


GREER ANDERSEN DOLBY

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EDUCATION

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

POSITIONS

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

RESEARCH INTERESTS

As an evolutionary biologist in the emerging field of geo-genomics, I study how species evolve in response to physical changes in the landscape over time. To do this I integrate population genetics and genomics with paleoclimatology, sea-level change, and earth surface and coastal processes to study this coevolution in a statistically explicit framework. My motivating questions are on the physical mechanisms governing biological evolution—they are often explicit in space and time and include:

- How does glacioeustatic sea-level change and coastal topography drive population structure and diversification of coastal marine species over recent and deep time?
- How does physical evolution of the lower Colorado River region mediate gene flow of speciating lineages since Pliocene time?
- What can population genetic theory tell us about the origins of life on Earth and rise of complexity?
- How can we disentangle the relative contribution of tectonic and climatic processes to the genomic signatures of evolution observed in the Baja Peninsula and Gulf of California?

PUBLICATIONS & PRODUCTS

In preparation (*corresponding, †contributed equally)

8. **Dolby GA***, Jacobs DK, The role of sea-level change plays in biogeographic breaks and genetic diversification through time: a global analysis, *Global and Planetary Change* (invited research paper).
7. **Dolby GA***, Mathis C, Kusumi K, Walker SI*, What population genetics can teach us about earliest life and the rise of complexity.

6. **Dolby GA***[†], Webster TH*[†], DeNardo D, Wilson Sayres M, Kusumi K, Mojave Desert Tortoise genome 2.0: population genomic resources for a long-lived desert reptile.

Preprints

5. Webster TH*[†], **Dolby GA***[†], 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>

Published or submitted (* press coverage)

4. **Dolby GA***, Ellingson RA, Findley LT, Jacobs DK*, (*In Press*) How sea-level change mediates genetic divergence in coastal species across regions with varying tectonic and sediment processes, *Molecular Ecology*.
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.
 - Nicholas Gerbis. "Desert Tortoise Genome Reveals Genetic Keys to Surviving Harsh Conditions, Threats." *NPR-KJZZ*, 31 May 2017. <http://tinyurl.com/y7st3ly6>.
 - "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>.
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.
 - "Research Highlight: Researchers Uncover New Details About California's Ancient Shoreline." *Scripps Institution of Oceanography*, 1 Mar 2017. <http://tinyurl.com/y7gb2vk8>.
 - "California's past and future coastal habitat." *UCLA Institute of the Environment and Sustainability*, 9 Dec 2016. <http://tinyurl.com/y99ju2h9>.
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.

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, n/a.
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>>

FELLOWSHIPS & GRANTS

Current (total: \$92,017)

\$11,970	2017–2018	PI	Desert Tortoise Council Research Grant
\$33,776	2017–2019	coPI	AZ Game & Fish Heritage Fund <i>Characterizing the Sonoran Desert tortoise through genomic analyses of hybrids and speciation</i>
\$33,375	2017–2018	coPI	Dept. of Interior—U.S.G.S. Cooperative agreement, Ecosystem Studies Unit: <i>Differential immune expression of tortoises raised on invasive versus native grasses</i>
\$5,400	2016–2017	coPI	Dovetail Genomics Matching Funds Award
\$7,496	2016–2017	PI	ASU Fostering Postdoctoral Research in the Life Sciences <i>Deciphering ecological drivers of speciation & local adaptation in the desert tortoise complex</i>

Pending (total: \$2.95M)

\$2,956,671 (\$874k, ASU)	2017	PI, ASU	NSF EAR Integrated Earth Systems (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 (total: \$134,244)

\$1,000	2015	PI	Next Generation Sonoran Desert Researchers Travel Award
\$1,900	2014–2015	PI	American Museum of Natural History Lerner Gray Memorial Grant
\$20,500+	2014–2015	PI	UCLA Dissertation Year Fellowship
\$2,400 (total)	2010–2014	PI	UCLA Research Travel Awards (N=4)
\$26,000 (total)	2008–2014	PI	UCLA Quarterly Grad. Fellowship (N=4)
\$14,960	2011–2013	coPI	NSF Doctoral Dissertation Improvement Grant (DDIG) Dissertation Research: <i>An interdisciplinary approach to testing intraspecific evolutionary processes</i>

\$51,984 (total)	2009–2011	PI	Dept. of Education GAANN Fellowship
\$6,000 (total)	2009–2012	PI	UCLA Research Award, N=3
\$4,500 (total)	2006–2008	PI	Boston University Undergraduate Research Award, N=3 (w/ M. Raymo)
\$5,000 + Board	2006	PI	NSF REU Fellowship Lamont Doherty Earth Observatory (w/ S. Pekar, N. Christie-Blick, G. Mountain)

HONORS & AWARDS

2017–	Desert Tortoise Council, Board of Directors	Elected member
2015	Simons Foundation Junior Fellow	Finalist
2014	UCLA Schechtman Award for Teaching Asst. 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	Fellow

INVITED TALKS

2015	<i>Arizona State University, School of Life Sciences</i>	Tempe, AZ
2015	<i>Washington State University, School of Biological Sciences</i>	Pullman, WA

CONFERENCE PRESENTATIONS

- 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, 01/13/2018.
- Dolby GA**, Jacobs DK. 2017. Sea-level change mediates genetic diversification of coastal fishes. Oral presentation. *Geological Society of America Annual Meeting*, Seattle, USA, 10/24/2017.
- 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, 02/26/2017.
- 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, 01/06/2017.
- Hutchins ED, Djordjevic D, Cornelius JA, **Dolby GA**, Ho JWK, Kusumi K. 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, Zhejiang, China, 8/15-21/2016.
- 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 2016*, Austin, TX 06/17-22/2016.

- Dolby GA**, Jacobs DK. 2014. Habitat modeling and genetic signatures of postglacial recolonization for tidal estuaries. Oral Presentation, *American Geophysical Union Fall Meeting 2014*, San Francisco, CA 12/15-19/2014.
- 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 2014*, Bodega Bay, CA, 09/27-29/2014.
- 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 2014*, Raleigh, NC, 06/24/2014.
- Jacobs DK, Ellingson R, **Dolby G**, Swift CC. 2013. Estuarine Habitat and Speciation Process in Bay Gobies: Cryptic Taxa, Anthropogenic Impacts And Restoration Conflicts. *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. *Southern California Academy of Sciences*, Long Beach, CA, 05/3-4/2013.
- 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 2012*, Querétaro, MX, 03/29/2012.
- Jacobs DK, Sim J, Swift CC, Findley LT, Ellingson R, **Dolby G**. 2011. Bay Gobies—Conservation Genetics and Conflicts in the Restoration of California Estuaries. *American Fisheries Society Annual Meeting*, Seattle Washington, Sept. 7, 2011.
- 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, 09/07/2011.
- Dolby GA**, Dea JH¹, Lau LF¹, Rose K¹. 2010. Genetically Distinct Extralimital Populations of Two Fish: Evidence of Extended Ranges during the Mid-Holocene Climatic Optimum in Southern California. Poster Presenter, *American Association for the Advancement of Science Annual Meeting 2010*, San Diego, CA, 02/20/2010. [¹trainees]
- 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 Annual Meeting 2006*, Philadelphia, USA.

TEACHING EXPERIENCE

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>)
2009–2015	3x	UCLA	Evolution (<i>U</i>)

2015		UCLA	Conservation Biology (<i>U</i>)
2009–2014	4x	UCLA	Molecular Evolution (<i>U</i>)
2011–2013	2x	UCLA	Life: concepts and issues (<i>U</i>)

Guest lecturer

2017		ECSU	Organismal Bio., <i>Eastern Connecticut State U.</i> (<i>U</i>)
2017		ASU	Env. Life Sciences: Grand Challenges (<i>G</i>)
2015		UCLA	Evolution (<i>U</i>)
2013		UCLA	Molecular Evolution (<i>U</i>)

FIELD EXPERIENCE

2017 (6x)	<u>Western Arizona, USA (multi-day)</u> —surveying and subcarapacial blood collection of desert tortoises; description of habitat (organizer).
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 focusing on effects of coastal sedimentation processes on Great Barrier Reef formation. Fieldwork included snorkeling, sediment coring, sketching rock sections, seismic data collection on the James Kirby Research Vessel.
2007	<u>Ecuador & 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

2017	ASU	Microsoft Azure Cloud Computing, workshop (half day)
2016	ASU	Alan Alda Center for Communicating Science, workshop (1 day)
2016	ASU	Python training, workshop (1 day)
2016	ASU	Galaxy Cloud Computing, workshop (1 day)
2016	ASU	ESRI training workshop, webinar (part day)
2015	UCLA	Scientific Visualizations Technical by Texas Advanced Computing Center, workshop (2 days)
2012	UCLA	Preparing Future Faculty training course (20 weeks)

OUTREACH

2017–	<u>CompuGirls</u> : coordinate and lead student outreach panels for underserved/underrepresented adolescent girls, contribute STEM curriculum development for in-class activities
2017	Turtle-trapping at the Phoenix Zoo—checked tortoise traps for nonnative species and processed turtles (one day)
2016	Intel ISEF Grand Award Judge: Computational Biology & Bioinformatics
2011–2013	<u>SPARK</u> program apprenticeship teacher for at-risk middle school youths.

2008– Mentor: ¹undergraduate, *went on to graduate school, ²Masters student, ³PhD student:
James Ahad^{1*} *Kelly Riestenberg*¹ *Matheo Morales*¹
*Hannah Barroga*¹ *Kate Rose*¹ *Pat Pataranutaporn*¹
Jessica Dea^{1*} *Faiz Tousif*^{1*} *Alex Gleason*²
Clive Lau^{1,2*} *Boyang Zhang*¹ *Cindy Xu*³
Shirin Mostofti^{1*} *Rena Emond*^{1*} *John Cornelius*³

PROFESSIONAL SERVICE

2017– Elected member of the Desert Tortoise Council, Board of Directors—foci: student outreach/engagement, providing genetics expertise, grantsmanship
2016– Development, organization, and leadership of a 30-week bioinformatics reading group for postdocs and graduate students. Syllabi available at www.greerdolby.org
2016– Peer reviewer (6x):
 Zoologica Scripta *Annals of Botany*
 Journal of Heredity *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
2014–2015 Coastal and Estuarine Research Federation
2012– Next Generation Sonoran Desert Researchers
2010– American Geophysical Union
2009– Society for the Study of Evolution
2006– Geological Society of America