

Thomas H. Painter, Ph.D.

Scientist IV, Jet Propulsion Laboratory/California Institute of Technology
Visiting Research Associate, UCLA/JIFRESSE
Assistant Adjunct Professor, Department of Geography, UCLA
Project Scientist, University Corporation for Atmospheric Research
P (303) 888.7119, E tpainter@jifresse.ucla.edu U <http://snow.utah.edu/>



Education

- 2003 **Postdoctoral Fellow**, Cooperative Institute for Research in Envir. Sci., with Konrad Steffen
2002 **PhD**, *Geography*, UC-Santa Barbara, with Jeff Dozier
Dissertation: *The Hyperspectral Bidirectional Reflectance of Snow: Modeling, Measurement and Instrumentation*
1996 **MA**, *Geography*, UC-Santa Barbara, with Jeff Dozier
Thesis: *Improving Spectral Mixture Analysis of Snow-Covered Area from AVIRIS Data*
1989 **BS**, *Mathematics*, Colorado State University, with Kenneth Klopfenstein
Foci: *Linear algebra, abstract algebra*

Research Interests

Multispectral remote sensing and imaging spectroscopy of snow, snow hydrology, radiative and hydrologic forcing by desert dust and industrial soot in snow and ice, integration of remote sensing and distributed hydrologic models, operational remote sensing infrastructure, robotic and spectroscopic instrumentation, exobiology in planetary ices

Personal Information

Born Fort Collins, CO USA
Spouse Tania U. Painter
Children Emile M. Painter, Micah R. Painter

Positions

- 2010 **Scientist IV**, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA.
2010 **Research Faculty**, Joint Institute for Regional Earth System Science and Engineering, UCLA, Los Angeles.
2010 **Assistant Adjunct Professor**, Department of Geography, UCLA.
2010 **Adjunct Professor**, Department of Atmospheric Sciences, University of Utah.
2007 – Present **Project Scientist**, GOES-R Cryospheric Team, University Corporation for Atmospheric Research, Boulder, Colorado.
2007 – Present **Director**, Snow Optics Laboratory, Jet Propulsion Laboratory.
2007 – 2010 **Assistant Professor**, Department of Geography,
2004 – 2007 **Research Scientist II**, National Snow and Ice Data Center, University of Colorado, Boulder.
2003 – 2004 **Research Scientist I**, National Snow and Ice Data Center, University of Colorado, Boulder.
2002 – 2003 **Research Associate**, CIRES Visiting Fellowship, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Supervisor: Koni Steffen.
1994 – 2002 **Graduate Student Researcher**, Institute for Computational Earth System Science, University of California, Santa Barbara.
1992 – 1994 **Programmer**, Climate System Modeling Program, National Center for Atmospheric Research, Boulder, CO.

Grants Awarded

- 2010-2013 NASA, *Integrated hydrological response to extreme dust deposition to the snow cover of the Colorado River Basin*, **Principal Investigator: Thomas H. Painter**, Amount: \$1,559,122.
2009-2010 USGS, *Climate change in dryland regions, dust production, and snow melt in the western US*, **Principal Investigator: Thomas H. Painter (Utah)**, Amount: \$19,740.

Curriculum Vitae – T. H. Painter – September 2010

- 2009-2010 USFS, *Characterization of dust and pollutant loading to snow cover of wilderness areas of the Uinta-Wasatch-Cache National Forests*, **Principal Investigator: Thomas H. Painter (Utah)**, Amount: \$25,341.
- 2009-2011 NOAA Western Water Assessment, *Impacts of coupled climate change and dust deposition on water resources in the Colorado River Basin*, **Principal Investigator: Thomas H. Painter (Utah)**, Co-Investigator: Jeffrey S. Deems (NSIDC), Amount: \$41,800.
- 2009-2012 NASA Earth System and Space Fellowship, PhD Student Annie Bryant, *Radiative forcing by desert dust in snowmelt-dominated hydrologic systems from coupled satellite and in situ measurements*, **Principal Investigator: Thomas H. Painter (Utah)**, Co-Investigator: Annie Bryant, Amount: \$90,000.
- 2009-2010 State of Colorado and Water Stakeholders, *Colorado Dust on Snow Monitoring Program*, Principal Investigator: Chris Landry (CSAS), **Co-Investigator: Thomas H. Painter (Utah)**, Utah Amount: in negotiation.
- 2009-2014 NASA, *Astrobiology of Icy Worlds: Habitability, Survivability, and Detectability*, Principal Investigator: Isik Kanik (JPL), **Co-Investigator: Thomas H. Painter (Utah)** among several others at various institutions, Utah Amount: \$291,201.
- 2008-2011 NASA, *EOS Sensor Fusion for Retrieval of Arctic Sea Ice Albedo*, **Principal Investigators: Julianne Stroeve (NSIDC), Thomas H. Painter (Utah)**, Utah Amount: \$94,000.
- 2007-2010 Naval Postgraduate School/National Geospatial-Intelligence Agency, *Mountain Snow Cover, Albedo, and Space-Time Interpolation from Multispectral Sensors*, Principal Investigator: Jeff Dozier (UCSB), **Co-Investigator: Thomas H. Painter (Utah)**, Utah Amount: \$145,236.
- 2007-2010 US Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, *Integrated, Operational High Resolution Snow Cover Mapping in the Optical and Microwave Wavelengths*, **Principal Investigator: Thomas H. Painter (Utah)**, Co-Investigators: Richard L. Armstrong (NSIDC), Mary J. Brodzik (NSIDC). Utah Amount: \$112,068.
- 2006-2007 Western Water Assessment, *Impacts of desert dust deposition on snowmelt runoff*, **Principal Investigator: Thomas H. Painter (NSIDC)**, Andrew P. Barrett (NSIDC). Amount: \$27,088.
- 2006-2007 Cooperative Institute for Research in Environmental Sciences (CIRES) Innovative Research Program, *Highly resolved wavelength dependencies of aerosol optical properties in the shortwave spectrum*, Allison McComiskey (CIRES), **Co-Investigators: Thomas H. Painter (NSIDC)**, Paul Ricchiazzi (UCSB). Amount: \$25,420.
- 2005-2006 Cooperative Institute for Research in Environmental Sciences (CIRES) Innovative Research Program, *Realization of Snow/Vegetation Interactions from Field Spectroscopy*, Principal Investigator: Noah P. Molotch (CIRES), **Co-Investigator: Thomas H. Painter (NSIDC)**. Amount: \$14,077.
- 2004-2009 NSF Atmospheric Sciences, Climate Dynamics, *Radiative Effects of Desert Dust Deposits in Alpine Snow*, **Principal Investigator: Thomas H. Painter (NSIDC/Utah)**, Co-Investigator: Chris Landry (Center for Snow and Avalanche Studies). Amount: \$428,569.
- 2004-2009 NASA REASoN, *Multi-Resolution Snow Products for the Hydrologic Sciences*, Principal Investigator: Jeff Dozier (UCSB), **Co-Investigators: James Frew (UCSB), Thomas H. Painter (NSIDC/Utah)**, Roger Bales (UCM), Jiancheng Shi (UCSB). Amount: \$3,950,000.
- 2004 Consortium of Universities for the Advancement of the Hydrologic Sciences (CUAHSI) Travel Grant for Position Paper, *Mountain Hydrology of the Semi-Arid Mountain West*: Roger C. Bales (UC-Merced), Jeff Dozier (UCSB), Noah Molotch (UA), **Thomas H. Painter (NSIDC)**, and Robert Rice (UC-Merced). Amount: \$5000.

Publications

In review

Shreve, C. M., G. S. Okin, and **T. H. Painter**, Spatial and temporal trends in fractional snow covered area and daytime land surface temperature in the Tibetan Plateau 2000-2007 using MODIS data, *Geophysical Research Letters*, **in review**.

Selected in preparation

Painter, T. H., Radiative forcing of dust in mountain snow from MODIS surface reflectance data, *in preparation*.

- Painter, T. H.**, K. Rittger, C. McKenzie, and J. Dozier, An assessment of the accuracy of current snow cover mapping algorithms for MODIS, *in preparation*.
- Painter, T. H.**, R. L. Armstrong, and M. J. Brodzik, A global map of permanent snow and ice in the EOS era, *in preparation*.

Published

2010

- [42] **Painter, T. H.**, J. Deems, J. Belnap, A. Hamlet, C. C. Landry, and B. Udall, Response of Colorado River runoff to dust radiative forcing in snow, *Proceedings of the National Academy of Sciences*, 10.1073/pnas.0913139107.
- [41] **Painter, T. H.**, *Comment on: S K SINGH, Anil V KULKARNI, Bajrang S CHAUDHARY*, Hyperspectral analysis of snow reflectance to understand the effects of contamination and grain size, *Annals of Glaciology* 51(54) 2010, *Journal of Glaciology*, in press.
- [40] Lawrence, C. R., **T. H. Painter**, C. C. Landry, and J. Neff, The Contemporary Physical and Chemical Composition of Aeolian Dust Deposition to Terrestrial Ecosystems of the San Juan Mountains, Colorado, USA, *Journal of Geophysical Research - Biogeosciences*, doi:10.1029/2009JG001077.
- [39] Field, J. P., J. Belnap, D. D. Breshears, J. C. Neff, G. S. Okin, J. J. Whicker, **T. H. Painter**, S. Ravi, M. C. Reheis, and R. L. Reynolds, The ecology of dust: local- to global-scale perspectives, *Frontiers in Ecology and the Environment*, doi:10.1890/090050.

2009

- [38] **Painter, T. H.**, K. Rittger, C. McKenzie, R. E. Davis, and J. Dozier, Retrieval of subpixel snow-covered area and grain size from MODIS reflectance data, *Remote Sensing of Environment*, 113, 868-879, doi:10.1016/j.rse.2009.01.001.
- [37] Steltzer, H., C. C. Landry, T. H. Painter, J. Anderson, and E. Ayres, Biological consequences of earlier snowmelt from desert dust deposition in alpine landscapes, *Proceedings of the National Academy of Sciences*, doi:10.1073/pnas.0900758106.
- [36] Flanner, M. G., C. S. Zender, P. G. Hess, N. M. Mahowald, **T. H. Painter**, V. Ramanathan, and P. J. Rasch, Springtime warming and reduced snow cover from carbonaceous particles, *Atmos. Chem. Phys*, 9, 2481-2497.
- [35] Shreve, C. M., G. S. Okin, and **T. H. Painter**, Indices for estimating fractional snow cover in the Western Tibetan Plateau, *Journal of Glaciology*, **55(192)**, 737-745.
- [34] Schaepman, M. S., S. L. Ustin, A. J. Plaza, **T. H. Painter**, J. Verrelst, and S. Liang, Earth System Science related Imaging Spectroscopy – an assessment, *Remote Sensing of Environment*, doi:10.1016/j.rse.2009.03.001.
- [33] Cline, D., S. Yueh, B. Chapman, B. Stankov, A. Gasiewski, D. Masters, K. Elder, R. Kelly, **T. H. Painter**, S. Miller, S. Katzberg, L. Mahrt, Cold Land Processes Experiment (CLPX 2002-2003): Airborne Remote Sensing, *Journal of Hydrometeorology*, **10(1)**, 338-346, doi: 10.1175/2008JHM883.1.
- [32] M. Clark, D. Slater, **T. H. Painter**, W. Meier, J. Stroeve, A. P. Barrett, B. Raup, and M. Serreze, Scientific and societal uses of remotely sensed snow and ice information, AGU Monograph: *Research and Economic Applications of Remote Sensing Data Products*, in press.
- [31] Dozier, J., R. O. Green, A. W. Nolin, and **T. H. Painter**, Interpretation of snow properties from imaging spectrometry, *Remote Sensing of Environment*, doi: 10.1016/j.rse.2007.07.029.

2008

- [30] J.C. Neff, A.P. Ballantyne, G.L. Farmer, N.M. Mahowald, J. Conroy, C.C Landry, J. Overpeck, **T. H. Painter**, C.R Lawrence, R. Reynolds, Recent Increases in Eolian Dust Deposition due to Human Activity in the Western United States, *Nature Geosciences*, doi: 10.1038/ngeo133.
- [29] Dozier, J., **T. H. Painter**, K. Rittger, and J. Frew, Time-space continuity of daily maps of fractional snow cover and albedo from MODIS, *Advances in Water Resources*, doi: 10.1016/j.advwatres.2008.08.011.
- [28] Davis, R. E., **Painter, T. H.**, Cline, D. W., Armstrong, R. L., Haran, T., McDonald, K., Forster, R., and Elder, K. (2008), NASA Cold Land Processes Experiment (CLPX 2002/03): Spaceborne Remote Sensing, *Journal of Hydrometeorology*, 9: 1427-1433, doi: 10.1175/2008JHM9261.
- [27] Hardy, J., Davis, R. E., Koh, Y., Cline, D. W., Elder, K., Armstrong, R. L., Marshall, H. P., **Painter, T. H.**, Castres Saint-Martin, G., DeRoo, R., Sarabandi, K., Graf, T., Koike, T., and McDonald, K. Cold

Land Processes Experiment (CLPX 2002-2003): Local Scale Observation Site (LSOS), *Journal of Hydrometeorology*, 9: 1434-1442, doi: 10.1175/2008JHM875.1.

- [26] Liu, J., Melloh, R. A., Woodcock, C. E., Davis, R. E., **Painter, T. H.**, and McKenzie, C. (2008), Modeling the view angle dependence of gap fractions in forest canopies: Implications for mapping fractional snow cover using optical remote sensing, *Journal of Hydrometeorology*, 9(5): 1005-1019, doi: 10.1175/2008JHM866.1.

2007

- [25] **Painter, T. H.**, A. P. Barrett, C. Landry, J. Neff, M. P. Cassidy, C. Lawrence, K. E. McBride, and G. L. Farmer, Impact of disturbed desert soils on duration of mountain snow cover, *Geophysical Research Letters*, 34, L12502, doi:10.1029/2007GL030284.
- [24] **Painter, T. H.**, N. Molotch, M. Cassidy, M. Flanner, and K. Steffen, Contact spectroscopy for the determination of stratigraphy of snow grain size, *Journal of Glaciology*, **53(180)**, 121-127, doi: N/A for journal.
- [23] **Painter, T. H.**, M. E. Schaepman, W. Schweizer, & J. Brazile, Spectroscopic discrimination of shit from Shinola. *Annals of Improbable Research*, 13, 22-23.
- [22] Scambos, T., Haran, T., Fahnestock, M., **Painter, T. H.**, and Bohlander, J. (2007), MODIS-based Mosaic of Antarctica (MOA) data sets: Continent-wide surface morphology and snow grain size, *Remote Sensing of Environment*, 111(2-3): 242-257, doi: 10.1016/j.rse.2006.12.020.
- [21] Malenovsky, Z., H. M. Bartholomeus, F. W. Acerbi-Junior, J. T. Schopfer, **T. H. Painter**, G. F. Epema, and A. K. Bregt, Scaling dimensions in spectroscopy of soil and vegetation, *International Journal of Applied Earth Observation and Geoinformation*, 9, doi:10.1016/j.jag.2006.08.003.

2006

- [20] Green R. O., **T. H. Painter**, D. A. Roberts, and J. Dozier, Measuring the three phases of water in a melting snow environment with an imaging spectrometer in the solar reflected spectrum, *Water Resources Research*, doi: 10.1029/2005WR004509.
- [19] Schaepman-Strub, G., M. Schaepman, **T. H. Painter**, J. Martonchik, and S. Dangel, Reflectance quantities in optical remote sensing - definitions and case studies, *Remote Sensing of Environment* **103(1)**, 27-42, doi: 10.1016/j.rse.2006.03.002.
- [18] Bales, R., N. Molotch, **T. H. Painter**, M. Dettinger, R. Rice, and J. Dozier, Mountain hydrology of the western United States, *Water Resources Research*, 42, W08432, doi:10.1029/2005WR004387.

2004

- [17] **Painter, T. H.**, and J. Dozier, The effect of anisotropic reflectance on imaging spectroscopy of snow parameters, *Remote Sensing of Environment* **89(4)**, 409-422, doi:10.1016/j.rse.2006.03.002.
- [16] **Painter, T. H.**, and J. Dozier, Measurements of the hemispherical-directional reflectance of snow at fine spectral and angular resolution, Vol. 109, No. D18, D18115, *Journal of Geophysical Research-Atmospheres*, doi: 10.1029/2003JD004458.
- [15] Dozier, J., and **T. H. Painter**, Multispectral and hyperspectral remote sensing of alpine snow properties, *Annual Review of Earth and Planetary Sciences* **32**, 465-494, doi: 10.1146/annurev.earth.32.101802.120404.
- [14] Okin, G., and **T. H. Painter**, Effect of grain size on spectral reflectance of sandy desert surfaces, *Remote Sensing of Environment* **89(3)**, 272-280, doi: 10.1016/j.rse.2003.10.008.
- [13] Molotch, N., **T. H. Painter**, R. Bales, and J. Dozier, Incorporation of remotely-sensed albedo into a spatially-distributed snowmelt model, Vol. 31, No. 3, L03501, *Geophysical Research Letters*, doi:10.1029/2003GL019063.

2003

- [12] **Painter, T. H.**, J. Dozier, D. A. Roberts, R. E. Davis, and R. O. Green, Retrieval of subpixel snow-covered area and grain size from imaging spectrometer data, *Remote Sensing of Environment* **85**, 64-77, doi: 10.1016/S0034-4257(02)00187-6.
- [11] **Painter, T. H.**, B. Paden, and J. Dozier, Automated Spectro-Goniometer: a spherical robot for the measurement of the bi-directional reflectance of snow, *Reviews of Scientific Instruments* **74(12)**, 5179-5188, doi: 10.1063/1.1626011.

2002

- [10] Green, R. O., J. Dozier, D.A. Roberts, and **T. H. Painter**, Spectral snow reflectance models for grain size and liquid water fraction in melting snow for the solar reflected spectrum, *Annals of Glaciology* **34**, 71-73, doi: N/A for journal.

2001

- [9] **Painter T.H.**, B. Duval, W.H. Thomas, M. Mendez, S. Heintzelman, and J. Dozier, Detection and quantification of snow algae using an airborne imaging spectrometer, *Applied and Environmental Microbiology*, **67(11)**, 5267-5272, doi: N/A.

1998

- [7] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, The effect of grain size on spectral mixture analysis of snow-covered area with AVIRIS data, *Remote Sensing of Environment*, **65**, 320-332, doi: N/A.
- [8] Albright, T.P., **T.H. Painter**, D.A. Roberts, J.C. Shi, J. Dozier, and E. Fielding, Classification of Surface Types Using SIR-C/X-SAR, Mt. Everest Area, Tibet , *Journal of Geophysical Research - Planets*, **V103(E11)**, 25,823-25,837, doi: N/A.

1997

- [6] Schimel, D.S., **VEMAP Participants**, and B.H. Braswell, Continental scale variability in ecosystem processes: Models, data, and the role of disturbance, *Ecological Monographs*, **V67(N2)**, 251-271, doi: N/A.

1996

- [5] Kittel, T.G.F., D.S. Ojima, D.S. Schimel, R. McKeown, J. G. Bromberg, **T.H. Painter**, N.A. Rosenbloom, W.J. Parton, and F. Giorgi, Model-GIS integration and dataset development for assessing the vulnerability of terrestrial ecosystems to climate change, pp293-297, in: *GIS and Environmental Modeling: Progress and Research Issues*. M.F. Goodchild, L.T. Steyaert, B.O. Parks, C. Johnston, D. Maidment, M. Crane and S. Glendinning (eds.). GIS World, Inc., Ft. Collins, CO.

1995

- [4] Kittel, T.G.F., N.A. Rosenbloom, **T.H. Painter**, D.S. Schimel, and VEMAP Modeling Participants, The VEMAP integrated database for modeling United States ecosystem/vegetation sensitivity to climate change, *Journal of Biogeography*, **22(4-5)**, 857-862, doi: N/A.
- [3] Kittel, T.G.F., N.A. Rosenbloom, D.S. Schimel, **T.H. Painter**, H.H. Fisher, A. Grimsdell, and VEMAP Members. The VEMAP United States Database. Web access (<http://www.gcd.ucar.edu/vemap/>). Published Dataset.
- [2] **VEMAP Members**, Vegetation/ecosystem modeling and analysis project: Comparing biogeography and biogeochemistry models in a continental-scale study of terrestrial ecosystem responses to climate change and CO₂ doubling , *Global Biogeochemical Cycles*, **9(4)**, 407-437, doi: N/A.

1994

- [1] Schimel, D.S., B.H. Braswell, E.A. Holland, R. McKeown, D.S. Ojima, **T.H. Painter**, W.J. Parton, and A.R. Townsend, Climatic, edaphic, and biotic controls over storage and turnover of carbon in soils, *Global Biogeochemical Cycles*, **8(3)**, 279-293, doi: N/A.

Book Chapters

2010

- [3] **Painter, T. H.**, and M. Schneebeli, Snow Grains, *Encyclopedia of Snow, Ice, and Glaciers*, Springer, Berlin.

2009

- [2] Schaepman-Strub, G., Schaepman, M., Martonchik, J. V., **Painter, T. H.**, and Dangel, S., Radiometry and reflectance: From terminology concepts to measured quantities. In: *The SAGE Handbook of Remote Sensing*, (T. A. Warner, M. D. Nellis and G. M. Foody, Ed.), SAGE, Los Angeles.

2004

- [1] Bruegge, C. J., M. Schaepman, G. Strub, U. Beisl, A. Demircan, B. Geiger, **T.H. Painter**, B.E. Paden, and J. Dozier, Outdoor measurements of BRDF, in *Reflection properties of Vegetation and Soil - with a BRDF Data base*, M. von Schönemark, B. Geiger, and H. P. Röser, eds., Berlin: Wissenschaft & Technik Verlag.

Professional Experience

Research

- 2010 - Present **Scientist IV**, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA.
- 2007 – 2010 **Assistant Professor**, Department of Geography, **Director**, Snow Optics Laboratory, University of Utah, Salt Lake City.

Curriculum Vitae – T. H. Painter – September 2010

- 2007 – Present **Project Scientist**, GOES-R Cryospheric Team, University Corporation for Atmospheric Research, Boulder, Colorado.
- 2004 – 2007 **Research Scientist II**, National Snow and Ice Data Center, University of Colorado, Boulder.
- 2003 – 2004 **Research Scientist I**, National Snow and Ice Data Center, University of Colorado, Boulder.
- 2006 – Present **Affiliate Scientist**, NOAA Western Water Assessment, Boulder, Colorado.
- 2005 – 2007 **Affiliate Faculty**, Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins.
- 2004 – Present **Research Associate (affiliate)**, Institute for Computational Earth System Science, University of California at Santa Barbara.
- 2002 – 2003 **Research Associate**, CIRES Visiting Fellowship, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Supervisor: Koni Steffen.
- 1999 – 2001 **Graduate Student Researcher**, NASA Earth Science Information Provider Program 'Earth System Science Workbench', Donald Bren School of Environmental Science and Management, UCSB, Supervisors: Jeff Dozier and James Frew.
- 1997 – 1999 **Graduate Student Researcher** (Non-funded), 'Detection and Mapping with Imaging Spectrometry', Los Alamos National Laboratory/University of California, Supervisor: Dar Roberts.
- 1994 – 2002 **Graduate Student Researcher**, NASA EOS IDS 'Hydrology, Hydro-Chemical Modeling, and Remote Sensing in Seasonally Snow-Covered Alpine Drainage Basins', Institute for Computational Earth System Science, UCSB, Supervisor: Jeff Dozier.
- 1992 – 1994 **Programmer**, Climate System Modeling Program, Climate and Global Dynamics Division, National Center for Atmospheric Research, Boulder, CO, USA, Supervisor: David Schimel.

Teaching

- F2008-2009 *Principles of Cartography*, GEOG3040, University of Utah
- S2008-2010 *Graduate seminar: Snow Hydrology*, GEOG6960, University of Utah
- S2008-2010 *Geo-Excursions: Snow Science*, GEOG3000, University of Utah
- F2007 *Earth Environments and Global Change*, GEOG1000 /ENVST1000, University of Utah
- 1995-2007 Co-taught Field Spectroscopy (CU), Mountain Snow Cover (UCSB), myriad guest lectures, etc.

Student Committees

Graduated

- Evan Burgess**, MA, Geography, University of Utah, Committee Member, 2009
- Jeffrey S. Deems**, PhD, Watershed Sciences, Colorado State University, Committee Member, 2007
- Corey P. Lawrence**, PhD, Geological Sciences, University of Colorado, Committee Member, 2009
- McKenzie Skiles**, MA, Geography, University of Utah, Chairman, 2010.
- Kathleen Thatcher**, MS, Geography, Northern Arizona University, Committee Member, 2007
- Preeti Tuladhar**, MS, Geosciences, Oregon State University, Committee Member, 2006
- Wendy Wagner**, MS, Atmospheric Sciences, University of Utah, Committee Member, 2009.

Projected

- Ann C. Bryant**, PhD, Geography, UCLA, Chairman, *Projected: 2012*
- Evan Burgess**, PhD, Geography, University of Utah, Committee Member, *Projected: 2012*
- Elias Deeb**, PhD, Geography, University of Utah, Committee Member, *Projected: 2010*
- Gregory Maurer**, PhD, Biology, University of Utah, Committee Member, *Projected: 2011*

Honors and Awards

- 2007 *Best Paper*, 'Snowcover along elevation gradients in the Upper Merced and Tuolumne River basin of the Sierra Nevada of California from MODIS and blended ground data', Western Snow Conference, co-author.
- 2006 *Group Achievement Award*, NASA EOSDIS Data Centers Support Team, National Snow and Ice Data Center.
- 2003 *Best Paper*, 'Incorporating Net Radiation Data into an Index Snowmelt Model in an Alpine Basin', Western Snow Conference, 2003, co-author
- 2002 *Visiting Researcher Fellowship*, Cooperative Institute for Research in Environmental Science, University of Colorado

Curriculum Vitae – T. H. Painter – September 2010

- 2001 *Dr. James E. Church Memorial Award*, Best Student Paper, 'Analysis of the spatial variability of snow cover depletion in an alpine watershed, Tokopah basin, Sierra Nevada, California, U.S.A.', Western Snow Conference, 2001, co-author
- 2000 *Dr. James E. Church Memorial Award*, Best Student Paper, 'Automated Spectro-Goniometer for the Measurement of Snow Bi-directional Reflectance', Western Snow Conference, 2000, lead author
- 1989 *Phi Beta Kappa*, Colorado State University.

Outreach

Media

- 2010 Denver Post, *Dust, snow make for problematic mix for skiers*, author: Scott Willoughby, http://www.denverpost.com/extremes/ci_14917371, 4/20/2010
- 2010 NSF website banner and Discovery report: *Dust-on-snow: On spring winds, something wicked this way comes*, author: Cheryl Dybas (NSF): http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=116707&org=NSF, 4/2/2010.
- 2010 SKIING Magazine, "Visionary: The Scientist", in article *Bright Ideas: The 28 People, Products, and Inventions Revolutionizing our Sport*, author: Cameron Walker, March issue.
- 2009 KPCW radio interview, related to talk at Park City Swaner EcoCenter with Jim Steenburgh and Peter Metcalf
- 2009 KCPW, KUER radio interviews.
- 2009 Los Angeles Times, Cover Story, "Colorado dust storms speed snowmelt", <http://www.latimes.com/news/nationworld/nation/la-na-pink-snow24-2009may24,0,1077488.story>, 5/24/2009.
- 2009 New York Times, "Climate change, water shortages conspire to create 21st Century Dust Bowl", <http://www.nytimes.com/gwire/2009/05/14/14greenwire-climate-change-water-shortages-conspire-to-cre-12208.html?pagewanted=all>, 5/14/2009.
- 2009 Washington Post, "Dust Storms Escalate, Prompting Environmental Fears: Increase in Dirt Affects Ecosystems In Western States", 4/23/2009.
- 2008 KOTO Radio, Telluride, CO public radio, Interview on snowmelt effects of dust in mountain snow, November 12.
- 2008 International media regarding pollution in snow research, including reports across Europe, Asia, and North America. January.
- 2008 KCPW Radio, Salt Lake City public radio, "Midday Metro", Interview with Lara Jones, <http://www.kcpw.org/article/5128>
- 2008 KSL-5, Salt Lake City, "The Grayest Snow on Earth?", Devoted story to Painter group research on impurities in snow, 16 January, 2008.
- 2008 Salt Lake Tribune, "U. Professor Explores the Part Pollution Plays in Melting Snow", 14 January, http://www.sltrib.com/ci_7964216
- 2007 "Trouble in Them Thar Hills", *Science Magazine*, 12 December, <http://sciencenow.sciencemag.org/cgi/content/full/2007/1212/3>
- 2007 Press Conference, "Climate change in high elevation mountains", *Fall Meeting of the American Geophysical Union*, San Francisco.
- 2007 "High Peaks, Dirty Snow", *Forest Magazine*, Winter 2008 article focused on Painter group's dust in snow research written by Allen Best - <http://www.fsee.org/index.html?page=http%3A%2F%2Fwww.fsee.org%2Fforestmag/>
- 2007 "Ouray Ice Climbing" – The Weather Channel, Epic Conditions, Painter as expert on snow and ice with respect to ice climbing.
- 2007 Reuters News, Nature Magazine, ABC News, LA Times, NY Times, FOX News, Aspen Times, Vail Trail, etc. National and international press coverage on our 2007 paper in *Geophysical Research Letters*, T. H. Painter, lead author.
- 2007 History Channel show on "Snow", Painter discussing snow hydrology and water resources.
- 2007 January, 2006 Backcountry Magazine, quote: "It is hard to appropriately wax for dust"
- 2006 31 May, 2006, National Public Radio, Morning Edition, Stirring Up Dust in the Desert, Richard Harris reporting, <http://www.npr.org/templates/story/story.php?storyId=5415315>
- 2006 30 May, 2006, National Public Radio, Morning Edition, Dust Storms Threaten Snow Packs, Richard Harris reporting, <http://www.npr.org/templates/story/story.php?storyId=5415308>

Curriculum Vitae – T. H. Painter – September 2010

- 2006 29 May, 2006 High Country News, Dust and Snow, Michelle Nijhuis reporting (Note: This article was in a series of three articles on climate change that won Michelle the American Association for the Advancement of Science 2006 Science Journalism Award for Small Newspapers), http://www.hcn.org/servlets/hcn.Article?article_id=16326
- 2006 December, 2006 Backcountry Magazine, Colorado's Dirty Little Secret, Mike Horn reporting, article devoted to effect of dust on Colorado snowpack.
- 2006 July 19, 2006, Quote in Discovery News on recent results suggesting glacier ice in Alps could be gone by year 2100. http://dsc.discovery.com/news/2006/07/19/glacier_pla.html?category=travel&guid=20060719104530

Invited Talks

- 2010 Colorado Water Workshop, *Snowmelt and hydrologic response to radiative forcing by dust in the Colorado River Basin*, Gunnison, Colorado 22 July.
- 2010 Alta Environmental Center, *Dirty Little Secrets of the Greatest Snow on Earth* (with Jim Steenburgh), Alta, Utah 19 February.
- 2009 Department of Interior – Undersecretary of Water and Energy Anne Castle, *Snowmelt and hydrologic response to radiative forcing by dust in the Colorado River Basin*, Presentation of results to undersecretary Castle, Washington, DC 1 November.
- 2009 Green Month Sustainability Lecture Series, sponsored by Swaner and the University of Utah Office of Sustainability, *Dirty Little Secrets of the Greatest Snow on Earth* (with Peter Metcalf and Jim Steenburgh), 8 October.
- 2009 Annual meeting of the Colorado River Water Conservancy District, *What's the Dirty Secret of Dirty Snow?*, 18 September.
- 2009 Jet Propulsion Laboratory, Science Visitor and Colloquium Program, *Where Deserts and Mountains Collide: the Impact of Desert Dust on Snowmelt in the Colorado River Basin*, 20 August.
- 2009 NASA Earth System Science at 20 years Symposium, *Where Mountains and Deserts Collide: Implications of Accelerated Snowmelt by Disturbed Desert Dust*, 24 June.
- 2009 Northrup-Grumman Space Technology, *Next Generation Snow Cover Mapping from MODIS and VIIRS*, 17 June.
- 2009 Guy F. Atkinson Distinguished Lecture Series, Department of Geology and Geophysics, *Where Deserts and Mountains Collide: the Implications of Accelerated Snowmelt by Desert Dust*, invited by Michael Thorne.
- 2008 Colorado River Forecast Operations Annual Meeting, Salt Lake City, UT,
- 2008 Telluride Public School, Telluride, CO, Presentations on snow science, remote sensing, and planetary science, 14 February.
- 2008 Pinhead Institute, Smithsonian Affiliate, Telluride, CO, *When Deserts and Mountains Collide*, 13 February.
- 2008 UCLA Department of Geography, *Where Deserts and Mountains Collide: The Problem of Dust in Mountain Snowcover*, 8 February; invited by Gregory S. Okin.
- 2008 Sundance Environmental Center, *When Deserts and Mountains Collide: The Problem of Dust in Mountain Snowcover*, 1 February.
- 2008 Utah Museum of Natural History, *When Deserts and Mountains Collide: The Problem of Dust in Mountain Snowcover*, 17 January.
- 2007 November, 2007, Lecture about research on impurities in snow and ice, *Global Climate Change seminar*, University of Utah.
- 2007 October, 2007, Presentation on research to the Leonardo, Utah Science Center.
- 2006 Western Water Assessment, NOAA, 'Accelerated post-settlement mountain snowmelt from desert dust radiative forcing', invited by Brad Udall.
- 2006 Natural Resource Ecology Laboratory, *'Dust in Snow Implications for Radiation and Hydrology in Colorado'*, invited by Jill Baron.
- 2006 European Geosciences Union, Session: 'Remote sensing of snow and sea ice', Title: *'Enhanced snow cover products from MODIS for the hydrologic and cryospheric sciences'*, invited by Marco Tedesco.
- 2005 University of California at Santa Barbara, Institute for Computational Earth System Science, *'Radiative and hydrologic impacts of desert dust deposits to alpine snow'*, invited by David Siegel.

Curriculum Vitae – T. H. Painter – September 2010

- 2005 University of Wageningen, The Netherlands, Centre for Geo-Information, Video-Conference Questions and Answers, invited by Michael Schaepman.
- 2005 University of Wageningen, The Netherlands, Centre for Geo-Information, '*New directions in remote sensing of mountain snowcover*', Professor Inauguration of Michael Schaepman.
- 2004 University of Wageningen, The Netherlands, Centre for Geo-Information, Video-Conference Questions and Answers, invited by Michael Schaepman.
- 2004 University of Wageningen, The Netherlands, Centre for Geo-Information, Topic: '*Imaging Spectroscopy of Alpine Snow*', invited by Michael Schaepman.
- 2002 Swiss Federal Institute for Snow and Avalanche Research, (Davos, Switzerland): '*Imaging spectroscopy of alpine snow cover*', invited by Jürg Schweizer.
- 2002 National Snow and Ice Data Center, University of Colorado (Boulder, CO, USA): '*Extension of subpixel snow mapping from hyperspectral to multispectral*', invited by Roger Barry.
- 2001 Department of Geography, University of Utah (Salt Lake City, UT, USA): '*Characterizing the alpine snowpack: hyperspectral goniometry to imaging spectroscopy*', invited by Thomas Cova
- 1998 Beijing, China: '*Automated Algorithm for Snow Properties from Imaging Spectrometer Data*', SPIE Imaging Spectrometry Meeting, invited by Robert O. Green

Editorial

Journals

Annals of Glaciology **48**, Papers of the cryospheric section of the 2008 International Union of Geodesy and Geophysics, Associate Editor.

Seminars Organized

- 2003-2006 **Cryospheric and Polar Processes Seminar**, National Snow and Ice Data Center, University of Colorado, Boulder
- 2002 **Front Range Cryosphere Seminar**, with Dr. Steven Fassnacht, co-convened at University of Colorado-Boulder and Colorado State University
- 1997 – 1999 **Remote Sensing: Techniques and Applications**, with Dr. Dar A. Roberts, University of California, Santa Barbara

Field Experience

- 2009 **Leader**, Field measurements of snow algae distribution and optical properties, Sierra Nevada, California, NASA Astrobiology Institute project Icy Worlds.
- 2008-present **Leader**, Field measurements of snow spectral reflectance, dust concentration, and snow water equivalence, Wasatch Mountains, Utah.
- 2005-present **Leader**, Field measurements of snow spectral reflectance, dust concentration, and snow water equivalence, Senator Beck Basin, San Juan Mountains, Colorado
- 2004 **Leader**, Field measurements of snow spectral reflectance and dust concentration, Senator Beck Basin, San Juan Mountains, Colorado
- 2003 **Participant**, Field measurements of glacier mass balance, Arapaho Glacier, Front Range, Colorado
- 2003 **Leader**, Field measurements of snow distribution for meteorological tower placement, Senator Beck Basin, San Juan Mountains, Colorado
- 2002-2003 **Intensive Study Area Leader and Team Leader**, NASA/NWS Cold Land Processes Experiment, Rocky Mountains, Colorado
- 2001 **Leader**, Field Measurements of Snow Bi-directional Reflectance Distribution Function and Spatial Distribution of Snow Physical Properties, Sierra Nevada, California
- 2000 **Co-leader and participant**, Field Measurements of Optical Properties of Algal Snow, Sierra Nevada, California
- 2000 **Leader and participant**, Ground Truth Mission for Research Scanning Polarimeter, Sierra Nevada, California
- 1997-1998 **Participant**, Monthly distributed snow water equivalent field campaigns - NASA, Sierra Nevada, California
- 1999-2002 **Co-leader**, Field measurements of optical and textural properties of desert surface, Manix Basin, California

Curriculum Vitae – T. H. Painter – September 2010

- 1995 – 2000 **Leader and participant**, Ground Truth Missions for NASA Airborne Visible InfraRed Imaging Spectrometer (AVIRIS), Sierra Nevada, California and Rocky Mountains, Colorado
- 1994 **Field Technician**, NASA BOREAS Project, Saskatchewan and Manitoba Provinces, Canada
- 1994 **Co-leader and Participant**, Ground Truth Mission for NASA SIR-C/X-SAR, Tien Shan, Xinjiang Province, China

Engineering and Design

- 2001 **Definition of Performance and Calibration Requirements**, Snow and ice property definitions for the Airborne Prism Experiment (APEX) airborne imaging spectrometer, in development by University of Zürich Remote Sensing Laboratories and Swiss-Belgian consortium on behalf of European Space Agency.
- 1998 – 2002 **Design, Contracting, and Assembly**, Automated Spectro-Goniometer (ASG), a robotic arm for the measurement of the hyperspectral bi-directional reflectance distribution function (BRDF) of snow

Data Management

- 2002 **Development**, Snow water equivalence field measurements data page, National Snow and Ice Data Center (NSIDC) (<http://nsidc.org/data/swe>)
- 1999 – 2002 **Design, Implementation, and Maintenance**, Data Management Plan, Mammoth Mountain Cooperative Snow Study Site (<http://neige.bren.ucsb.edu/mmsa/>)

Website Management

- 2001 – Present Webmaster, Western Snow Conf., (<http://www.westernsnowconference.org>)

Journal Reviews

Annals of Glaciology, Computers & Geosciences, Geophysical Research Letters, Hydrological Processes, IEEE Transactions on Geoscience and Remote Sensing, International Journal of Applied Earth Observation and Geoinformation, Journal of Geophysical Research-Atmospheres, Journal of Geophysical Research-Solid Earth, Journal of Glaciology, Journal of Atmospheric and Oceanic Technology, Photogrammetric Engineering and Remote Sensing, Remote Sensing of Environment, Water Resources Research

Proposal Reviews

National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), USDA Small Business Innovation Research (USDA, SBIR), US Army Research Laboratory, US Naval Research Laboratory

Scientific Committees/Working Groups

- 2010 AGU Governance Meeting, Washington DC, June 7-10.
- 2009 Soil Moisture Active Passive (SMAP), Calibration/Validation Workshop, June 9-11.
- 2009 NASA Astrobiology Institute, Strategic Initiative Workshop, Phoenix, AZ, May 13-15.
- 2009 Ice, Snow, and Water: Impacts of Climate Change on California and Himalayan Asia, La Jolla, CA, May 4-6.
- 2008 JPL HYSPIRI - Imaging Spectrometer and Infrared Imager - Science Workshop, Monrovia, CA, October 21-23.
- 2008 GOES-R, Algorithm Working Group Meeting, Madison, WI, June 23-26.
- 2008 NASA MODIS/VIIRS Workshop, Baltimore, MD, May 13-16.
- 2006 Phoenix Water Stressor Workshop, Consortium for Science, Policy, and Outcomes, Arizona State University, November 2-3.
- 2005 Snow System Science Workshop, Center for Snow and Avalanche Studies and Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder, October 21.
- 2005 San Juan Mountains 2nd Research Retreat, Mountain Studies Institute, September 17, *University of Colorado at Boulder*.
- 2004 Workshop on EOS Snow and Ice Products, Raytheon Building, Largo, MD, November 16-17, Invited Panelist.
- 2005 NSIDC Distributed Active Archive Center User Working Group, NSIDC, University of Colorado at Boulder, February 16-17 (Organizer for NSIDC)

Curriculum Vitae – T. H. Painter – September 2010

- 2004 NSIDC Distributed Active Archive Center User Working Group, NSIDC, University of Colorado at Boulder, June 2-4 (Organizer for NSIDC)
- 2004 Dust Emission and Modeling Workshop, University of Colorado at Boulder, October.
- 2003 NSIDC Distributed Active Archive Center User Working Group, Byrd Polar Research Center, Ohio State University, Columbus, OH, October 16-17 (Organizer for NSIDC)
- 2003 North Park Snow Workshop, National Center for Atmospheric Research, Boulder, CO, November 6-7
- 2003 8th NASA Cold Land Processes Experiment (CLPX) Workshop, Boulder, CO, May 28-29
- 2002 7th NASA Cold Land Processes Experiment (CLPX) Workshop, Hanover, NH, June 3-4
- 2001 6th NASA Cold Land Processes Experiment (CLPX) Workshop, Boulder, CO, November 7-9
- 1998 Post-2002 NASA Land Surface Hydrology Mission Planning Workshop, Irvine, CA, April

Service

- 2010 – Present AGU Council, Vice-Chair of Cryospheric Focus Group
- 2009 – Present NASA/HyspIRI Science Study Group
- 2008 - Present AGU Joint Focus Group Fellows Committee
- 2006 – Present American Geophysical Union Cryospheric Executive Board
- 2003 - 2007 National Snow and Ice Data Center Science Planning Board, Junior Scientific Representative
- 2004 - 2007 Science advisor, NSIDC MODIS product team
- 2004 - Present American Geophysical Union Remote Sensing Technical Committee

Professional Organizations

- AAC (American Alpine Club)
- AGU (American Geophysical Union)
- EGU (European Geophysical Union)
- IGS (International Glaciological Society)
- WSC (Western Snow Conference)

Scientific Collaborations

- CIRA Cooperative Institute for Research in the Atmosphere, Colorado State University, Global mapping of radiative forcing of desert dust in mountain snow cover (Steve Miller, Armin Sorooshian)
- CSAS Center for Snow and Avalanche Studies, Radiative effects of dust deposits in alpine snow (Chris Landry)
- JPL NASA Jet Propulsion Laboratory, Field and imaging spectroscopy of Earth analogues for astrobiological applications (Isik Kanik, Kevin Hand)
- JPL NASA Jet Propulsion Laboratory, Imaging spectroscopy of snow properties (Robert O. Green)
- JPL NASA Jet Propulsion Laboratory, Integration of remote sensing with hydrologic modeling (Noah P. Molotch)
- NCAR National Center for Atmospheric Research, Radiative effects of dust deposits in global snow cover (Mark Flanner)
- NREL Natural Resource Ecology Laboratory, Colorado State University, Phenology impacts of dust-induced snowmelt (Heidi Steltzer)
- NSIDC National Snow and Ice Data Center, Radiative and hydrologic effects of dust deposits in alpine snow (Andrew Barrett)
- NSIDC National Snow and Ice Data Center, Global Land Ice Measurements from Space (Richard Armstrong, Mary Jo Brodzik)
- NSIDC National Snow and Ice Data Center, Arctic sea ice albedo (Julienne Stroeve)
- PSI Paul Scherrer Institute, Villigen, Switzerland, Radiative forcing by black carbon in the Khumbu Himal (Susan Kaspari)
- RSL University of Zurich, Remote Sensing Laboratory, Zurich, Switzerland, Hyperspectral goniometric measurement of bidirectional reflectance distribution functions of terrestrial surfaces, Reflectance nomenclature (Michael Schaepman, Gabriela Schaepman-Strub)
- SIO Scripps Institute of Oceanography, La Jolla, CA, Remote sensing of snow algae (William Thomas)
- CU-B University of Colorado at Boulder, Radiative effects of dust deposits in global snow cover, Paleo records of dust emissions (Jason Neff)

Curriculum Vitae – T. H. Painter – September 2010

- UCI University of California, Irvine, Radiative effects of dust and soot in global snow cover (Charlie Zender)
- UCLA University of California, Los Angeles, Documentation of dust emission sites in western US and globally (Gregory Okin)
- UCM University of California, Merced, Integration of remotely sensed snow products into regional hydrologic models (Roger Bales)
- UCSB University of California, Santa Barbara, Spectral mixture analysis techniques for snow cover characterization with imaging spectrometer data (Jeff Dozier, Dar A. Roberts)
- USACE CRREL United States Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Optical properties and laboratory characterization of snow (Robert E. Davis)

Meetings/Sessions Convened

- 2010 Organizer, NSF Workshop on *Absorbing Impurities in Snow and Ice*, Silverton, CO 20-23 June.
- 2009 Session organizer, Fall AGU, San Francisco, CA, Session Titles: *Remote Sensing of the Cryosphere*.
- 2009 Session organizer, EGU, Vienna, Austria, Session Title: *Remote Sensing of the Cryosphere*.
- 2008 Session organizer, Fall AGU, San Francisco, CA, Session Titles: *Remote Sensing of the Cryosphere, Snow and Ice Impurities: Chemical, Climate, and Hydrologic Significance*
- 2007 Session organizer: Fall AGU, San Francisco, CA, Session Title: *Remote Sensing of the Cryosphere*.
- 2007 Science committee, 10th Symposium on Physical Measurements and Signatures in Remote Sensing, Davos, Switzerland, 12-14 March.
- 2005 Session organizer: Fall AGU, San Francisco, CA, Session Title: *Integrative Earth Sciences: Biogeochemical and Water Cycles* (joint with A, H, OS, PP, C, GC).

Programming Languages

FORTRAN77, FORTRAN90, IDL, C, Visual Basic, PERL, HTML, XML

Software

Image Processing
ENVI, IDL, IPW
Snowmelt Models
SNTHERM.89, SNOBAL

Personal Interests

Alpine and Nordic Skiing
Rock Climbing and Mountaineering
Road Cycling
Trail Running
International Travel
Music

Abstracts

2010

- [110] **Painter, T. H.**, Snowmelt and hydrologic response to radiative forcing by dust in the Colorado River Basin, *NSF Workshop on Impurities in Snow and Ice*, Silverton, CO.
- [109] **Painter, T. H.**, Runoff loss in the Upper Colorado River Basin driven by dust radiative forcing in snow, *Western Snow Conference*, Logan, UT (invited talk).
- [108] Bryant, A., and **T. H. Painter**, Radiative forcing by dust in snowmelt-dominated hydrologic systems using coupled satellite and in situ measurements, *Western Snow Conference*, Logan, UT.
- [107] Skiles, S. M., and **T. H. Painter**, Interannual variability in radiative forcing in snow of the Colorado River Basin by desert dust, *Western Snow Conference*, Logan, UT.
- [106] **Painter, T. H.**, Complexity of the spectral reflectance of snow cover from field and imaging spectroscopy, *Art, Science, and Applications of Reflectance Spectroscopy (ASD Symposium)*, Boulder, CO USA.

2009

Curriculum Vitae – T. H. Painter – September 2010

- [105] **Painter, T. H.**, J. S. Deems, J. Belnap, A. F. Hamlet, C. C. Landry, and B. Udall, U13B-0052 T1: Water yield loss in the Upper Colorado River basin driven by dust radiative forcing in snow, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [104] **Painter, T. H.**, K. E. Rittger, and J. Dozier, Assessment of the accuracy of current snow cover mapping algorithms for MODIS (*Invited*), *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [103] Bales, R. C., R. Rice, K. E. Rittger, and **T. H. Painter**, Trends in Sierra Nevada snowmelt based on 10 years of MODIS fractional snow covered area data: the apparent and the missing (*Invited*), *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [102] Brodzik, M., **T. H. Painter**, and R. L. Armstrong, A systematically-derived global glacier map derived from MODIS, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [101] Bryant, A. C., and **T. H. Painter**, Radiative forcing by desert dust in the Colorado River Basin from 2000 to 2009 inferred from MODIS data, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [100] Skiles, S. M., **T. H. Painter**, and A. P. Barrett, A five-year record of radiative and hydrologic forcing by desert dust in the Colorado River Basin, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [99] **Painter, T. H.**, and J. Dozier, Mountain snow cover, albedo, and space-time interpolation from multispectral sensors, *NGA Academic Research Program (NARP) Annual Meeting*, Washington, DC.
- [98] **Painter, T. H.**, and A. Bryant, Radiative Forcing of Dust in Mountain Snow from MODIS surface reflectance data, *AGU Joint Assembly*, Toronto, Canada.
- [97] Bryant, A., and **T. H. Painter**, Impact of Sub-Pixel Topographic Variation in Snow-Covered Area Modeling, *Association of American Geographers Annual Meeting*, Las Vegas, NV.

2008

- [96] **Painter, T. H.**, A. P. Barrett, C. C. Landry, P. McNeally, and A. Powell, A 4-year climatology of aerosol optical depth and dust concentration in a mountain snow cover regime, *Fall Meeting of the American Geophysical Union*.
- [95] Han, J., V. V. Salomonson, and **T. H. Painter**, Comparison of snow mapping methods over the Weber River Basin, Utah using MODIS observations, *Fall Meeting of the American Geophysical Union*.
- [94] Landry, C. C., **T. H. Painter**, and A. P. Barrett, Applying dust-on-snow research to Colorado water management, *Fall Meeting of the American Geophysical Union*.
- [93] Flanner, M. G., C S Zender, P G Hess, N M Mahowald, **T. H. Painter**, V Ramanathan, P J Rasch, Springtime Warming and Reduced Snow Cover from Carbonaceous Particles, *Fall Meeting of the American Geophysical Union*.
- [92] Molotch, N. P., S. A. Margulis, J. Dozier, **T. H. Painter**, D. Shen, and A. Kwok, Interannual variability in snow cover depletion and snow water equivalent in the Sierra Nevada inferred from MODIS data, *Fall Meeting of the American Geophysical Union*.
- [91] Rittger, C. McKenzie, **T. H. Painter**, and J. Dozier, Validation of binary, fractional, and interpolated snow maps at multiple resolutions, *Fall Meeting of the American Geophysical Union*.
- [90] **Painter, T. H.**, A. P. Barrett, C. C. Landry, J. C. Neff, and A. Guess, Linkages between dust from disturbed lands and snowmelt hydrology, *Annual Meeting of the Ecological Society of America*.
- [89] Jayne Belnap¹, Richard L. Reynolds², Marith C. Reheis², Jason C. Neff³, Frank E. Urban¹, Harland Goldstein², and Thomas Painter, Implications of disturbance and drought on aeolian processes in the southwestern US, *Annual Meeting of the Ecological Society of America*.
- [88] **Painter, T. H.**, K. Rittger, and J. Dozier, Validation and operationalization of the MODIS snow covered area and grain size (MODSCAG) model, *Eastern Snow Conference*, Fairlee, VT, USA.

2007

- [87] **Painter, T. H.**, M. P. Flanner, J. C. Neff, C. Zender, and N. Mahowald, Climate response in the western United States to dust-shortened snow cover duration since late 1800s soil disturbance, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [86] Landry, C. C., **T. H. Painter**, A. P. Barrett, and M. P. Cassidy, Toward Standardization in Methods and Techniques for Measuring and Monitoring Snowcover Albedo, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.

- [85] Dozier, J., J. S. Famiglietti, R. Rice, N. P. Molotch, K. Rittger, **T. H. Painter**, and R. C. Bales, Analysis of the Sierra Nevada Snowpack in the 21st Century, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [84] Lawrence, C. R., J.C. Neff, L. Farmer, **T. H. Painter**, C. Landry, Geochemical and Isotopic Estimates of Eolian Dust in Soils of the San Juan Mountains, USA, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [83] Frew, J., P. Slaughter, and **T. H. Painter**, ES3: Automatic capture and reconstruction of science product lineage and metadata, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [82] Ritter, K., **T. H. Painter**, and J. Dozier, Historical Analysis of Remotely Sensed Snow Properties' Relation to Streamflow, *Fall Meeting of the American Geophysical Union*, San Francisco, CA.
- [81] Neff, J. C., many others including **T. H. Painter**, Human caused increases in dust deposition in the Western US, *Annual Meeting of the Ecological Society of America*.
- [80] Nolin, A. W., **T. H. Painter**, Y. Knyazikhin, A multi-sensor synergistic approach to improving fractional snow cover mapping in forested areas, *2007 International Union for Geodesy and Geophysics*, Perugia, Italy.
- [79] Zender, C., M. Flanner, ... **T. H. Painter**, *2007 International Union for Geodesy and Geophysics*, Perugia, Italy.
- [78] Zender, C., M. Flanner, ... **T. H. Painter**, *2007 International Union for Geodesy and Geophysics*, Perugia, Italy.
- [77] **Painter, T. H.**, J. Dozier, P. Slaughter, and J. Frew, MODIS Fractional Snow Cover Products for Hydrologic Science with Space-Time Consistency, *2007 International Union for Geodesy and Geophysics*, Perugia, Italy.
- [76] **Painter, T. H.**, A. P. Barrett, C. Landry, J. Neff, M. P. Cassidy, C. Lawrence, K. E. McBride, and G. L. Farmer, Impact of disturbed desert soils on duration of mountain snowcover, *2007 International Union for Geodesy and Geophysics*, Perugia, Italy.
- [75] Nolin, A. W., **T. H. Painter**, and Y. Knyazikhin, A Multi-Sensor Synergistic Approach To Improving Fractional Snow Cover Mapping In Forested Areas, *2007 Eastern Snow Conference*, St. John's, Newfoundland, Canada.
- [74] **T. H. Painter**, N. P. Molotch, M. P. Cassidy, M. Flanner, and K. Steffen, Contact spectroscopy for the determination of stratigraphy of snow optical grain size, *2007 AVIRIS Workshop*, Pasadena, California, USA.
- [73] McBride, K., **T. H. Painter**, and C. Landry, A synoptic climatology of desert dust deposition to the alpine snowpack in the San Juan Mountains, Colorado, U.S.A., *2007 Annual Meeting of the AAG*, San Francisco, California, USA.
- [72] Rice, R., R. Bales, **T. H. Painter**, and J. Dozier, Snowcover along elevation gradients in the Upper Merced and Tuolumne River basin of the Sierra Nevada of California from MODIS and blended ground data, *2007 Western Snow Conference*, Kona, Hawaii, USA.

2006

- [71] **Painter, T. H.**, J. Dozier, M. P. Clark, and P. Slaughter, Enhanced snow cover products from MODIS for the hydrologic and cryospheric sciences, *2006 European Geophysical Union*, Vienna, Austria.
- [70] **Painter, T. H.**, A. P. Barrett, J. C. Neff, and C. Landry, Radiative forcing by dust deposition in mountain snow cover, *2006 European Geophysical Union*, Vienna, Austria.
- [69] Rice, R., **T. H. Painter**, and R. Bales, Integration of the MODIS snowcover products into snowmelt runoff modeling, *2006 Western Snow Conference*, Las Cruces, NM.
- [68] **Painter, T. H.**, A. P. Barrett, C. Landry, M. Cassidy, J. C. Neff, C. Lawrence, K. Thatcher, Radiative and Hydrologic Forcing by Desert Dust in Mountain Snow, *2006 CIRES Symposium*, Boulder, CO, USA.
- [67] Barrett, A. P., **T. H. Painter**, and C. Landry, Impact of desert dust on melt rates and runoff from mountain snowpacks, *63rd Eastern Snow Conference*, Newark, Delaware, USA.
- [66] **Painter, T. H.**, and N. P. Molotch, Realization of snow/vegetation interactions with field spectroscopy and automated snow depth observations, *63rd Eastern Snow Conference*, Newark, Delaware, USA.
- [65] Dozier, J., R. O. Green, A. W. Nolin, and **T. H. Painter**, Interpretation of Snow's Color from Imaging Spectrometry, *IGARSS 2006*, Denver, Colorado, USA.
- [64] Frew, J., **T. H. Painter**, P. Slaughter, and J. Dozier, Tracking Metadata and Lineage of the Data Processing Chain for Mapping Snow Cover Properties With the NASA MODIS, *IGARSS 2006*, Denver, Colorado, USA.

- [63] Landry, C., **T. H. Painter**, A. P. Barrett, and J. Neff, Radiative and hydrologic impacts of desert dust in mountain snow cover, *Colorado Water Workshop*, Gunnison, Colorado, USA.
- [62] **Painter, T. H.**, Shortwave radiative and snowmelt forcing by dust deposition in mountain snow cover, *MTNCLIM Symposium 2006*, Mt. Hood, Oregon, USA.
- [61] **Painter, T. H.**, and M. P. Cassidy, Hyperspectral Analysis of Direct Shortwave Radiative Forcing of Dust in Mountain Snowcover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.
- [60] Barrett, A. P., **T. H. Painter**, and C. Landry, Impacts of desert dust on snowmelt and runoff from mountain snow cover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.
- [59] Anderson, A., and **T. H. Painter**, The effect of desert dust on avalanche formation, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.
- [58] Deems, J., and **T. H. Painter**, Lidar measurement of snow depth: accuracy and error sources, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.
- [57] Lawrence, C., J. Neff, **T. H. Painter**, and S. Castle, The coupling of mountains and deserts: Biogeochemical influence of eolian deposition in the San Juan Mountains, CO USA, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.
- [56] **Painter, T. H.**, A. P. Barrett, C. Landry, J. Neff, M. P. Cassidy, C. Lawrence, and K. McBride, Shortwave radiative and melt forcing by dust in mountain snow cover, *Fall AGU 2006*, San Francisco, California, USA.
- [55] Barrett, A. P., and **T. H. Painter**, Diagnosing Early 2006 Snowmelt and Runoff in the Colorado Rocky Mountains, *Fall AGU 2006*, San Francisco, California, USA.
- [54] Schneebeli, M., C. Maetzler, and **T. H. Painter**, The Relevance of a Precise In Situ Measurement of the Optically Equivalent Grain Size in a Snowpack, *Fall AGU 2006*, San Francisco, California, USA.
- [53] Rice, R., R. Bales, and **T. H. Painter**, Estimating the spatial distribution of snow properties in Sierra Nevada, California basins using MODIS fractional snowcover products, *Fall AGU 2006*, San Francisco, California, USA.
- [52] Nolin, A. W., **T. H. Painter**, and M. C. Payne, A Spectro-directional Approach To Improving Snow Cover Mapping In Forested Areas, *Fall AGU 2006*, San Francisco, California, USA.
- [51] Molotch, N. P., **T. H. Painter**, and M. P. Cassidy, Snow / Vegetation Interactions Inferred From Contact Spectroscopy, *Fall AGU 2006*, San Francisco, California, USA.
- [50] Dozier, J., **T. H. Painter**, and J. E. Frew, Space-Time Series of MODIS Snow Cover Products, *Fall AGU 2006*, San Francisco, California, USA.
- [49] Khalsa, S. J. S., **T. H. Painter**, M. McAllister, and R. Duerr, Applications of MODIS Snow and Ice Products, *Fall AGU 2006*, San Francisco, California, USA.
- [48] Landry, C., P. Lyon, **T. H. Painter**, and A. P. Barrett, Mountain system monitoring at Senator Beck Basin, San Juan Mountains, Colorado, *Fall AGU 2006*, San Francisco, California, USA.
- [47] Sickman, J., N. P. Molotch, T. Meixner, M. Williams, and **T. H. Painter**, Estimating Stream Chemistry During the Snowmelt Pulse Using Remotely Sensed Snow Observations and a Coupled Snowmelt and Biogeochemical Modeling Approach, *Fall AGU 2006*, San Francisco, California, USA.
- [46] Zender, C. S., M. G. Flanner, J. T. Randerson, N. M. Mahowald, P. J. Rasch, M. Yoshioka, and **T. H. Painter**, Climate Effects and Efficacy of Dust and Soot in Snow, *Fall AGU 2006*, San Francisco, California, USA.

2005

- [45] **Painter, T.H.**, R. Bales, and J. Dozier, Enhanced subpixel snow cover products from MODIS for snowmelt hydrologic applications, *4th EARSeL Workshop – Remote sensing of snow and glaciers – Important Water Resources of the Future*, 21-23 February 2005, Berne, Switzerland.
- [44] **Painter, T. H.**, J. Neff, C. Landry, and A. P. Barrett, Radiative and hydrologic effects of desert dust deposits in alpine snow, *Annual meeting of the Association of American Geographers*, 5-9 April, Denver, CO.
- [43] Deems, J., **T. H. Painter**, and C. Landry, Spatial and historical contingency of snowpack properties, *Annual meeting of the Association of American Geographers*, 5-9 April, Denver, CO.
- [42] **Painter, T. H.**, J. Dozier, and R. Bales, Enhanced Satellite Remote Sensing Products from MODIS for Estimation of Snowcover, *Western Snow Conference*, 11-14 April, Great Falls, MT.

- [41] Clark, M., A. Slater, A. Barrett, L. Hay, G. Leavesley, and **T. H. Painter**, Hydrologic Applications of Remotely Sensed Snow Information: Challenges and Opportunities, *Western Snow Conference*, 11-14 April, Great Falls, MT.
- [40] **Painter, T. H.**, A.P. Barrett, C. Landry, and J.C. Neff, Desert dust deposition in mountain snow cover, *2005 Fall AGU Meeting*, San Francisco, CA.
- [39] Barrett, A.P., **T.H. Painter**, and C. Landry, Impact of Desert Dust on Meltrates and Runoff from Mountain Snowpacks, *2005 Fall AGU Meeting*, San Francisco, CA.
- [38] Cassidy, M., and **T.H. Painter**, Hyperspectral Analysis of Dust Concentration, Snow Grain Size, and Broadband Albedo of Alpine Snowcover, *2005 Fall AGU Meeting*, San Francisco, CA.
- [37] Dozier, J., **T.H. Painter**, and J. E. Frew, Characteristics of Snow Cover in the Sierra Nevada from MODIS and Landsat, *2005 Fall AGU Meeting*, San Francisco, CA.
- [36] Mahowald, N., D. Muhs, S. Levis, M. Yoshioka, P. Rasch, C. Zender, G. Okin, and **T.H. Painter**, Deposition Changes in the Past And The Future, *2005 Fall AGU Meeting*, San Francisco, CA.
- [35] McBride, K., **T.H. Painter**, and C. Landry, A synoptic climatology of desert dust deposition to the alpine snowpack in the San Juan Mountains, Colorado, U.S.A., *2005 Fall AGU Meeting*, San Francisco, CA.
- [34] Neff, J., L. Farmer, **T.H. Painter**, C. Landry, and R. Reynolds, Effects of Desert Dust on Nutrient Cycling in the San Juan Mountains, Colorado, *2005 Fall AGU Meeting*, San Francisco, CA.

2004

- [33] **Painter, T. H.**, Analysis of the 2003 AVIRIS acquisitions for the Cold Land Processes Experiment, *2004 AVIRIS Workshop*, Pasadena, CA.
- [32] **Painter, T. H.**, R. Bales, Enhanced snow cover products from MODIS for the hydrologic sciences, *2004 Fall AGU Meeting*, San Francisco, CA.
- [31] Bales, R., J. Dozier, N. Molotch, **T. H. Painter**, and R. Rice, Mountain hydrology of the semi-arid western U.S.: Research needs, opportunities, and challenges, *2004 Fall AGU Meeting*, San Francisco, CA.
- [30] Landry, C., **T. H. Painter**, and A. P. Barrett, Mountain snow system interactions – an integrative approach, *2004 Fall AGU Meeting*, San Francisco, CA.
- [29] Molotch, N. P., **T.H. Painter**, and R.C. Bales, Simulating snow / atmosphere energy exchange using semi-physical models and remotely sensed snow albedo data, *2004 AGU Western Pacific Geophysics Meeting*, Honolulu, HI.

2003

- [28] **Painter, T. H.**, 2002 NASA/NWS Cold Land Processes Experiment (CLPX): AVIRIS Missions, *2003 AVIRIS Workshop*, Pasadena, CA.
- [27] Molotch, N., **T. H. Painter**, and J. Dozier, Incorporation of remotely-sensed snow grain size into a spatially-distributed physical snowmelt model, *2003 AVIRIS Workshop*, Pasadena, CA.
- [26] **Painter, T. H.**, W. H. Thomas, and B. Duval, Spatio-temporal dynamics of alpine snow algae measured with multi-year imaging spectrometer data, *AGU/EGS Joint Assembly*, Nice, France.
- [25] Molotch, N. P., **T. H. Painter**, R. C. Bales, and J. Dozier, Accuracy assessment of a net radiation and temperature index snowmelt model using ground observations of snow water equivalent in an alpine basin, *AGU/EGS Joint Assembly*, Nice, France.
- [24] Molotch N. P., **T. H. Painter**, R. C. Bales, and J. Dozier, Incorporating Net Radiation Data into an Index Snowmelt Model in an Alpine Basin, *2003 Western Snow Conference*, Scottsdale, AZ.
- [23] **Painter, T. H.**, Analysis of airborne and spaceborne hyperspectral data for the 2003 Cold Land Processes Experiment, *2003 Fall AGU Meeting*, San Francisco, CA.
- [22] Clark, B., **T. H. Painter**, W. Manley, and J. Dixon, Using sub-pixel resolution of satellite imagery to determine archeological site potential in the cryosphere, *2003 Fall AGU Meeting*, San Francisco, CA.
- [21] Barrett, A. P., M. Dyrgerov, **T. H. Painter**, T. Pfeffer, and B. Raup, Mass Balance Measurements of a Small Glacier in the Colorado Front Range, *2003 Fall AGU Meeting*, San Francisco, CA.
- [20] Molotch, N.P., **T.H. Painter**, R.C. Bales, and J. Dozier, Assimilation of remotely sensed snow cover properties into operational snowmelt modeling, *13th Annual El Dia del Agua*, Dept. of Hydrology and Water Resources, University of Arizona.

2002

- [19] **Painter, T. H.**, J. Dozier, and D. A. Roberts, The effect of anisotropic reflectance on retrievals of snow properties from imaging spectrometer data, *Summaries of the 11th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory.
- [18] Okin, G., and **T. H. Painter**, Grain size effects on spectral reflectance of desert soil surfaces, *11th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA.
- [17] **Painter, T. H.**, Analysis of airborne and spaceborne hyperspectral data for the 2002 Cold Land Processes Experiment, *2002 Fall AGU Meeting*, San Francisco, CA.
- [16] Colee, M. T., **T. H. Painter**, Dozier, J., Turney, D., and N. Molotch, A Spatially-Explicit Snow Model of a Mid-latitude Alpine Basin, *2002 Fall AGU Meeting*, San Francisco, CA.
- [15] Molotch, N., **T. Painter**, M. T. Colee, R. C. Bales, and J. Dozier, Incorporating Remotely Sensed Snow Surface Grain Size Into Spatially Distributed Snowmelt Modeling, *2002 Fall AGU Meeting*, San Francisco, CA.
- [14] Davis, R. E., D. Cline, K. Elder, G. Scharfen, M. Parsons, J. C. Shi, K. McDonald, and **T. Painter**, The Cold Land Processes Field Experiment (CLPX): Satellite Measurements, *2002 Fall AGU Meeting*, San Francisco, CA.
- [13] Carroll, T., D. Cline, D. Imel, J. C. Shi, A. Gasiewski, S. Yueh, **T. Painter**, and S. Katzberg, The Cold Land Processes Field Experiment (CLPX): Airborne Remote Sensing Data Collection, *2002 Fall AGU Meeting*, San Francisco, CA.

2001

- [12] **Painter, T. H.**, B. Duval, W. Thomas, and J. Dozier, Mapping snow algae concentrations in the Sierra Nevada snowpack with AVIRIS data, *10th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA.
- [11] **Painter, T. H.**, J. Dozier, and D. A. Roberts, The effect of anisotropic bi-directional reflectance on imaging spectroscopy models for retrieving snow physical properties, *2001 Fall AGU Meeting*, San Francisco, CA.

2000

- [10] Sickman, J.O., J.L. Stoddard, **T.H. Painter**, and J.M. Melack, Regional analysis of inorganic-nitrogen yield and retention in high-elevation ecosystems of the Sierra Nevada and Rocky Mountains, *2000 Fall AGU Meeting*, San Francisco, CA.

1997

- [9] Albright, T., **T.H. Painter**, D.A. Roberts, E. Fielding, J.C. Shi, and J. Dozier, Mapping snow and ice in the Khumbu Himal with DEM-corrected SIR-C/X-SAR data, *Workshop on Remote Sensing of Planetary Ices: Earth and Other Solid Bodies*, Flagstaff, AZ.
- [8] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Snow-covered area and grain size from remotely-sensed spectral data, *ICE, News Bulletin of the International Glaciological Society*, **113/114**.
- [7] **Painter, T.H.**, D.A. Roberts, and J. Dozier, Distributed sub-pixel snow parameters from remote sensing of maritime and continental snow regimes, *1997 Fall AGU Meeting*, San Francisco.

1996

- [6] Ojima, D.S., T.G.F. Kittel, R. McKeown, D.S. Schimel, W.J. Parton, H.H. Fisher, and **T.H. Painter**, Ecosystem modeling of spatially explicit land surface changes for climate and global change analysis, *Workshop on Integrating GIS and Environmental Modeling*, Santa Fe, NM.
- [5] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Snow-covered area and snow grain size from complex mixture analysis, *Progress in Electromagnetics Research Symposium (PIERS'96)*, Innsbruck, Austria, **546**.
- [4] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Sub-pixel snow-covered area and snow grain size from reference endmember spectral mixture models, *1996 Fall AGU Meeting*, San Francisco, CA.

1995

- [3] Rosenbloom, N.A., T.F.G. Kittel, R. McKeown, D.S. Schimel, and **VEMAP Modeling Participants**, The importance of topographic effects in a gridded bioclimatology for scaling ecological models, *1995 AGU Spring Meeting*, Baltimore, MD, EOS, **S126**.
- [2] Kittel, T.G.F., N.A. Rosenbloom, D.S. Schimel, **T.H. Painter**, H.H. Fisher, A.W. Grimsdell, and VEMAP Modeling Participants, A bioclimatic, soils, and land cover database for simulation of U.S. ecosystem/Vegetation responses to global change: The VEMAP dataset, *IUGG XXI General Assembly*, Boulder, CO, **A200**.

1994

- [1] Kittel, T.G.F., N.A. Rosenbloom, **T.H. Painter**, D.S. Schimel, and VEMAP Modeling Participants, A physically-consistent database for simulation of U.S. ecosystem/vegetation responses to global change: The VEMAP dataset, *1994 AGU Fall Meeting*, San Francisco, CA, EOS, **218**.

Conference Proceedings

2006

- [19] **Painter, T. H.**, A. P. Barrett, and C. Landry, Shortwave radiative forcing by desert dust deposition in mountain snowcover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

2005

- [18] **Painter, T. H.**, J. Dozier, and R. Bales, Enhanced satellite remote sensing products from MODIS for estimation of snow cover, *Proceedings of the 73rd Western Snow Conference*, Great Falls, Montana, USA.

- [17] Schaepman-Strub G, M Schaepman, S Dangel, **T.H. Painter** and J Martonchik, About the use of reflectance terminology in imaging spectroscopy. *EARSeL eProceedings*, 4(2), 191-202.

2004

- [16] Schaepman-Strub, G., **T. H. Painter**, S. Huber, S. Dangel, M. Schaepman, J. Martonchik, and F. Berendse, About the importance of the definition of reflectance quantities – results of case studies, *ISPRS 2004*, Istanbul, Turkey.

2002

- [15] **Painter, T. H.**, and J. Dozier, Measurements of the bi-directional reflectance factor of snow at fine spectral and angular resolution, *Proceedings of the 70th Western Snow Conference*, Sol Vista, Colorado, USA.

2001

- [14] **Painter, T. H.**, B. Duval, W. H. Thomas, M. Mendez, S. Heintzelman, and J. Dozier, Mapping snow algae concentration in the Sierra Nevada with imaging spectroscopy, *Proceedings of the Western Snow Conference (in press)*, Sun Valley, Idaho.

- [13] Molotch, N. P., **T. H. Painter**, M. T. Colee, C. W. Rosenthal, J. Dozier, and R. C. Bales, Analysis of the spatial variability of snow cover depletion in an alpine watershed, Tokopah Basin, Sierra Nevada, California, USA, *Proceedings of the Western Snow Conference*, Sun Valley, Idaho, USA (*Best Student Paper Award*).

2000

- [12] **Painter, T.H.**, B. Paden, and J. Dozier, Automated Spectro-Goniometer: a robotic arm for the measurement of snow bi-directional reflectance distribution function, *Western Snow Conference 2000*, Port Angeles, WA (*Best Student Paper Award*).

- [11] Colee, M.T., **T.H. Painter**, C.W. Rosenthal, and J. Dozier, A high-resolution distributed snowmelt model in an Alpine catchment, *Western Snow Conference 2000*, Port Angeles, WA.

- [10] **Painter, T.H.**, J. Dozier, and D. A. Roberts, Validation of an automated algorithm for the retrieval of snow covered area and snow grain size from imaging spectrometer data, *Proceedings SPIE2000*, San Diego, California.

- [9] **Painter, T.H.**, R.E. Davis, J. Dozier, D. Donahue, W. Li, R. Kattelman, D. Dawson, W. Rosenthal, J. Fiori, B. Harrington, and P. Pagner, The Mammoth Mountain cooperative snow study site: Data acquisition, management, and dissemination, *International Snow Science Workshop 2000*, Big Sky, Montana.

1999

- [8] Okin, G.S., B. Murray, D.W. Curkendall, H. Siegel, J. Collier, C.D. Miller, D.A. Roberts, **T.H. Painter**, and W.J. Okin, The Supercomputing Visualization Workbench for the Analysis and Classification of Imaging Spectrometer Data, *Summaries of the 8th JPL Airborne Earth Science Workshop, AVIRIS Workshop*, Jet Propulsion Laboratory.

1998

- [7] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Automated subpixel snow parameter mapping with AVIRIS data, *Summaries of the 7th JPL Airborne Earth Science Workshop, AVIRIS Workshop*, Jet Propulsion Laboratory.

- [6] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Automated subpixel snow parameter mapping of imaging spectrometer data, *SPIE '98*, Beijing, China (*Invited Paper*).

1997

Curriculum Vitae – T. H. Painter – September 2010

- [5] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Estimating snowcover and grain size from AVIRIS data with spectral mixture analysis and modeled snow spectra, *SPIE '97*, San Diego, CA.

1996

- [4] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Sub-pixel snow-covered area and snow grain size from mixture analysis with AVIRIS data, *Summaries of the Sixth Annual JPL Airborne Earth Science Workshop*, AVIRIS Workshop, Jet Propulsion Laboratory, Pasadena, CA.
- [3] Shi, J.C., **T.H. Painter**, and J. Dozier, Estimation of snow surface albedo using Landsat Thematic Mapper, *Proceedings IGARSS'96*, Lincoln, NE, pp. 2249-2251.

1995

- [2] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Improving alpine-region spectral unmixing with optimal-fit snow endmembers, *Summaries of the Fifth Annual JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA, pp. 125-128.
- [1] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Improving alpine-region spectral mixture analysis estimates of snow-covered area, *Proceedings of Conference on Multispectral and Hyperspectral Sensing of Forestry and Natural Resources at the European Symposium on Satellite Remote Sensing II*, Paris, France, SPIE Volume 2585, pp. 323-333.