

# RYAN R. BART

## CURRICULUM VITAE

Sierra Nevada Research Institute | University of California, Merced | Merced, CA

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## EDUCATION

- |      |       |   |
|------|-------|---|
| 2014 | Ph.D. | Geography, University of California, Santa Barbara & San Diego State University |
| 2008 | M.S.  | Geography, San Diego State University   |
| 2001 | B.S.  | Genetics, University of California, Davis                                       |

## PROFESSIONAL APPOINTMENTS

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|-----------|--|
| 2019-     | Assistant Project Scientist, Sierra Nevada Research Institute, University of California, Merced                      |
| 2018-2019 | Postdoctoral Scholar, Sierra Nevada Research Institute, University of California, Merced                             |
| 2015-2017 | Postdoctoral Scholar, Earth Research Institute, University of California, Santa Barbara                              |
| 2014-2015 | Postdoctoral Scholar, Department of Environmental Science, Policy and Management, University of California, Berkeley |
| 2007-2012 | Teaching Associate, Department of Geography, San Diego State University  |
| 2005-2007 | Graduate Assistant, Department of Geography, San Diego State University  |
| 2001-2005 | Marketing/Accounting, E-Babylon, Inc. Simi Valley, California  |

## PUBLICATIONS

### Journal Articles

19. Ren J, Hanan EJ, Hicke JA, Kolden CA, Abatzoglou JT, Tague CL, **Bart RR**, Kennedy MC, Liu M, Adam JC. 2023. Bark beetle effects on fire regimes depend on underlying fuel modifications in semiarid systems. *Journal of Advances in Modeling Earth Systems*, 15(1), e2022MS003073.
18. Yang Y, Berhe AA, Hunsaker CT, Johnson DW, Safeeq M, Barnes ME, McCorkle EP, Stacy EM, Bales RC, **Bart RR**, Goulden ML, Hart SC. 2022. Impacts of climate and disturbance on nutrient fluxes and stoichiometry in mixed-conifer forests. *Biogeochemistry*, 158, 1-20.
17. Safeeq M, **Bart RR**, Pelak NF, Singh CK, Dralle DN, Hartsough P, Wagenbrenner JW. 2021. How realistic are water-balance closure assumptions? A demonstration from the southern Sierra Critical Zone Observatory and Kings River Experimental Watersheds. *Hydrological Processes*, 35(5): e14199.
16. Kennedy MC, **Bart RR**, Tague CL, Choate JS. 2021. Does hot and dry equal more wildfire? Contrasting short- and long-term climate effects on fire in the Sierra Nevada, CA. *Ecosphere*, 12(7), e03657.
15. **Bart RR**, Ray RL, Conklin MH, Safeeq M, Saksa PC, Tague CL, Bales RC. 2021. Assessing the effects of forest biomass reductions on forest health and streamflow. *Hydrological Processes*, 35(3), e14114.
14. Hanan EJ, Ren J, Tague CL, Kolden CA, Abatzoglou JT, **Bart RR**, Kennedy MC, Liu M, Adam JC. 2021. How climate change and fire exclusion drive wildfire regimes at actionable scales. *Environmental Research Letters*, 16(2), 024051.
13. **Bart RR**, Safeeq M, Wagenbrenner JW, Hunsaker CT. 2021. Do fuel treatments decrease forest mortality or increase streamflow? A case study from the Sierra Nevada (USA). *Ecohydrology*, 14, e2254.

12. Ackerer J, Steefel C, Liu F, **Bart RR**, Safeeq M, O'Geen A, Hunsaker C, Bales R. 2020. Determining how Critical Zone structure constrains hydrogeochemical behavior of watersheds: Learning from an elevation gradient in California's Sierra Nevada. *Frontiers in Water*, 2:23.
11. **Bart RR**, Kennedy MC, Tague CL, McKenzie D. 2020. Integrating fire effects on vegetation carbon cycling within an ecohydrologic model. *Ecological Modelling*, 416, 108880.
10. Anderson SE, **Bart RR**, Kennedy MC, MacDonald AJ, Moritz MA, Plantinga AJ, Tague CL, Wibbenmeyer M. 2018. The dangers of disaster-driven responses to climate change. *Nature Climate Change*, 8(8), 651-653.
9. **Bart RR**, Tague CL, Dennison PE. 2017. Modeling annual grassland phenology along the central coast of California. *Ecosphere*, 8(7):e01875.
8. **Bart RR**, Tague CL. 2017. The impact of wildfire on baseflow recession rates in California. *Hydrological Processes*, 31, 1662-1673.
7. **Bart RR**, Tague CL, Moritz MA. 2016. Effect of tree-to-shrub type conversion in lower montane forests of the Sierra Nevada (USA) on streamflow. *PLOS ONE*, 11(8):e0161805.
6. **Bart RR**. 2016. A regional estimate of postfire streamflow change in California. *Water Resources Research*, 52, 1465-1478.
5. **Bart RR**, Hope AS. 2014. Inter-seasonal variability in baseflow recession curves: The role of aquifer antecedent storage in central California watersheds. *Journal of Hydrology*, 519, 205-213.
4. Hope AS, **Bart RR**. 2012. Synthetic monthly flow duration curves for the Cape Floristic Region, South Africa. *Water SA*, 38(2), 191-200.
3. Hope AS, **Bart RR**. 2012. Evaluation of a regionalization approach for daily flow duration curves in central and southern California watersheds. *Journal of the American Water Resources Association (JAWRA)*, 48(1), 123-133.
2. Hope AS, Albers N, **Bart RR**. 2012. Characterizing post-fire recovery of fynbos vegetation in the Western Cape Region of South Africa using MODIS data. *International Journal of Remote Sensing*, 33(4), 979-999.
1. **Bart RR**, Hope AS. 2010. Streamflow response to fire in large catchments of a Mediterranean-climate region using paired-catchment experiments. *Journal of Hydrology*, 388, 370-378.

## Reports

3. **Bart RR**, Safeeq M. 2021. The Effects of the Climate Change and Wildfire Regime Change on Water Resources on the South Fork Tule River. Project report for California Department of Water Resources Disadvantaged Community Involvement Program. Sierra Nevada Research Institute, University of California, Merced.
2. **Bart RR**, Safeeq M, Bales RC. 2019. Characterizing Evapotranspiration in the Kings River Watershed Prior to Fire Suppression. Project report for the Southern Sierra Integrated Regional Water Management Group. Sierra Nevada Research Institute, University of California, Merced.
1. **Bart RR**, Safeeq M, Bales RC. 2018. Evaluating Climate Change Effects on the Hydrology of Southern Sierra Nevada Basins: A report for the Southern Sierra Integrated Regional Water Management Plan. Sierra Nevada Research Institute, University of California, Merced.

## EXTERNAL FUNDING

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*Total Funding Awarded: \$1,119,500 (All dollar amounts indicate Bart portion)*

5. Projecting climate change effects on carbon, water, and wildfire on California's natural and working lands (extension). California Air Resources Board. PI. 2023-2025. \$400,000.
4. A decision-support tool for mapping climate change and wildfire effects on Southern Sierra Nevada streamflow and sediment yield. California Department of Water Resources. PI. 2023-2026. \$275,000.

3. Projecting climate change effects on carbon, water, and wildfire on California's natural and working lands. California Air Resources Board. PI. 2021-2023. \$300,000.
2. Water supply assessment for the Tule River Reservation under changing climate & fire regimes. California Department of Water Resources. PI. 2020. \$69,500.
1. Links between climate change, wildfire regimes, and forest hydrology in the Southern Sierra Nevada. USFS Pacific Southwest Research Station. Co-PI. 2019-2020. \$75,000.

## **AWARDS**

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- 2012 McFarland Geography Scholarship. \$5030  
 2012 Norma Sullivan Memorial Endowed Scholarship. \$800  
 2011 McFarland Geography Scholarship. \$4200  
 2007 Ned H. Greenwood Award. \$500  
 2006 Alvena Storm Memorial Scholarship. \$750

## **PRESENTATIONS**

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### Invited Talks

- 11 **Bart RR.** 2021. Managing Sierra Nevada forests for multiple benefits: New insights from modeling the interactions between wildfire, carbon sequestration, and hydrology under a changing climate. *Sierra Nevada Research Institute Research Symposium*, University of California, Merced, Merced, California.
- 10 **Bart RR.** 2020. Ecohydrologic responses to forest fuel treatments and changes in wildfire regimes. *Enviro-Lunch Seminar*, University of California, Merced, Merced, California.
- 9 **Bart RR.** 2019. The Importance of Vegetation Change for Understanding Surface Hydrology. *Simon Fraser University Geography Seminar*, Burnaby, British Columbia, Canada.
- 8 **Bart RR.** 2018. Feedbacks between vegetation change and hydrology in the Sierra Nevada. *Enviro-Lunch Seminar*, University of California, Merced, Merced, California.
- 7 **Bart RR.** 2018. Water and the Sierra Nevada: Why vegetation matters! *Sierra College Science Speaker Series*, Grass Valley, California.
- 6 **Bart RR.** 2018. Links between vegetation change and hydrology under a changing climate. *University of Nevada Las Vegas Geosciences Colloquia*, Las Vegas, Nevada.
- 5 **Bart RR.** 2017. Linkages between wildfire and hydrology in California under a changing climate. *California State University San Marcos Geography Seminar*, San Marcos, California.
- 4 **Bart RR.** 2017. Wildfire and hydrology in a changing world. *California State University Northridge Geography Colloquia*, Northridge, California.
- 3 **Bart RR.** 2015. River Flow Response to Fire in California. *SDSU Geography Department Colloquia Series*, San Diego, California.
- 2 **Bart RR.** 2015. Investigating the Effect of Type-Conversion on Streamflow in the Sierra Nevada. *UCSB Biogeosciences (BGS) Seminar Series*, Santa Barbara, California.
- 1 **Bart RR.** 2008. From Process Models to Paired Catchments. *ARC-ISCW Hydrology Seminar*, Agricultural Research Council, Pretoria, South Africa.

### Professional Conferences

- 44 **Bart RR, Kennedy MC, Tague CL, Choate JS.** 2022. Evaluating short- and long-term climate-change effects on fire in the Sierra Nevada. *Yosemite Hydroclimate Conference*. Yosemite National Park, CA.
- 43 **Bart RR, Tague CL, Burke WD, Kennedy MC, Wagenbrenner JW, Safeeq M.** 2020. Evaluating how climate-induced changes in wildfire regimes affect forest hydrology in the Sierra Nevada. *American Geophysical Union Fall Meeting*. Virtual.

- 42 **Bart RR**, Safeeq M. 2020. Evaluating the effects of forest fuel treatments on forest health and streamflow. *California Association of Resource Conservation Districts Conference*. Virtual.
- 41 **Bart RR**, Safeeq M, Wagenbrenner J, Hunsaker C. 2020. Evaluating fuel treatment effects on forest mortality and water yield in the Kings River Experimental Watersheds. *Dinkey Collaborative Science Symposium*. Fresno, CA.
- 40 **Bart RR**, Safeeq M, Wagenbrenner J, Hunsaker C. 2019. Fuel treatment effects on forest mortality resistance and water yield during drought. *American Geophysical Union Fall Meeting*. San Francisco, CA.
- 39 Safeeq M, Livneh B, **Bart RR**, Singh C, Shukla S. 2019. Assessment of hydrologic impacts of climate change in the Sierra Nevada: comparisons between radiative change and CO<sub>2</sub> fertilization. *American Geophysical Union Fall Meeting*. San Francisco, CA.
- 38 Choate J, Tague C, Turpin E, Gordon D, **Bart RR**, Kennedy M, Burke W. 2019. Future Mountain: An interactive visualization of people, fire, water and climate in forested landscapes. *American Geophysical Union Fall Meeting*. San Francisco, CA.
- 37 Wagenbrenner J, Safeeq M, **Bart RR**, Hunsaker C. 2019. The Kings River Experimental Watersheds: resolving processes in Sierra Nevada headwaters since 2002. *American Geophysical Union Fall Meeting*. San Francisco, CA.
- 36 **Bart RR**, Safeeq M, Wagenbrenner J, Hunsaker C. 2019. Fuel treatment effects on forest mortality resistance and water yield during drought. *Yosemite Hydroclimate Conference*. Yosemite National Park, CA.
- 35 Kennedy MC, **Bart RR**, Tague CL, McKenzie D. 2019. Coupling Fire Spread With Eco-Hydrology to Integrate Fire-Regime and Watershed Dynamics Under a Changing Climate. *Ecological Society of America Annual Meeting*. Louisville, KY.
- 34 **Bart RR**, Safeeq M, Wagenbrenner J, Bales RC. 2018. How do forest fuel treatments affect watershed hydrology during extreme drought? Insight from the southern Sierra Nevada. *American Geophysical Union Fall Meeting*. Washington DC.
- 33 Hanan EJ, Tague CL, **Bart RR**, Kennedy M, Abatzoglou J, Kolden C, Adam J. 2018. Effects of fire suppression and climate change on wildfire activity in the Inland Northwest. *American Geophysical Union Fall Meeting*. Washington DC.
- 32 **Bart RR**, Safeeq M, Wagenbrenner J. 2018. How do fuel treatments affect watershed hydrology during drought? Insight from the Kings River Experimental Watersheds. *Sequoia and Kings Canyon Science Symposium*. Three Rivers, CA.
- 31 **Bart RR**, Safeeq M, Wagenbrenner J. 2018. Do forest fuel treatments enhance streamflow during drought? Case study from the Kings River Experimental Watersheds. *Yosemite Hydroclimate Conference*. Yosemite National Park, CA.
- 30 **Bart RR**, Safeeq M, Wagenbrenner J, Hunsaker C. 2018. Sierra Nevada streamflow response to forest fuels treatments during the California drought. *6th Interagency Conference on Research in the Watersheds*. Shepherdstown, WV.
- 29 **Bart RR**, Tague C, Kennedy M, Hanan E. A 2017. Coupled Model for Simulating Future Wildfire Regimes in the Western U.S. *American Geophysical Union Fall Meeting*. New Orleans, Louisiana.
- 28 Hanan E, Tague C, **Bart RR**, Kennedy M, Abatzoglou J, Kolden C, Adam J. 2017. Effects of fire suppression under a changing climate in Pacific Northwest mixed-pine forests. *American Geophysical Union Fall Meeting*. New Orleans, Louisiana.
- 27 Tague CL, Burke W, **Bart RR**, Turpin E, Wood T, Gordon D. 2017. Communicating why land surface heterogeneity matters. *American Geophysical Union Fall Meeting*. New Orleans, Louisiana.
- 26 **Bart RR**, Tague C, Kennedy M, Hanan E. 2017. Development of a coupled model for investigating the effects of climate and forest management on wildfire regimes in the western

- U.S. *Columbia University Initiative on Extreme Weather and Climate: Fire Prediction Across Scale*. New York, New York.
- 25 Hanan E, Tague C, **Bart RR**, Kennedy M, Kolden C, Abatzoglou J, Adam J. 2017. Factors driving fire spread under a changing climate in Pacific Northwest mixed-pine forests. *Columbia University Initiative on Extreme Weather and Climate: Fire Prediction Across Scale*. New York, New York.
  - 24 Tague CL, Moritz MA, **Bart RR**, Hanan EJ. 2017. Why subsurface features matter for managing forests, water and fire in the face of increasing drought frequency and severity. *AGU Chapman Conference on Extreme Climate Event Impacts on Aquatic Biogeochemical Cycles and Fluxes*. San Juan, Puerto Rico.
  - 23 **Bart RR**, Tague C, Kennedy M, McKenzie D. 2016. Integrating fire effects into an ecohydrologic model for simulating fire regimes. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 22 Kennedy M, McKenzie D, Tague C, **Bart RR**. 2016. Ecohydrological projections of fire regimes: Balancing uncertainty and complexity to integrate cross-disciplinary simulation systems. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 21 Tague C, Moritz M, **Bart RR**, Turpin E. 2016. Seeing the water in the trees: Challenges in estimating the impact of fuel treatments and fire on hydrology. *CUAHSI Biennial Symposium*. Shepherdstown, West Virginia.
  - 20 **Bart RR**, Anderson S, Moritz M, Plantinga A, Tague C. 2015. An Integrated Model for Identifying Linkages Between the Management of Fuel Treatments, Fire and Ecosystem Services. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 19 Tague C, Moritz M, **Bart RR**, Hanan E, Choate J, Kennedy M. 2015. Modeling the complex interactions among wildfire, fuel treatments and hydrology. *10th EARSeL Forest Fire Special Interest Group Workshop*. Limassol, Cyprus.
  - 18 Baguskas S, **Bart RR**, Molinari N, Tague C, Moritz M. 2014. Potential effects of tree-to-shrub type conversion on streamflow in California's Sierra Nevada. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 17 **Bart RR**. 2014. A Regional-Scale Estimate of Annual Streamflow Response to Fire in California. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 16 Baguskas S, **Bart RR**, Molinari N, Tague C, Moritz M. 2014. Potential effects of tree-to-shrub type conversion on streamflow in California's Sierra Nevada. *Critical Zone Observatory (CZO) All Hands Meeting*. Fish Camp, California.
  - 15 **Bart RR**. 2013. A Mixed Modeling Approach for Combining Post-Fire Streamflow and Erosion Change Results. *AGU Chapman Conference on Synthesizing Empirical Results to Improve Predictions of Post-wildfire Runoff and Erosion Response*. Estes Park, Colorado.
  - 14 **Bart RR**. 2013. Fire effects on river flow recession rates in central California watersheds. *Association of American Geographers Annual Meeting*. Los Angeles, California.
  - 13 **Bart RR**, Hope A. 2012. Effects of antecedent storage on inter-seasonal recession curve variability. *American Geophysical Union Fall Meeting*. San Francisco, California.
  - 12 Hope A, **Bart RR**. 2012. Hydrologic significance of vegetation in Mediterranean-type climate regions. *International Journal of Arts & Sciences Annual Conference*. Aix-En-Provence, France.
  - 11 **Bart RR**, Hope A. 2012. Seasonal controls on streamflow recession curves in southern California. *Association of American Geographers Annual Meeting*. New York, New York.
  - 10 **Bart RR**, Hope A. 2011. Application of a meta-analytic technique for assessing the effects of fire on river flows in southern California. *Association of American Geographers Annual Meeting*. Seattle, Washington.
  - 9 **Bart RR**. 2011. Meta-analysis in hydrology: an application for land-cover change experiments. *San Diego State University Student Research Symposium*, San Diego, California.

- 8     Hawtree D, Hope A, **Bart RR**. 2010. A comparison of IHACRES ensemble streamflow predictions in California's Mediterranean climate region. *European Geosciences Union General Assembly*, Vienna, Austria.
- 7     Hope A, Albers N, **Bart RR**. 2010. Monitoring post-fire recovery of shrublands in Mediterranean-type ecosystems using MODIS and TM/ETM+ data. *European Geosciences Union General Assembly*, Vienna, Austria.
- 6     Hope A, **Bart RR**, Albers N, Stow D. 2009. Resilience of Watershed Response to Land Cover/Land Use Change in Mediterranean Climate Regions. *Association of Pacific Coast Geographers Annual Meeting*, San Diego, California.
- 5     Hope A, **Bart RR**, Fitch D, Hawtree D, Burvall A, Albers N, Stow D. 2009. Effects of Land-Cover Variability on River Flows in Mediterranean-Type Ecosystems. *HydroEco ' 2009 Conference*, Vienna, Austria.
- 4     **Bart RR**, Hope A, Hawtree D. 2008. Application of Existing Streamflow Gauge Networks and Remote Sensing for Use in Paired Watershed Experiments. *American Geophysical Union Fall Meeting*. San Francisco, California.
- 3     **Bart RR**. 2008. From Process Models to Paired Catchments. *Workshop on Prediction of River Flow in Ungauged Catchments and Response to Land-Cover Land-Use Change in Mediterranean Climate Regions*, Stellenbosch, South Africa.
- 2     **Bart RR**, Hope A. 2007. Impact of Fire on Streamflow in Southern California Watersheds. *American Geophysical Union Fall Meeting*. San Francisco, California.
- 1     Hope A, Burvall A, Hawtree D, Clark R, **Bart RR**. 2007. Partitioning river flow data to better understand and characterize uncertainties in hydrological modelling. *International Union of Geodesy and Geophysics Conference*. Perugia, Italy.

## TEACHING

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### Instructor

- |            |   |
|------------|---|
| 2014       | Physical Geography, Mesa College, San Diego, CA (2 Sections)                                    |
| 2014       | Elements of Physical Geography, Cuyamaca College, El Cajon, CA (1 Section)                      |
| 2012       | Introduction to Geography: Physical Elements, Southwestern College, Chula Vista, CA (1 Section) |
| 2010, 2011 | Water Resources, San Diego State University, San Diego, CA (2 Sections)                         |

### Guest Lectures

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|------------|---|
| 2016       | Climate Change Impacts and Adaptation, UC Santa Barbara               |
| 2015       | Environmental Modeling, UC Santa Barbara                              |
| 2011       | Global Climate Change, San Diego State University                     |
| 2007, 2012 | Hydrology and Global Environmental Change, San Diego State University |

## MODEL DEVELOPMENT

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| 2016- | Principal developer of RHESSysIOinR, a package to operate RHESSys from R:<br><a href="https://github.com/RHESSys/RHESSysIOinR">https://github.com/RHESSys/RHESSysIOinR</a>  |
| 2014- | Active contributor to the Regional Hydro-Ecologic Simulation System Model (RHESSys):<br><a href="https://github.com/RHESSys/RHESSys">https://github.com/RHESSys/RHESSys</a> |

## COMMUNITY OUTREACH

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- 2018 Southern Sierra Regional Water Management Group (SSRWMG): Assisted with the 2018 update to the Southern Sierra Integrated Regional Water Management Plan (SSIRWMP). Analyzed and reported on the effects of climate change on water resources in the Southern Sierra Nevada.
- 2017 SERI Summer Seminar: Co-organized a weeklong environmental modeling workshop for upper-level undergraduate and master's students.

## PROFESSIONAL ACTIVITIES

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### Manuscript Reviewer

*Agricultural and Forest Meteorology* | *AGU Geophysical Monograph Series* | *Ecohydrology* | *Ecological Processes* | *Fire* | *Hydrological Processes* | *International Journal of Wildland Fire* | *Journal of the American Water Resources Association* | *Journal of Hydrology* | *Natural Hazards* | *Nature Communications* | *Nature Geoscience* | *PLOS ONE* | *Science* | *Water Resources Research* | *Water*

### Professional Affiliations

American Geophysical Union | Association of American Geographers