

Matthew M. Kling

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RESEARCH

I investigate what shapes the geographic distributions of plant genes, species, and ecosystems, and how we can predict and prevent the erosion of biodiversity under global environmental change. My work integrates new modeling approaches with big data to explore vulnerability patterns at macroecological scales.

EDUCATION

PhD, Integrative Biology *expected 2020*

University of California, Berkeley—David Ackerly, advisor

Thesis: *Macroecological perspectives on plant biodiversity under global change*

BA, Conservation Biology & Environmental Studies *2005*

Middlebury College—Stephen Trombulak & Andrea Lloyd, advisors

Thesis: *The ecophysiology of alpine treeline: a case study of balsam fir*

AWARDS & FELLOWSHIPS

NSF Graduate Research Fellow (\$102,000 + tuition) *2015–2020*

Berkeley Fellow (\$60,000 + tuition) *2015–2020*

NSF NRT Data Science Fellow *2015–2017*

USGS-NatureServe EcoInforma student app award (\$2000 travel) *2015*

EPA Apps for the Environment (National runner-up) *2011*

Departmental High Honors & *Magna Cum Laude*, Middlebury College *2005*

RESEARCH POSITIONS

Consultant in Global Change Biology—NatureServe *2015–2019*

Bioclimate Analyst—NatureServe *2013–2015*

Science Analyst—Brighter Planet *2008–2013*

Supervisory Biologist—Institute for Wildlife Studies *2007–2008*

Canid Ecology Crew Leader—Yellowstone Ecol. Rsrch. Center *2005–2006*

Plant Ecology Technician—US Geological Survey *2005*

Ungulate Ecology Technician—National Park Service *2005*

Environmental Intern—Administracion Ambiental Cooperativa Chilena *2004*

Research Assistant—USDA National Wildlife Research Center *2002*

LANGUAGES & SKILLS

Spoken: English (native), French (adv.), Spanish (adv.), German (beg.)

Programming: R (adv.), Python (int.), L^AT_EX(int.), git (int.)

Geographic information systems: ArcGIS, R

Design software: Illustrator, InDesign, Photoshop

JOURNAL ARTICLES

Skelton, R., L. Anderegg, J. Diaz, **M. Kling**, P. Papper, L. Lamarque, S. Delzon, T. Dawson, and D. Ackerly. Evolutionary relationships between drought-related traits and climate shaped large hydraulic safety margins in North American oaks. *In revision*.

Kling, M., and D. Ackerly. (2020) Global wind patterns and the vulnerability of wind-dispersed species to climate change. *Nature Climate Change*: doi 10.1038/s41558-020-0848-3

Ackerly, D., **M. Kling**, M. Clark, P. Papper, M. Oldfather, A. Flint, and L. Flint. (2020) Topoclimates and Biotic Responses to Climate Change: Which locations on the landscape will be most sensitive? *Frontiers in Ecology and the Environment*, 18(5): 288297; doi 10.1002/fee.2204

Stevens, J., **M. Kling**, D. Schwilk, M. Varner, and J. Kane (2020). Biogeography of fire regimes in western US conifer forests: a trait-based approach. *Global Ecology and Biogeography*, 29: 944-955; doi 10.1111/geb.13079

Kling, M., S. Auer, P. Comer, D. Ackerly, and H. Hamilton (2020). Multiple axes of ecological vulnerability to climate change. *Global Change Biology*, 26: 2798-2813; doi 10.1111/gcb.15008

Oldfather, M., **M. Kling**, S. Sheth, N. Emery, and D. Ackerly (2019). Range Edges in Heterogeneous Landscapes: Incorporating Realistic Landscapes into Range Dynamics. *Global Change Biology*, 26: 1055-1067; doi 10.1111/gcb.14897

Comer, P., J. Hak, M. Reid, S. Auer, K. Schulz, H. Hamilton, R. Smyth, and **M. Kling** (2019). Assessing climate change vulnerability of major vegetation types of the western interior United States. *Land* 8(7): 108

Skelton, R., Anderegg, L., Papper, P., Dawson, T., **Kling, M.**, Thompson, S., Diaz, J., Reich, E., and D. Ackerly (2019). No local adaptation in leaf or stem xylem vulnerability to embolism, but consistent vulnerability segmentation in a North American oak. *New Phytologist*, doi: 10.1111/nph.15886

Daru, B., **M. Kling**, E. Meineke, and A. van Wyk (2019). Temperature controls phenology in continuously flowering *Protea* species of subtropical Africa. *Applications in Plant Sciences* 7(3): e1232

Kling, M., B. Mishler, B. Baldwin, A. Thornhill, and D. Ackerly (2018). Facets of phylodiversity: evolutionary diversification, divergence, and survival as conservation targets. *Philosophical Transactions of the Royal Society B* 374: 20170397

Morueta-Holme, N., M. Oldfather, R. Olliff-Yang, A. Weitz, C. Lefine, **M. Kling**, E. Riordan, C. Merow, S. Sheth, A. Thornhill, and D. Ackerly (2018). Best practices for reporting climate data in ecology. *Nature Climate Change* 8:92–94

Thornhill, A., B. Baldwin, W. Freyman, S. Nostratinia, **M. Kling**, N. Morueta-Holme, T. Madsen, D. Ackerly, and B. Mishler (2017). Spatial phylogenetics of the native California flora. *BCM Biology* 15(1): 96

Hammerson, G., **M. Kling**, M. Harkness, M. Ormes, and B. Young (2017). Strong geographic and temporal patterns in the conservation status of North American bats. *Biological Conservation* 212: 144–152

Baldwin, B., A. Thornhill, W. Freyman, D. Ackerly, **M. Kling**, N. Morueta-Holme, and B. Mishler (2017). Species richness and endemism in the native flora of California. *American Journal of Botany*, 104(3): 487–501

Sterner, R., **M. Kling**, S. Schwiff, and D. Slate (2003). Oral rabies vaccination: reducing economic uncertainty via response surface analysis. *Proceedings of the 10th Wildlife Damage Management Conference* (K. Fagerstone, G. Witmer, Eds).

INVITED TALKS

Kling, M. (2019, Dec). California plant conservation gaps: an evolutionary perspective. Mary Bowerman Science & Research Colloquium, Berkeley, California.

Kling, M. (2019, Dec). Winds of change: climate-driven migration and the geography of wind. Carnegie Institution at Stanford, Palo Alto, California.

Kling, M. (2019, Oct). California plant conservation gaps: an evolutionary perspective. Half-Earth Day symposium, Berkeley, California.

Kling, M. (2019, Sep). Seeds of change: climate-smart seed collection for ecological restoration. Bay Area National Park Science Symposium, San Francisco, California.

Kling, M. (2019, May). Save the trees: informing conservation planning with multiple facets of phylogenetic diversity. Hennig XXXVIII symposium, Berkeley, California.

Kling, M., S. Brown, A. Harvey, and P. Gonzalez (2019, May). Seeds of change: climate-smart seed provenancing for ecological restoration. US National Park Service workshop, San Francisco, California.

Kling, M. (2018, Sep). Conserving the evolutionary diversity of the California flora. Botany Lunch seminar series, Berkeley, California.

CONTRIB. TALKS & POSTERS

Kling, M. and D. Ackerly (2020, Aug). Isolation by wind: wind connectivity shapes the landscape genetics of the world's forests. Talk presented at Ecological Society of America, virtual conference.

Kling, M., H. Hamilton, D. Ackerly, P. Comer, and S. Auer (2020, Jul). Dimensions of climate change vulnerability and their management implications. Talk presented at North American Congress for Conservation Biology, virtual conference.

Kling, M. and D. Ackerly (2019, *Jul*). Winds of change: wind connectivity, gene flow, and climate adaptation in trees. Talk presented at Species on the Move, Kruger, South Africa.

Kling, M., B. Mishler, B. Baldwin, A. Thornhill, and D. Ackerly (2018, *Jul*). Conserving the evolutionary diversity of the California flora. Talk presented at North American Congress for Conservation Biology, Toronto, Canada.

Kling, M., B. Mishler, B. Baldwin, A. Thornhill, and D. Ackerly (2018, *Jun*). Future priorities for conserving the evolutionary diversity of the California flora. Talk presented at Digital Data in Biodiversity Research Conference, Berkeley, CA.

Kling, M. (2016, *Dec*). Multidecadal historic trends in California's coastal fog. Poster presented at the American Geophysical Union, San Francisco, CA.

Kling, M., E. Burns, P. Cowan, and H. Hamilton (2016, *Sept*). The coast redwood climate envelope: 20th-century trends across space and time. Talk presented at Coast Redwood Science Symposium, Eureka, CA.

Kling, M., M. Fernandez, and H. Hamilton (2014, *Jun*). The biogeography of recent climate change in coast redwood ecosystems. Poster presented at the Smithsonian Botanical Symposium, Washington, DC.

Kling, M., M. Fernandez, and H. Hamilton (2014, *Jul*). Spatiotemporal patterns in greater sage-grouse exposure to recent climate change. Talk presented at the Society for Conservation GIS Conference, Monterey, CA.

GRAY LITERATURE

EcoAdapt [multiple authors] (2014). A Climate Change Vulnerability Assessment for Resources of Nez Perce-Clearwater National Forests. Version 3.0. EcoAdapt, Bainbridge Island, WA.

Bureau of Land Management [multiple authors] (2014). Madrean Archipeligo Rapid Ecoloregional Assessment. US BLM, Washington, DC.

Kling, M. and I. Hough (2011). Air travel carbon and energy efficiency: case studies, best practices, industry trends, airline rankings. Brighter Planet, San Francisco, CA. Presented at the 2012 Conference of the Institute for Computational Sustainability, Copenhagen, Denmark.

Kling, M. and I. Hough (2012). Hotel carbon and energy efficiency: chain rankings, industry trends, efficiency drivers, market patterns. Brighter Planet, San Francisco, CA

Kling, M. and I. Hough (2011). Employee Engagement in Sustainability. Brighter Planet, San Francisco, CA

Kling, M. and I. Hough (2010). The American carbon footprint: understanding your foods impact on climate change. Brighter Planet, San Francisco, CA

Kling, M. (2005). The ecophysiology of alpine treeline: spatial patterns in balsam fir (*Abies balsamea*) growth and water relations on Mount Abraham, Vermont. Undergraduate senior honors thesis, Middlebury College.

TEACHING	Data Science in Global Change Ecology, UC Berkeley Graduate Student Instructor	<i>Fall 2019</i>
	Reproducible & Collaborative Data Science, UC Berkeley Graduate Student Instructor	<i>Spring 2019</i>
	Building web applications with Shiny, UC Berkeley Lead workshop instructor	<i>Jan 2019; Jan 2018</i>
	Introductory R, UC Berkeley Workshop co-instructor	<i>Jan 2017</i>
PEER REVIEW	Biological Conservation Diversity and Distributions Global Change Biology Global Ecology and Biogeography Heredity Journal of Biogeography PeerJ Philosophical Transactions of the Royal Society: B PLOS One Proceedings of the National Academy of Sciences	
SOCIETIES	Ecological Society of America International Biogeography Society American Geophysical Union Society for Conservation Biology Society for Conservation GIS	