

Andy Kleinhesselink

Quantitative Ecologist

www.communityecology.science

+1 541 973-1725

andy.kleinhesselink@gmail.com

Education and Experience

- 2021-Present** **Rangeland Ecologist. Rangeland Analysis Platform, Numerical Terradynamic Simulation Group, University of Montana, Missoula, MT.**
- Performed a multi-scale analysis of vegetation trends on 230 million acres of rangelands in Western North America using remote sensing data and **Google Earth Engine**.
 - Used remote sensing data to analyze effectiveness of invasive conifer removal for restoring sagebrush ecosystems in the Northern Great Basin.
- 2020** **Ecosystem modeling consultant. Apex RMS, Ottawa, Canada.**
- Modeled land use and land cover change for USGS funded study of coastal wetlands.
- 2017-2020** **Postdoctoral Researcher: Higher order interactions and trait-based models of competition. Department of Ecology and Evolutionary Biology, UCLA. Advisors: Nathan Kraft of UCLA and Jonathan Levine of Princeton.**
- Developed a new general definition for competitive higher order interactions.
 - Designed and conducted lab and field work on the functional traits of California annual plant communities at UC Sedgwick Reserve.
- 2017** **Ph.D. Ecology. Utah State University, Logan, UT. Advisor: Peter Adler. Dissertation: "Direct and indirect effects of climate change on plant populations and communities in sagebrush steppe."**
- 2011** **M.S. Biology. Sonoma State University, Rohnert Park, CA. Advisor: Hall Cushman. Thesis: "Community-level effects of a dominant shrub across an environmental gradient: variable responses of native and exotic plants."**
- 2006-2009** **Restoration Science Technician. Presidio Trust, San Francisco, CA.**
- Successfully managed native plant restoration at several remediation sites.
 - Led field-based education and volunteering programs.
- 2007** **Fall Banding Internship, Point Blue Conservation Science, Petaluma, CA**
- Completed fall migratory bird counts and banding on SE Farallon Island, CA.
- 2005** **B.A. Biology. Carleton College, Northfield, MN. *Magnum Cum Laude*.**

Awards, Fellowships and Grants

- 2014** **Graduate Student Researcher of the Year. Quinney College of Natural Resources, Utah State University.**
- 2013** **Utah State University Dissertation Improvement Grant, (\$9000). Impact of cold season fungal pathogens on range limits of sagebrush (*Artemisia* spp.)**

- 2013 **Ecology Center Research Support Award, Utah State University.** (\$3000). The effect of competition on sagebrush (*Artemisia spp.*) range limits.
- 2011 **National Science Foundation Graduate Research Fellowship.**
- 2011 **Utah State University, Quinney Wildland Resources PhD Fellowship.**
- 2010 **Sigma Xi Grants in Aid of Research.** Moss facilitation of invasive annual grasses in coastal dunes

Publications

- 2022 **Kleinhesselink, A. R.,** N. J. B. Kraft, S. W. Pacala, and J. M. Levine. 2022. Detecting and interpreting higher-order interactions in ecological communities. *Ecology Letters* 25:1604–1617.
- 2022 Kandlikar, G.S., **Kleinhesselink, A.R.** and Kraft, N.J., Functional traits predict species responses to environmental variation in a California grassland annual plant community. *Journal of Ecology*, 110 (4), pp.833-844.
- 2022 Smith, J.T., Allred, B.W., Boyd, C.S., Davies, K.W., Jones, M.O., **Kleinhesselink, A.R.**, Maestas, J.D., Morford, S.L. and Naugle, D.E., 2022. The elevational ascent and spread of exotic annual grass dominance in the Great Basin, USA. *Diversity and Distributions*, 28(1), pp.83-96.
- 2021 Hulvey, K.B., Mellon, C.D. and **Kleinhesselink, A.R.** Rotational grazing can mitigate ecosystem service trade-offs between livestock production and water quality in semi-arid rangelands. *Journal of Applied Ecology*, 58(10), pp.2113-2123
- 2021 Sandel, B., Pavelka, C., Hayashi, T., Charles, L., Funk, J., Halliday, F.W., Kandlikar, G.S., **Kleinhesselink, A.R.**, Kraft, N.J., Larios, L. and Madsen-McQueen, T. Predicting intraspecific trait variation among California's grasses. *Journal of Ecology*, 109(7), pp.2662-2677.
- 2021 Durso, A., Bolon, I., **Kleinhesselink, A.R.**, et al. Crowdsourcing snake identification with online communities of professional herpetologists and avocational snake enthusiasts. *Royal Society Open Science*. 8(1), p.201273.
- 2020 **Kleinhesselink, A.R.** Evidence Is Growing That Alternative Stable States in Semiarid Grasslands Are the Exception, Not the Rule. *Journal of Geophysical Research: Biogeosciences*. 125:5.
- 2019 Smull, D. M., N. Pendleton, **A.R. Kleinhesselink**, and P. B. Adler. Climate change, snow mold and the *Bromus tectorum* invasion: mixed evidence for release from cold weather pathogens. *AoB Plants* 11.
- 2019 **Kleinhesselink, A.R.**, and J. H. Cushman. Effects of native bryophytes on exotic grass invasion across an environmental gradient. *Ecosphere* 10:e02769.
- 2019 Firn, J., and others (...A.R. Kleinhesselink...). Leaf nutrients, not specific leaf area, are consistent indicators of elevated nutrient inputs. *Nature Ecology & Evolution* 3:400.
- 2018 **Kleinhesselink, A.R.**, and P. B. Adler. The response of big sagebrush (*Artemisia tridentata*) to interannual climate variation changes across its range. *Ecology* 99:1139–1149.

- 2018** Adler, P. B., **A.R. Kleinhesselink**, G. Hooker, J. B. Taylor, B. Teller, and S. P. Ellner. Weak interspecific interactions in a sagebrush steppe? Conflicting evidence from observations and experiments. *Ecology* 99:1621–1632.
- 2018** Renwick, K. M., C. Curtis, **A.R. Kleinhesselink**, D. Schlaepfer, B. A. Bradley, C. L. Aldridge, B. Poulter, and P. B. Adler. Multi-model comparison highlights consistency in predicted effect of warming on a semi-arid shrub. *Global Change Biology* 24:424–438.
- 2018** Tredennick, A. T., **A.R. Kleinhesselink**, J. B. Taylor, and P. B. Adler. Ecosystem functional response across precipitation extremes in a sagebrush steppe. *PeerJ* 6:e4485.
- 2016** Tredennick, A. T., M. B. Hooten, C. L. Aldridge, C. G. Homer, **A.R. Kleinhesselink**, and P. B. Adler. Forecasting climate change impacts on plant populations over large spatial extents. *Ecosphere* 7:e01525.
- 2016** Chu, C., **A.R. Kleinhesselink**, K. M. Havstad, M. P. McClaran, D. P. Peters, L. T. Vermeire, H. Wei, and P. B. Adler. Direct effects dominate responses to climate perturbations in grassland plant communities. *Nature Communications* 7:11766.
- 2015** **Kleinhesselink, A.R.**, and P. B. Adler. Indirect effects of environmental change in resource competition models. *The American Naturalist* 186:766–776.
- 2014** **Kleinhesselink, A.R.**, S. M. Magnoli, and J. H. Cushman. Shrubs as ecosystem engineers across an environmental gradient: effects on species richness and exotic plant invasion. *Oecologia* 175:1277–1290.
- 2013** Magnoli, S. M., **A.R. Kleinhesselink**, and J. H. Cushman. Responses to invasion and invader removal differ between native and exotic plant groups in a coastal dune. *Oecologia* 173:1521–1530.
- 2013** Adler, P. B., A. Fajardo, **A.R. Kleinhesselink**, and N. J. Kraft. Trait-based tests of coexistence mechanisms. *Ecology Letters* 16:1294–1306.

Teaching and Mentoring

- 2020** **Pritzker Education Fellow**, Institute of Environment and Sustainability, UCLA, Los Angeles CA.
- Advised undergraduate capstone project, “Creating a living seed bank for urban restoration in Los Angeles”
 - Taught students methods in species distribution modeling and GIS analysis
- 2018** **Instructor, Software Carpentry Foundation.** (www.carpentries.org)
- Taught coding skills for research scientists in biology, using R, Python, Git and Shell.
 - Organized and led R workshop for UCLA EEB, April 7th 2018. <https://ucla-data-archive.github.io/2018-04-07-ucla-eeb/>
- 2017-2020** **Undergraduate Mentor**, Kraft Lab, UCLA. Los Angeles, CA.
- Mentor undergraduate independent research projects on plant traits
- 2012-2016** **Undergraduate Mentor**, Adler Lab, Utah State University, Logan UT.
- Mentor undergraduate research projects on plant competition and plant pathogens.

- 2012** **Mentor for Ecological Society of America, SEEDS program.** ESA annual meeting in Portland, OR.
- 2009-2011** **Teaching Assistant,** Department of Biology, Sonoma State University, Rohnert Park, CA.
 ○ *Labs: Biol. 110: “Biological Inquiry” and Biol. 121: “Diversity Structure and Function”*
- 2009-2010** **Vice President. San Francisco Nature Education.** San Francisco CA.
 ○ Led environmental education field trips for students from underserved public schools.
- 2006** **Mentor for LINC Program.** Golden Gate National Parks Conservancy. San Francisco, CA.
 ○ Mentored high school student interns in botany and habitat restoration.

Service and Public Outreach

- 2013-2020** **Peer Reviewer.** [Link to Publons Profile.](#)
 ○ Reviewer for 20 journals including: *Ecology Letters, Ecography, Ecology, The American Naturalist, New Phytologist, Global Ecology and Biogeography, Oecologia, Biological Invasions, Functional Ecology*
- 2018-2020** **Field Trip Leader, UCLA Bruin Naturalist Club.**
 ○ Organized and led natural history field trips for undergraduate and graduate students.
 ○ Taught students how to identify and document biodiversity with iNaturalist.
- 2018-2020** **Field Trip Leader, co-chair, UCLA Birding Club.**
 ○ Organized and led birdwatching trips in LA.
 ○ Lead weekly birding trips in the UCLA Botanical Garden.
- 2013-2014** **Graduate Student Chair, Ecology Seminar Committee.** Utah State University
 ○ Led student committee to invite and host invited seminar speakers in ecology.

Select Presentations

- 2018** “Climate Change and Competition in Plant Communities” *Invited Seminar, Department of Biology, California State University, Los Angeles. October 18th 2018.*
- 2018** “Detecting higher order interactions in mechanistic resource competition models” *Ecological Society of America 103rd Annual Meeting, New Orleans, LA.*
- 2017** “An experimental test of population predictions based on historical climate-demography correlations”, *Ecological Society of America 102nd Annual Meeting, Portland, OR.*
- 2016** “Do populations in hot and cold portions of a species’ range differ in response to annual climate variation?” *Ecological Society of America 101st Annual Meeting, Fort Lauderdale, FL.*
- 2015** “Home field advantage: Do species’ vital rates decline towards range limits and does competition play a role?” *Ecological Society of America 100th Annual Meeting, Baltimore, MD.*
- 2014** “Niche overlap predicts the magnitude of the indirect effects of environmental change in a mechanistic resource competition model” *Ecological Society of America 99th Annual Meeting, Sacramento, CA.*
- 2012** “Testing the stress gradient hypothesis at the community level: Effects of shrub facilitation across a dune stress gradient” *Ecological Society of America 97th Annual Mtg, Portland, OR.*

Skills and Expertise

- **R** and **ShinyR** for statistical analysis, data visualization and simulation modeling.
- **Google Earth Engine** for remote sensing and spatial analysis.
- **Git/Github** for collaboration and publishing code. Github: <https://github.com/akleinhesselink>.
- Bayesian Modeling with **STAN** and **rStan**.
- Field identification of North American birds. Link to eBird profile: <https://ebird.org/profile/MTM5OTI2/US-CA-037>
- Botanical field identification of common plant species and genera in California floristic region
- West Coast Natural History. Prolific contributor to iNaturalist (>5000 observations). Profile: <https://www.inaturalist.org/people/andy71>

References

- **Dr. Peter Adler.** Professor, Department of Wildland Resources, Utah State University. peter.adler@usu.edu; **435-797-1021**.
- **Dr. Nathan Kraft.** Associate Professor, Department of Ecology and Evolutionary Biology, UCLA. nkraft@ucla.edu; **(301) 825-3593**
- **Dr. Jonathan Levine.** Professor, Department of Ecology and Evolutionary Biology. Princeton University. levinej@princeton.edu; **(609) 258-8256**.