ANNE W. NOLIN

Assistant Professor
Department of Geosciences
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Oregon State University
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RESEARCH INTERESTS

Snow hydrology, western U.S. water resources, cryosphere-climate interactions, remote sensing (hyperspectral, multispectral, and multiangular spectrometry, laser altimetry, passive microwave), snowmelt modeling, and radiative transfer modeling.

EDUCATION

Ph.D. 1993 Department of Geography
The University of California-Santa Barbara

M.S. 1987 Department of Soil and Water Science
The University of Arizona

B.A. 1980 Department of Anthropology (Minor: Geology)
The University of Arizona

PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Geosciences, Oregon State University
December, 2002 – present

Research Scientist, National Snow and Ice Data Center, University of Colorado-Boulder
September, 1994 – December, 2002

Visiting Fellow, CIRES, University of Colorado, Boulder
September, 1993 – September, 1994

Graduate Student Researcher, Dept. of Geography, University of California-Santa Barbara
January, 1987 – September, 1993 (Dr. Jeff Dozier, Ph.D. Advisor)

Post-graduate fellow, NASA/Jet Propulsion Laboratory
September, 1989 – June, 1992

Graduate Research Assistant, Dept. of Soils, Water and Engineering, University of Arizona
January, 1985 – June, 1987 (Dr. Alfredo Huete, M.S. Advisor)

AWARDS AND HONORS

August, 2005 - present: Expert Reviewer for the Working Group I contribution to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, *Climate Change 2007: The Physical Science Basis*

March, 2005 - present: Vice-chair, Panel for Water Resources and the Global Hydrologic Cycle, National Academies of Science study on Earth Science and Applications from Space: A Community Assessment and Strategy for the Future

February, 2000 - present: Science Team Member of NASA's Multi-angle Imaging SpectroRadiometer (MISR)

January, 2002: NASA Group Achievement Award as part of the Multi-angle Imaging SpectroRadiometer Science Team

September, 1993 – September, 1994: CIRES Visiting Fellow, University of Colorado, Boulder

September, 1989 – June, 1992: Post-graduate Research Fellow, NASA/Jet Propulsion Laboratory, Pasadena, CA

CURRENT AND RECENT CONTRACTS AND GRANTS

Title: Influence of Climate Change on Water Supply in the McKenzie River Basin: Analysis of Long-term and Spatial Hydrologic Data
Funding Agency: CWESt/USGS
Principal Investigator: Anne Nolin
Period: April 1, 2005 – March 31, 2006
Amount: $41,212

Title: An Energy-Balance Automated Weather Station
Funding Agency: OSU/RERF
Principal Investigator: Anne Nolin
Period: January, 2005
Amount: $11,443

Title: Geosciences Winter Policy Seminar: "Formulating Policy for an Uncertain Earth"
Funding Agency: OSU Foundation, L.L. Stewart Faculty Development Award
Principal Investigator: Anne Nolin
Period: January 1, 2004 – June 30, 2004
Amount: $2,200

Title: Multiresolution Snow Products for the Hydrologic Sciences
Funding Agency: NASA
Principal Investigator: Jeff Dozier, University of California-Santa Barbara
Co-Investigators/Collaborators: James Frew, Jiancheng Shi, Thomas Painter, Anne Nolin, Walter Rosenthal, Mike Colee, Debbie Donohue
Period: 7/1/03 – 6/30/08
OSU Subcontract Amount: $140,000

Title: Improving Arctic Energy Budget Estimates by Combining New EOS-Era Products from Multiple Satellite Sensors
Funding Agency: NASA
Principal Investigator: Eugene Clothiaux, Penn State University
Co-Investigators/Collaborators: Anne Nolin, Jennifer Francis, Larry DiGiralomo, and Seiji Kato
Period: 7/1/03 – 6/30/08
OSU Subcontract Amount: $94,000

Title: Support for MISR Science Team Activities

Funding Agency: NASA
Principal Investigator: David J. Diner, NASA/JPL
Period: 04/1/04 – 03/31/07
OSU Subcontract Amount: $100,000

Title: Validation Studies and Sensitivity Analyses for Retrievals of Snow Albedo from MODIS and MISR
Funding Agency: NASA
Principal Investigator: Anne Nolin
Co-Investigator: Julienne Stroeve
Period: 11/97-9/04
Amount: $333,000

Title: Support for MISR Science Team Activities
Funding Agency: NASA
Principal Investigator: David J. Diner, NASA/JPL
Period: 12/02 – 03/04
Subcontract Amount: $12,435

Title: Improving Operational Hydrologic Forecasting in the Upper Colorado River Basin, Southwest Regional Earth Science Applications Center (SW-RESAC), a subcontract to CU-Boulder from the University of Arizona (Project PI: Roger Bales)
Funding Agency: NASA
Principal Investigator: Anne Nolin
Subcontract Co-Investigator: Martyn Clark
Period: 2/99-2/03
Amount: $236,000

Title: Local, Regional, and Remote Effects of Northern Hemisphere Snow Cover on Western US Climate and Water Resources
Funding Agency: NSF
Principal Investigator: Anne Nolin
Co-Investigators: Sue Marshall, Mark Serreze, Martyn Clark, Allan Frei, Martin Hoerling
Period: 9/99–8/03
Amount: $399,000

Title: A Regional, Integrated Monitoring System for the Hydrology of the Pan-Arctic Land Mass
Funding Agency: NASA
Principal Investigator: Mark Serreze
Co-Investigators: Anne Nolin, Roger Barry, Richard Armstrong, Tingjun Zhang, Charles Vorosmarty
Period: 8/00 – 7/03
Amount: $536,000

Title: Investigating Downscaling Techniques and Evaluating Climate Models for Use in Estimating Regional Water Resources in Mountainous Regions Under Changing Climate Conditions
Funding Agency: NASA
Principal Investigator: Allan Frei
Co-Investigators: Anne Nolin, Richard Armstrong, Mark Serreze
Period: 7/98-8/03
Amount: $318,000

Title: Advancing Glaciological Applications of Remote Sensing with EO-1
Funding Agency: NASA
Principal Investigator: Robert Bindschadler
Co-Investigators: Anne Nolin, Ted Scambos, Mark Fahnestock, Dorothy Hall, Julienne Stroeve
Period: 1/00 – 12/03
Amount: $118,000

Title: Multispectral Analysis of the Martian Polar Ice Caps
Funding Agency: NASA
Principal Investigator: Anne Nolin
Co-Investigator: Bill Farrand
Period: 3/99-2/03
Amount: $222,000

COURSES TAUGHT
Remote Sensing of the Environment, GEO 444/544
Digital Image Processing, GEO 466/566
Advanced Techniques in Remote Sensing and Digital Image Processing, GEO 439/539
Snow Hydrology, GEO 483/583
Proseminar, GEO 518
Geography Fall Seminar GEO 407/507
Geosciences Winter Seminar GEO 407/507 (“Formulating Policy for an Uncertain Earth”)

STUDENT ADVISING
Current Graduate Advisor:
Jon Michael Bosley, Dept. of Geosciences, OSU (M.S.)
Robert Friedel, Dept. of Geosciences, OSU (M.S.)
Quin Ourada, Dept. of Geosciences, OSU (M.S.)
Jeff Schmalenberg, Dept. of Geosciences, OSU (M.S.)
David Selkowitz, Dept. of Geosciences, OSU (M.S.)
Preeti Tuladar, Dept. of Geosciences, OSU (M.S.)

Current Graduate Committee Member:
Ryan Dey, Dept. of Geosciences, OSU (M.S.)
Keldah Hedstrom, Dept. of Geosciences, OSU (M.S.)
Jennifer Hogue, Dept. of Geosciences, OSU (M.S.)
Biniam Iyob, Dept. of Geosciences, OSU (M.S.)

Sarah Purdy, Dept. of Anthropology, OSU (M.S.)
Faron Anslow, Dept. of Geosciences, OSU (Ph.D.)
Erika Kraft, Dept. of Bio-Resources Engineering (Ph.D.)
Derrick Lampkin, Dept. of Geography, University of Arizona (Ph.D.)
Janine Rice, Dept. of Geosciences. OSU (Ph.D.)
Vijay Satyal, Environmental Sciences Graduate Program, OSU (Ph.D.)

Committee Member for Completed Degrees:
Dale Lindeman, Dept. of Geosciences, OSU (M.S.)
Sarah Lobser, Dept. of Forestry, OSU (M.S.)
Eileen Hall-McKim, Dept. of Geography, University of Colorado (M.S.)
Mark Rempel, Dept. of Geosciences, OSU (M.S.)
Julienne Stroeve, Dept. of Geography, University of Colorado (Ph.D.)

Undergraduate Advising:
Adam Koslowski, Dept. of Geosciences, OSU (Undergraduate special project)

DEPARTMENTAL SERVICE
2005 – present: Member, Alumni Relations Committee

2004 – 2005: Member, Curriculum Committee

Winter 2004: Organized Geosciences policy seminar entitled "Formulating Policy for an Uncertain Earth"

2003 – 2004: Member, Long Range Planning Committee

UNIVERSITY SERVICE
2005 – present: Search Committees: COSINe Director, COAS Solid Earth Remote Sensing faculty position, Bioengineering River EcoEngineer faculty position

2004 – present: Member, of Pacific Northwest Hydrologic Observatory Design Team

2004 – present: Member, Water Resources Graduate Degree Program

2004 – present: Member, Institute for Water and Watersheds

1997-2001: NSIDC Research Scientist representative to the CIRES Members Council

1996-2003: Member, the Colorado Center for Chaos and Complexity

SERVICE TO SCIENTIFIC COMMUNITY
August 2005 – present: Assistant Editor, Remote Sensing of Environment – Special Issue on Multi-angular Remote Sensing.

August, 2005 - present: Expert Reviewer for the Working Group I contribution to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, *Climate Change 2007: The Physical Science Basis*

March, 2005 - present: Vice-chair, Panel for Water Resources and the Global Hydrologic Cycle, National Academies of Science study on Earth Science and Applications from Space: A Community Assessment and Strategy for the Future

Assistant Editor, Annals of Glaciology, vol. 40

Convener, Third International Workshop on Multiangular Measurements and Models, June 10-12, 2001, **http://cires.colorado.edu/iwmmm-3**

Co-convener, First Conference on Mars-Earth Planetary Science, June 1998.

2001 – 2003 Member, AAG Cryospheric Specialty Group Board of Directors

Manuscript reviewer for the following journals:

Water Resources Research
Journal of Hydrometeorology
Journal of Geophysical Research
IEEE Trans. on Geoscience and Remote Sensing
Journal of Glaciology
Arctic, Antarctic, and Alpine Research
Cold Regions Science and Technology
Hydrological Processes
Geophysical Research Letters
Journal of Climate
Remote Sensing of Environment
Annals of Glaciology
Int'l Journal of Remote Sensing
Physical Geography

Proposal reviewer for the following agencies:

NASA, NSF, NOAA, USDA, DOE, USGS, Swiss National Science Foundation, Space Research Organization, Netherlands

Educational outreach activities:

Glaciology consultant for Science Discoverers, University of Colorado
Featured in an NSF-funded poster project: "Visualizing Women in Science, Mathematics and Engineering" (http://www.physics.ucla.edu/scienceandart/pdavisposters.index.html), 2001
Earth Systems Science Workshop for K-12 Teachers, 1997
Panel Discussant, "Polar Careers Discussion", National Science and Technology Week, 1998
Family Science Day volunteer, 1998

PROFESSIONAL AFFILIATIONS

American Geophysical Union
Association of American Geographers
International Glaciological Society
American Meteorological Society

PEER-REVIEWED PUBLICATIONS

Schmalenberg, J., A. **Nolin** and J. McDonnell, Wildfire effects on snow accumulation and ablation in the Cascade Mountains of Oregon, Proc. Western Snow Conference, *in press*.

Farrand, W.H., L. Kirkland, A.W. **Nolin**, and K. Thome. "Principles of Hyperspectral Remote Sensing" chapter in Hyperspectral Remote Sensing (E.A. Cloutis, Ed.), a volume in the 3rd Edition of the Manual of Remote Sensing, ASPRS, *in press*.

Diner, D. J., B. H. Braswell, R. Davies, N. Gobron, J. Hu, Y. Jin, R. A. Kahn, Y. Knyazikhin, N. Loeb, J-P.Muller, A. W. **Nolin**, B. Pinty, C. B. Schaaf, G. Seiz, and J. Stroeve, The value of multiangle measurements for retrieving structurally and radiatively consistent properties of clouds, aerosols, and surfaces, Remote Sens. Environ., 97, 495-518, 2005.

Stroeve, J., Box, J., Gao, F., Liang, S., **Nolin**, A., Schaaf C., Accuracy Assessment of the MODIS 16-day albedo product for snow: Comparisons with Greenland in situ Measurements. Remote Sensing of the Environment, 94, 46-60, 2005.

Nolin, A. W., Towards retrieval of forest cover density over snow using the Multi-angle Imaging SpectroRadiometer (MISR), Hydrological Processes, 18, 3623-3636, 2004.

Marshall, S., R. J Oglesby and A. W. **Nolin**, The predictability of winter snow cover over the western United States, J. Climate, 16, 1062-1073, 2003.

Nolin, A. W., F. M. Fetterer, and T. A. Scambos, Surface roughness characterizations of sea ice and ice sheets: Case studies with MISR data, IEEE Trans. Geosci. Remote Sens., 40, 1605-1615, 2002.

Stroeve, J. C. and A. W. **Nolin**, Comparison of snow albedo from MISR with ground-based observations on the Greenland ice sheet, IEEE Trans. Geosci. Remote Sens., 40, 1616-1625, 2002.

Nolin, A. W. and A. Frei, Remote Sensing of Snow and Snow Albedo Characterization for Climate Simulations, In: Beniston, M. and M. M. Verstraete (Eds.), *Remote Sensing and Climate Simulations: Synergies and Limitations, Advances in Global Change Research*, Kluwer Academic Publishers, Dordrecht and Boston, pp. 159-180, 2001.

Barrett, A., G. Leavesley, R. L. Viger, A. W. **Nolin**, and M. P. Clark, A comparison of satellite- and model-derived snow covered area of a mountain watershed, In M. Owe, K. Brubaker, J. Ritchie and A. Rango (Eds.), *Remote Sensing and Hydrology 2000*, IAHS Publ. no. 267, 87-92, 2001.

Marshall, S., R. J Oglesby and A. W. **Nolin**, Effect of western U.S. snow cover on climate, Ann. Glaciol., 32, 82-86, 2001.

Nolin, A. W. and J. Dozier, A hyperspectral method for remotely sensing the grain size of snow, Remote Sens. Environ., 74, 207-216, 2000.

Nolin, A. W. and S. Liang, Progress in bidirectional reflectance modeling and applications for surface particulate media: Snow and soils, Remote Sensing Reviews, 18, 307-342, S. Liang and A.H. Strahler (Eds.) *Land Surface Bidirectional Reflectance Distribution Function (BRDF): Recent Advances and Future Prospects*, 2000.

Diner, D. J., G. P. Asner, R. Davies, J-P. Muller, A. W. **Nolin**, B. Pinty, C. B. Schaaf, and J. Stroeve, New directions in Earth observing: Scientific applications of multi-angle remote sensing, Bull. Am. Meteorol. Soc., 80, 2209-2228, 1999.

Nolin, A. W., Mapping the Martian polar caps: Applications of terrestrial optical remote sensing methods, J. Geophys. Res., 103, 25851-25864, 1998.

Nolin, A. W. and J. Stroeve, The changing albedo of the Greenland ice sheet: Implications for climate modeling, Ann. Glaciol., 25, 51-57, 1997.

Stroeve, J., A. **Nolin**, and K. Steffen, Comparison of AVHRR-derived and in situ surface albedo over the Greenland Ice Sheet, Remote Sens. Environ., 62, 262-276, 1997.

Nolin, A. W. and J. Dozier, Estimating snow grain size using AVIRIS data, Remote Sens. Environ., 44, 231-238, 1993.

Nolin, A. W., J. Dozier, and L. A. K. Mertes, Mapping alpine snow using a spectral mixture modeling technique, Ann. Glaciol., 17, 121-124, 1993.

Davis, R. E., A. W. **Nolin**, R. Jordan, and J. Dozier, Forecasting temporal changes of the spectral signature of snow in visible and near-infrared wavelengths, Ann. Glaciol., 17, 143-148, 1993.

Journal Articles in Preparation:

Nolin, A. W. and C. Daly, Mapping "at-risk" snow in the Pacific Northwest, to be submitted to Journal of Hydrometeorology.

Nolin, A. W. and E. Hall-McKim, Characteristic frequencies of monsoon precipitation in Arizona and New Mexico, to be submitted to Monthly Weather Review.

Lampkin, D. and A. W. **Nolin**, Relationships Between Snowpack Optical Properties and Internal Energetics Associated with Snowmelt Discharge, to be submitted to Remote Sensing of Environment.