Fellow, Dept. Ecology & Evolutionary Biology, Parker Lab

Demographic response of the invader *Brassica tournefortii* under simulated solar panels in the Mojave Desert
Fall 2021 - present

Doctoral Research, Dept. Ecology & Evolutionary Biology, advised by Ingrid M. Parker

Plant response to land use change in two iconically stressful habitats: California's desert solar fields and restored coastal salt marshes
Fall 2014 – spring 2020

Graduate Student Researcher appointments

Effects of planting pattern across a stress gradient in the high marsh
P.I. Kerstin Wasson – Elkhorn Slough National Estuarine Research Reserve. Spring 2018

Renewable energy development impacts on desert annual plant seed banks & communities
P.I. Rebecca R. Hernandez – University of California, Davis, funded by the California Energy Commission. Eight quarters, 2016 – 2019

Development of rare plant monitoring protocols at Ash Meadows National Wildlife Refuge
P.I. Kara A. Moore-O'Leary – University of California, Davis, funded by U.S. Fish & Wildlife Service. Summer 2015

Modeling demographic performance of annual plants under simulated solar panels in the Mojave Desert
P.I. Kara A. Moore-O'Leary – University of California, Davis, funded by the California Energy Commission. 2011 – 2015

Undergraduate Researcher appointments

Designing an experimental study to measure impacts of solar development on desert annual plants
P.I. Bruce M. Pavlik, Mills College; Kara A. Moore-O'Leary, University of California, Davis. Funded by the Jill Barrett Research Foundation. Spring - summer 2011

PROFESSIONAL EXPERIENCE

California State Sea Grant Fellow at San Francisco Bay Conservation and Development Commission (BCDC)
Supervisor: Dana Brechwald
Awarded one of 30 fellowships in California focused on natural resource management to benefit the environment and residents of the state. Project lead on research assessing sea level rise planning around the Bay to identify barriers hindering progress. Harvest policies and programs from city planning documents and develop SurveyMonkey tool to collect data from local governments directly. Carry out analyses using the statistical computing package R and visualize data using Adobe Illustrator, ArcGIS Story Maps and ArcGIS Dashboards.

Member of team developing social media strategy and Twitter and Facebook content to share agency news and conduct educational outreach on Bay issues. Support a collaborative Bay-wide sea level rise planning effort led by BCDC and involving dozens of agency and community stakeholders. Experience with Slack, Zoom, Microsoft Teams, Dropbox, Google Apps. Spring 2020 – present

Junior Specialist, Dept. Evolution and Ecology, University of California, Davis. Supervisor: Kara A. Moore-O'Leary
Identified and installed sites, developed survey methods, and created GIS resources during development of a rare plant monitoring program at Ash Meadows National Wildlife Refuge. Trained field technicians and volunteer crews, led data collection surveys. Winter – summer 2014

Research Technician, BMP Ecosciences. Supervisor: Bruce M. Pavlik
Project lead for experimental shading study on select annual species, and field technician for population biology study on a suite of rare Mojave Desert plants. Winter 2012 – winter 2014

Senior Product Lead, Product Lead, Software Quality Engineer at Adobe Systems, Inc. Supervisor: Mike Abbott
Translated engineering specifications into broad-based quality assurance plans for 7 shrinkwrap releases of the Illustrator product. Led a globally distributed team engaged in analytical problem-solving and software qualification. February 1998 – July 2009

Software Quality Engineer, Claris Corporation. Supervisor: Robert Hunt. May 1996 – February 1998

Software Quality Engineer, Apple Computer, Inc. under contract with ADIA. January 1995 – May 1996

INTERNSHIPS

Least Tern Intern, U.S. Fish & Wildlife Service. Supervisor: Susan Euing
Collection and organization of data on mating, nesting and chick rearing behavior of the Alameda Point least tern colony. Collection and processing of seed from endangered plant species at Antioch Dunes National Wildlife Refuge. Spring – summer 2010

FELLOWSHIPS AND HONORS

2020 **Conservation Research Award**, Elkhorn Slough National Estuarine Research Reserve & Elkhorn Slough Foundation

5 years **Graduate Research Grants**, Dept. Ecology & Evolutionary Biology, University of California, Santa Cruz $1,500 each (2015 - 2019)

2018 **Future Leaders in Coastal Science Award** – $19,000

2018 **Jean H. Langenheim Graduate Fellowship in Plant Ecology and Evolution** – $3,200

2018 **Hardman Native Plant Award** – $1,000

2017 **Best Student Talk Award** at the California Invasive Plant Council 2017 meeting – $250

2017 **Travel Grant**, California Invasive Plant Council 2017 Meeting – $150

2017 **Marilyn C. Davis Memorial Scholarship** – $1,500

2016 **SCB Conservation Grant**, Southern California Botanists – $1,000

2016 **Reduce the Environmental and Public Health Impacts of Electrical Generation Grant**, California Energy Commission (co-written with P.I. Kara Moore O'Leary, implemented under P.I. Rebecca R. Hernandez) – $98,800 subcontract to UC Santa Cruz

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2016 **Research Scholarship**, Northern California Botanists – $1,000

2016 **Teaching Award** for outstanding performance as a teaching assistant, UC Santa Cruz – $500

2015 **Natalie Hopkins Award**, California Native Plant Society – $500

2014 **Honorable Mention**, research proposal submitted to NSF Graduate Research Fellowships Program

2014 **Doc Burr Award**, California Native Plant Society – $850

2013 **Educational Grant**, California Native Plant Society – $300

2013 **EcoArts Festival Featured Artist**, Ecological Society of America – artwork "Rustle In The Brush" included in "An Evening of Art & Music" session

2012 **Phi Beta Kappa** induction, Mills College

2012 **Vera Long Prize**, Mills College – awarded for an outstanding thesis on environmental biology

2012 **Bruce McCollum Prize**, Mills College – for senior science majors with the highest GPA

2 years **Dean's Scholarship**, Mills College – $3,500 (2010) and $7,000 (2011)

2010 **Jill Barrett Foundation** research scholarship, Mills College – $2,000

2009 **Service Learning Commendation**, San Jose City College – awarded for honors work in Organic Chemistry developing software-based resources and laboratory instrumentation manual

2007 **People's Choice Award: Crazy Ivan**, Adobe Systems, Inc. – awarded for innovation in technology

PUBLICATIONS

- Shikuzawa, J, E Watson, **Tanner, KE,** B Wilburn, S Fork, S Larson, MC Fountain AS Thomsen, K Wasson. *In preparation*. Ecosystem Functions of Plant Diversity in Restoration: Comparisons from a Large-Scale Salt Marsh Restoration Experiment in Central California, USA.

- Thomsen, AS, J Krause, M Appiano, **Tanner, KE**, C Endris, J Haskins, E Watson, A Woolfolk, MC Fountain, K Wasson. 2021. Monitoring vegetation dynamics at a tidal marsh restoration site: integrating field methods, remote sensing and modeling. *Estuaries and Coasts* https://doi.org/10.1007/s12237-021-00977-4

- **Tanner, KE,** KA Moore-O'Leary, S Haji, IM Parker, BM Pavlik and RR Hernandez. 2021. Microhabitats associated with solar energy development alter demography of two desert annuals. *Ecological Applications* https://doi.org/10.1002/eap.2349.

- Wasson K, **KE Tanner**, A Woolfolk, S McCain, J Suraci. 2020. Top-down and sideways: Herbivory and cross-ecosystem connectivity shape restoration success at the salt marsh-upland ecotone. *PLoS ONE* 16(2):e0247374. https://doi.org/10.1371/journal.pone.0247374.

- Hernandez, RR, **KE Tanner,** S Haji, IM Parker, BM Pavlik and KA Moore-O'Leary. 2020. Simulated photovoltaic solar panels alter the seed bank survival of two desert annual plant species. *Plants* 9(9):1125 http://dx.doi.org/10.3390/plants9091125

- **Tanner**, **KE,** IM Parker, S Haji, KA Moore-O'Leary, RR Hernandez. 2020. Effects of solar panel microhabitats on Saharan mustard demography. *California Invasive Plant Council Dispatch* Volume 28(3):12-13.

- **Tanner**, **KE,** KA Moore-O'Leary, IM Parker, BM Pavlik and RR Hernandez. 2020. Simulated solar panels create altered microhabitats in desert landforms. *Ecosphere* 11(4):e03089 http://dx.doi.org/10.1002/ecs2.3089

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- **Tanner**, **KE,** K Wasson, M Fountain, A Thomsen, IM Parker. 2019. Testing clustered plantings as a high marsh restoration tool. *Ecesis* 29(2):1-3.
- Moore-O'Leary, KA, RR Hernandez, SR Abella, **KE Tanner**, AC Swanson, J Kreitler, and JE Lovich 2017. Sustainability of utility-scale solar energy – critical energy concepts. *Frontiers in Ecology and the Environment* 7(15): 385-394.
- Pearse, D, H Holmlund, J Herman, S Grove, J Winnikoff, **K Tanner,** S Sianta, N Macias, A Vershinina. (2017). A Review of: *Invasion Genetics: The Baker and Stebbins Legacy.* Edited by Barrett, Colautti, Dlugosch, and Rieseberg. *Quarterly Review of Biology* 92:334.
- **Tanner, KE**, KA Moore-O'Leary, and BM Pavlik. 2014. Measuring impacts of solar development on desert plants. *Fremontia* 42:15-16.
- **Tanner, KE** (2011). Community susceptibility to invasion is regulated by niche space availability and the invasive potential of arriving exotic species. *Mills Academic Research Journal (MARJ).*

Technical reports

- Grodsky, SM, **KE Tanner**, RR Hernandez. 2020. Desert Plant Response to Solar Energy Development: Trophic Interactions, Rare and Invasive Species, and Management Implications. *Report prepared for the California Energy Commission.*
- Grodsky, SM, **KE Tanner**, J Whitney, RR Hernandez. 2019. Optimizing solar facility configuration effects on habitat, managed plants, and essential species interactions. *Report prepared for the California Energy Commission.*
- Moore-O'Leary KA, **KE Tanner**, C Levine. 2019. Site-specific protocol for monitoring abundance and traits of nine endemic rare plants at Ash Meadows National Wildlife Refuge. *Prepared for U.S. Fish and Wildlife Service, National Wildlife Refuge System, Pacific Southwest Region, Inventory & Monitoring Program. Sacramento, CA.*
- **Tanner, KE**, KA Moore, and BM Pavlik. Chapter 2 in Moore-O'Leary, KA and BM Pavlik, Measuring and Evaluating Rare Plant Demography in the California Deserts: Implications for Solar Energy Development. 2016. *Report prepared for the California Energy Commission.*
- **Tanner, KE** and KA Moore-O'Leary. Rare Plant Fact Sheets for the Endemic Plants of Ash Meadows National Wildlife Refuge. 2014. *Technical materials prepared for the U.S. Fish & Wildlife Service.*

Technical reports (unpublished)

- Grodsky, SM, **KE Tanner,** J Whitney, RR Hernandez. Optimizing solar facility configuration effects on habitat, managed plants, and essential species interactions. *Monthly Reports / Annual Environmental and Experimental Reports prepared for California Energy Commission.*

INVITED TALKS

Solar development impacts on annual plants in California's desert. University of California, Hernandez Lab, Department of Land, Air and Water Resources, Davis, CA – 2021

Restoration of high marsh diversity: does clustering help reduce stressful conditions? Elkhorn Slough National Estuarine Research Reserve, Castroville, CA – 2020

Solar energy ecology. Grodsky, S. M., K. Tanner, L. Saul-Gerschenz, K. Moore-O'Leary, J. P. Whitney, and R. R. Hernandez. Environmental Protection Agency, San Francisco, CA – 2019

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Solar development impacts on annual plants in California's desert. California Native Plant Society, Santa Clara Chapter Meeting, Los Altos, CA – 2019

ORAL PRESENTATIONS

Testing clustered plantings to inform salt marsh restoration. Slough Symposium, Moss Landing, CA – 2019

Testing science-based strategies to improve salt marsh restoration success.
SERCAL Conference, Santa Barbara CA – 2019
9th Biennial Plant Research Symposium, Santa Cruz, CA – 2019
Bay Area Vegetation Manager's Workgroup Meeting, Presidio, CA – 2018

Effects of renewable energy development on demography of *Brassica tournefortii.*
California Invasive Plant Council Symposium, Palm Springs, CA – 2017

Harnessing plant interactions to improve restoration outcomes in a salt marsh.
Dept. Ecology & Evolutionary Biology Symposium, Santa Cruz, CA – 2017
8th Biennial Plant Research Symposium, Santa Cruz, CA – 2017

Effects of renewable energy development on annual plant seed bank dynamics.
26th Graduate Student Meeting, California Botanical Society, Santa Barbara, CA – 2017

Demographic effects of experimental shading and microtopography on desert annual plant performance.
Ecological Society of America Annual Meeting, Baltimore, MD – 2015
Dept. Ecology & Evolutionary Biology Symposium, Santa Cruz, CA – 2016

Changes to shade and water regimes imposed by solar development affect desert plant performance and community attributes.
Ecological Society of America Annual Meeting, Sacramento, CA – 2014
7th Biennial Plant Research Symposium, Santa Cruz, CA – 2015

Designing an experimental study to investigate impacts of utility-scale solar development on desert annuals.
California Native Plant Society Conservation Conference, San Diego, CA – 2012

POSTER PRESENTATIONS

Testing clustered plantings to inform salt marsh restoration. State of the San Francisco Estuary Conference, Oakland, CA – 2019

Testing novel science-based strategies to improve salt marsh restoration success.
9th National Summit on Coastal and Estuarine Restoration and Management, Long Beach, CA – 2018
Ecological Society of America Annual Meeting, New Orleans, LA – 2018

Desert annual plants and communities exhibit variable response to shade and water regime changes associated with solar development. California Native Plant Society Conservation Conference, San Jose, CA – 2015

Ethanol - A student investigation of the economic practicality of corn and newspaper biofuels. 239th American Chemical Society National Meeting & Exposition, San Francisco, CA – 2010

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Teaching Experience

Teaching assistant appointments at University of California, Santa Cruz:

- Plants & Society BIOE 118 – 2020
- Plant Ecology BIOE 145 (upper division) – 2017
- Evolution BIOE 109 (upper division) – 2016
- Systematic Botany BIOE 117 (upper division) – 2016
- Community Ecology BIOE 293 (upper division) – 2015
- Ecology BIOE 20C (lower division) – 2015

Teaching assistant appointments at Mills College, Oakland, California:

- Genetics BIO 135 (upper division) – 2011

Mentoring

I mentored 3 senior thesis students at UCSC, 2 summer interns in the Research Experience for Undergraduates program, and 2 visiting interns from other institutions (CalPoly and Antioch College). I have also trained 18 consultants and 74 undergraduate students on field data collection and laboratory techniques, including 53 women and 15 individuals from demographic groups under-represented in the sciences.

Training

- NOAA Planning Effective Projects for Coastal Communities Workshop, fall 2020
- USDN Equity Foundations Training, fall 2020
- ANR Drone Camp – University of California Informatics and GIS program, summer 2019
- Graduate Student Professional Communication Certificate Program – UCSC, winter 2019

Affiliations

- The Coastal Society – 2018 to present
- Sigma Xi – 2016 to present
- Northern California Botanists – 2016 to present
- Southern California Botanists – 2016 to present
- Ecological Society of America – 2015 to present
- Society for Conservation Biology – 2015 to present
- California Invasive Plant Council (Cal-IPC) – 2013 to present
- Phi Beta Kappa – 2012 to present
- California Native Plant Society – 2011 to present

Outreach & Activities

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Meals on Wheels driver for the Health Trust – fall 2020 to present

Science mentor for San Lorenzo High School Environmental Monitoring Program (Santa Cruz, CA) – 2019

Invited panelist for WISE (Women in Science and Engineering) undergraduate outreach program – spring 2019

Program coordinator and lead instructor for monthly citizen science outreach workshop, the UCSC Arboretum Phenology Walk, affiliated with the USA National Phenology Network – 2017 to 2020

Hosted Watsonville high school students for Rotary Club Job Shadowing event – 2018, 2019

Contributed articles to the Slough News, a community newsletter published by the Elkhorn Slough Foundation:
"Do clustered plants improve restoration outcomes in the high marsh?" – 2019
"Lessons on plant restoration from Whistlestop Lagoon" – 2018
"Can positive plant interactions improve restoration outcomes?" – 2017

Formed partnership with San Lorenzo High School faculty (Hayward, CA) to develop student-run citizen science phenology monitoring program – 2018

Graduate Student Peer Mentor, Department of Ecology & Evolutionary Biology, UCSC – 2017, 2018

Citizen science restoration planting event with the Carmel Garden Club at Elkhorn Slough – 2017

California Native Plant Society, Santa Clara Chapter:
Rare Plant committee member, 2014 – 2016
Rare Plant Treasure Hunt participant, 2012 – 2016
LIVeCoRPs conservation committee member, 2012 – 2014
Invasive Plant Chair, 2012 – 2014

Volunteer gardening and plant propagation, Mills College Botanic Garden – 2011

Volunteer shift supervisor at Wildlife Center of Silicon Valley, with primary roles in volunteer training, animal intake and examination, and animal care – 2003 to 2009

Earthwatch Institute volunteer researcher:
Tropical bird populations of Ecuador. P.I. Constance Dustin Becker, Kansas State University – 2004
Osprey populations of Flathead Lake. P.I. Charles R. Blem, Virginia Commonwealth University – 2002