


# GREER ANDERSEN DOLBY

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## EDUCATION

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2015	Ph.D.	Biology <i>Physical drivers of spatiotemporal genetic patterns and evolutionary processes among and within species of the North American southwest</i>	UCLA	Los Angeles, CA
2013	MSc.	Biology	UCLA	Los Angeles, CA
2008	B.A.	1. Earth Sciences 2. Biology, Conservation & Ecology	Boston University	Boston, MA

## POSITIONS

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2016–		<i>Postdoctoral Research Associate</i> Arizona State University, School of Life Sciences		Tempe, AZ
2014–2015		<i>Instructor</i> UCLA, Department of Ecology and Evolutionary Biology		Los Angeles, CA
2008–2015		<i>Teaching Fellow</i> UCLA, Department of Ecology and Evolutionary Biology		Los Angeles, CA

## RESEARCH INTERESTS

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As an evolutionary biologist, I study geo-genomics and speciation through the lens of Earth-life coevolution. I use quantitative approaches to integrate models of the changing paleo-landscape with genomic signatures that record how populations co-evolved with those landscapes. Ongoing research projects include: (1) sea-level change and diversification of coastal species; (2) speciation and geo-climatic evolution of the southwest, and (3) psuedocongruence and evolutionary inference in geo-climatically complex regions.

### *Driving questions*

- What geo-climatic processes most drive speciation over recent and deep time?
- What is the range of organismal responses to a set of shared extrinsic forces?
- How can we quantitatively integrate disparate types of data (among geology, physics, biology)?
- How can we compare genomic divergence signatures across disparate types of organisms?

## HONORS & AWARDS

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2017–	Desert Tortoise Council, Board of Directors	Elected member
2015	Simons Foundation Junior Fellow	Finalist
2014	UCLA Schechtman Award for Teaching Excellence	Nominee
2013	UCLA Graduate poster competition award	First place
2010	NSF Graduate Research Fellowship Program (GRFP)	Honorable Mention
2006	NSF Research Experience for Undergraduates (REU)	Fellow

## PUBLICATIONS & PRODUCTS

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### *In preparation* (\*corresponding, †contributed equally, <sup>1</sup>trainee)

9. Morales M<sup>1</sup>, **Dolby GA**, Kusumi K, Gene family evolution of Toll-Like Receptors, Aquaporins, and Heat Shock Factors across reptiles.
8. **Dolby GA\***, Munguía Vega A, Jacobs DK, The roles tectonics and sea-level change play in genetic evolution of coastal species: a global analysis, *Global and Planetary Change* (invited research paper)—due 31 Dec 2018.
7. **Dolby GA\***, Morales M<sup>1</sup>, Webster TH, DeNardo D, Wilson Sayres M, Kusumi K, Mojave Desert tortoise genome 2.0: population genomic resource for a long-lived desert reptile.
6. **Dolby GA\***, Dorsey RJ, Graham MR, Charting the biogeographic legacy of the lower Colorado River: new insights from geology and comparative phylogeography of terrestrial desert fauna, *Journal of Biogeography—Humboldt Special Issue: The legacy of Alexander von Humboldt: Exploring the links between geo- and biodiversity*.

### *Preprints*

5. Webster TH\*<sup>†</sup>, **Dolby GA\***<sup>†</sup>, Wilson Sayres M, Kusumi K, Improved draft of the Mojave Desert tortoise genome, *Gopherus agassizii*, version 1.1. <https://doi.org/10.7287/peerj.preprints.3266v3>

### *Peer-reviewed articles (published or submitted)*

4. **Dolby GA\***, Ellingson RA, Findley LT, Jacobs DK\*, (2018) How sea level change mediates genetic divergence in coastal species across regions with varying tectonic and sediment processes, *Molecular Ecology*, 27, 994–1101. [DOI: 10.1111/mec.14487](https://doi.org/10.1111/mec.14487)
3. Tollis M, DeNardo DF, Cornelius JA, **Dolby GA**, Edwards T, Henen BT, Karl AE, Murphy RW, Kusumi K (2017) The Agassiz's Desert tortoise genome provides a resource for the conservation of a threatened species, *PLoS ONE*, 12:5, e0177708. [DOI: 10.1371/journal.pone.0177708](https://doi.org/10.1371/journal.pone.0177708)
2. **Dolby GA\***, Hechinger R, Ellingson RA, Findley LT, Lorda J, Jacobs DK\* (2016) Sea-level driven glacial-age refugia and post-glacial mixing on subtropical coasts, a palaeohabitat and genetic study, *Proceedings of the Royal Society B*, 283:20161571, 1–8. [DOI: 10.1098/rspb.2016.1571](https://doi.org/10.1098/rspb.2016.1571)
1. **Dolby GA\***, Bennett SEK, Lira-Noriega A, Wilder BT, Munguía-Vega A (2015) The geologic and climatic forcing of biodiversity surrounding the Gulf of California, *Journal of the Southwest*, 57:2–3, 391–455. [DOI: 10.1353/jsw.2015.0005](https://doi.org/10.1353/jsw.2015.0005)

### *Published abstracts*

5. **Dolby GA**, Jacobs DK (2017) Sea-level change mediates genetic diversification of coastal fishes. *Geological Society of America Abstracts with Programs*, 49:6.
4. Jacobs DK, **Dolby GA**, Hechinger R, Lorda J, Ellingson R, Findley L (2017) Sea-level cycles generate glacial age refugia on subtropical coasts. *Society for Integrative and Comparative Biology; Oxford University Press*, 56:E302.
3. **Dolby GA**, Jacobs DK (2014) Habitat modeling and genetic signatures of postglacial recolonization for tidal estuaries. *American Geophysical Union*, 2014:PP13C-02.
2. **Dolby GA**, Ellingson RA, Day PP, Jacobs DK (2012) How origination of modern fish lineages may reflect timing of when the Gulf of California opened: a new biological approach. *Geological Society of America Abstracts with Programs*, 44:3, 18.
1. **Dolby GA**, Pekar SF, Mountain GS, Christie-Blick N (2006) A comparison of stratal geometry in the Greenhouse and Icehouse worlds from multichannel seismic reflection and chirp sonar data from the New York Bight. *Geological Society of America Abstracts with programs*, 38:7, 227.

*Animations & educational videos (^student)*

1. **Dolby GA**, ^Pataranutaporn P, Jacobs DK, Kusumi K (2017) *Sea level & genetic diversification*. Vimeo. <https://vimeo.com/219921821>

**GRANTS & FELLOWSHIPS**

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**Current grants (\$79k)**

~1.2M CPU-hrs	2018–2019	<b>PI</b>	<b>Blue Waters, National Center for Supercomputing Applications (NCSA)</b> Broadening Participation Allocation: <i>Fine-scale geospatial interpolation of variants across hundreds of genomes to determine drivers of speciation.</i>
100k CPU-hrs	2018–2019	<b>PI</b>	<b>XSEDE</b> Computing allocations on Comet & Bridges.
\$11,970	2017–2018	<b>PI</b>	<b>Desert Tortoise Council</b> Research Grant: <i>Genomic insights into extralimital populations and hybrids of a Threatened species</i>
\$33,776	2017–2019	<b>coPI</b>	<b>AZ Game &amp; Fish Heritage Fund</b> <i>Characterizing the Sonoran Desert tortoise through genomic analyses of hybrids and speciation</i>
\$33,375	2017–2018	<b>coPI</b>	<b>Dept. of Interior—U.S.G.S.</b> Cooperative agreement, Ecosystem Studies Unit: <i>Differential immune expression of tortoises raised on invasive versus native grasses</i>

**Pending grants (\$2.95M)**

\$2,956,671 (\$874k, ASU)	resubmission 2018	<b>ASU PI</b>	<b>NSF EAR Integrated Earth Systems</b> (resubmission) Collaborative Research: <i>A geogenomic assessment of mechanisms driving genetic discordance along the Baja California peninsula</i> PIs: Dorsey, Dolby, Hausback, Wilder
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**Completed grants (\$40k)**

\$5,400	2016–2017	<b>coPI</b>	<b>Dovetail Genomics</b> Matching Funds Award
\$7,496	2016–2017	<b>PI</b>	<b>ASU Fostering Postdoctoral Research in the Life Sciences</b> <i>Deciphering ecological drivers of speciation &amp; local adaptation in the desert tortoise complex</i>
\$1,900	2014–2015	<b>PI</b>	<b>American Museum of Natural History</b> Lerner Gray Memorial Grant
\$14,960	2011–2013	<b>coPI</b>	<b>NSF Doctoral Dissertation Improvement Grant (DDIG)</b> Dissertation Research: <i>An interdisciplinary approach to testing intraspecific evolutionary processes</i>
\$6,000 (total)	2009–2012	<b>PI</b>	<b>UCLA</b> Research Award, N=3

\$4,500 (total)	2006–2008	PI	<b>Boston University Undergraduate Research Award, N=3 (w/ M. Raymo)</b>
<b>Completed fellowships/awards (\$105k)</b>			
\$1,000	2015	awardee	<b>Next Generation Sonoran Desert Researchers Travel Award</b>
\$20,500	2014–2015	awardee	<b>UCLA Dissertation Year Fellowship</b>
\$26,000 (total)	2008–2014	awardee	<b>UCLA Quarterly Grad. Fellowship (N=4)</b>
\$51,984 (total)	2009–2011	awardee	<b>Dept. of Education GAANN Fellowship</b>
\$5,000	2006	awardee	<b>NSF REU Fellowship</b> <i>Lamont Doherty Earth Observatory (w/ S. Pekar, N. Christie-Blick, G. Mountain)</i>

### **INVITED TALKS**

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2018	<u>Arizona State University</u> , School of Earth and Space Exploration <i>Faculty search—Assistant Professor, Geobiology</i>	Tempe, AZ
2015	<u>Arizona State University</u> , School of Life Sciences	Tempe, AZ
2015	<u>Washington State University</u> , School of Biological Sciences	Pullman, WA

### **CONFERENCE PRESENTATIONS**

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- Dolby GA** (2018) Genomic data offers an independent perspective on evolution of the lower Colorado River region *in* Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California. Oral presentation. *114<sup>th</sup> Cordilleran Annual Section Meeting, Geological Society of America*, Flagstaff, AZ.
- Dolby GA**, Webster TH, DeNardo D, Wilson Sayres MA, Kusumi K (2018) Geologic history and genomic divergence between *Gopherus agassizii* and *G. morafkai*. Oral presentation. *Annual Meeting and Symposium of the Desert Tortoise Council*, Las Vegas, NV.
- Dolby GA**, Webster TH, DeNardo D, Wilson Sayres MA, Kusumi K (2018) Extrinsic forcing of genomic evolution during speciation: a geo-genomic study of *Gopherus* desert tortoises. Oral presentation. *Plant and Animal Genome XXVI Conference: Population and Conservation Genomics Workshop*. San Diego, CA.
- Dolby GA**, Jacobs DK (2017) Sea-level change mediates genetic diversification of coastal fishes. Oral presentation. *Geological Society of America Annual Meeting*, Seattle, USA.
- Dolby GA**, DeNardo D, Kusumi K (2017) Progress Towards a Sonoran Desert Tortoise Genome to Advance Conservation and Wildlife Management. Oral Presentation. *Annual Meeting and Symposium of the Desert Tortoise Council*, Las Vegas, NV.
- Jacobs DK, **Dolby GA**, Hechinger R, Lorda J, Ellingson R, Findley L (2017) Sea-level cycles generate glacial age refugia on subtropical coasts. Oral Presentation, *Society for Integrative and Comparative Biology*, New Orleans, LA.
- Hutchins ED, Djordjevic D, Cornelius JA, **Dolby GA**, Ho JWK, Kusumi K (2017) The Evolution of Regeneration in Reptiles and Amphibians: Insights from Comparative Genomic Analysis of Gene Regulatory Networks *in* Amphibian & Reptile Genomics: Recent Success, Current Progress, and Future Challenges. Oral presentation, *8th World Congress of Herpetology*, Hangzhou, China.
- Dolby GA**, Ellingson RA, Findley LT, Jacobs DK (2016) Sea-level mediated refugia as a driver of genetic diversification on subtropical coastlines--a paleohabitat and genetic study. Oral Presentation, *Society for Evolution Annual Meeting*, Austin, TX.

- Dolby GA**, Jacobs DK (2014) Habitat modeling and genetic signatures of postglacial recolonization for tidal estuaries. Oral Presentation, *American Geophysical Union Fall Meeting*, San Francisco, CA.
- Dolby GA**, Jacobs DK (2014) Tidal estuarine habitat abundance since the last glacial maximum in southern and Baja California. Poster Presentation, *California Estuarine Research Society Annual Meeting*, Bodega Bay, CA.
- Dolby GA**, Jacobs DK (2014) Assessing GIS Estuarine habitat predictions with a new statistical approach for genetic signatures of postglacial recolonization. Oral Presentation, *Society for Evolution Annual Meeting*, Raleigh, NC.
- Jacobs DK, Ellingson R, **Dolby G**, Swift CC (2013) Estuarine Habitat and Speciation Process in Bay Gobies: Cryptic Taxa, Anthropogenic Impacts And Restoration Conflicts. Oral Presentation, *Western Society of Naturalists Annual Meeting*. Oxnard, CA.
- Jacobs DK, Ellingson R, **Dolby G**, Swift CC (2013) Bay Gobies in California and The Gulf of California—Phylogeny, Speciation Process, Cryptic Taxa, Anthropogenic Impacts And Restoration Conflicts. Oral Presentation, *Southern California Academy of Sciences*, Long Beach, CA.
- Dolby GA**, Ellingson R, Day PP, Jacobs DK (2012) How origination of modern fish lineages may reflect timing of when the Gulf of California opened: a new biological approach *in*: What Fossil Ages and Distributions Tell Us about the History of the Ancient Gulf of California. Oral Presentation, *Geological Society of America Annual Meeting*, Querétaro, MX.
- Jacobs DK, Sim J, Swift CC, Findley LT, Ellingson R, **Dolby GA** (2011) Bay Gobies—Conservation Genetics and Conflicts in the Restoration of California Estuaries *in*: Ecology and Evolutionary Biology of Gobies in North America: Conservation Concerns in a Changing World. Oral Presentation, *American Fisheries Society Annual Meeting 2011*, Seattle, WA.
- Dolby GA**, Ellingson R, Jacobs DK (2011) An Interdisciplinary Approach to Studying Incipient Speciation: The Role of Seaways in the Phylogeography of the American Shadow Goby *in*: Ecology and Evolutionary Biology of Gobies in North America: Conservation Concerns in a Changing World. Oral Presentation, *American Fisheries Society Annual Meeting 2011*, Seattle, WA.
- Dolby GA**, Dea JH<sup>1</sup>, Lau LF<sup>1</sup>, Rose K<sup>1</sup> (2010) Genetically Distinct Extralimital Populations of Two Fish: Evidence of Extended Ranges during the Mid-Holocene Climatic Optimum in Southern California. Poster Presentation, *American Association for the Advancement of Science Annual Meeting*, San Diego, CA. [<sup>1</sup>trainees]
- Dolby GA**, Pekar SF, Mountain GS, Christie-Blick N (2006) A Comparison of Stratal Geometry in the Greenhouse and Icehouse Worlds from Multichannel Seismic Reflection and Chirp Sonar Data from the New York Bight. Poster Presentation, *Geological Society of America Annual Meeting*, Philadelphia, USA.

## **TEACHING EXPERIENCE**

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### ***Instructor of record (G-graduate, U-undergraduate)***

2017–2018	2x	ASU, co-I	Molecular Genetics & Genomics ( <i>G</i> )
2013–2015	2x	UCLA	Introduction to Ecology and Behavior, Lab ( <i>U</i> )
2009–2011	2x	UCLA	Directed Research ( <i>U</i> )
2009–2011	3x	UCLA	Departmental Honors Contract Course ( <i>U</i> )

### ***Teaching Fellow***

2015		UCLA	Introduction to GIS ( <i>U</i> )
2015		UCLA	Conservation Biology ( <i>U</i> )

2009–2015	3x	UCLA	Evolution ( <i>U</i> )
2009–2014	4x	UCLA	Molecular Evolution ( <i>U</i> )
2011–2013	2x	UCLA	Life: concepts and issues (non-majors course) ( <i>U</i> )

#### ***Invited lecturer***

2018		ASU	Molecular Cell Biology & Neuroscience ( <i>G</i> )
2017–2018	2x	ASU	Environ. Life Sciences: Grand Challenges ( <i>G</i> )
2017		ECSU	Organismal Bio., <i>Eastern Connecticut State U.</i> ( <i>U</i> )
2015		UCLA	Evolution ( <i>U</i> )
2013		UCLA	Molecular Evolution ( <i>U</i> )

### **FIELD EXPERIENCE**

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2017–2018 (9x)	<u>Western Arizona, USA (multi-day)</u> —surveying and subcarapacial blood collection from desert tortoises; habitat descriptions (organizer, permit-holder).
2014–2015 (3x)	<u>Southern California, USA (day trips)</u> —augur coring, seining to collect fishes, geomorphological descriptions of estuary sites, deploying cameras and DO/Temp recorders.
2009–2014 (3x)	<u>Baja California, Mexico (3 weeks ea.)</u> —led measuring, describing, sampling stratigraphic sections; seining and collecting fishes and invertebrates in nearshore and estuarine habitats (organizer).
2008	<u>Queensland, Australia (3 weeks)</u> —field techniques course on effects of coastal sedimentation processes on Great Barrier Reef formation. Work included snorkeling, sediment coring, sketching rock sections, seismic data collection on the James Kirby Research Vessel.
2007	<u>Ecuador &amp; Galápagos Islands (5 months)</u> —independent projects in Andean montane ecosystems, Amazon rainforest (Tiputini Biodiversity Station), Galápagos Islands and Pacific coastal regions focusing on observational and non-invasive projects.

### **PROFESSIONAL DEVELOPMENT**

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2018	Midwestern	PATRIC: Bioinformatic computing platform, workshop ( <i>1 day</i> )
2018	AGFD	Arizona Interagency Desert Tortoise Team, meeting ( <i>1 day</i> )
2018	ASU	Patenting and IP Protection, trademarking, workshop ( <i>part day</i> )
2018	NCSA	Blue Waters new user training, workshop ( <i>half day</i> )
2017	ASU	Microsoft Azure Cloud Computing, workshop ( <i>half day</i> )
2016–2018	ASU	Postdoctoral Community Association, meetings ( <i>weekly</i> )
2016	ASU	Alan Alda Center for Communicating Science, workshop ( <i>1 day</i> )
2016	ASU	Python training, workshop ( <i>1 day</i> )
2016	ASU	Galaxy Cloud Computing, workshop ( <i>1 day</i> )
2016	ASU	ESRI training workshop, webinar ( <i>part day</i> )
2015	UCLA	Scientific Visualizations Technical by Texas Advanced Computing Center, workshop ( <i>2 days</i> )
2012	UCLA	Preparing Future Faculty training course ( <i>20 weeks</i> )

### **PRESS COVERAGE**

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David Colgan. “How changes in sea level and geography affect genetics of coastal marine life.” *UCLA Institute of the Environment and Sustainability*, 15 January 2018. <https://tinyurl.com/y86c4j7v>.

Nicholas Gerbis. “Desert Tortoise Genome Reveals Genetic Keys to Surviving Harsh Conditions, Threats.” *NPR-KJZZ*, 31 May 2017. <http://tinyurl.com/y7st3ly6>.

Editorial staff. “Decoded genome may help Mojave Desert tortoise win race to survive.” *ScienceDaily*, 31 May 2017. <http://tinyurl.com/y778bzcw>.

Matthew Cabe. “This Desert Life: A massive plane, a decoded genome.” *Daily Press*, 9 June 2017. <http://tinyurl.com/ydatrfxy>.

Editorial staff. “Research Highlight: Researchers Uncover New Details About California’s Ancient Shoreline.” *Scripps Institution of Oceanography*, 1 Mar 2017. <http://tinyurl.com/y7gb2vk8>.

David Colgan. “California’s past and future coastal habitat.” *UCLA Institute of the Environment and Sustainability*, 9 Dec 2016. <http://tinyurl.com/y99ju2h9>.

## **OUTREACH**

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2018–2019	Arizona PBS TV show, “Catalyst”—interviewee, field contributor (30-min episode, reptiles of the southwest)
2017–	<u>CompuGirls</u> : coordinate and lead student outreach panels for underserved and underrepresented adolescent girls
2017	Turtle-trapping at the Phoenix Zoo—checked tortoise traps for nonnative species and processed turtles, interacted with volunteers (one day)
2016	Intel ISEF Grand Award Judge: Computational Biology & Bioinformatics
2011–2013	<u>Apprenticeship teacher</u> at SPARK: a program to keep at-risk middle school youths in school
2008–	Mentor (UCLA & ASU):

### ***Undergraduate students***

\*entered graduate school; <sup>1</sup>biology, <sup>2</sup>GIS, <sup>3</sup>computer science, <sup>4</sup>art

<i>James Ahad</i> <sup>3</sup>	<i>Kelly Riestenberg</i> <sup>1</sup>	<i>Matheo Morales</i> <sup>3</sup>
<i>Hannah Barroga</i> <sup>1</sup>	<i>Kate Rose</i> <sup>1</sup>	<i>Pat Pataranutaporn</i> <sup>* 4</sup>
<i>Jessica Dea</i> <sup>* 1</sup>	<i>Faiz Tousif</i> <sup>* 1</sup>	<i>Arturo Bedolla</i> <sup>2</sup>
<i>Clive Lau</i> <sup>* 1</sup>	<i>Boyang Zhang</i> <sup>1</sup>	<i>Vivek Mahendra</i> <sup>3</sup>
<i>Shirin Mostofi</i> <sup>* 1</sup>	<i>Rena Emond</i> <sup>* 1</sup>	

### ***Masters students***

<i>Clive Lau</i>	<i>Alex Gleason</i>	<i>John Cornelius</i>
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### ***PhD students***

<i>Cindy Xu</i>	<i>Joey Orton</i>
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## **PROFESSIONAL SERVICE**

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2018–2019	<u>Committee Member</u> , Special/Technical Sessions Committee— <i>Geological Society of America Annual Meeting</i> , 2019.
2017–	<u>Elected Board Member at Large</u> , Desert Tortoise Council, Board of Directors—foci: 1) Student Outreach/Engagement Committee, 2) Ecosystem Advisory Committee for Arizona, 3) Grants Committee <i>Organizer: professional development Lunch n’ Learn panel and networking event for conservation-oriented undergraduates in Arizona.</i>

- 2016–2017 Development, organization, and leadership of a 30-week bioinformatics reading group for postdocs and graduate students. Syllabi available at [www.greerdolby.org](http://www.greerdolby.org)
- 2016– Ad hoc peer reviewer:  
*Nature Communications*    *Journal of Heredity*  
*Molecular Ecology*        *Annals of Botany*  
*Zoologica Scripta*         *Chelonian Conservation and Biology*
- 2012 Next Gen. Sonoran Desert Researchers inaugural meeting—contributed expertise and guidance to launch the binational, cross-disciplinary society (invited)
- 2011–2012 Graduate Awards Committee, Dept. EEB, UCLA

***Professional memberships***

- 2015– Desert Tortoise Council (DTC)
- 2014–2015 Coastal and Estuarine Research Federation (CERF)
- 2012– Next Generation Sonoran Desert Researchers (NGEN)
- 2010– American Geophysical Union (AGU)
- 2009– Society for the Study of Evolution (SSE)
- 2006– Geological Society of America (GSA)