


## 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 of Record</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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Drawing from evolution and geobiology, I study speciation through the lens of Earth-life evolution. I use quantitative models to integrate how paleo-landscapes change over time along with genomic signatures that record how populations evolved with those landscapes. Ongoing projects include **(1)** sea-level change and diversification of coastal species; **(2)** speciation, adaptation, and geo-climatic evolution of the American southwest, **(3)** patterns of genetic pseudo-congruence in geo-climatically complex regions.

#### *Driving questions*

- Which geo-climatic processes most generate biodiversity over recent and deep time?
- How much do organisms vary in their response to shared extrinsic (geoclimatic) forces?
- How can we quantitatively integrate disparate types of data among biology, geology, physics?
- What tools allow us to compare signatures of genomic divergence across 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, ^trainee)

9. **Dolby GA\***<sup>†</sup>, Webster TH<sup>†</sup>, McCartney-Melstad E, Shaffer HB, DeNardo D, Wilson Sayres M, Kusumi K\*, Speciation by river vicariance and monsoon adaptation via low-coverage genome sequencing of desert tortoises.
8. **Dolby GA\***, Bedolla A<sup>^</sup>, Bennet SEK, Jacobs DK\*, Global physical controls on estuarine habitat distribution during sea level change: consequences for genetic diversification through time, *Global and Planetary Change*. ***Invited research paper***.
7. **Dolby GA\***, Morales M<sup>^</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.

### ***Preprints***

6. 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 in revision)***

5. **Dolby GA\***, Dorsey RJ, Graham MR, (*in revision*) A legacy of geo-climatic complexity and speciation along the lower Colorado River: Insights from the deep-time stratigraphic record and 33 desert-adapted animals, *Journal of Biogeography—Humboldt Special Issue: The legacy of Alexander von Humboldt: Exploring the links between geo- and biodiversity*.
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 (\$98k)**

~1.2M CPU-hrs	2018–2019	PI	<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	PI	<b>XSEDE Research Computing Allocation:</b> <i>Characterizing the Sonoran Desert tortoise through genomic analyses of hybrids and speciation (TG-BIO180021)</i>
\$11,970	2017–2019	PI	<b>Desert Tortoise Council Research Grant:</b> <i>Genomic insights into extralimital populations and hybrids of a threatened species</i>
\$52,458	2017–2019	coPI	<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	coPI	<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 (\$2.84M)**

\$2,843,629 (\$875k, ASU)	2019	ASU PI	<b>NSF EAR Frontier Research in Earth Sci.</b> (resubmission) Collaborative Research: <i>Testing evolutionary pseudocongruence along the Baja California peninsula through integration of geologic and genomic data</i> PIs: Dorsey, Dolby, Hausback, Wilder
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**Completed grants (\$40k)**

\$5,400	2016–2017	coPI	<b>Dovetail Genomics Matching Funds Award:</b> <i>Improved scaffolding for the desert tortoise genome v2.0</i>
\$7,496	2016–2017	PI	<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	PI	<b>American Museum of Natural History</b> Lerner Gray Memorial Grant
\$14,960	2011–2013	coPI	<b>NSF Doctoral Dissertation Improvement Grant (DDIG)</b> Dissertation Research: <i>An</i>

\$6,000 (total)	2009–2012	PI	<i>interdisciplinary approach to testing intraspecific evolutionary processes</i> UCLA Research Award, N=3
\$4,500 (total)	2006–2008	PI	<b>Boston University Undergraduate Research Award</b> , N=3 (w/ M. Raymo)
<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</i> (w/ S. Pekar, N. Christie-Blick, G. Mountain)

### **INVITED TALKS**

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

### **CONFERENCE PRESENTATIONS**

- Dolby GA** (2019) Speciation by neutral and adaptive forces: disentangling pseudo-congruent genomic signatures within geo-climatically complex regions *in* Deep Time Paleogenomics. Oral Presentation. *North American Paleontological Convention*, Riverside, CA. **†Invited, Keynote speaker**
- Dolby GA**, Webster TH, DeNardo D, Wilson MA, Kusumi K (2019) Population genomic analysis of speciation among threatened desert tortoises. *Evolution*, Providence, RI.
- Dolby GA**, Kusumi K (2019) Genomics & diversification of desert tortoises. *Turtle Survival Alliance*, Tucson, AZ. **†Invited**
- Dolby GA**, Webster TH, DeNardo D, Wilson MA, Kusumi K (2019) Genomic insights into speciation of southwestern desert tortoises. *Desert Tortoise Council Annual Symposium*, Tucson, AZ.
- 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. **Invited**
- 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*, 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*, Seattle, WA.
- Dolby GA**, Dea JH<sup>^</sup>, Lau LF<sup>^</sup>, Rose K<sup>^</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>^</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 (G)
2013–2015	2x	UCLA	Introduction to Ecology and Behavior, Lab (U)
2009–2011	2x	UCLA	Directed Research (U)
2009–2011	3x	UCLA	Departmental Honors Contract Course (U)

### *Teaching Fellow*

2015		UCLA	Introduction to GIS (U)
2015		UCLA	Conservation Biology (U)
2009–2015	3x	UCLA	Evolution (U)
2009–2014	4x	UCLA	Molecular Evolution (U)
2011–2013	2x	UCLA	Life: concepts and issues (non-majors course) (U)

### *Invited lecturer*

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

## FIELD EXPERIENCE

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2017–2019 (9x)	<u>Western Arizona, USA (multi-day ea.)</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	ASU	Mentoring 101: First-Generation Graduate Success Panel ( <i>part day</i> )
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)                                  |
| 2016, 2019 | Intel ISEF Grand Award Judge: Computational Biology & Bioinformatics  |
| 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) |
| 2011–2013  | <u>Apprenticeship teacher</u> at SPARK: a program to keep at-risk middle school youths in school  |
| 2008–      | Mentor (UCLA & ASU):  |
|            | <b>Undergraduate students</b>   |
|            | *proceeded to graduate school; <sup>1</sup> biology, <sup>2</sup> GIS, <sup>3</sup> computer science, <sup>4</sup> art                      |
|            | James Ahad <sup>3</sup> Kate Rose <sup>1</sup> Arturo Bedolla <sup>2</sup>  |
|            | Hannah Barroga <sup>1</sup> Faiz Tousif * <sup>1</sup> Vivek Mahendra <sup>3</sup>  |
|            | Jessica Dea * <sup>1</sup> Boyang Zhang <sup>1</sup> Ray Elementi <sup>4</sup>  |
|            | Clive Lau * <sup>1</sup> Rena Emond * <sup>1</sup> Clemente Francisco <sup>1</sup>  |
|            | Shirin Mostofti * <sup>1</sup> Matheo Morales <sup>3</sup> Jake Staut <sup>2</sup>  |
|            | Kelly Riestenberg <sup>1</sup> Pat Pataranutaporn * <sup>4</sup> Gaspar Manuel <sup>2,3</sup>   |
|            | <b>Masters students</b>   |
|            | Clive Lau <sup>1</sup> Alex Gleason <sup>1</sup> John Cornelius <sup>1</sup>  |

Ryan Lugo Gomez <sup>2</sup>

Praneetha Reddy <sup>2,3</sup>

Raul Araya-Donoso <sup>1</sup>

**PhD students**

Cindy Xu

Joey Orton

**PROFESSIONAL SERVICE**

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- 2018–2019      **Co-Chair**, Student Activities Sub-committee—*Geological Society of America National Annual Meeting*, 2019.
- 2017–            **Elected Board Member at Large**, Desert Tortoise Council, Board of Directors—foci: 1) Student Outreach/Engagement Committee, 2) Ecosystem Advisory Committee for Arizona, 3) Grants Committee  
*Write comment letters for construction and management decisions in Arizona to convey scientific knowledge to the public and stakeholders.*
- 2016–2017      **Developer**, organizer, and leader of a 30-week bioinformatics reading group for postdocs and graduate students. Syllabi available at [www.greerdolby.org](http://www.greerdolby.org)
- 2016–            **Peer reviewer**, ad hoc (Publons profile [here](#)):  
*Nature Ecology & Evolution*      *Journal of Heredity*  
*Molecular Ecology*                *Annals of Botany*  
*Zoologica Scripta*                    *Chelonian Conservation and Biology*
- 2012             **Contributor**, Next Gen. Sonoran Desert Researchers inaugural meeting to launch the binational, cross-disciplinary society (invited)
- 2011–2012      **Member**, 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)
- 2010–2016      American Geophysical Union (AGU)
- 2009–            Society for the Study of Evolution (SSE)
- 2006–            Geological Society of America (GSA)