Peter B. Kirchner

Postdoctoral Scholar
Joint Institute for Regional Earth System Science and Engineering
University of California, Los Angeles
Jet Propulsion Laboratory
4800 Oak Grove Drive, Pasadena California 91109
phone: (209) 834-7628 m
email: Peter.B.Kirchner@jpl.nasa.gov

EDUCATION

Ph.D.

Environmental Systems, School of Engineering, University of California, Merced, Advisor Roger Bales, Dissertation: Snow Hydrology of Forested Sierra Nevada Ecosystems

M.S.

Geography, Mackay School of Earth Sciences and Engineering, University of Nevada, Reno, Advisor Franco Biondi, Thesis: Trace Metals in Tree-Rings of the Tahoe Basin

B.S.

Zoology, Foci: Ecology and Evolution, School of Agriculture and Environmental Sciences, University of California, Davis

RESEARCH INTERESTS

Bridging the spatial and temporal relationships between hydrologic, ecologic, and biogeochemical processes through the integration of in-situ and remote sensing observations

PUBLICATIONS

Peer-reviewed

2014

P. Kirchner, R. Bales, N. Molotch, J. Flanagan, Q. Guo**;** *LiDAR measurement of seasonal snow accumulation along an elevation gradient southern Sierra Nevada, California* Hydrology and Earth System Sciences Discussions (*2014*)

A. Harpold, Q. Guo, N. Molotch, R. Bales, K. Musselman, **P. Kirchner,** M. Litvak and P. Brooks**;** *Snowmelt Infiltration in Mixed-Conifer Subalpine Forests* Hydrologic Processes (*in review*)

2013

Dissertation **P. Kirchner,** *Snow Distribution Over an Elevation Gradient and Forest Snow Hydrology of the Southern Sierra Nevada, California*
University of California, Merced (2013)

A. Harpold, Q. Guo, N. Molotch, P. Brooks**,** R. Bales, J. Fernandez-Diaz, K. Musselman, T. Swetnam, **P. Kirchner,** M. Meadows, J. Flanagen, R. Lucas; *LiDAR Derived Snowpack Datasets From Mixed Conifer Forests Across the Western U.S.,* Water Resources Research (2013)

2012

K. Musselman, N. Molotch, S. Margulis, **P. Kirchner,** R. Bales; *Relationships between conifer forest structure and snowmelt dynamics inferred from in-situ observations, hemispherical photographs and canopy radiative transfer,* Agricultural and Forest Meteorology (2012) 161:46-56

2011

R. Bales, J. Hopmans, T. O'Geen, M. Meadows, P. Hartsough, **P. Kirchner,** C. Hunsaker, D. Beaudette; *Soil Moisture Response to Snowmelt and Rainfall in a Sierra Nevada Mixed-Conifer Forest,* Vadose Zone Journal (2011) 10:786-799

2008

P. Kirchner, F. Biondi, J. McConnell, R. Edwards**;** *Variability of trace metal concentrations in Jeffrey pine (Pinus jeffreyi) tree rings from the Tahoe Basin, California, USA,* Journal of Forest Research (2008) 13:347–356

2006

M.S. Thesis **P. Kirchner,** *Tree Rings and Archived Trace Metals in the Tahoe Basin,* University of Nevada, Reno (2006) 131pp.

Manuscripts in preparation

P. Kirchner, T. Painter, *Snow surface temperature, snowpack density and soil moisture: hydrologic response to radiative forcing*

P. Kirchner, R. Bales, K. Musselman, N. Molotch, T. Painter, *Under-canopy snow accumulation in mixed conifer forests*

P. Kirchner, K. Bormann**,** R. Kattleman, T. Painter, *Snow density; a literature review*

P. Kirchner, J. Roche, T. Ghezzehei, R. Bales, *Rapid snowmelt in a subalpine catchment, using temperature as a tracer for flood response in mountain streams*

J. Blankinship, **P. Kirchner,** S. Hart, *Nitrogen cycling response to fine scale variability in temperature and moisture gradients in sub-alpine forest ecosystems*

INVITED LECTURES

2013

Measuring Sierra Snow From the Air, Sequoia Speaks, United States National Park Service public lecture series, Visalia, California, February 23

2011

Resolving Snow Depth using Gridded LiDAR Data, Critical Zone Observatory LiDAR Acquisition Initiative and Workshop, Berkeley, California, December 4

Southern Sierra Nevada Mountain Front Precipitation Accumulation and Ablation Analyzed with Scanning LiDAR Snow Depth and In-Situ Instrumental Measurements, Yosemite Hydroclimate Meeting, Yosemite Valley, California, October 6

Mountain catchments and Forest Snowcover: Measuring and Modeling Snowpack in the Southern Sierra Nevada, Sierra Nevada Research Institute Research Symposium, April 18

2008

Chemistry, discharge, and nutrient contribution of rock glaciers in the southern Sierra Nevada mountains of California, White Mountain Research Symposium, Climate Ecosystems and Resources in Eastern California, Bishop, California, November 5

SCIENTIFIC REVIEWS

Arctic Antarctic and Alpine Research
Fire Ecology

HONORS AND AWARDS

2011

Grant to attend *Remote Sensing of the Terrestrial Water Cycle*, Kona, Hawaii

2010

Southern California Edison Fellowship for Mountain Hydrology Research
Thayer soil science scholarship

Nominated for full membership in Sigma Xi, The Scientific Research Society

2009

Grant to attend *Examining Ecohydrological Feedbacks of Landscape Change Along Elevation Gradients in Semiarid Regions***,** Boise and Sun Valley, Idaho

2006

Outstanding Graduate Student of the Year, Department of Geography, Mackay School of Environmental Science and Engineering, University of Nevada, Reno

2005

Nominated to Phi Kappa Phi, National Honor Society

2nd place analytical poster competition, Nevada Geographic Information Society annual meeting

2004

Mountain Desert Research Scholarship, Department of Geography, University of Nevada, Reno

PROFESSIONAL ORGANIZATIONS

American Geophysical Union
Soil Science Society of America
Western Snow Conference

FOREIGN LANGUAGES

Spanish; satisfactory skill level in speaking, reading, and writing

SOFTWARE AND PROGRAMING

Statistical and analysis software; Arc GIS, R, Sigmaplot, Geo-Da, Golden Software Surfer Modeling software; Hydrus 1D, PHREQ, Mod-flow, ESAP, Net-Path
Programming language; Visual Basic, Python, R
General; Google Docs, Adobe Photoshop, Illustrator and, Microsoft Office

TEACHING PORTFOLIO

Available upon request

PROFESSIONAL EXPERIENCE

Research Scientist, Remote Sensing of Snow
Dec 2013-Present

Postdoctoral Scholar, University of California, Los Angeles, Joint Institute for Regional Earth System Science and Engineering

○ Conducting research snow property response to dust deposition and hydrologic impacts.

Jan 2013-Dec 2013

Research associate, University of California, Los Angeles, Joint Institute for Regional Earth System Science and Engineering

○ Conducting calibration and validation of airborne light detection and ranging radar (LiDAR) and hyperspectral reflectance measurements of snow at the Jet Propulsion Laboratory for the Airborne Snow Observatory mission.

Field Research, Observatory Design and Construction
2006-2013

Graduate Research Scientist, University of California Merced, Sierra Nevada Research Institute, Critical Zone Observatory, National Science Foundation grant, P.I. Roger Bales

○ Facilitated the construction of the Sequoia National Park Hydrologic Observatory and collection of three years of continuous data from over 175 sensors deployed as an integrated network of sensors throughout a 7.5 km catchment

○ Facilitated permitting for SNRI faculty and scientists from other Universities and assisted with research conducted at the Sequoia National Park Hydrologic Observatory; four manuscripts published and five are in preparation

○ Assisted in the design, permitting and construction of additional SNRI Hydrologic Observatories and flux towers for the Critical Zone Observatory and Sierra Nevada Adaptive Management Project

○ Assisted California Department of Water Resources in locating and permitting new snow depth and density sensor

○ Served as liaison between UC Merced, NPS staff, Delaware North Corporation (concessioner), UCM facilities personnel, researchers from other universities, and outside contractors on the use, operation, and maintenance of the SNRI Sequoia Field Station facilities

2006

Research Associate, University of California Merced, Sierra Nevada Research Institute, Lawrence Livermore National Laboratory major instrumentation grant, P.I. Roger Bales

○ Began construction on prototype Sequoia National Park Hydrologic Observatory

○ Managed crews of up to four field assistants

2003-2006

Graduate Student Researcher Dendrolab, Department of Geography University of Nevada, Reno, Supervisor: Franco Biondi

○ Studied climatology, GIS, and remote sensing at UNR and geochemistry in the McConnel laboratory at the Desert Research Institute

○ Collected tree cores from remote locations of California and Nevada, contributing to millennial time scale tree ring chronologies of the Great Basin and Sierra Nevada

2002

Consultant United States Department of Agriculture, Forest Service, Sequoia National Forest client contact: Beth Plymale

○ Conducted spatial data analysis and quality assurance of Western Lakes Survey data set

2001-2002

Research Associate University of California, Davis, California and California Department of Fish and Game, Bishop, California, Supervisor: Curtis Milliron

○ Supervised two to four person field crews conducting amphibian monitoring and restoration in Sierra Nevada lakes and ponds

1995-2001

Research Assistant University of California, Santa Barbara, Institute for Computational Earth System Science and the Marine Sciences Institute, Eastern Sierra Natural Reserve System, worked on multiple grants, often concurrently, conducting scientific research with the following Principle Investigators: James Sickman, John Melack, Roland Knapp, Jeff Dozier, John Stoddard, Robert Jellison, Scott Cooper, Daniel Dawson, and David Herbst

○ Conducted remote sensing ground truth campaigns in the Sierra Nevada

○ Coordinated winter and spring snow hydrology field campaigns of snow and water isotope chemistry and geochemistry of high altitude lakes

○ Supervised field crews of two to eight individuals in remote locations, often days travel from the nearest road

○ Constructed, maintained and decommissioned remote weather stations, snow depth monitoring sensors, soil moisture sensors and hydrologic gauging stations

○ Managed data streams from remote automated stations and regular snow and water sample collections from multiple locations

○ Planned logistics for multi-day, up to four week, filed campaigns to conduct surveys of Sierra Nevada lakes, ponds**,** and meadows

○ Collected, identified, and analyzed population data for aquatic invertebrate and zooplankton of Sierra Nevada lakes and streams

○ Maintained Sierra Nevada Aquatic Research Laboratory meteorology station data base

○ Prepared monthly Coop station reports for the Western Regional Climate Center

○ Captained research vessel for monthly limnology surveys of Mono Lake, California and research campaigns on Crowley Lake, California

○ Characterized soil types and plant communities in Sierra Nevada alpine ecosystems

○ Performed routine chemistry and laboratory tasks related to water chemistry and the processing of biological samples

○ Outfitted and operated boats, snowmobiles and 4 wheel drive vehicles for scientific field research

○ Facilitated interpretive outreach for public and K-12 school groups for the NRS Eastern Sierra Valentine Reserve

1999

Research Assistant, University of California San Diego, Scripps Institution of Oceanography, Life Cycle of Sierra Nevada Snow Algae P.I. William Thomas

○ Collected data and managed field research of red snow algae in Yosemite and the Hall Natural Area

1995-1996

Snow Surveyor, California Department of Water Resources Sacramento, California, Contract Supervisor: Dave Hart

○ Collected and reported monthly measurements for the Big Pine Creek snow courses

1993-1995

Scientific Aid, California Department of Fish and Game, wild trout monitoring and restoration program, Bishop, California, Supervisor: Steve Parameter

○ Conducted wild trout surveys throughout the Sierra Nevada and mountains of Southern California

○ Monitored populations of endangered fish and amphibians

○ Analyzed hydrologic data and investigated stage/discharge relationships

○Managed and evaluated data for reports on wild trout and amphibian populations

1992-1995

Field Botanist, Mark O. Bagley Consulting Botanist, Bishop, California

○ Conducted belt, plot, and transect plant surveys in the Sierra Nevada, Great Basin, and Mojave Desert, California

1992-1994

Biologist, PSOMAS Engineering, environmental consultants, Costa Mesa, California

○ Collected and managed data for the re-licensing of Southern California Edison, run of the river hydropower operations in Lundy and Big Pine Canyons

○ Cored riparian tree species for tree ring analysis and conducted water potential measurements

Education/Teaching

2009 **Guest lecturer,** Environmental Systems 292**,** Advanced Spatial Analysis University of California, Merced, Professor Qinghua Guo

○ Lectured on "spatial and temporal scaling of in-situ filed measurements"

2008

Course proposal, Environmental Systems 292**,** *Integrated Environmental Research in Catchment Hydrology*, University of California, Merced, Professor Martha Conklin

○ Proposed course, created budget, secured funding from Dean and invited four of the six lecturers to teach graduate course on innovative concepts in catchment hydrology

2003-2006

Graduate Student Instructor, Department of Geography, University of Nevada, Reno

Geography 103, ***Earth System Science*** (two semesters)

○ Lectured, taught laboratory sections and graded course assignments, anonymous teaching evaluation rating of 7.1/8, 40 students and 7.3/8, 30 students

Geography 418, ***Geographic Thought*** (upper division course, one semester)

○ Lectured, introduced assignments and graded course assignments, anonymous teaching evaluation rating of 6.9/8, 20 students

Geography 205, ***Geographic Information Systems*** (one semester)

○ Taught laboratory sections and graded course assignments, anonymous teaching evaluation rating of 6.9/8, 12 students

Leadership, Management, Operations, Administration, Project Planning

2009-2011

Representative, University of California, Merced Campus Budget Committee

○ Reviewed operational budgets of campus departments and units, created guidelines and made recommendations for distribution of annual funding

○ Provided feedback on the internal economy of the campus at a time of rapid campus growth and funding constraint

1990-2000

President, Birchim Community Services District, domestic water supply and fire protection services

○ Governed board of directors through monthly to biweekly public meetings

○ Supervised district manager and administrative assistant
○ While in office we planned, financed (USDA rural development community facility loan) permitted (USDA Forest Service) and constructed (outside engineer/contractor) a community water distribution system to provide water and fire protection to a rural community of 70 homes
○ Created a long range financial and maintenance plan for water system
○ Managed other testing, repair and maintenance projects of facilities with, fire district, outside engineers and contractors
○ Directed compliance with US EPA safe drinking water act

1990-1999

Instructor and Chief Instructor, Pacific Crest and Loch Eil Outward Bound Schools, California, Oregon, Washington, Mexico and the United Kingdom
○ Taught wilderness based experiential education courses for adolescents, at risk youth, adults and professionals in the Western U.S. and abroad, focused on leadership, team building, and personal growth through community service projects and the mastery of outdoor pursuits (rock climbing, ice climbing, mountaineering, sea kayaking, wilderness first aid, and mountain, and desert backcountry travel)
○ Supervised two to four groups of two instructors with 10 students, designed courses to meet learning objectives, established safety and course management policies and procedures, and contributed to writing course area guides for the Sequoia King's Canyon, Southern Yosemite region and Joshua Tree National Monument
○ Designed and instructed four day professional development courses for corporate managers, e.g. Home Depot, Honda Motor Corporation, and SmithKline Beecham
○ Safely supervised > 7,000 person days in the field without a serious accident, injury or evacuation

1993-1996

Training Officer, Mono County Sheriff's Search and Rescue (SAR) Team, directed training and team preparation for professional and volunteer team members, and SAR volunteer
○ Coordinated training program for one of the busiest volunteer search and rescue teams in California
○ Taught high angle rescue, aircraft Emergency Locator Transmitter, wilderness first aid, navigation, and winter backcountry travel
○ Participated in > 70 search and rescue operations including: missing persons, high angle, swift water, downed aircraft, auto extraction in difficult terrain and winter SAR
○ Participated in > 20 mutual aid agreement search and rescue flight operations with USDA Forest Service, National Park Service, Air National Guard, California Highway Patrol, and Naval Air Station SAR

Outreach

2012

Presentation of current research to University of California, Merced administration and members of the Southern California Edison Board of Trustees UC Merced, January 27

Article in University of California, Merced news: *Graduate Student at Home with Mountain Water Research* http://www.ucmerced.edu/news/graduate-student-home-mountain-water-research January 6

2011

Video interview on University of California, Merced Impact: Critical Research in the Sierra Nevada http://www.youtube.com/watch?v=BNZ2oNHyvkc&feature=player_embedded November 8

Presentation of current research to University of California, Merced administration and members of the Southern California Edison Board of Trustees UC Merced, March 3

2010

Video interview in KVIE *Climate Change in California* series at: 5 minute life videopedia http://www.5min.com/Video/Climate-Change-in-California--The-Forests-Cry-300996056

Presentation of current research to University of California, Merced Board of Trustees, February 10

2009

Presentation *Environmental Monitoring for Hydrologic Resources; a look into the future* Geophysical Information for Teachers (GIFT) workshop, American Geophysical Union, San Francisco, December 15

Interview featured in *California at the Tipping Point* KQED *Quest* public **television documentary** on California climate change science, first aired on April 17 http://www.kqed.org/quest/television/climate-watch-california-at-the-tipping-point-part-one

Eastern Sierra Roadside Heritage project, Snow and Ice in the Sierra Nevada, NSF funded **video interview and middle school educational outreach**. September 15 http://www.roadsideheritage.org/index.html

2008

Interview featured in *California Heat* a KVIE *View Finder* public **television documentary** on climate change impacts in California, first aired in October 14 http://vids.kvie.org/video/1510189933/

2006

San Francisco Chronicle, **cover story**, *Scientists set up in Sierra to track shrinking snowpack* November 11 http:// www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/11/12/MNG5LMBD7R1.DTL

SELECTED PROJECTS

Project Permitting, Design, Construction, and Maintenance

2006-2013

Prepared annual research **permits and reports** for Sierra Nevada Research Institute activities in Sequoia National Park, California

2009

Designed and installed the Wolverton Creek v notch weir, Sequoia National Park, California

2008

Design and programming for the University of California, Merced Solar Irradiance Sensing and Tracking Observatory

2007

Designed, located, assembled, and programmed the Panther Meadow Meteorological station, Sierra Nevada, California

Design and site location **consultation** for Kings River Experimental Watershed**,** snow depth and soil moisture monitoring stations, California

Site location **consultation and** initial **permitting** of the Providence watershed eddy covariance flux tower, Kings River Experimental Watershed, California

2006

Designed, located, assembled, and programmed Wolverton meteorological station, and distributed snow and soil moisture monitoring stations, Sierra Nevada, California

Site location **consultation** for Sierra Nevada Adaptive Management Project Meteorological, and stream gauging stations, Sierra Nevada, California

Remote sensing

2013-present

Organized and **executed** ground truth snow surveys for **NASA – JPL** Airborne Snow Observatory Light Detection And Ranging (LiDAR) and spectroscopy mission surveys in Tuolumne River watershed, California and the Uncompahgre watershed, Colorado

2010

Organized and **executed** ground truth snow surveys for airborne Light Detection And Ranging (LiDAR) surveys of Southern Sierra Critical Zone Observatory field sites

2009

Organized and executed four ground truth spectroscopy missions Airborne Visible Infra Red Imaging System (AVIRIS), Sierra Nevada, California

1996-2000

Conducted ground truth surveys of snow, grain size and spectroscopy for multiple AVIRIS missions in the Sierra Nevada, California

Hydrology and snow study

1995-Present

Project Leader for multiple snow surveys of depth, density and distribution in the mountains of California and Nevada

1995-Present

Field **measurement** of discharge and creation of rating curves for multiple catchments using tracer injections, current meters, and cross sectional surveys in hard-rock hydrology locations

Data management

- 2006 - 2011
    - Database **Maintenance** for the Wolverton study area, Sierra Nevada San Joaquin Hydrologic Observatory digital data library for integrated clusters of distributed instruments and monitoring stations, https://eng.ucmerced.edu/snsjho

ABSTRACTS

2013 Session convener: K. Musselman, **P. Kirchner**, A. Harpold *H13J. H13J. Using LiDAR Data Sets To Improve Ecohydrological Observations*; American Geophysical Union, San Francisco, California, December 9

Poster: **P. Kirchner,** R. Bales, T. Painter, *Estimating forest snow accumulation with LiDAR derived canopy metrics, southern Sierra Nevada, California;* American Geophysical Union, San Francisco, California, December 9

Talk: Thomas H. Painter; Konstantinos Andreadis; Daniel F. Berisford; Cameron E. Goodale; Andrew F. Hart; Cate Heneghan; Jeffrey S. Deems; Frank Gehrke; Danny G. Marks; Chris A. Mattmann; Bruce J. McGurk; Paul Ramirez; Felix C. Seidel; McKenzie Skiles; Amy Trangsrud; Adam H. Winstral; Peter Kirchner; Paul A. Zimdars; Rojeh Yaghoobi; Maziyar Boustani; Shakeh Khudikyan; Megan Richardson; Richard Atwater; Jason Horn; Daniel Goods; Rishi Verma; Joseph W. BoardmanTalk: N. Molotch, K. Musselman, **P. Kirchner**, R. Bales, P. Brooks, *The Airborne Snow Observatory: fusion of imaging spectrometer and scanning lidar for studies of mountain snow cover;* American Geophysical Union, San Francisco, California, December 9

Poster: T. Painter, K. Andreadis, J. Deems, F. Gehrke, C. Heneghan, **P. Kirchner,** *The NASA JPL Airborne Snow Observatory in the southern Sierra Nevada,* Southern Sierra Nevada Change Adaptation Workshop, Visalia, California, February 20-22

Talk: **P. Kirchner**, T. Painter, R. Bales, *Measuring Sierra Snow From the Air,* Sequoia Speaks, United States National Park Service public lecture series, Visalia, California, February 23

Talk: **P. Kirchner**, R. Bales, K. Musselman, N. Molotch, *Measuring Under-Canopy Snow Accumulation using Airborne and Ground Based Sensors in the Southern Sierra Nevada, California;* 79th Annual Meeting of the Western Snow Conference, Jackson Hole, Wyoming, April 16

2012 Talk: N. Molotch, K. Musselman, **P. Kirchner**, R. Bales, P. Brooks, *Effects of forest structure on snow accumulation and melt derived from ecohydrological instrument clusters across the Western US;* American Geophysical Union, San Francisco, California, December 5

Talk: **P. Kirchner**, R. Bales, K. Musselman, N. Molotch, *Under-canopy snow accumulation and ablation measured with airborne scanning LiDAR altimetry and in-situ instrumental measurements, southern Sierra Nevada, California;* American Geophysical Union, San Francisco, California, December 3

Poster: **P. Kirchner,** R. Bales, N. Molotch *Measuring under-canopy snow accumulation with airborne scanning LiDAR altimetry and in-situ instrumental measurements, southern Sierra Nevada, California* AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, Kona, Hawaii, February 20

2011 Talk: **P. Kirchner**, R. Bales, J. Flanagan, K. Musselman, N. Molotch, *Mountain front precipitation accumulation over a 3300m elevation gradient from scanning LiDAR snow depth and in-situ instrumental measurements, southern Sierra Nevada, California;* American Geophysical Union, San Francisco, California, December 7

Poster: K. Musselman, N. Molotch, S. Margulis, **P. Kirchner**, R. Bales *Inter-annual snow accumulation and melt patterns in a sub-alpine mixed conifer forest: results from a distributed physically based snow model;* American Geophysical Union, San Francisco, California, December 6

Talk: **P Kirchner,** R. Bales, J. Flanagan, *Southern Sierra CZO LiDAR derived snow depth;* Southern Sierra Critical Zone Observatories meeting, Shaver Lake, California, May 9

Poster: **P. Kirchner**, R. Bales, J. Flanagan, K. Musselman, N. Molotch, *Seeing the Snow Through the Trees Snow Cover in forested catchments as determined from snow depth sensor and LiDAR measurements;* National Critical Zone Observatories program meeting, Tucson, Arizona, May 9

Talk: R. Rice, R. Bales, **P. Kirchner**, P. Saksa, K. Rittger, T. Painter, J. Dozier, *A Comparison of the Fractional MODIS and LANDSAT Thematic Mapper Snow Covered Area with Ground-Based Snow Surveys in the Sierra;* 79th Annual Meeting of the Western Snow Conference, Stateline, Nevada, April 19

Talk: **P. Kirchner**, R. Rice, R. Bales, K. Musselman, N. Molotch, *Measuring and Modeling Under-Canopy Snow Ablation in Southern Sierra Nevada Subalpine Red-Fir Forest;* 79th Annual Meeting of the Western Snow Conference, Stateline, Nevada, April 18

Poster: **P. Kirchner,** R. Bales, *California's Water Tower: Yields From Mountain Catchments;* National Academy of Engineering, Berkeley, California, March 31

2010

Poster: K. Musselman, N. Molotch, S. Margulis, M. Lehning, **P. Kirchner**, R. Bales, *Simulating plot-scale variability of snowpack states in conifer forests using hemispherical photography and a process based one-dimensional snow model;* American Geophysical Union, San Francisco, California, December 15

Poster: R. Rice, R. Bales, **P. Kirchner**, P. Saksa, K. Rittger, T. H. Painter, and J. Dozier, *A Comparison of the Fractional MODIS and LANDSAT Thematic Mapper with Ground-Based Snow Surveys in the Sierra Nevada;* American Geophysical Union, San Francisco, California, December 15

Poster: **P. Kirchner**, R. Rice, R. Bales, K. Musselman, N. Molotch, *Estimating under-canopy ablation in a subalpine red-fir forest, southern Sierra Nevada, California;* American Geophysical Union, San Francisco, California, December 15

Poster: **P. Kirchner,** F. Liu, R. Rice, *Rock Glacier Chemistry and Discharge*; International Glaciological Conference on Ice and Climate Change, Valdivia, Chile, February 3-5

2009

Talk: **P. Kirchner**, K. Musselman, N. Molotch, R. Bales, *Multi-scale observations and modeling of the snowpack in a forested Sierra Nevada catchment;* American Geophysical Union, San Francisco, California, December 15

Talk: K. Musselman, N. Molotch, S. Margulis, **P. Kirchner**, R. Bales, *A mechanistic approach for estimating snowpack dynamics in a conifer forest, Southern Sierra Nevada;* American Geophysical Union, San Francisco, California, December 15

Poster: M. Meadows, R. Bales, J. Hopmans, P. Hartsough, T. O'Geen, **P. Kirchner**, *Soil moisture response to snowmelt and rainfall across elevation, aspect and canopy cover in the Southern Sierra Nevada;* American Geophysical Union, San Francisco, California, December 15

Talk: M. Conklin, N. Crook, **P. Kirchner**, R. Lucas, *Seasonal transitions in water sources and moisture patterns in a mountain meadow, Southern Sierra Nevada;* American Geophysical Union, San Francisco, California, December 14

2008

Poster: **P. Kirchner,** *Snowmelt infiltration and evapotranspiration in Red Fir forest ecosystems of the Sierra Nevada*; American Geophysical Union, San Francisco, California, December 12

Poster: Bales R., Meadows M., Hopmans J., Hartsough P., **P. Kirchner,** *Snow and Soil Moisture Response Across Elevation, Aspect and Canopy Variables in a Mixed-conifer Forest, Southern Sierra Nevada;* American Geophysical Union, San Francisco, California, December 12

Poster; Bales R., C. Hunsaker, **P. Kirchner**, M. Conklin, R.Lucas, *Hydroclimate, Ecosystem links & the Southern Sierra Critical Zone Observatory*; Southern Sierra Science Symposium, Visalia, California, September 5

Poster; **P. Kirchner**, R. Rice, F. Liu; *Rock Glacier Discharge and Chemistry, a comparison of two sites*; Research Day, University of California, Merced, April 10

2007

Poster: **P. Kirchner,** R. Rice, F. Liu, *Stream Flow Contributions of Rock Glaciers in the Southern Sierra Nevada Mountains of California;* American Geophysical Union, San Francisco, California, December 13

Talk; R. Bales, C. Hunsaker, M. Conklin, J. Kirchner, B. Boyer, **P. Kirchner** *Southern Sierra Critical Zone Observatory (CZO): Hydrochemical characteristics, science & measurement strategy*; American Geophysical Union, San Francisco, California, December 14

Talk; **P. Kirchner**, *Integrated measurements & modeling of Sierra Nevada water budgets*; Yosemite Hydroclimate Symposium, Yosemite Valley, California, October 4

Talk; Bales R., M. Conklin, R. Rice, F.Liu, **P. Kirchner**. S*urface & subsurface processes in mountain environments*; Global Energy and Water Cycle Experiment, North American Mountain Hydroclimate Workshop, Boulder, Colorado, October 18

2006

Talk; **P. Kirchner,** F. Biondi, J. McConnell *Dendrochemistry of Yellow Pines, a Comparison of Multiple Samples;* Annual Meeting of the American Association of Geographers, Chicago Illinois, March 9

2005

Poster; **P. Kirchner**, H. Reitman, *Impervious Cover in the Tahoe Basin, a statistical analysis;* Nevada Geographic Information Society, Reno, Nevada, April 28

Talk; **P. Kirchner**, F. Biondi, J. McConnell *Tree Rings and Trace Metals in the Tahoe Basin;* Annual Meeting of the American Association of Geographers, Denver, Colorado, April 7

2004

Poster; **P. Kirchner,** H. Reitman, *The human footprint, land use in the Tahoe Basin;* Association of Pacific Coast Geographers, San Luis Obispo, California, October 16