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RESEARCH INTERESTS

Ecology of mountain environments, plant species interactions with climate, life in extreme environments, terrestrial-aquatic linkages, biogeochemistry, hydrochemistry, surface-groundwater interactions, acid mine drainage, natural isotopes, physical-chemical interactions of the snowpack, hydrology, snow hydrology, atmospheric deposition, remote sensing of glaciers, avalanche dynamics.

EDUCATION

All degrees in Biological Sciences, with emphasis on ecology.

Ph.D. 1991 University of California, Santa Barbara

Ph.D. 1987 Matriculated, UC Santa Barbara

B.A. 1985 University of California, Santa Barbara

EMPLOYMENT

Present-2005: Professor of Geography and Fellow at the Institute of Arctic and Alpine Research, University of Colorado, Boulder.

2003-2001: Associate Co-Director, Undergraduate Academy, University of Colorado, Boulder.

2005-1998: Associate Professor of Geography and Fellow at the Institute of Arctic and Alpine Research, University of Colorado, Boulder.

1998-1991: Assistant Professor of Geography and Research Associate II at the Institute of Arctic and Alpine Research, University of Colorado, Boulder.

1987-1991: Research assistant, teaching assistant, Department of Biological Sciences, Center for Remote Sensing and Environmental Optics, University of California, Santa Barbara.

1985-1986: Field assistant, Emerald Lake Integrated Watershed Study; University of California, Santa Barbara.

1985-1988: General Partner, May, Williams and Ossofsky Trail Construction, Bishop, California.

1977-1984: General Partner, General Manager, Rock Creek Winter Lodge, Mammoth Lakes, California.

1977-1980: Wilderness Ranger, Wilderness Foreman, Mammoth Lakes Ranger District, Inyo National Forest, Mammoth Lakes, California.

1976: Interpretive Naturalist, Glacier Bay National Monument, Gustavus, Alaska.

1974-1976: Naturalist, Santa Barbara County Schools, Santa Barbara, California.

AWARDS AND HONORS

2012: elected Fellow, American Geophysical Union.

2008: Denali Recent Accomplishment Award, AAG Mountain Geography Speciality Group.

2008: First visiting professor, Institut de la Montagne, University of Savoie, Chambéry, France. May 31 to July 15, 2008.

2006-2007 academic year: Faculty Fellowship, CU-Boulder.

2006: Residence Life Academic Teaching Award, CU-Boulder.

2006: National Park Service, First Intermountain West Annual Award for Research to Support Park Service Resource Management by a non-Federal Scientist.

2004: ARCUS visiting scholar, Fairbanks and Juneau Alaska.

2000-1999 academic year: Faculty Fellowship, CU-Boulder.

1999: Fulbright Research Fellowship, Ecuador.

1998: US Environmental Protection Agency (EPA) Region VIII Outstanding Environmental Achievement Award.

1997: Council on Research and Creative Writing award, CU-Boulder.

1992: Junior Faculty Development Award, CU-Boulder.

1991: Department of Energy Global Change Distinguished Postdoctoral Fellowship.

1991-1988: NSF Pre-doctoral Fellowship for Minority Students.

PROFESSIONAL SOCIETIES

Association of American Geographers, American Geophysical Union, American Society of Limnology and Oceanography, American Water Resources Association, Eastern Snow Conference, Ecological Society of America, International Association of Hydrologic Sciences, National Ground Water Association, Western Snow Conference.

PUBLICATIONS

Peer-Reviewed Journals

- Fountain, A. G., J. L. Campbell, E. A. G. Schuur, S. E. Stammerjohn, M. W. Williams, and H. W. Ducklow, The Disappearing Cryosphere: Impacts and Ecosystem Responses to Rapid Cryosphere Loss, *BioSciences*, 2012 (in press) .
- Gao, J., M. W. Williams, X. D. Fu, G. Q. Wang, and T. L. Gong, Spatiotemporal Distribution of Snow in Eastern Tibet and the Response to Climate Change, *Remote Sensing of Environment*, 2012 (in press).
- Jepsen, S. M., N. P. Molotch, M. W. Williams, K. E. Rittger, and J. O. Sickman, Interannual Variability of Snowmelt in the Sierra Nevada and Rocky Mountains, USA (1996-2007): Examples from Two Alpine Watersheds, *Water Resources Research*, 2012 (in press).
- Robertson, P. G., S. L. Collins, D. R. Foster, N. Brokaw, H. W. Ducklow, T. L. Gragson, C. Gries S. K. Hamilton, A. D. McGuire, J. C. Moore, E. H. Stanley, R. B. Waide, and M. W. Williams, Long Term Ecological Research in a Human Dominated World, *BioScience*, 2012 (in press).
- Jones, J. A., many_others, and M. W. Williams, Ecosystem Processes and Human Influences Regulate Streamflow Response to Climate Change at Long-Term Ecological Research Sites, *BioScience*, 2012 (in press).
- Janke, J. R., M. W. Williams, and A. Evans, A comparison of permafrost prediction models along a section of Trail Ridge Road, Rocky Mountain National Park, Colorado, USA, *Geomorphology*, 138, 111-120, 2012.
- Williams, M. W., R. T. Barnes, J. N. Parman, M. Freppaz, and E. Hood, Stream Water Chemistry along an Elevational Gradient from the Continental Divide to the Foothills of the Rocky Mountains, *Vadose Zone Journal*, 10, 900-914, 2011.
- Darrouzet-Nardi, A., J. Erbland, W. D. Bowman, J. Savarino, and M. W. Williams, Landscape-level nitrogen import and export in an ecosystem with complex terrain, Colorado Front Range, *Biogeochemistry*, 2011.
- Gutmann, E. D., K. M. Larson, M. W. Williams, F. G. Nievinski, and V. Zavorotny, Snow measurement by GPS interferometric reflectometry: an evaluation at Niwot Ridge, Colorado, *Hydrologic Processes*, 2011 (in press).
- Zaslavsky, I., T. Whitenack, M. Williams, D. Tarboton, K. A. T. Schreuders, and A. Aufdenkampe, Initial Design of Data Sharing Infrastructure for the Critical Zone Observatory, *Environmental Information Management*, 2011 (in press).

- Leopold, M., M. W. Williams, N. Caine, J. Volkel, and D. Dethier, Internal Structure of the Green Lake 5 Rock Glacier, Colorado Front Range, USA, *Permafrost and Periglacial Processes*, 22, 107-119, 2011.
- Schmidt, S. K., R. C. Lynch, A. J. King, D. Karki, M. S. Robeson, L. Nagy, M. W. Williams, M. S. Mitter, and K. R. Freeman, Phylogeography of microbial phototrophs in the dry valleys of the high Himalayas and Antarctica, *Proc. R. Soc. B*, 1-7, 2010.
- Leopold, M., J. Voelkel, D. Dethier, M. W. Williams, and N. Caine, Mountain Permafrost - A Valid Archive to Study Climate Change? Examples from the Rocky Mountains Front Range of Colorado, USA, *Nova Acta Leopoldina*, 112, 281-289, 2010.
- Williams, M. W., T. A. Erickson, and J. L. Petrzela, Visualizing meltwater flow through snow at the centimetre-to-metre scale using a snow guillotine, *Hydrologic Processes*, 2010 .
- Miller, M. P., B. E. Simone, D. M. McKnight, R. M. Cory, M. W. Williams, and E. W. Boyer, New light on a dark subject: comment, *Aquatic Sciences*, 72, 269-275, 2010.
- Freppaz, M., D. Godone, G. Filippa, M. Maggioni, S. Lunardi, M. W. Williams, and E. Zanini, Soil Erosion Caused by Snow Avalanches: A Case Study in the Aosta Valley (NW-ITALY), *Arctic Antarctic and Alpine Research*, 42, 412-421, 2010.
- Filippa, G., M. Freppaz, M. W. Williams, and E. Zanini, Major Element Chemistry in inner-alpine Snowpacks (Aosta Valley Region, North Western Italy), *Cold Regions Science and Technology*, 2010.
- Larson, K. M., E. D. Gutmann, V. U. Zavorotny, J. J. Braun, M. W. Williams, and F. G. Nievinski, Can we measure snow depth with GPS receivers? Geophysical Research Letters, L17502, DOI:10.1029/2009GL03943, 2009.
- Williams, M. W., D. Helmig, and P. Blanken, White on green: under-snow microbial processes and trace gas fluxes through snow, Niwot Ridge, Colorado Front Range, *Biogeochemistry*, 95, 1-12, 2009.
- Blanken, P., M. W. Williams, S. P. Burns, R. K. Monson, J. Knowles, K. Chowanski, and T. Ackerman, A comparison of water and carbon dioxide exchange at a windy alpine tundra and subalpine forest site near Niwot Ridge, Colorado, *Biogeochemistry*, 95, 61-76, 2009.
- Fassnacht, S. R., M.W. Williams, and M.V. Corrao, Changes in the surface roughness of snow from millimetre to metre scales, *Ecological Complexity*, 6 , 221-229, 2009 .
- Maggioni, M., M. Freppaz , P. Piccini , M. W. Williams, and E. Zanini , Snow cover effects on glacier ice surface temperature, *Arctic Antarctic and Alpine Research*, 41, 323-329, 2009.

- Helmig, D., B. Seok, M. W. Williams, and R. Sanford Jr, Fluxes and Chemistry of Nitrogen Oxides in the Niwot Ridge, Colorado, Snowpack, *Biogeochemistry*, 95, 115-130, 2009.
- Seok, B., D. Helmig, M. W. Williams, D. Liptzin, K. Chowanski, and J. Hueber, An automated system for continuous measurements of trace gas fluxes through snow: an evaluation of the gas diffusion method at a subalpine forest site, Niwot Ridge, Colorado, *Biogeochemistry*, 95, 95-113, 2009.
- Liptzin, D., M. W. Williams, D. Helmig, B. Seok, G. Filippa, K. Chowanski, and J. Hueber, Process-level controls on CO₂ fluxes from a seasonally snow-covered subalpine meadow soil, Niwot Ridge, Colorado, *Biogeochemistry*, 95, 151-166, 2009.
- Miller, M. P., D. M. McKnight, S. C. Chapra, and M. W. Williams, A model of degradation and production of three pools of dissolved organic matter in an alpine lake, *Limnology and Oceanography*, 54, 2213-2227, 2009.
- Nanus, L., M. W. Williams, D. H. Campbell, K. A. Tonnessen, T. Blett, and D. W. Clow, Assessment of Lake Sensitivity to Acidic Deposition in National Parks of the Rocky Mountains, *Ecological Applications*, 19, 961-973, 2009.
- Flanagan, C. M., D. M. McKnight, D. Liptzin, M. W. Williams, and M. P. Miller, Response of the Phytoplankton Community in an Alpine Lake to Drought Conditions: Colorado Rocky Mountain Front Range, US, *Arctic Antarctic and Alpine Research*, 41, 191-203, 2009.
- Bowling, D. R., W. J. Massman, S. M. Schaeffer, S. P. Burns, R. K. Monson, and M. W. Williams, Biological and physical influences on the carbon isotope content of CO₂ in a subalpine forest snowpack, Niwot Ridge, Colorado, *Biogeochemistry*, 95, 37-59, 2009.
- Williams, M. W., C. Seibold, and K. Chowanski, Storage and Release of Solutes from a Subalpine Seasonal Snowpack: Soil and Stream Water Response, Niwot Ridge, Colorado, *Biogeochemistry*, 95, 77-94, 2009.
- Filippa, G., M. Freppaz, D. Liptzin, B. Seok, K. Chowanski, B. Hall, D. Helmig, and M. W. Williams, Winter and summer nitrous oxide and nitrogen oxides fluxes from a seasonally snow-covered subalpine meadow at Niwot Ridge, Colorado, *Biogeochemistry*, 95, 131-149, 2009.
- Molotch, N. P., T. Meixner, and M. W. Williams, Estimating stream chemistry during the snowmelt pulse using a spatially distributed, coupled snowmelt and hydrochemical modeling approach, *Water Resour. Res.*, 44, W11429, 2008.
- Marshall, J. D., J. M. Blair, D. Peters, G. Okin, A. Rango, and M. W. Williams, Predicting and Understanding Ecosystem Responses to Climate Change at Continental

- Scales, *Frontiers in Ecology and the Environment*, 6, 273-280, 2008.
- Nanus, L., M. W. Williams, D. H. Campbell, E. M. Elliott, and C. Kendall, Evaluating Regional Patterns in Nitrate Sources to Watersheds in National Parks of the Rocky Mountains using Nitrate Isotopes, *Environmental Science and Technology*, 42, 6487-6493, 2008.
- Racoviteanu, A., Y. Arnaud, M. W. Williams, M. Zapata, and J. Ordonez, Decadal changes in glacial parameters for the Cordillera Blanca, Peru derived from SPOT 5 satellite imagery and aerial photography, *Journal of Glaciology*, 54, 499-510, 2008 .
- Racoviteanu, A., M. W. Williams, and R. B. Barry, Review: Optical Remote Sensing of Glacier Characteristics: A Review with Focus on the Himalaya, *Sensors*, 8, 3355-3383, 2008 .
- Bebbington, A. and M. W. Williams, Water and mining conflicts in Peru, *Mountain Research and Development*, 28, 190-195, 2008.
- Li, X. G. and M. W. Williams, Snowmelt Runoff Modeling in an Arid Mountain Watershed, Tarim Basin, China, *Hydrologic Processes*, 2, 3931-3940, 2008 .
- Litaor, M. I., M. W. Williams, and T. Seastedt, Topographic controls on snow distribution, soil moisture, and species diversity of herbaceous alpine vegetation, Niwot Ridge, Colorado, *J. Geophys. Res.*, 113, G02008, 2008 .
- Lazar, B. and M. W. Williams, Climate change in western ski areas: Potential changes in the timing of wet avalanches and snow quality for the Aspen ski area in the years 2030 and 2100, *Cold Regions Science and Technology*, 51, 219-228, 2008.
- Molotch, N. P., P. D. Blanken, M. W. Williams, A. Turnipseed, R. Monson, and S. Margulis, Estimating sublimation of intercepted and sub-canopy snow using eddy covariance systems, *Hydrologic Processes*, 21, 1567-1575, 2007.
- Williams, M., M. Knauf, R. Cory, N. Caine, and F. J. Liu, Nitrate content and potential microbial signature of rock glacier outflow, Colorado Front Range, *Earth Surface Processes*, 32, 1032-1047, 2007.
- Racoviteanu, A., W. Manley, Y. Arnaud, and M. W. Williams, Evaluating digital elevation models for glaciologic applications on Nevado Coropuna, Peruvian Andes, *Global and Planetary Change*, 59, 110-125, 2007.
- Miller, M. P., D. M. McKnight, R. M. Cory, M. W. Williams, and R. Runkel, Hyporheic Exchange and Fulvic Acid Redox Reactions in an Alpine Stream/Wetland Ecosystem, Colorado Front Range, *Environmental Science & Technology*, 40, 5943-5949, 2006.
- Hock, R., G. Rees, M. W. Williams, and E. Ramirez, Preface: Contributions from glaciers and snow cover to runoff from mountains in different climates, *Hydrologic*

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- Konovalov, V. and M. W. Williams, Multi-year oscillations of glacier regime and river discharge in Central Asia in recent years, *Meteorology and Hydrology*, 9, 2005 (in Russian).
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- Erickson, T., M. W. Williams, and A. Winstral, Persistence of topographic controls on the spatial distribution of snow depth in rugged mountain terrain, Colorado, USA, *Water Resources Research*, 41, W04014, 2005.
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- Liu, F., M. W. Williams, and N. Caine, Source waters and flowpaths in a seasonally snow-covered catchment, *Water Resources Research*, 40, 2004.
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- Ley, R., M. W. Williams, and S. Schmidt, Microbial population dynamics in an extreme environment: controlling factors in talus soils at 3750 m in the Colorado Rocky Mountains, *Biogeochemistry*, 68, 297-311, 2004.
- Hood, E., D. McKnight, and M. W. Williams, Sources and chemical character of dissolved organic carbon (DOC) across an alpine/subalpine ecotone, Green Lakes Valley, Colorado Front Range, USA, *Water Resources Research*, 39, 2003.

- Hood, E., M. W. Williams, and N. Caine, Landscape controls on organic and inorganic nitrogen leaching across an alpine-subalpine ecotone, Green Lakes Valley, Colorado Front Range, *Ecosystems*, *6*, 31-45, 2003.
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- Williams, M. W., M. Losleben, and H. Hamann, Alpine areas in the Colorado Front Range as monitors of climate change and ecosystem response, *Geographical Review*, *92*, 180-191, 2002.
- Hood, E., M. W. Williams, and N. Caine, Yields of dissolved organic C, N, and P from three high-elevation catchments, Colorado Front Range, USA, *Water, Air, and Soil Pollution*, *2*, 165-180, 2002.
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- Hardy, D., M. W. Williams, and C. Escobar, Near-surface faceted crystals and avalanche dynamics in high-elevation, tropical mountains of Bolivia, *Cold Regions Science and Technology*, *33*, 291-302, 2001.
- Williams, M. W., E. Hood, G. Ostberg, B. Francou, and R. Galarraga, Synoptic survey of inorganic and organic C, N, and P concentrations, paramo high-altitude region, Antisana Ecological Reserve, Ecuador, *Arctic, Alpine, and Antarctic Research*, *33*, 2001.
- Williams, M. W., E. Hood, and N. Caine, The role of organic nitrogen in the nitrogen cycle of a high-elevation catchment, Colorado Front Range, USA, *Water Resources Research*, *25*, 2569-2582, 2001.
- Hood, E. and M. W. Williams, Seasonal changes in the character and nitrogen content of dissolved organic material in an alpine/subalpine headwater catchment, *The Scientific World*, *1*, 2001.
- Williams, M. W. and D. Manthorne, Class I areas at risk: Event-based nitrogen deposition to a high-elevation, western site, *The Scientific World*, *1*, 2001.
- Pomeroy, J. W., P. Holler, P. Marsh, , D. A. Walker, and M. W. Williams, Snow vegetation interactions: issues for a new initiative, in *Soil-Vegetation-Atmosphere Transfer Schemes and Large Scale Hydrological Models*, edited by J.W. Pomeroy, IAHS Publ. No. 270, pp. 299-305, IAHS Press, Wallingford, UK, 2001.
- Inyan, B. and M. W. Williams, Protecting headwater catchments from future degradation, San Miguel River, CO, *Mountain Research and Development*, *21*, 71-78, 2001.

- Williams, M. W. and K. A. Tonnessen, Critical loads for nitrogen deposition in the Colorado Rocky Mountains, USA, *Ecological Applications*, *10*, 1648-1665, 2000.
- Williams, M. W., M. R. Rikkers, and W. T. Pfeffer, Ice columns and frozen rills in a warm snowpack, Green Lakes Valley, Colorado, USA., *Nordic Hydrology*, *31*, 169-186, 2000.
- Meixner, T. M., R. C. Bales, M. W. Williams, D. H. Campbell, and J. S. Baron, Stream chemistry modeling of two watersheds in the Front Range, Colorado, *Water Resources Research*, *36*, 77-88, 2000.
- Baron, J. S. and M. W. Williams, Preface, Recent Loch Vale Watershed Research, *Water Resources Research*, *36*, 11-12, 2000.
- Williams, M. W., D. Cline, M. Hartmann, and T. Bardsley, Data for snowmelt model development, calibration, and verification at an alpine site, Colorado Front Range, *Water Resources Research*, *35*, 3205-3209, 1999.
- Williams, M. W., R. Sommerfeld, S. Massman, and M. Rikkers, Correlation lengths of vertical flowpaths in melting snowpacks, Colorado Front Range, USA, *Hydrologic Processes*, *13*, 1807-1826, 1999.
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- Williams, M. W., T. Bardsley, and M. Rikkers, Oversampling of snow and inorganic nitrogen wetfall using NADP data, Niwot Ridge, Colorado, *Atmospheric Environment*, *32*, 3827-3833, 1998.
- Bieber, A. J., M. W. Williams, M. J. Johnsson, and T. C. Davinroy, Nitrogen transformations in alpine talus fields, Green Lakes Valley, Front Range, Colorado, USA, *Arctic and Alpine Research*, *30*, 266-271, 1998.

- Williams, M. W., P. D. Brooks, and T. Seastedt, Nitrogen and carbon soil dynamics in response to climate change in a high-elevation ecosystem in the Rocky Mountains, *Arctic and Alpine Research*, *30*, 25-29, 1998.
- Inyan, B., M. W. Williams, K. A. Tonnessen, D. Campbell, and J. Turk, Nitrogen leaching from high-elevation lakes on the west slope of the Colorado Front Range, *Physical Geography*, *19*, 406-420, 1998.
- Williams, M. W., T. Davinroy, and P. D. Brooks, Organic and inorganic nitrogen pools in talus soils and water, Green Lakes Valley, Colorado Front Range, *Hydrologic Processes*, *11*, 1747-1760, 1997.
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- Williams, M. W., P. D. Brooks, A. Mosier, and K. A. Tonnessen, Mineral nitrogen transformations in and under seasonal snow in a high-elevation catchment, Rocky Mountains, USA, *Water Resources Research*, *32*, 3161-3171, 1996.
- Williams, M. W., M. Losleben, N. Caine, and D. Greenland, Changes in climate and hydrochemical responses in a high-elevation catchment, Rocky Mountains, *Limnology and Oceanography*, *41*, 939-946, 1996.
- Williams, M. W., J. Baron, N. Caine, R. Sommerfeld, and R. Sanford, Nitrogen saturation in the Colorado Front Range, *Environmental Science and Technology*, *30*, 640-646, 1996.
- Brooks, P. D., M. W. Williams, and S. K. Schmidt, Microbial activity under alpine snowpacks, Niwot Ridge, Colorado, *Biogeochemistry*, *32*, 93-113, 1996.
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- Williams, M. W., K. Tonnessen, J. Melack, and D. Yang, Sources and spatial variation of the solute content of snow in the Tien Shan, PR China, *Annals of Glaciology*, 16, 25-32, 1992.
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Books: Editorship, Peer-Reviewed Chapters

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- Erickson, T., M. W. Williams, and M. Tomaszewski, Landscape controls on snow accumulation in an alpine catchments, *Proceedings of the 69th Western Snow Conference*, Sun Valley, Idaho, 2001.
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- Erickson, T., M. W. Williams, and R. Sommerfeld, Spatial statistics of snowmelt, in *XIII International Conference on Computational Methods in Water Resources*, edited by G. F. Pindar, vol. 2, pp. 1147-1152, A. A. Balkema, Rotterdam, 2000.
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- Williams, M. W., P. D. Brooks, T. Seastedt, and S. Schmidt, Biogeochemical responses to climate changes in mountain areas, Colorado, USA, in *Montanas, Glaciares y Cambios Climaticos*, edited by R. Galarraga and B. Ibarra, pp. 75-83, Escuela Politecnica Nacional, ORSTROM-FUNDACYT, Quito, Ecuador, 1997.
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- Williams, M. W. and N. Caine, Hydrologic similarities in maritime and continental alpine basins, *Proceedings of AGU Hydrology Days*, 12, 338-351, 1992.
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- Melack, J. M., S. K. Hamilton, K. W. Kratz, and M. W. Williams, Ecological consequences of acidic deposition in the Sierra Nevada, in *Third biennial watershed management conference: Managing California's watersheds at the urban interface*, California Water Resources Center Publication No. 75, pp. 47-53, 1991.
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- Williams, M. W. and D. W. Clow, Hydrologic and biologic consequences of an avalanche striking an ice-covered lake, *Proceedings of the Western Snow Conference*, 58, 51-60, 1990.
- Elder, K., M. Williams, and J. Dozier, Spatial considerations of snow chemistry as a non-point contamination source in alpine watersheds, in *Proceedings, First USA/USSR Joint Conference on Environmental Hydrology and Hydrogeology*, pp. 31-38, American Institute of Hydrology, Leningrad, Russia, 1990.

GRANT ACTIVITY (funded grants)

- USAID (Co-I), Establishing a Collaborative Effort to Assess the Role of Glaciers and Seasonal Snow Cover in the Hydrology of the Mountains of High Asia, \$5,400,000, 9/11-8/15.
- NSF (Co-I), The Role of Dust on Snow and Other Aeolian Inputs in Soil Formation and Biogeochemical Cycling in Barren, Alpine Catchments, \$556,774, 09/11 -08/2014.
- NSF (Co-I), CNH: Dynamics of Coupled Natural and Human Systems in the Colorado Front Range Wildland/Urban Interface: Causes and Consequences, \$1,430,000, 9/11-8/14

- NSF (PI); THE NIWOT RIDGE LONG-TERM ECOLOGICAL RESEARCH PROGRAM 2011-2016: Tipping points in high-elevation ecosystems in response to changes in climate and atmospheric deposition, 12/1/10 - 11/30/16, \$5,880,000.
- NSF (PI); \$194,000, LTER supplement, 6/10-5/11.
- CU-Boulder (PI); CU-Boulder outreach grant, "Water Resources Outreach to the Four-Corners Area of Colorado", \$4,958, awarded July 2010.
- Christensen Fund (PI); Climate change runs downhill; \$30,000; 6/15/09-7/15/11.
- NSF (PI); \$114,000, LTER supplement, 6/09-5/10.
- NSF (CoI); Developing a Methodology to Estimate Snow Depth from GPS Data; \$380,051 ; 1/1/10- 12/31/12.
- NSF (PI); Collaborative Research: Snowpack Energy and Mass Balance, Implications for biogeochemical feedbacks in alpine basins, \$47,000, 12/1/08-11/30/12.
- BLM (PI); HYDROGEOLOGIC, ISOTOPIC AND GEOCHEMICAL ANALYSIS OF GROUND WATER-SURFACE WATER INTERACTIONS ALONG THE FRUITLAND OUTCROP: AN ADDITION TO THE 4M PROJECT, \$96,000, 1 October 2008 to 30 September 2011, (through the Mountain Studies Institute).
- State of Colorado Department of Public Health and Environment (PI); AWARD NO.: PO FEA HAZ0900047 / 09-00047; PROJECT TITLE:Isotope Tracing Analysis Work Plan for the Commodore and Nelson Mine Shafts Near Creede, CO; PROPOSAL NO.: 0109.70.0068B; AMOUNT: \$111,598.00; PROJECT NO./SPEED TYPE NO: 1545798 / 130191970; START DATE: 6/1/2009; END DATE:7/31/2011
- NPS (PI); Rocky Mountain Inventory and Monitoring Network Stream Ecological Integrity Monitoring, Water Chemistry Project; PROPOSAL NO.:0609.06.1084B; \$4,202; PROJECT NO./SPEED TYPE NO: 1545928 / 13092748; 6/30/2009-12/31/2011.
- CU-Boulder (PI); San Juan Collaboratory, \$60,000, 15 November 2008 to 14 November 2009
- NSF (PI); Long Term Ecological Research: The Landscape Continuum Model: A Biogeochemical Paradigm for High Elevation Ecosystem, \$4,920,000, 12/01/04-11/30/10.
- NSF-CMG (Co-I); "Multiscale nonlinear domain decomposition method for modeling the impact of climate change on groundwater resources"; \$564,704; 9/1/09-8/31/12.
- NSF-SGER (Co-I); Human and ecosystem responses to the mountain pine beetle outbreak, Colorado Front Range, \$95,000, 6/1/08-5/30/10.

- NSF-EAR (Co-I); "Aquisition and upgrade of instrumentation for research on transport and reactivity of dissolved and particulate organic matter in soils, sediments, and the atmosphere", \$80,069, 2009.
- NSF (Senior personnel); CZO: Boulder Creek Critical Zone Observatory: Weathered Profile Development in a Rocky Environment and Its Influence on Watershed Hydrology and Biogeochemistry, \$4,500,000, 15 Sept 2007 to 14 Sept 2012.
- NSF (PI); Doctoral Dissertation Research: Developing and Field Testing New Remote Sensing and GIS Tools to Assess Decadal Changes in Glacier Parameters Across the Himalayas, \$12,000, 1 Sept 2007 to 30 August 2010.
- NSF (PI), \$107,000, LTER supplement, 6/08-5/09.
- NPS (PI); Evaluating and Reporting Climate Data to Inventory & Monitoring Networks and Parks, \$29,963.00, 9/30/2007 to 11/30/2008.
- CU-Boulder (Co-I); CU Boulder Outreach Program, Classroom Development and Testing of the Spanish edition of My Water Comes from the Mountains [Mi Agua Viene de las Montanas Rocosas], \$4,968 2007-08 Academic Year.
- NASA (PI); Remote Sensing, GIS and Field Techniques for Studying Glacier Changes in the Indian Himalayas: A Multi-Scale Approach Using ASTER Data, Earth Sciences Fellowship, 1 Sept 2006 to 30 August 2009, \$72,000.
- NSF (PI); \$74,000, LTER supplement, 6/07-5/08.
- MSI (PI); (Mountain Studies Institute), Hydrogeologic study of the Wolf Creek Pass area, \$15,000, 1 Sept 2006 to 30 August 2007.
- NSF (PI); Schoolyard LTER supplement, \$15,000, 06/01/06-05/30/07.
- NSF (PI); NWT LTER supplement 2 for 2006, \$57,000, 06/01/05-05/30/06.
- CU-Boulder (PI); CU-Boulder faculty fellowship, \$75,000, fall 2006-spring 2007 academic year.
- NSF (PI); Schoolyard LTER supplement, \$15,000, 06/01/05-05/30/06.
- NSF (PI); Schoolyard LTER expansion, \$42,000, 06/01/05-05/30/06.
- NPS (PI); Analysis of PRIME-Net Data and Contributions to Final Report, \$50,000, 7/01/04-6/30/06.
- NPS (Co-I); Long-term data on the species composition of alpine plants: Is atmospheric N deposition affecting species composition of the alpine, \$100,000, 10/06-9/08.
- NSF (Co-I); CU-LTER Scholars Program in Biology and Applied Math for Undergraduates, \$99,927, 9/03-8/06.
- NPS (PI); Developing Screening Procedures and Sampling Protocols for Assessment of Deposition-Sensitive Surface Waters in the Rocky Mountains, \$50,000,

8/15/03-5/30/06.

- NPS (PI); Development of Vital Signs for the N-Status of Ecosystems in National Parks: DIN, DON, and C:N in Streams and Rivers, \$32,440, 8/15/03-12/1/06.
- NPS (Co-I); Aquatic Ecosystems Risk Assessment, Greater Yellowstone and Grand Teton National Parks, \$25,000, 9/03-8/05.
- EPA (Co-I); New Tools for Evaluating Alpine Sensitivity and Water Quality in the Upper Animas Watershed, San Juan County, Colorado, \$15,000, 9/03-8/05.
- NPS (PI); Soda Butte Creek: Vital Signs Monitoring Program, \$24,754, 5/03-4/04.
- Colorado Mountain College (PI), Isotope Tracing Analysis for Leadville Mine Drainage Tunnel, California Gulch Superfund Site and Affected Areas, \$135,152, 3/03-12/06.
- NSF (Co-I), Complexity across boundaries: Coupled human and natural systems in the Yellowstone Northern Elk Winter Range \$600,000, (my budget \$72,000), 10/02-8/05.
- State of Colorado, Division of Natural Resources (PI), Development of Stable and Radiogenic Tracers, Mary Murphy Mine, Chalk Creek, Colorado, \$40,000, 10/02-8/04.
- NSF (PI), Regional updating and expansion of the Global Historical Climate Network (GHCN) database: High-Mountain areas of Central Asia, \$99,929, 9/01-9/03.
- NSF (PI), Dissolved organic nitrogen intersite comparison (DONIC), \$299,000, 9/00-8/04.
- NSF (Co-I), Infrastructure for the Advancement of Hydrologic Science; \$600,000; 9/2001-8/2004.
- Army Research Office (PI), RADAR investigation of meltwater flow through snow, \$17,000, 5/00-12/00.
- San Miguel County (PI), AIRMoN installation and operation, \$19,545, 1/00-7/01.
- State of Colorado, Division of Natural Resources (PI), Hydrologic flowpaths in the Mary Murphy mine, \$20,000, 5/00-6/01.
- CU-Boulder (PI), Faculty Fellowship, \$60,000, 1999-2000 academic year.
- Fulbright Fellowship, Climate change and glacial response, Antisana, Ecuador, \$12,000, 9/99-12/99.
- NPS (PI), The role of dissolved organic nitrogen in high-elevation catchments. \$65,000, 6/99-5/01.
- CU Boulder ATLAS (PI), Vertical integration of technology into the Geography curriculum, \$37,500, 6/99-12/00.

- State of Colorado, Division of Natural Resources (PI), Hydrologic flowpaths in the Mary Murphy mine, \$10,000, 5/99-5/00.
- CU-Boulder (PI), Council on Research and Creative Work (CRCW), \$4,000, 1999-2000 academic year.
- NATO (PI), Linkage Grant with Central Asia, 6/98-9/2000, \$26,000.
- NATO (PI), Computer Facility Upgrade in Central Asia, 9/99-9/2000, \$8,236.
- ARO (PI), Instrumentation for Meltwater Flow through Snow, \$12,500, 9/98-7/00.
- San Miguel County, CO (PI), Watershed Characterization for Purposes of Alpine Basin Sensitivity Analysis: San Miguel River, \$32,000, 8/98-7/00.
- NSF (Co-I), Microbial Diversity and Energy Flow in Barren Alpine Tundra, \$300,000, 1/99-12/2001.
- NSF (Co-I), Effects of Climate Change in the Colorado Alpine (NWT-LTER), \$4,200,000 with about about \$20,000/yr for my lab, 10/98-10/2004.
- CU-Boulder (Co-I), Distributing Geographic Information Systems for Earth Science: An Internet-Based GIS for the Rest of Us, \$33,197, 8/98-6/99.
- NPS (PI), Nitrogen Dynamics: Snowpack-Soil Interactions (renewal), \$23,000, 1/97-12/98.
- University of Colorado President's Office (PI), Changing the Learning Paradigm through Technology Initiative, Bringing Research into the Classroom, \$19,000, January 1997 to September, 1997.
- China National Science Foundation (Co-I), A Model of Snowmelt and Runoff Chemistry in a Typical Alpine Basin, Northwest China, \$15,000, January 1997 to December, 1999.
- San Miguel County (PI), Watershed characterization for purposes of alpine basin sensitivity analysis: San Miguel County, Colorado, \$37,500, September 1996 to October 1998.
- ARO (PI), Instrumentation for Snow Hydrology Research, \$136,248, 1996.
- NSF (PI), Meltwater flow through snow from plot to basin scales, \$120,000, 4/96-4/00.
- ARO (PI), Meltwater flow through snow from plot to basin scales, \$100,000, 4/96-4/00.
- NASA (PI), Hydrology, Hydrochemical Modeling, and Remote Sensing in Alpine Basins, supplement to subcontract from UC Santa Barbara (NASA grant), \$20,160, 4/96-12/00.
- NPS (PI), Nitrogen Dynamics: Snowpack-Soil Interactions (renewal), \$41,000, 3/96-2/97.

- CU-Boulder (PI), Council on Research and Creative Work (CRCW) Grant-in-Aid for Regional Evaluation of Nitrogen Saturation, \$4,000, 6/96-5/97.
- NSF (PI), Doctoral Dissertation Research (Thomas Davinroy): Biogeochemical Processes and Hydrologic Characteristics of Alpine Talus, \$10,000, 6/96-5/00.
- USFS (PI), Meltwater Flow Through Snow, \$10,000, 9/96-4/97.
- NSF (Co-I), Biotic controls on C and N flux: comparisons between species and between ecosystems: A supplement to the NWT LTER, \$40,000, 8/96-7/98.
- NSF (Co-I), REU supplement for LTER grant, \$10,000, 6/96-9/96.
- NSF (PI), Biogeochemical and Hydrologic Controls on Solutes and Flowpaths in Alpine Watersheds, \$223,000, 9/95-12/99.
- NSF (Co-I), REU supplement for LTER grant, \$10,000, 6/95-9/95.
- EPA (Co-I), The Effects of Anthropogenic Nitrogen Deposition on the Functioning of Alpine and Subalpine Ecosystems: Nitrogen Cycling and Trace Gas Fluxes, \$341,662, 10/95-9/98.
- NPS (PI), Nitrogen Dynamics: Snowpack-Soil Interactions (renewal), \$36,000, 1/95-12/95.
- USFS (Co-I), Spatial Statistics of Snow Meltwater Flow: Lysimeters and Aerial Photos. \$25,000, 1/94-12/95.
- NPS (PI), Nitrogen Dynamics: Snowpack-Soil Interactions, \$70,000, 1/94-12/94.
- NASA (PI), Hydrology, Hydrochemical Modeling, and Remote Sensing in Alpine Basins, subcontract from UC Santa Barbara (NASA grant), \$327,000, 1/94-12/2000.
- NSF (PI), LTER supplement, computer equipment, \$20,000, 1994.
- NSF (PI), LTER supplement, subnivian laboratory, \$23,000, 1993.
- NSF (PI), LTER supplement, international collaboration, \$4,500, 1993.
- NSF (Co-I), Effects of Climate Change in the Colorado Alpine (NWT-LTER), about \$20,000/yr for my lab, 10/92-10/98.

TALKS: INVITED PRESENTATIONS (Colloquia, keynotes, plenary sessions) for SCIENCE and OUTREACH (out of about 500 presentations)

Plenary address, NSF - NERC Workshop: Critical Zone Science, Arlington VA, 1 March 2010

Plenary address, NSF - NERC Workshop: Critical Zone Science, Arlington VA, 1 March 2010
Keynote, annual meeting of the Wilderness Medical Society, 22 February 2010, Park City Utah.

- Colloquia, CSU water resources seminar series, 16 February 2010, Fort Collins CO.
- Keynote speaker, NSF-sponsored Cyberobservatories workshop, Boulder Colorado, May 18 2010.
- Plenary speaker, NCALM national steering committee, Boulder CO, 30 May 2010.
- Plenary talk, Strategic Implementation Plan for Information Management for the LTER network, LTER Science Council national meeting, Peabody MA, 14 May 2010.
- Keynote, International GMBA-DIVERSITAS conference "Functional significance of mountain biodiversity", NWT LTER as a prototype for understanding the controls on alpine biodiversity: the challenge of converting long term monitoring into science, Chandolin Switzerland, 30 July 2010.
- Invited talk, Ecological Society of American annual meeting, SYMP 8 - Ecosystem Threshold Responses to Global Warming: Key Dynamics and Management and Policy Implications, "The disappearing cryosphere in the Rocky Mountains: Tipping points and ecosystem responses to changes in mountain climate", Pittsburgy PA, 3 August 2010.
- Keynote, Colorado Laboratories consortium congressional meet and greet, "The San Juan Collaboratory", August 12 2010, Boulder CO.
- Keynote, Ditch and Reservoir Company Alliance, Water Tour on Amtrak's California Zephyr Denver to Glenwood Springs, December 3 2010.
- Keynote address, "Ecosystem response to disappearing snow", LTER workshop on "Ecosystem response to disappearing snow and ice", Woods Hole MA, 31 March 2009.
- Plenary address, "the future of snow and the future of skiing in the Rockies", 2009 Spring runoff conference and intermountain meteorology workshop: "Climate Change and the Intermountain West: Downscaling the Future, Logan Utah, 2 April 2009.
- Invited talk, European Geophysical Union annual meeting, "Climate change impacts on the hydrology of high-elevation catchments", April 20 2009, Vienna Austria.
- Invited talk, European Geophysical Union annual meeting, "Scientific Outreach for K-6 Students: The LTER Schoolyard Children's Book Series", April 24 2009, Vienna Austria.
- Plenary address, National Groundwater Association Theis conference: "Ground water and climate change", Boulder CO, 3 October 2009.
- Colloquia, Fort Lewis College, Colorado, College of Natural Sciences, "Climate change in seasonally snow-covered mountain areas around the world", October 22, 2009.

- Colloquia, Kathmandu University, Nepal, School of Environmental Sciences and Engineering, "Remote sensing of snow and ice", October 28, 2009.
- Colloquia, Kathmandu University, Nepal, School of Environmental Sciences and Engineering, "Temperature-Index models and climate change", October 29, 2009.
- Colloquia, Kathmandu University, Nepal, School of Environmental Sciences and Engineering, "Climate change and ecosystem response of high-elevation ecosystems", October 30, 2009.
- Colloquia, Tribhuvan University, Kathmandu, Nepal, Department of Biology, "Climate change and ecosystem response", Nov 8, 2009.
- Invited talk, American Geophysical Union (AGU) annual meeting: Hydrochemical responses to climate change in high-elevation catchments of the Colorado Front Range, December 16, 2009, San Francisco, CO.
- Keynote talk, "Save our Snow", Annual meeting of the Cross Country Ski Areas Association, Devil's Thumb Ski Area, Colorado, 8 April, 2008.
- Seminar speaker, National Snow and Ice Data Center weekly seminar series, April 11, 2008, Boulder, CO.
- Seminar speaker, INSTAAR noon seminar series, 21 April 2008, Boulder, CO.
- Seminar speaker, Geography department colloquim series, University of Colorado, Boulder, 2 May 2008.
- Seminar speaker, Beaver Meadows Visitor Center, East Entrance, Rocky Mountain National Park, 9 February 2008, Estes Park, CO.
- Seminar speaker, Kawuneeche Visitor Center, West Entrance, Rocky Mountain National Park, 11 April 2008, Granby, CO.
- Plenary speaker, "Integrating Social Sciences with Ecological Sciences at the Niwot Ridge LTER", workshop on social sciences in cold region LTER sites, 5 May 2008, Baltimore, Maryland.
- Plenary speaker, "Les conditions de ski en 2030 et 2100 dans lâouest des Ãtats-Unis : les impacts du changement climatique sur la neige, les domaines skiabls et les Ãconomies locales.", mardi 3 juin 2008, lâInstitut de la Montagne, University of Savoie, Chambéry, France.
- Keynote speaker, workshop on "Evaluating current and future climate change impacts on the distribution of mountain plants in the Rocky Mountains and in the Alps: assessing differential sensitivity and testing the high-elevation refuge hypothesis", Lausanne Switzerland, Oct 5-11, 2008.

- Keynote Address, "Neve, valanghe e suolo: ricerca, divulgazione e gestione del territorio", Alagna, Italy, 3-4 April, 2007.
- Colloquia speaker, School of Agricultural, University of Torino, Italy, 5 April, 2007.
- Keynote Speaker and field trip leader, "Vail and Snow"; Vail Symposium and Gore Range Natural Science School, 13 Feb 2007, Vail Colorado.
- Plenary talk, climate change working group report, NEON meeting, Las Cruces, New Mexico, 30 November, 2006.
- Keynote speaker, Yale Alumni Annual Meeting, "A Discussion on the Future of Water in Colorado and Climate Change", Denver Colorado, July 19, 2006.
- Invited presenter, DayCent-Chem modeling workshop, Fort Collins, CO, February 16-17 2006; organized by EPA and National Park Service.
- Keynote Speaker, National Advisory Committee presentation, Aspen Climate Change Impacts Assessment, 4 January 2006, Aspen Colorado.
- Keynote Speaker, Stakeholders meeting, Aspen Climate Change Impacts Assessment, 5 January 2006, Aspen Colorado.
- Invited Speaker, George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites, Philadelphia, PA, 14 March 2005.
- Invited Speaker, Colorado State University, "Hydrology and water resources seminar series: New Directions for Water Research in an Era of Integrated Water Management", 31 March 2005, Fort Collins, CO.
- Invited Speaker, 2005 Scripps Institute on the Environment, Boulder CO, 19 May 2005.
- Keynote Speaker, Sustainable Agriculture and Food Systems Funders, 3rd Annual Conference, Taos and Santa Fe, New Mexico, 6-8 June, 2005.
- Plenary presentations (two), LTER expansion workshop, June 14-17 2005, Santa Fe, New Mexico.
- Keynote Speaker, American Ground Water Trust: Colorado Groundwater Institute Program, 12-13 July, 2005, Denver CO.
- Plenary Speaker, National Park Service Inventory and Monitoring planning workshop for the Rocky Mountain region, 12 May 2005.
- Plenary talk, Workshop on "How do we design science agendas for National Parks", National Park Service, Gardiner Montana, 17 October 2005.
- Colloquia Speaker, Geophysics Department seminar series, Colorado State University, 3 November 2005.
- Colloquim speaker, Cold and Arid Lands Engineering and Environment Institute, "Isotope hydrology in seasonally snow-covered mountains", Lanzhou China, 14 August

2004.

Colloquium speaker, Geophysical Institute and IARCS, University of Fairbanks, "Source waters and flowpaths in the Rocky Mountains, USA", Geophysical Institute and IARCS, University of Fairbanks, 22 April, 2004.

Colloquium speaker, Institute of Northern Hydrology, WERC, University of Fairbanks, "Modeling the spatial distribution of snow in topographically rugged terrain", 23 April, 2004.

Colloquium speaker, Environmental Sciences Department, University of Alaska, "Source waters, flowpaths, and spatial distribution of snow, Rocky Mountains, USA", Juneau AK, 20 April 2004.

Invited speaker, "Snow hydrology in temperate mountain systems" Tibetan Plateau Climate Workshop, Chengdu, China, 10 August 2004.

Keynote speaker, "Long-term climate change in the mountains of Central Asia", 4th International Symposium on the Tibetan Plateau, Lhasa, Tibet, 5 August 2004.

Invited speaker, GSA annual meeting, 10 November, 2004, Denver, CO.

Keynote Speaker, NSF-LTER minisymposium, "Acid mine remediation in the Western US", 26 February 2004, Washington DC.

Colloquium speaker, Geography Department, CU-Boulder, Snow-elk interactions in Yellowstone National Park, Feb 6, 2004.

Colloquia speaker, Utah State, College of Natural Resources, 13 January 2003.

Colloquia speaker, CU-Boulder, Geological Sciences, 12 March 2003.

Colloquia, speaker CU-Boulder, Geography Department, 14 March 2003.

Invited speaker, Geological Society of American annual meeting, 2 November 2003.

Colloquia speaker, Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, 5 September, 2003.

Colloquia speaker, SLC Swedish School of Agriculture, Uppsala, Sweden, 3 October 2003.

Colloquia speaker, Environmental Studies Faculty Seminar Series, CU-Boulder, 20 September 2002.

Invited speaker, Colorado State Department of Health and Environment, mercury deposition in Colorado, Denver Colorado, 19 August 2002.

Invited speaker, NEON forum, Ecological Society of America annual meeting, Tucson, AZ, 5 August 2002.

- Invited speaker, "Isotope Tracers and Ground-Water Flow from Abandoned Mines in Fractured Rock Settings", conference on Fractured Rock in Groundwater Hydrology, March 14, 2002.
- Colloquia speaker, Colorado School of Mines, Environmental Engineering Department, January 24, 2002.
- Invited speaker, "Long-Term Hydrological Observatories", American Geophysical Union annual meeting, San Francisco, CA, December 2001.
- Invited speaker, "Paramo at risk, Antisana, Ecuador", Montology Conference, Athens, Georgia, November 6, 2001.
- Invited speaker, "Snowpack controls on soil processes in alpine and subalpine landscapes", 3rd Cryopedology Conference, Copenhagen, Denmark, August 2001.
- Colloquia Speaker, "Meltwater flow through snow", Geology and Center for Geophysical Research, Boise State University, 9 April 2001.
- Invited speaker: Tools for Scaling Meltwater Flow from Plot to Regional Scales, Army Research Office Workshop on Snow and Ice, February 16, 2000, Hanover, NH.
- Interpreting climate signals from a shallow equatorial ice core: Antisana, Ecuador. Patagonia Ice Fields Scientific Task Force, Abroad Chilean Naval Vessel AQUILES, 26 March 2000, Southern Chile.
- Invited speaker, Meltwater flow through snow, Hydrologic Sciences seminar series, CU-Boulder, 1999.
- Invited speaker, An Overview of Snow Hydrology, CIRES Water in the West, CU-Boulder, 1999.
- Invited speaker, Meltwater Flow through Snow, ARO PI meeting, BSU Center for Geophysical Investigation of the Shallow Subsurface, 1999.
- Invited speaker, Boulder Creek Watershed Forum, June 24, 1998, Boulder, CO.
- Invited speaker, San Miguel County Planning Department, public meeting, 14 January, 1998.
- Invited speaker, San Miguel County Planning Department, public meeting and workshop for County Commissioners, 11 March, 1998.
- Invited speaker, San Miguel County Board of County Commissioners, public debate on Land Use Codes, 6 May 1998.
- Invited speaker: Interpreting climate signals from a shallow equatorial ice core: Antisana, Ecuador. Patagonia Ice Fields Scientific Task Force, Abroad Chilean Naval Vessel AQUILES, 26 March 2000, Southern Chile.

- Invited speaker, From Foundations to Best Practices: Teaching with Technology, Colorado Commission on Higher Education, Colorado School of Mines, Golden, Colorado, 30 July, 1997.
- Invited speaker, US Army Waterways Experiment Station, Vicksburg, Mississippi, 21 July, 1997.
- Invited speaker, Chinese Ecological Research Network (CERN), Beijing, China, 6 June 1997.
- Invited speaker, AGU Spring Meeting, Baltimore, Maryland, 30 May 1997.
- Invited speaker, National Watershed Coalition, Reno, NV, 19 May 1997.
- Invited speaker, Global Change Symposium, University of Colorado, Boulder, CO, 28 April, 1997.
- Invited speaker, panel on Educational Models for Interdisciplinary Studies of High-Altitude Mountain Science, AAAS and Aga Khan Foundation, Bishkek, Kirghizia, 1996.
- Invited speaker, Chapman Conference on Nitrogen Saturation, American Geophysical Union, Bend, OR, 1996.
- Invited speaker (6 talks), Montanas, Glaciares, y Cambios Climaticos, Escuela Politecnica Nacional, Quito, Ecuador, 1996.
- Invited speaker, Swiss Committee of IGBP on "The role of the hydrologic cycle in mountain ecosystems", Zurich, Switzerland, November 16-17, 1995.
- Invited speaker, Ecological Society of America Annual Meeting, Snowbird, Utah, 1995.
- Invited speaker, Department of Geography Colloquim, University of Colorado, Boulder, CO, April, 1994.
- Invited poster, Gordon conference on "Hydrologic/Geochemical/Biological Interactions in Forested Catchments", August, 1993.
- Invited Speaker, Lanzhou Institute of Glaciology and Geocryology, Lanzhou, China, June 1992.
- Invited speaker, IAHS Workshop, HW4, Snow Chemistry and Water Quality, Vienna, Austria, August, 1991.
- Invited Speaker, Colloquim speaker, Department of Hydrology, University of Arizona, Tucson, AZ, October, 1991.
- Invited Speaker, Lanzhou Institute of Glaciology and Geocryology, Lanzhou, China, June 1990.

WRITTEN OR BROADCAST REVIEWS OF WORK: 2010-2006

- Ski areas and climate change, LA-ABC news report: <http://www.greenrightnow.com/kabc/2010/02/03/global-warming-threatens-ski-industry-with-meltdown/>
- Climbing Magazine, March 2010 "Green" issue. Interview with me featured in the lead story on climate change and impacts on future mountaineering.
- Science 23 April 2010: Vol. 328. no. 5977, pp. 418 - 420 DOI: 10.1126/science.328.5977.418, "A Groundbreaking Observatory to Monitor the Environment", features conversations with me. <http://www.sciencemag.org/cgi/content/full/328/5977/418>
- The Watch, 17 June 2010, "Scientists Scrutinize Uranium Mill Application", extensive interview with me. online version at: http://www.watchnewspapers.com/view/full_story/7953131/article-Scientists-Scrutinize-Uranium-Mill-Application?instance=top_story
- Telluride Daily Planet, 12 June 2010, "In local uranium hearings, passions run deep", extensive interview with me. online version at: <http://www.telluridenews.com/articles/2010/06/12/news/doc4c12d93c51309123490973.txt>
- Interviewed for Los Angeles Times article on a dust on snow paper by Painter et al., 21 September 2010.
- Mountain Town News, quoted in article on future changes in snow resources at Lake Tahoe, California.
- Aspen Public Radio: Interviewed for "Water in the West: A Special Series", December 15 2010. My stuff starts at 2:25: http://www.aspenpublicradio.org/news_archive_detail.php?story=8574
- Press conference panel member on "Outreach and education activities for the Cryosphere", 1-hr, included streaming video, European Geophysical Union annual meeting, April 22 2009, Vienna Austria.
- Radio interview, Utah Public Radio, 18 minutes, 3 April 2009.
- My work featured in ClimateBiz article: "Climate Change Lessons from the Slopes", 22 January 2009(<http://www.climatebiz.com/feature/2009/01/22/climate-change-1>)
- 45-minute interview, Canadian special on climate change for Canadian National Broadcasting Network, April 21 2009, Vienna Austria. We'll see if they use any of this footage.
- Work featured in "Ski Area Management" Magazine, "A Slightly Skeptical Look at Global Warming" by Allen Best, Volume: 48-3, May 2009.

CBS news channel 5, San Francisco, CA, Dec 17, 7pm, 2008. Two and a half minute interview of my AGU talk on future snow conditions in ski areas in response to climate change.

CBS news channel 4, Denver, CO, Dec 15, 2008. Two minute interview of my AGU talk on future snow conditions in ski areas in response to climate change.

Associate Press, Dec 15 2008, extensive article on my AGU talk on future snow conditions in ski areas in response to climate change. Carried in many national and international newspapers. Appeared locally in the Denver Post and Boulder Daily Camera.

Los Angeles Times feature on ski areas and climate change, at <http://latimes-blogs.latimes.com/greenspace/2008/12/mountain-melt.html>

Denver Post article, Feb 19 2008: "Flooding in tunnel is blamed on feds" extensively quotes me on the Leadville Mine Drainage Tunnel problem.

Colorado Independent, 2 November 2008, "Making ski resorts green", featured interview with me.

NPR radio interview, "Climate change in mountains", October 26, 2007. <http://stream.publicbroadcasting.net/production/mp3/kunc/local-kunc-643206.mp3>

Denver Post, Katy Human article "Fake snow ices climate sting", quotes me extensively, 17 April 2007.

Denver 5280 Magazine (local rag), Environment - "Spring is Here!" By Hillary Rosner, article that features my expert commentary, April 2007.

Television interview, TeleMonteRosa, Alagna, Italy, 3 April, 2007.

NPR radio interview, "Climate change and avalanches", 2 February, 2007.

Associated Press, Save our Snow talk, 10 January 2007. Picked up and rewritten by dozens of newspapers.

AOL news release, "save our snow" research activity, 12 January 2007.

USA Today, article on "save our snow" research activity, 11 January, 2007.

ABC news, national news and website article (3 pages) on "save our snow" research activity, 12 January 2007.

Deseret news (Salt Lake City), article on "save our snow", 10 January 2007.

Salt Lake City tribune, article on "save our snow" research activity, 10 January, 2007.

NPR radio interview, follow-up interview to the "save our snow" presentation, 10 January 2007.

NPR radio interview, "Save our snow" research activity, 5 January 2007.

"Chasing Spring", by Bruce Stutz. "Altitude Addled" chapter 12, describes his experience as a participant on my annual snow hydrology field trip. Scribner book company, ISBN: 0743262476.

Colorado Engineer Magazine article "Aspen Skiing Goes Downhill" featured my work on future climate change at Aspen Ski Mountain, Volume 103, Num. 1 (Sp. 06) 2006.

High Country News, feature article "Save our Snow" chatted about my research on climate change at Aspen Ski Mountain, March 6, 2006.

Denver Post, "Science of snow: from fluff to ice", 27 December 2006.

Chemical and Engineering News, feature article "High-altitude quest for data", October 30, 2006.

PROFESSIONAL SERVICE: National and Regional

Host, Critical Zones Observatory workshop on developing an integrated data management system, 26-27 February, Boulder CO.

CUAHSI Standing Committee on Observations, 2010. 2 days per year.

Advisory Group Member, NSF DRK12 program "Reasoning Tools for Understanding Water Systems", 2010.

Organizer and chair, workshop on developing an integrated data management system for the Critical Zone Observatories program, Boulder CO, May 19-20.

Organizing committee, NSF workshop "NSF Workshop on Creating Scientific Software Innovation Institutes for Sustained Cyberinfrastructure Achievement and Excellence in the Environmental Observatory Communities", October 4-5 2010, Arlington VA.

Executive Committee, South Continental Section, Western Snow Conference.

External advisory committee, New Mexico EPSCoR program, site visit 24-25 October Albuquerque, NM.

LTER hydrology workshop, Sevilleta LTER site, New Mexico, 5-7 November 2010.

Participant, LTER 30-year review committee site visit to LTER Network Office, 26 October, Albuquerque NM.

Board of Directors, Mountain Studies Institute, 2010. 4 travel days per year, 10 work days per year.

Executive committee, NSF-funded Long-Term Ecological Research program. 4 travel days per year, bimonthly phone conferences, 1 day per month homework.

NSF LTER program, Chair, Strategic Implementation Plan for integrated data management.

- Expert witness, Telluride town council meeting on possible environmental affects from proposed uranium mill in the Paradox Valley, CO, 5 October 2010.
- Expert testimony, Colorado Department of Public Health and the Environment public meeting on the proposed Pinon Ridge Uranium Mill, Ophir CO, 10 June 2010.
- Expert testimony to the Radiation Division and Air Quality Division of the Colorado Department of Public Health and the Environment on the proposed Pinyon Ridge Uranium Mill in the Paradox Valley, CO, August 18, 2010.
- Biogeochemistry, Associate Editor, present from 2004.
- Associate Editor, The Professional Geographer, present from 2008.
- Board of Directors, Mountain Studies Institute, present from 2007.
- Executive committee, NSF-funded Long-Term Ecological Research program, present since 2007.
- Program Committee, All Scientists Meeting (ASM), LTER network. Network-wide meeting that occurs every 3 years, about 900 participants. Sept 10-15, 2009, Estes Park, CO.
- Poster subcommittee, LTER all-scientists meeting, 2009.
- Remote Sensing Committee, LTER network, 2009.
- New Mexico EPSCoR Climate Change External Advisory Committee.
- Steering committee, 3rd Interagency Conference for Research in the Watersheds, 8-11 September 2008 in Estes Park, Colorado.
- Nominator, The University of Montana, RM-CESU team for the "group" award, Cooperative Ecosystem Study Unit national awards at the Biennial CESU meeting on June 18, 2008, Washington, DC. They won.
- Ad hoc reviewer, CUAHSI data publication system.
- Selection Committee, Young Investigator Award, Cryosphere Section, American Geophysical Union.
- NSF Panel, EPSCoR program, Dec 14-16, Washington DC. Evaluated nine proposals worth \$180,000,000.
- CUAHSI, Hydrologic Instrumentation Facilities standing committee, 2008.
- Review team member, New Mexico EPSCoR State Climate Change Program, 12-13 November 2007, Albuquerque NM.
- Breakout group leader, North American Mountain Hydroclimate Workshop Boulder, CO, October 17 - 19, 2007.

- Writing team, LTER Network, decadal science plan, entitled "Integrative Science for Society and the Environment: A Plan for Research, Education, and Cyberinfrastructure in the U.S. Long-Term Ecological Research Network." Submitted to NSF 1 October 2007.
- Participant, Critical Zone Exploration Network data and information systems workshop, State College, PA, USA, 17-18 September 2007.
- Local host, National Atmospheric Deposition Program (NADP) annual meeting, 10-13 September 2007, Boulder, CO.
- Standing committee member, Hydrologic Instrumentation Facilities oversight committee, CUAHSI, 2006-2007.
- Mentor and host, Big 12 Faculty Fellowship to assistant Professor Xingong Li, University of Kansas, to spend a week (20-27 May 2007) in Boulder under my tutelage.
- PI-lead, NEON proposal for Niwot Ridge as core site for Southern Rockies/Colorado Plateau climate domain (domain 13), submitted 5 January 2007. Niwot Ridge selected as NEON core site for domain 13.
- PI-lead, NEON proposal for Colorado Front Range transect as domain sites for Southern Rockies, Colorado Plateau climate domain, submitted 5 January 2007. Colorado Front Range selected as domain transect for domain 13.
- Chair, workshop on climate change and snowmelt, national NEON meeting, Las Cruces, New Mexico, 29 November to 1 December 2006.
- Delegation member, British Parliament special investigation of "Mining and Development in Peru with Special Reference to The Rio Blanco Project, Piura, Peru," 29 September to 9 October 2006, Peru.
- Field trip leader, Mountain Research Station and Niwot Ridge LTER site, 21 people including 4 representatives of the National Science Foundation, 26 September, 2006.
- Session Co-convenor, LTER All Scientists Meeting, "Ecosystem Response to changes in climate in cold regimes", Estes Park CO, September 2006.
- Session Co-convenor, LTER All Scientists Meeting, "Biogeochemical cross-site inter-comparison using the DayCent-Chem model", Estes Park CO, September 2006.
- NSF-LTER working group meeting, LTER Network's decadal science plan, entitled "Integrative Science for Society and the Environment: A Plan for Research, Education, and Cyberinfrastructure in the U.S. Long-Term Ecological Research Network." June 21-24, 2006, Madison Wisconsin.
- NWT LTER representative to LTER coordinating committee meeting, May 22-25, 2006, Cedar Creek LTER site, Minnesota.

- NSF, review committee for NEON's draft Request For Proposal, May 12, 2006, Denver Colorado (NEON flunked).
- NSF-LTER working group meeting, LTER Decadal science plan, Feb 8-12, 2006, Santa Barbara, CA.
- CU-Boulder representative to the annual executive meeting of the Rocky Mountain Cooperative Ecosystem Study Unit (RM-CESU), Fort Collins, CO, 18 April 2006.
- Assessment team member, Aspen Canary Initiative, 2005-2006.
- Science Task Force representative, National Park Service, Rocky Mountain Inventory and Monitoring Network, Montana workshop, 24-27 January, 2005.
- Science Task Force representative, National Park Service, Rocky Mountain Vital Signs Selection Meeting, 10-11 May 2005, Lakewood, Colorado.
- Host and chair, LTER workshop on "Climate and Ecosystem Response", 31 Jan-2 February 2005, Boulder, CO.
- NWT LTER representative, LTER coordination committee, 5-8 April, 2005, Key Largo, Florida.
- Speaker and attendee, Mountain Studies Institute workshop on new research initiatives, 29-30 June 2005, Silverton, CO.
- LTER decadal science plan workshop, 16-17 August, Boston, MA.
- Host and participant, National Park Service workshop on monitoring alpine areas, Mountain Research Station, 20-22 September 2005. I promoted this workshop with the NPS and got them to hold the workshop at the University of Colorado's Mountain Research Station (MRS) to help publicize the MRS.
- Host, Mountain Studies Institute workshop on setting research agendas, INSTAAR, 17 September 2005.
- National Atmospheric Deposition Program (NADP), ad hoc committee on revamping NADP protocols for mountain sites, 2005-2007.
- Co-Convenor, SYMPOSIUM on the Contribution from Glaciers and Snow Cover to Runoff from Mountains in Different Climates (ICSI), Foz do Igua, Brazil, 4-9 April, 2005.
- Co-chair, LTER-NSF workshop on "Climate change and ecological impacts", 9-12 November 2004, Cape Canaveral, Florida.
- Planning committee, American Geophysical Union annual fall meeting, 2004 (10,600 abstracts).
- Advisory Board, Mountain Studies Institute, Silverton, Colorado, 2004 to present.

Editor, Arctic, Antarctic, and Alpine Research, 2002 to 2004.

Chair, Cryosphere Focus Group, American Geophysical Union, 2002 to 2004.

Planning committee, American Geophysical Union annual fall meeting, 2003 (9,100 abstracts).

Contributer, LTER Decade of Synthesis planning meeting, October 2003.

Convenor and chair, workshop on Snow and Ecology, LTER All-Scientists Meeting, Seattle WA, September 2003.

Convenor and chair, General Cryosphere Session, American Geophysical Union annual meeting, San Francisco, CA, December 2003.

Executive Committee, Western Snow Conference, 2003.

Chair, Special Session on Ice Cores, Association of American Geographers annual meeting, New Orleans, March 2003.

Co-chair, standing committee on Long-term Hydrological Observatories, CUAHSI, 2002.

Invited participant, NEON (National Ecological Observing Network) workshop on designing core measurements and facilities, Boulder, CO, June 3,4 2002.

Invited Participant, WCRP workshop on measuring solid precipitation, Fairbanks, Alaska, 9-15 June, 2002.

Webmaster, Western Snow Conference, 2002-1996.

Co-Convenor, special session on Snow-Climate Interactions, American Geophysical Union annual meeting, San Francisco, CA, December 2002.

Co-Convenor, special session on Long-Term Hydrological Observatories, American Geophysical Union annual meeting, San Francisco, CA, December 2001.

Chair, Standing committee on Long-term Hydrological Observatories, Consortium of Universities for the Advancement of Hydrologic Sciences (CUAHSI), 2001.

Co-Convenor, special session on Mountain Ecosystems, American Geophysical Union annual meeting, San Francisco, CA, December 2000.

Invited participant, IGBP Mountain Initiative Workshop for Latin America, March 8-10, 2000, Papallacta, Ecuador.

Invited participant, Army Research Office Workshop on Snow and Ice, February 15-17, 2000, Hanover, NH.

Invited participant, Campos de Heilo (Patagonia Ice Fields) Science Advisory Task Force, Punta Arenas, Chile, 23-30 March, 2000.

Executive Board, Snow Vegetation Interactions Working Group, International Association of Hydrological Sciences, April 2000.

- Co-convenor, Interactions between the Cryosphere, Climate and Greenhouse Gases, 22nd IUGG General Assembly, 19-30 July, 1999, Birmingham, UK.
- SIP representative, first annual planning meeting, American Geophysical Union, Denver, CO 25-26 June, 1999.
- Member, White House Office of Science and Technology's Committee on Environment and Natural Resources (CENR), 1999-1997.
- Associate Editor, Water Resources Research, 1998 to 2000.
- Session Chair, annual meeting of the Western Snow Conference, April 1998.
- Convenor, special session on Terrestrial-Aquatic Linkages in Seasonally Snow-Covered Catchments, American Geophysical Union annual meeting, San Francisco, CA, December 1997.
- Panel member, National Science Foundation/Environmental Protection Agency Friendship Panel: Water and Watersheds, 1997.
- Member, Snow, Ice, and Permafrost Committee, American Geophysical Union, 1996 to 2002.
- Roving judge, Student Presentation Award in Hydrology, Annual AGU meeting, San Francisco, CA, Dec 15-17, 1996.
- US representative, International Committee on Water Quality, International Association of Hydrologic Sciences, 1996 to 1998.
- Convenor, workshop on air quality and catchment response in the Rocky Mountains, with EPA, USGS, USFS, and NPS, Denver, Colorado, 1996.
- Chair, panel on Educational Models for Interdisciplinary Studies of High-Altitude Mountain Science, AAAS and Aga Khan Foundation, Bishkek, Kirghizia, 1996.
- Review Committee, Fort Collins Ecological Units, Technical Assistance Visit (TAV), US Forest Service, 1996.
- Roving judge, Student Presentation Award in Hydrology, Annual AGU meeting, San Francisco, CA, Dec 11-15, 1995.
- Working committee member, Mountain Research: Challenges and Directions for the 21st Century, Bishkek, Kirghizstan, October 14-18, 1996, sponsored by AAAS, 1995 and 1996.
- Participant, Workshop on Future Directions in Snow and Ice Research, sponsored by Army Research Office, Bozeman, Montana, October 5-6, 1995.
- Chair, Hubbard Brook LTER site review, NSF Division of Environmental Biology, 1995.
- Co-convenor, IAHS-IUGG session on Hydrology and Hydrochemistry of Seasonally Snow-Covered Catchments, Boulder, CO, 1995.

Session chair, IAHS-IUGG session on Hydrology and Hydrochemistry of Seasonally Snow-Covered Catchments, Boulder, CO, 1995.

Co-convenor, Mountain Hydrology session, Association of American Geographers annual meeting, San Francisco, CA, April, 1994.

Western Snow Conference Executive Committee, 1994 to 1998.

Western Snow Conference Technical Committee, 1993 and 1994.

Committee Member, Ad hoc committee on evaluation of Fort St. Vrain Power Plant application, National Park Service, 1993-1992.

Visiting scientist, Lanzhou Institute of Glaciology and Geocryology, Lanzhou, China, June 1992.

Invited participant, GLEES (Glacier Lakes Ecosystem Experiments Site) workshop on snow environments research, Laramie, WY, November 1990.

Invited participant, NASA/JPL Earth Sciences Summer School, Pasadena, CA, August 1990.

Invited participant, NATO Advanced Research Workshop on Snowpack Chemistry, Maratea, Italy, July 1990.

Invited participant, California Air Resources Board (CARB) Sierra Watershed Research Discussion Group, Santa Barbara, CA, July 1990.

PROFESSIONAL SERVICE AT CU-BOULDER (last 2 years only)

INSTAAR Open House, April 10th 2009. I gave two of the overview talks. 4 of my grad students lead student groups.

Center of the American West, Faculty Affiliate, 2009

GEOG: ad hoc website design committee, spring and fall 2009.

ENVS, core faculty, 2009

INSTAAR, Executive Committee, Mountain Research Station, 2009

GEOG, Fall semester, Chair, Waleed Abadali's re-appointment committee, 2009

INSTAAR, Fall 2009, ad hoc committee on soft-money scientists.

INSTAAR, Fall 2009, Personnel Committee.

GEOG, diversity committee, spring 2009.

Arts and Sciences Personal Committee, Spring and Fall 2009. Handles all promotion cases in A&S. Meets weekly for two hours, with about 8 hours of prep and report writing per week.

Executive committee representative for CU-Boulder to the Rocky Mountain Cooperative Ecosystems Study Unit, 2009.

Co-director, San Juan Collaboratory, 2009.

Center of the American West, Faculty Affiliate, 2008.

GEOG: ad hoc committee on departmental newsletter. We published the first departmental newsletter in several years, 2008.

GEOG: undergraduate committee, spring 2008.

GEOG/INSTAAR: Suzanne Anderson's promotion and tenure committee member (forget which unit I represented).

GEOG/INSTAAR: joint Hydrology position selection committee (forget which unit I represented).

GEOG: ad hoc website design committee, spring and fall 2008.

GEOG: diversity committee, fall 2008.

INSTAAR, hosted international colleague, Swiss post-doc Chris Randin, 1 January to 21 September 2008.

INSTAAR, hosted international colleague, Dr Yiyong Wang, Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Changchun City, China, 28 September to 31 December 2008.

INSTAAR, hosted international colleague, Dr Maya Bhatt, Kathmandu University, Kathmandu Nepal, 14 August to 21 August 2008.

ENVS, core faculty, 2008.

INSTAAR, Executive Committee, Mountain Research Station, 2008.

COLLABORATORS (last 48 months)

John M. Blair (KSU), Deb Peters (NMS), Dave Clow (USGS), Yves Arnaud (IRD France), Tom Meixner (UA), Noah Molotch (UCLA), Peter Blanken (CU-B), Dave Bowling (Utah), Russ Monson (CU-B), Steve Schmidt (CU-B), Fengjing Liu (UCM), Diane McKnight (CU-B), Phil Verplanck (USGS), Detlev Helmig (CU-B), Iggy Litaor (Tel-Aviv), Don Campbell (USGS).

ADVISOR

Ph.D.: John Melack (UCSB).

COURSES TAUGHT

- Introduction to Physical Geography: Landscapes and Waters (Geog 1011), 4 units.
- Introduction of Mountain Geography (ARSC 1500), 1 unit.
- Field Techniques in Environmental Sciences (Geog 2043), 3 units.
- Introduction to Hydrology (Geog 3251), 4 units.
- Mountain Geography (Geog 3511), 3 units.
- Snow Hydrology Internship Program (Geog 3900), 3 units.
- Snow Hydrology (Geog 4321/5321), 4 units.
- Alpine Hydrology and Hydrochemistry (Geog 4113), 3 units.
- Watershed Biogeochemistry (Geog 4311/5421), 3 units.
- Hydrologic and Hydrochemical Modelling (Geog 5421), 3 units.
- Snow Ecology (Geog 5421), 3 units.
- Modeling Seasonally-Snow Covered Catchments (Geog 5421), 3 units.

Co-taught: Global Sediment and Solute Flux (Geol 6530), 3 units;

Co-taught: Alpine Snow Science (Geog 122b) at UC Santa Barbara, 3 units.

M. Williams: GRADUATE STUDENTS

Please find below the names of my graduate students, degree, year graduated (to best of my recollection), and current position.

George Ingersoll, MA 1995, hydrologist, USGS, Lakewood CO.

Paul Brooks, Ph.D (EPOB) 1995, Associate Prof, Hydrology, U Arizona.

Eran Hood, MA 1998, entered PhD program.

Mark Ridders, MA 1998, avalanche forecaster, Colorado Avalanche Information Center.

Mindia Brown, MA 1998, chief, Virginia State Forestry GIS Lab.

Barbara Inyan, Ph.D 1999, water adjudicator, Nez Perce Indian Tribe

Tom Davinroy, Ph.D 2000, Assistant Professor, Metropolitan State College of Denver.

Andrew Loveland, MA 2000, UC Davis Law School (oh well).

Jen Hazen, MA 2000, hydrologist, Stratus Engineering, Boulder, CO.

Eran Hood, Ph.D 2001, Asst. Prof, ENV5, U Alaska-Juneau.

Dave Manthorn, MA 2002, hydrologist, USGS.

Andreas Torrizo, MA 2002, hydrogeologist, Ross Environmental Associates, Inc., Stowe, VT.

Fengjing Liu, Ph.D 2004, postdoc with Roger Bales, UC-Merced.

Tyler Erickson, Ph.D 2004, project scientist, Altarum, Ann Arbor, Michigan.

Meredith Knauf, MA 2004, environmental scientist, Trihydro Engineering, Laramie, Wyoming.

Adina Racoviteanu, MA 2004, current PhD student.

Kim Raby, MA (ENVS), MA 2005, Environmental Scientist/Hydrologist for New Fields LLC in Boulder CO.

Craig Anderson, MA 2005, Hydrogeologist, USGS, Flagstaff AZ.

Daniel Cordalis, MA 2007, Director of Environmental and Natural Resources, National Congress of American Indians, Washington, DC.

Leora Nanus, Ph.D 2008, Adjunct Professor, San Francisco State University.

Ken Hill, MA 2008, Physical Scientist, NPS Arctic Network Inventory and Monitoring Project.

Ashley Nielson, MA 2008, Hydrologist, National Weather Service, Hydrologic Information Center, Salt Lake City

Ty Atkins, MA, current.

Jennifer Petrzelka, MA, current.

Adrienne Kroepsch, MA, current.

Tony Krupica, MA, current.

Rory Cowie, MA, current.

Jordan Parman, MA, current.

Daniel Cordalis, PhD ENVS/Law, current.

POSTDOCS

Paul Brooks (Associate Professor, University of Arizona).

Don Cline (Chief of Hydrology, NOAA).

Eran Hood (Associate Professor, University of Alaska SE).

Christophe Randin (post-doc at ETH Zurich).

INDEPENDENT STUDY STUDENTS

- Independent studies, spring semester 2009, 3 units, Keith Reneke, "*Hydrogeology of mountain areas*".
- Independent studies, spring semester 2009, 1 unit, Jacob Maggart, "*Mountain warfare*".
- Director, Geography 2007 summer internship program.
- Scott Jackson, 2007, GEOG 3840, 3 units, *CO2 flux through snow*.
- Advisor, Karen Prisby, winter internship at Niwot Ridge 2006, Colby College in Waterville, Maine, *Nitrogen deposition effects on nitrogen cycling*.
- Andrew Nichols, 3 units, 2005, GEOG 3840. *Understanding avalanche dynamics in the Colorado Front Range*.
- Adina Rocoviteanu, 2005, 3 units, GEOG 3840, *Glaciers of the Cordillera Blanca, Peru*.
- Lucas Zukiewicz, 2003, GEOG 3840, 3 units, *Role of buried surface hoar in avalanches*.
- Paul Abood, 2003, GEOG 3840, 3 units, *Alpine lakes as hotspots of dissolved organic carbon production*.
- Mike Ardison, 2003, GEOG 3840, 1 unit, *Mountain hydrology*.
- Kelly Doyle, 2003, GEOG 3840, 1 unit, *Snow making*.
- Phillip Jacobson, 2002, GEOG 3840, 3 units, *Snow melt in a forested system*.
- Roxanne Baca, 2002, GEOG 3840, 1 unit, *Medical practices in Spain*.
- Quinn Stevens, 2002, GEOG 3840, 1 unit, *Medical practices in Spain*.
- Rebecca Harrison, 2002, University of Lanchaster exchange student, *Meltwater flow through snow*.

- Matthew Tomaszewski, 2001, GEOG 3840, 3 units, *GIS of snow-covered area*.
- Alessandra Nisco, 1997, GEOG 3840, 1 unit, *Mountain cultures*.
- Tambi Gustafon, 1996, GEOG 3840, 2 units, *Proposed wilderness act legislation in Utah*.
- Tyler Scheid, 1996, GEOG 3840, 3 units, *Atmospheric deposition to Niwot Ridge*.
- Kelly Starrett, 1996, GEOG 3840, 3 units, *Atmospheric deposition to Niwot Ridge*.
- Jen Shanahan, 1995, GEOG 3840, 1 unit, *Nazca Indian artifacts*.
- Laurissa Gough, 1995, GEOG 3840, 1 unit, *Factors determining treeline*.
- Jamie Harris, 1995, GEOG 3840, 1 unit, *Hydrologic pathways in mountain catchments*.
- Dave Furman, 1995, GEOG 3840, 2 units, *Glacial erosional and depositional features*.
- Wes Moses, 1995, GEOG 3840, 3 units, *Groundwater pollution at Beech Open Space*.
- Graham Kane, 1994, GEOG 3840, 3 units, *Evaluation of methods to measure snow depth at Niwot Ridge*.
- Ben Brown, 1994, GEOG 3840, 3 units, *Statistical analysis of snow depth measurements at Niwot Ridge*.
- Chi Yang, 1994, GEOG 3840, 6 units, *Water quality of North Boulder Creek*.
- Catherine Sullivan, 1994, GEOG 3840, 1 unit, *Geology of the Grand Tetons*.
- Todd Dye, 1994, GEOG 3840, 3 units, *Experimental manipulation of kinetic-growth snow grains*.
- Jamie Harris, 1994, GEOG 3840, 3 units, *Hydrologic pathways in the North Boulder Creek catchment*.
- Seth Waldeman, 1993, GEOG 3840, 2 units, *Andean culture in high mountain environments*.
- Mark Ridders, 1993, GEOG 3840, 3 units, *Measurement of solid precipitation*.
- Nicholas Hedley, 1993, GEOG 3840, 3 units, *Conflicts between mountain bikes and hikers in the Colorado Front Range*.
- Barbara Barnard, 1993, GEOG 3840, 1 unit, *Physiologic adaptations to high-elevation*.
- Joanne Darwin, 1993, GEOG 3840, 1 unit, *Political and cultural conflicts with telescope placement near Phoenix, AZ*.

- Bob Cress, 1993, GEOG 3840, 3 units, *Dry deposition of nitrogen to snow*.
- Christi Seeman, 1992, GEOG 3840, 1 unit, *Huascarán avalanches of 1962 and 1970*.
- Willis Lambertson, 1992, GEOG 3840, 1 unit, *Tropical deforestation*.
- Daniel Braymiller, 1992, GEOG 3840, 1 unit, *Geologic evolution of Yosemite Valley*.
- Kathy Baganz, 1991, GEOG 3840, 3 units, *Como Creek water quality*.

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM (UROP) ADVISOR

Holly Schuss, fall 2009, junior, UROP student in lab.

Holly Schuss, spring 2009, sophomore, UROP student in lab.

- Matt McGough, Undergraduate Research Opportunities Program, Spring 2005.
- Daniel Gullen, Undergraduate Research Opportunities Program, Spring 2005.
- Lucas Zukiewicz, 2004, *Role of buried surface hoar in avalanches*.
- Shannon Perrault, 2002, UROP Assistantship, *Dissolved organic matter in surface waters*.
- Sarah Blakeslee, 1999, SURF award; *Glacial retreat on Antisana, Ecuador*.
- Andy O'Reilly, 1998, SURF award; *Strontium isotopes and calcium distribution*.
- Kerry Shea, 1997, Individual, *Web page development for hydrology in Geography*.
- Alessandra Nisco, 1997, SURF award, *Wetlands in San Miguel County*.
- Research experience for lower division students, 1997: Bret Wohlgemuth, Laura Manley, Doris Rigoni, Mark Evanoff, Keri Selinger, Courtney Wagner, Sarah Blakeslee, and Cynthia Malleck.
- Chi Yang, 1994, Individual, *Water quality of North Boulder Creek*.
- UROP Research Team, 1994, *Spatial distribution of snow depth at Niwot Ridge*: Margie Franseen, Lex Ivey, Dave Pritham, Eric Halverson, and Nick Hedley.
- UROP Research Group, 1993, *Calibration of solid precipitation collector, Niwot Ridge*: Ben Brown, Steve Christie, Lex Ivey, Tom Liebert, Justin McCarthy, Dave Pritham, Mark Ridders, and Chi Yang.

- Bob Cress, 1993, individual, *Dry deposition of nitrogen to snow*.
- UROP Teaching award for *Alpine Hydrology and Hydrochemistry*, 1993, 13 students.

PUBLISHED PAPERS WITH UNDERGRADUATES

Williams, M. W., R. Sommerfeld, †S. Massman, and M. Rikkers, Correlation lengths of vertical flowpaths in melting snowpacks, Colorado Front Range, USA, *Hydrologic Processes*, V 13, 1807-1826, 1999.

†Bieber, A., M. W. Williams, M. Johnsson, and T. Davinroy, Mineralization in alpine talus fields, Green Lakes Valley, Colorado, *Arctic and Alpine Research*, v 30, n 3, pp 266-271, 1998.

†Cress, B., M. W. Williams, and H. Sievering, Dry deposition of nitrogen to wet snow, Niwot Ridge, CO, *Biogeochemistry of Seasonally Snow Covered Basins*, ed by K. A. Tonnessen, M. W. Williams, and M. Tranter, IAHS-AIHS Publication 228, International Association of Hydrological Sciences, Wallingford, UK, pp 33-40, 1995.

RESEARCH EMPLOYMENT FOR UNDERGRADUATES (NSF program)

- Paul Abood, Summer 2003, Principal Advisor, Alpine lakes as hotspots of DOC production.
- Adrian Clark, Summer 2001, Principal Advisor, Dissolved organic N in streams.
- Oliver Platts-Mills, Wesleyan University, Summer 1999, Principal Advisor, Dissolved organic N in streams.
- Alisa Beeber, Bryn Mayr, Summer 1996, Principal Advisor, Microbial activity in talus.
- Tim Platts-Mills, Harvard University, Summer 1995, Principal Advisor, Spatial patterns of nitrogen saturation in the Colorado Front Range.

NIWOT RIDGE INTERNSHIP (GEOG 3990, 3 units)

2009: Nick Blatz, James Sill, Miles Daly.

2008: Joel Parker, Heather McIntyre, Zak Davies, Russ Williams, Jennifer Morse, Matt Primomo.

2005: Evan Levine.

2003: Julia Fairbank, Nieve Pettigrew, Dan Tullos, Josh Stackhouse, Lucas Zukiewicz.

2002: Molly Anderson, Susan Trzaskos, Doug Hultstrand, Craig Anderson.

1999: Kelly Krieger, Jennifer Nissen, Christie Portac, Phil Morstad, Jonathan Coles.

1998: Sarah Blakeslee, Sandy Jocoy, Sam Massman, Chris Fish, Derek Shrout.

1997: Gabriela Hess, Debbie Moffitt, Eran Ganser, Kerry Shea, Brian Smith, and Patrick Ernst.

1996: Melissa Klein, Alessandra Nisco, John Schneider, Clay Alspaugh, and Jake Cukjati.

1995: Drew Scheussel and Dave Furman.

UNDERGRADUATE HONORS STUDENTS

Chair, Spring 2009, Joel Parker, magnum cum laude honors in Geography: "Modeling Surface Energy Balances and Melt Energy Partitioning of a Sub-Alpine Snowpack within a Tree Stand Affected by the Mountain Pine Beetle (*Dendroctonus ponderosa*), Niwot Ridge, Colorado".

Chair, Spring 2009, Carlos Ezequiel Chalbaud, cum laude Honor's in Geography, " Melt Timing of Alpine Snowpacks and Water Management".

Chair, Fall 2009, Matthew C Primomo, summa cum laude Honors in Geography, "A Historical Analysis of the Stanley Avalanche Area With Implications For Forecasting Road-Hit Avalanches".

Paul Abood, 2003, ENVS, Chair, Undergraduate Honor's Committee, Alpine lakes as hotspots of biological activity.

Penny Stinton, 1997, EPO Biology, Undergraduate Honor's Committee, Determining Historical C3 and C4 Species Abundance in Boulder Open Space Grasslands Using Carbon Isotope Measurements.

Stacie Simon, 1997, EPO Biology, Undergraduate Honor's Committee, Decomposition of russian olive and cottonwood leaves in Boulder Creek riparian zones.

Robert Assington, 1997, EPO Biology, Undergraduate Honor's Committee, Microarthropod activity under snow, Niwot Ridge, CO.

- David Lewis, 1996, Geography, Principal Advisor, Nonpoint and point pollution sources of nitrogen in Clear Creek, CO.
- Dai Yamamoto, 1995, Geography, Principal Advisor, Synoptic climate and snowfall in the western US.
- Chi Yang, 1995, Environmental Science, Principal Advisor, Evaluation of sources of contamination in North Boulder Creek, CO.
- Alexander Ivey, 1995, EPO Biology, Undergraduate Honor's Committee, Factors controlling downstream macroinvertebrate diversity below a deep-release dam in southwestern Colorado.
- Bob Cress, 1994, Environmental Science, Principal Advisor, Dry Deposition of nitrogen to snow, Niwot Ridge, CO.
- Margie Franseen, 1994, Geography, Principal Advisor, Spatial variation in snow depth, Niwot Ridge.
- Michel Wunder, 1994, EPO Biology, Undergraduate Honor's Committee, Nesting characteristics of owls, SW New Mexico.
- John Marshall, 1994, EPO Biology, Undergraduate Honor's Committee, Acid mine drainage and water quality, Animas River, CO.
- Brooke Zantrell, 1994, EPO Biology, Undergraduate Honor's Committee, Macroinvertebrate responses to changes in sedimentation.
- Jason Neff, 1994, EPO Biology, Undergraduate Honor's Committee, Trace gas flux from Niwot Ridge.
- Brian Thomas, 1994, EPOB, Undergraduate Honor's Committee, Nitrogen fixation by legumes at Niwot Ridge.