

CURRICULUM VITAE

Leland R. Dexter, Ph.D., GISP

Current to 5/15/08

Department of Geography, Planning & Recreation
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EMPLOYMENT HISTORY

Emeritus Professor of Geography, Northern Arizona University, 2008 to present

Professor of Geography, Northern Arizona University, 1989-2008. Areas of specialization include: mountain geography, alpine environments, snow & ice, weather and climate, hydrology, geomorphology, geographic information systems and other computer applications in geography.

Assistant Professor of Geography, California State University at San Bernardino, 1987-1989.

Instructor, Department of Geography, Northern Arizona University, 1986-1987.

Consultant for snow and ice problems. Manufacturer of prototype and custom snow research equipment, 1982 - present.

Avalanche hazard forecaster, Colorado Avalanche Information Center, State of Colorado, 1984-1985.

Instructor (GPTI), Department of Geography, University of Colorado, 1982-1985.

Founder, co-owner and director, *Sacred Mountain Ski Tours*, Flagstaff, Arizona, 1974-1982.

Founder, co-owner, *The Alpineer*, Flagstaff, Arizona, 1972-1982.

Laboratory technician, U.S. Geological Survey Rock Lab, Flagstaff, Arizona, 1968-1969.

Fire control aid, U.S. National Park Service, Yosemite, California, summer 1966 and 1967.

Park assistant (Student Conservation Association), Zion, Utah, 1965.

MILITARY SERVICE

Combat engineer (12B40), U.S. Army, Viet Nam era, honorable discharge, 1969-1971.

PROFESSIONAL CREDENTIALS

Certified Geographic Information Systems Professional (GISP), granted by GIS Certification Institute (GISCI), certification number 00057294, date certified, 5/25/07.

EDUCATION

Ph.D., Geography, University of Colorado, Boulder, Colorado, 3.95 GPA, 1982-1986.

M.S., Earth Science, Northern Arizona University, Flagstaff, Arizona, 3.89 GPA, 1979-1981.

Unclassified graduate studies, Northern Arizona University, Flagstaff, Arizona, 1971-1972.

B.S., Geology, Northern Arizona University, Flagstaff, Arizona, 3.59 GPA, 1966-1969.

Lower division transfer studies, El Camino College, Torrance, California, 1964-1966.

High School Diploma, Inglewood High School, Inglewood, California, 1959-1964.

HONORS AND AWARDS

Best Poster Presentation Award - Monitoring snowpack ablation using lysimetry. 62nd Western Snow Conference, Santa Fe, New Mexico. April 18-24, 1994.

Recipient, Centennial Professor of the Year, 1998-99, College of Ecosystems Science and Management., Northern Arizona University.

Recipient, Presidents Award, 1996, Northern Arizona University.

Elected to Sigma Xi, a national professional research honorary.

Recipient, W.A. Tarr award, outstanding student in earth science, Northern Arizona University.

Charter Member, N.A.U. Chapter, Sigma Gamma Epsilon, an earth science honorary.

Elected to Phi Kappa Phi, a national scholastic honorary.

Elected to Alpha Gamma Sigma, a California scholastic honorary.

PROFESSIONAL ACTIVITIES

Research in Progress:

Habitat mapping and analysis for the *Senecio Fransicanus* Greene, a plant on the federal T&E list. In cooperation with Dr. Barbara Phillips, U.S.F.S.

Micro-meteorological and energy balance studies. 1) Energy balance over rock glaciers with Donald Friend, MSU. 2) Energy balance studies inside a parabolic shaped landform using a local cinder cone with G. Lennis Berlin, NAU.

Snow evapo-sublimation studies, field measurements of energy flow and water exchange within the seasonal snowpack. Currently investigating the differences caused by canopy cover vs. clear sky exposure on rates of evapo-sublimation loss.

Modeling and field measurements of rates of tafoni development in the arid Southwest. In conjunction with Steve Norwick, Department of Geography, California State University, Sonoma.

Snow avalanche activity on the San Francisco Peaks, Arizona.

Articles:

In Preparation:

Snowpack ablation regimes across forest-edge transects in northern Arizona.
Anticipated publisher Arctic and Alpine Research. Manuscript one-quarter completed.

Using the seasonal snowcover to identify and analyze areas of anomalous ground heat flow.
Anticipated publisher Arctic and Alpine Research. Manuscript one-half completed.

The Rime River
Anticipated publisher Physical Geography. Manuscript one-half completed.

Completed:

Learner-Centered Teaching and Assessment in an Undergraduate Field Analysis Course.
Co-authored with Thomas W. Paradis, 2007, Journal of Geography, 106: 171-180 (peer reviewed).

Challenges to an Avalanche Center in a Time of Seasonal Changing Climate, co authored with David Lovejoy and Kevin Tatsugawa, in ISSW '06 Proceedings: 2006 International Snow Science Workshop, Telluride, Colorado, October 1-6, 2006 (reviewed by a papers committee).

Rates of development of tafoni in the Moenkopi and Kaibab Formations in Meteor Crater and on the Colorado Plateau, Northeastern Arizona. Co-authored with Steve Norwick. in Earth Surface Processes and Landforms, #27 2002, p. 11-26 (peer reviewed work).

Cyclic erosional instability of sandbars along the Colorado River in Grand Canyon, Arizona.. Co-authored with Brian L. Cluer in Annals of the Association of American Geographers, 89(2), 1999, p.238-266 (peer reviewed work).

The rime river (Co-authored with A. Kokenakis). ISSW '98 Proceedings: 1998 International Snow Science Workshop, Sunriver, Oregon, September 27-October 1, 1998, p 544-550. (reviewed by a papers committee).

Avalanche forecasting with G.I.S. (Co-authored with Robert. Bolognesi and Matthieu Denuelle). Proceedings: International Snow Science Workshop, ISSW '96, Banff, Canada, October 6-11, 1996, p 11-13 (reviewd by a papers committee).

Effects of the 1996 beach/habitat-building flow on Colorado River sand bars and sediment storage along the Colorado River Corridor, Grand Canyon, Arizona. (Co-authored with Roderic Parnell, Joe Hazel, Matt Kaplinski, Mark Manone, Alan Dale and James Ellsworth) in Proceedings of a Symposium on the 1996 Habitat Building Flows, Flagstaff, Arizona.

Monitoring sandbar stability in Grand Canyon on a daily time scale using terrestrial photogrammetry. In Proceedings of the Second Biennial Conference on Research in Colorado Plateau National Parks. Flagstaff Arizona.

Using a G.I.S. to Monitor Sediment Resources in the Colorado River, Grand Canyon, Arizona. 1994. GSA Co author with M. A. Kaplinski, M. A., D. M. Best, M. Manone, H. B. Mayes, J. Wilkerson, P. Wright.

Monitoring snowpack ablation using lysimetry. Proceedings 62nd Western Snow Conference, Santa Fe, New Mexico. April 18-24, 1994 (reviewd by a papers committee)..

Where has all the snow gone? Proceedings 61st Western Snow Conference, Jackson, Wyoming Co-author with C.C. Avery (reviewd by a papers committee)..

Rapid erosion and slow redposition of san bars along the regulated Colorado River in Grand Canyon. (Co authored with B. L. Cluer, M. C. Carpenter and M. F. Manone) In Proceedings of the 1993 American Geophysical Union, San Francisco, California.

Considerations in implementing a geographic information system to assist long term monitoring of Glen and Grand Canyons, in-house position paper presented to the National Research Council Water and Science Technology Board for use in guiding development of the Long Term Ecological monitoring of Grand Canyon, September, 1993.

Using Spreadsheet software in climatic water balance modeling. Computers and Geoscience, Vol. 17, No. 4, pp. 527-536, 1991 (peer reviewed work).

A simple snowpack structure model and its application to mountain snowpack problems. In Large Scale Effects of Seasonal Snow cover, International Association of Hydrological Sciences Publ. No. 166, 1987 (peer reviewed work).

Avalanche hazard zoning in Vail, Colorado: the use of scientific information in the implementation of hazard reduction strategies (Co-authored with S. Oaks). Mountain Research and Development, Vol. 7, No. 2, p. 157-168, 1987. (peer reviewed work).

Inferences about undocumented avalanche event characteristics based on engineering calculations, Journal of the Ariz-Nev. Academy of Science, v. 22, 1987 (reviewd by a papers committee).

Avalanche frequency and magnitude determination for ski touring operations (Co-authored with B. Armstrong). Proceedings: International Snow Science Workshop, Aspen, Colorado, October 24-27, 1984, p 1-7 (reviewd by a papers committee).

Using D.C. resistivity to monitor snow metamorphism, Avalanche Review, v. 2 n. 5, March, 1984, p. 4.

Research reports:

Final Report: Mapping Impacts Related to the Senecio Fransicanus Greene – Phase II. August 27, 2007. A GIS and remote sensing analysis on the alpine and subalpine areas of the San Francisco Peaks. Data layers considered important to the baseline monitoring of the *Senecio Fransicanus Greene* plant were analyzed for the USFS, Coconino National Forest.

Final Report: Mapping Impacts Related to the Senecio Fransicanus Greene – Phase I. February 1, 2005. A GIS data acquisition project on the alpine and subalpine areas of the San Francisco Peaks. Data layers considered important to the baseline monitoring of the *Senecio Fransicanus Greene* plant were developed for the USFS, Coconino National Forest.

Improving flood mapping for Coconino County, Arizona. April, 2004. A research report culmination a GIS investigation of flood hazard mapping for Coconino County GIS Department using the Rio de Flag through the Doney Park Planning Area as a field study. The objective of the report is to suggest GIS techniques that would allow the County to produce their own DFIRM flood maps.

Promoting mountain geography in the San Juan Mountains, Colorado. March, 2004. A position paper compiled for the Mountain Studies Institute. Includes 30 minute video and CD photo album of 180 photos.

Final report: Pioneer Garden Siting Project for the Arboretum at Flagstaff. This research involves undergraduate students from GGR 362, Weather & Climate II, spring semester 2001.

Final Report: Partitioning the causative factors of snowpack evapo-sublimation. In conjunction with Charles Avery, School of Forestry funding agency, Western Regional Water Resources Research competitive grants, 1999-2000.

Final Report: Monitoring sandbar stability in Grand Canyon on a daily time scale using terrestrial photogrammetry. Co-authored with Brian Cluer. Funding agency, U.S. National Park Service and U.S. Bureau of Reclamation.

Final Report: Sublimation studies, field measurements of water loss from the seasonal snowpack. In conjunction with Charles Avery, School of Forestry funding agency, Salt River Project and U.S. Forest Service.

Assessing the significance of sublimation to snowpack disappearance at 7000 ft on the Salt-Verde Watershed, Arizona. Upon arrival at N.A.U. I teamed with Charles Avery, School of Forestry on a project funded by Salt River Project.

Tree ring dating of the Fairview School olive grove. work done for Dr. Russell Barber, C.S.U. Dept. of Anthropology, May, 1989.

Informed opinion review of "The Old Webster Quarry" Environmental Impact Report.

Books, chapters, manuals and course supplements:

In preparation: invited book chapter, The Grand Canyon in Piotr (ed) Geomorphological Points of Interest Across the World.

In preparation: "Snow, Ice, Avalanches, and Glaciers", with Karl Birkeland. Chapter four of Peaks and Peoples, a new textbook on mountain geography edited by Alton Byers and Donald Friend. To be published by the University of California Press.

A Field Guide to the San Francisco Peaks Manuscript one half complete. Anticipated self-publishing pilot edition in 2008.

Mountain and Highland Geography: Class Resources Materials, 2004 ed. Used for GGR 547, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture.

Snow and Ice: Class Resources Materials, 2005 ed. Used for GGR 451, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture.

Snow and Ice: Exercises, 2005 ed. Used for GGR 451, Consists of a set of 7 original lab and field exercises.

GIS Principles I: Foundations: An Exercise Manual, 2007-8 ed. Used for GGR 5/331, this is a series of 13 exercises custom tailored to software available to me at N.A.U.

GIS Principles I: Foundations: Class Resources Materials, 2007-8 ed. Used for GGR 5/331, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture. This volume is available as an option to students to streamline (but not eliminate) note taking,

Weather and Climate II: Macro and Micro Climates Class Resources Materials, 2005 ed. Used for GGR 462, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture. Also includes a set of 7 original lab and field exercises.

Weather and Climate I: Class Resources Materials, 2007 ed. Used for GGR 461, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture.

GIS Principles II: Project Design and Implementation: An Exercise Manual, 2007-8 ed. Used for GGR 5/433, this is a set of 12 original exercises designed to use ArcGIS, Idrisi, Surfer and Cartalinx. software packages.

GIS Principles II: Project Design and Implementation: Class Resources Materials, 2007-8 ed, Used for GGR 5/433 this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture. This volume is available as an option to students to streamline (but not eliminate) note taking.

Landforms: Class Resources Materials, 1996 ed. Used for GGR 251, this is a compilation of numerous outlines, figures, tables, diagrams etc. that match overheads used in lecture. This volume is available as an option to students to streamline (but not eliminate) note taking.

Field Analysis Workbook, 1992 ed. Used in GGR 480, this is a series of 10 original exercises designed to give the senior level geography major hands-on experience with a wide variety of tools and techniques, mainly from the physical side of the field.

Geography of the United States: A Map Supplement, 1992 ed. Used for GGR 346, this is a compilation of maps from numerous sources showing various thematic elements of the United States. These maps were selected with an eye toward readable Xerographic reproduction. The maps correspond to overheads used in lecture.

Snow climate and avalanche frequency on the San Francisco Peaks, Arizona. Submitted as a short monograph to the Office of the State Climatologist, Tempe, Arizona, August 1988.

Aspect and Elevation Effects on the Structure of the Seasonal Snowcover in Colorado.
University Microfilms, 1986.

Observers Manual, Colorado Avalanche Information Center, Denver, Colorado. Published in-house and distributed to 35 co-operative observers, 1986.

Landforms and Soils Lab Manual - U. of Colorado. Dept. of Geography, used 1983-1984 academic years.

Presentations and other session activities:

Challenges to an Avalanche Center in a Time of Seasonal Changing Climate, 2006, Presented along with David Lovejoy, Prescott College, and Kevin Tatsugawa, NAU, at the International Snow Science Workshop, Telluride, Colorado. October, 2006.

Honors week speaker, NAU Geography, Planning, and Recreation *Snows of Arizona*. April 2006.

Session chair, Arizona Geographic Information Council Conference, Prescott, AZ *Creating Survey Grade Control in Gila and Cochise Counties*. October, 2005.

Poster presentation: Observations and Measurements on Rock Glacier Energy Exchange and Flow Rates, San Juan Mountains, Colorado. With Donald A. Friend and Richard J. Trujillo. Presented at the Association of American Geographers Annual Meeting, Denver, CO, April 2005.

Session chair, Arizona Geographic Information Council Conference, Prescott, AZ *GIS in Stormwater Management*, October 2004.

Poster presentation: Recent rock glacier investigations in the San Juan Mountains, Colorado With Donald A. Friend and Richard J. Trujillo. Presented at the Mountain Studies Institute's State of the San Juan Conference, Silverton, Colorado, September, 2004.

Illustrated talk: Mountain learning and mountain geography in Silverton, Colorado, a thirty-year long tradition. Co-presenter with Donald A. Friend to the annual meeting of the AAG, Philadelphia, Pennsylvania, April, 2004.

Oral Presentation: Does Balch Ventilation Act on Rock Glaciers?: A Preliminary Assessment. Presented at the Arizona/Nevada Academy of Science, April, 2003, Flagstaff, Arizona.

Illustrated talk: Rock Glacier Energy Balance: Active vs. Inactive Rock Glaciers. Presented along D. Friend to the annual meeting of the AAG, New Orleans, Louisiana, March, 2003.

Illustrated talk: Rock Glacier Energy Balance: Hypotheses. Presented along with D. Friend to the annual meeting of the AAG, New Orleans, Louisiana, March, 2003.

Illustrated talk: Developing a Liberal Studies GIS Course, along with S. Arundel and R. D. Hawley, presented to the annual meeting of the AAG, Los Angeles, California, March, 2002.

Oral Presentation: Pioneer Garden Siting Project for the Arboretum at Flagstaff. This presentation included undergraduate students from GGR 362, Weather & Climate II, spring 2001.

The Potential for a Unique Mountain Studies Center in Silverton Colorado Oral presentation to the annual meeting of the AAG, New York City, New York, March, 2001.

The Mountain Geographer's Contribution or the Proposed Alpine Research Center. Oral presentation to San Juan Mountains Workshop, Fort Lewis College, Durango, Colorado, August 2000.

A Unique Rime Flow Event. Oral presentation to the annual meeting of the AAG, Honolulu, Hawaii, April, 1999

Effects of snowpack evapo-sublimation on the planning of precipitation and runoff augmentation programs. Oral presentation at the annual meeting of the APCG, Flagstaff, Arizona, October 1998.

The Rime River Oral presentation to the 1998 International Snow Science Workshop, Sun River Oregon.

Panel discussant, GIS in Education: MAGIC held at A.S.U., Aug, 1998.

Effects of snowpack evapo-sublimation on the planning of precipitation and runoff augmentation programs. Poster presented at the annual meeting of the AAG, Boston, Massachusetts, March, 1998.

Invited presentation, A simple model of the seasonal snowcover for possible use in animal migration studies, Oral seminar presentation to the Department of Earth Sciences, Montana State University, Bozeman, Montana, February 1998.

The mechanisms underlying sublimation (Co authored with Charles Avery and William Delinger) Oral presentation by William Delinger at the Arizona/Nevada Academy of Science, April, 1997, Las Vegas, Nevada.

Erosional stability of sandbars in Grand Canyon, Arizona. Oral presentation at the Annual Meeting of the AAG, March 1997, Fort Worth, Texas.

Changes in Sandbar Morphology Pre and Post Flood, Grand Canyon, Arizona. Oral presentation to the Annual Meeting of the Arizona Hydrological Society, September, 1996, Prescott, Arizona.

Avalanche forecasting with geographic information systems. Robert. Bolognesi, Matthieu Denuelle and Lee Dexter. Oral presentation by Matthieu Denuelle at the International Snow Science Workshop, October, 1996, Banff, Canada.

Session chair: GIS Applications Session, MAGIC conference, August, 1996 Camelback Inn, Phoenix, Arizona.

Snowpack sublimation (Co-author with C.C. Avery and W. Delinger) Oral presentation at the Scientific Meeting of the Canadian Geophysical Union, Banff, Alberta, Canada, May 22-26, 1995.

Monitoring snowpack ablation using lysimetry. Poster presentation, 62nd Western Snow Conference, Santa Fe, New Mexico. April 18-24, 1994. Voted "best poster of conference" by the WSC technical program committee.

N.A.U./G.C.E.S. sediment studies in Grand Canyon. Oral presentation at the annual meeting of the Arizona Arc/Info Users Group, Phoenix, Arizona, April 11, 1994.

Monitoring sandbar stability in Grand Canyon on a daily time scale using terrestrial photogrammetry. , Co-authored with Brian Cluer and Mark Manone, Oral presentation by Mark Manone, San Francisco A.A.G., April 1994.

Sublimation Studies in Northern Arizona, Oral presentation at the Annual Meeting of the AAG, April 1994, San Francisco, California.

Colorado River Bars and Sediments and G.I.S., Invited oral seminar presentation, A.S.U. department of Geography, Tempe Arizona, November 12, 1993.

Monitoring sandbar stability in Grand Canyon on a daily time scale using terrestrial photogrammetry. Oral presentation at the Second Biennial Conference on Research in Colorado Plateau National Parks. Flagstaff Arizona.

Invited participant, National Research Council workshop on Long Term Environmental Monitoring in Glen Canyon and the Grand Canyon. N.R.C. Beckman Center, Irvine, California, October 5-6, 1992.

Losses from seasonal snowcover before runoff, Poster presentation, Annual Meeting of the Association of American Geographers, San Diego, California April 15-20, 1993.

Estimating and measuring evapo-sublimation loss from the seasonal snow cover in northern Arizona, Oral presentation at the annual meeting of the Association of Pacific Coast Geographers, U. of A., Tucson, Arizona, September, 1991.

Field methods for validating sublimation estimates. Oral presentation at First Conference on Sublimation, N.A.U., Flagstaff, Arizona, June 16, 1991.

Evapo-sublimation studies in Northern Arizona. Oral presentation at the annual meeting of the Association of American Geographers, Miami, April, 1991.

Session chair: Longwave radiation in mountain environments, Conference on Longwave Radiation held at A.S.U., Feb. 8-11, 1990.

Snow and Avalanches in Arizona, invited speaker for the Arizona Winter Weather Workshop, sponsored by the National Weather Service, Oct. 24, 1989.

An analysis of rockfall events along a mountain highway in California. Oral presentation at the Association of Pacific Coast Geographers meeting, September 27-31, 1989, Fairbanks, Alaska.

Does the seasonal snowcover lose mass from within? Oral presentation at the Arizona/Nevada Academy of Science, April 15, 1989, Las Vegas, Nevada.

Avalanches in Colorado, the Physical Setting and the Human Response, invited speaker, Department of Geography, University of California at Santa Barbara, Feb. 25, 1988.

Density anomalies in a Colorado mountain snowpack. Presented at the Fall 1987 meeting of the American Geophysical Union, San Francisco, California.

A simple snowpack structure model and its application to mountain snowpack problems. Presented as an illustrated talk at the 1987 International Geophysical Union Meeting, Vancouver, Canada.

Avalanche frequency determination for ski touring operations. Oral presentation at the International Snow Science Workshop, Aspen, Colorado, October 24-27, 1984.

Inferences about undocumented avalanche event characteristics based on engineering calculations. Oral presentation to the Ariz-Nev. Academy of Science meeting, Flagstaff, Arizona, April, 1987.

Session Chair: Physical Geography, Ariz.-Nev. Academy of Science Meeting, Flagstaff, Az., April, 1987.

Sonde-type instruments for spatial analysis of the seasonal snowpack, Niwot Ridge, Colorado; (invited paper), Program Abstract of the A.A.G. Annual Meeting, Detroit, Michigan, April 21-24 1985.

Avalanches in Arizona; Program, Great Plains/Rocky Mountain Region A.A.G., Boulder, Colorado, October, 1983.

Session Chair: Snow and Ice in the Environment, Great Plains/Rocky Mountain Region A.A.G., Boulder, Colorado, 1983.

Snow Avalanches on the San Francisco Peaks; presented to the 34th Annual Symposium on Southwestern Geology and Paleontology, Museum of Northern Arizona, Flagstaff, Arizona, August 28, 1981.

Software:

Vicinity Mapping Arc Objects automation code. A program to automate much of the City of Sedona's GIS Department vicinity mapping tasks. This Visual Basic for Applications & Arc Objects code reduces the production time for a vicinity map package from 45 to 15 minutes.

CARTOM a Visual Basic program that solves several fundamental computer cartometric and GIS equations. Used both as an operational utility and as a teaching tool.

VBENBAL an upgraded Visual Basic version of the ENBAL program to convert micrometeorological data obtained from Omni and Campbell brand data loggers directly into energy balance terms via the Bowen ratio method.

WATBAL, a complete water balance spreadsheet template to run under Excel, Lotus 123, Quattro Pro and other spreadsheet programs.

SNOMOD V.3.4, a comprehensive snowpack modeling program. The program accepts daily, weekly or monthly temperature, snowfall and new snow density and computes complete snowpack profiles (to any user specified depth interval) including depth, density, temperature, metamorphic state, strength, and crystal size.

ENBAL, a program to solve the energy balance equations using the Bowen ratio method given user entered instrument values

STADIA, a program to reduce plane surveying data to both polar and Cartesian co-ordinates.

RAD, a program to reduce data from an experimental net radiometer. The program first linearizes thermistor temperature values then solves for all wave radiation via the Stefan-Boltzman method.

THORN, a program to classify the climate of any station given monthly precipitation and temperature values based on the Thornthwaite method.

GLACVEL, a program to solve shear stress and Glen's flow law for any given set of glacial conditions and return a velocity profile.

SUMATAB and KURTAB, programs to read XY coordinates from an electronic digitizing tablet. The program gives the user both graphic and coordinate outputs to the screen, creates coordinate files in ASCII format and optionally strips the files to yield just the XY data.

Book, article, software and grant reviews:

Developmental software ("beta version") tester for Mapviewer v.3.0, 4.0, 5.0, 6.0 and 7.0; and Didger v.1.0 and 2.0, 3.0 and 4.0, Golden Software, Golden, Colorado, 1997-2007.

Reviewed a proposed textbook *Mountain Weather and Climate, 3rd ed.* Routledge, London.

Reviewed a proposed textbook *A System Approach to Physical Geography*, Prentice Hall, New York.

Review of Nepal article for *Tourism Geographies*.

Review of *Verification of Snowpack Stability and Avalanche Danger* by J. Schweizer, K. Kronholm and T. Weisinger for *Cold Regions Science & Technology*.

Review of *Implications of New Evidence for Late Quaternary Glaciation in the Spring Mountains, Southern Nevada* by R. Orndorff and J. Van Hoesen for *Journal of the Arizona-Nevada Academy of Science*.

Review of *Geomorphological Hazards in High Mountain Areas, 1998, Kluwer Academic Publishers*, for *Journal of Geoscience Education*. Invited book review.

Reviewed a proposed textbook *Theory and Practice of Physical Geography* by Butler and Malanson, Prentice Hall, New York.

Review of *Changing Climates: The Context of Floods and Droughts*. Collier and Webb Invited manuscript review, U of A Press.

Review of *Geomorphological Hazards in High Mountain Areas, 1998, Kluwer Academic Publishers*, for *Journal of Geoscience Education*. Invited book review.

Reviewed an introductory text on GIS, Carstensen et al, WCB/McGraw Hill, Dubuque, IA 1998.

Reviewed five chapters for a proposed new introductory GIS textbook by unspecified authors to be considered for publication by Brown and Benchmark, June, 1996

Reviewed a revision of the textbook Geosystems, by Robert Christopherson, Macmillan Publishers, New York.

GISTARS, a software review, November 1991 issue of the Professional Geographer.

Reviewed half of a forthcoming new textbook on Physical Geography by Harm DeBlij and Peter Muller to be published by John Wiley & Sons. June, 1991.

Reviewed an outline for a proposed new textbook on Digital Mapping and Geographic Analysis by unspecified authors to be considered for publishing by Wm. C. Brown, May, 1991.

Reviewed a N.S.F. grant proposal on Propagating Digital Elevation Model Error into the Accuracy of a Viewshed, July, 1991.

Reviewed several chapters of Regional Landscapes of the United States and Canada by Stephen Birdsall and John Florin published by John Wiley & Sons, June, 1990.

Reviewed an article on Teaching Natural Hazards: the Use of Snow Avalanches in Demonstrating Geographic Principles, for Journal of Geography, March, 1988.

Proposals and Grants (total funded = \$895,985):

Awarded \$ 2,500 for Mapping Impacts Related to *Senecio fransicanus* Greene– Phase II by the United States Forest Service.

Applied for \$100,000 from the Technology Research Initiative Fund (TRIF) along with Mr. Grant Brummels for Wind Energy Mapping in Three Dimension Visualization Environments Using Geographic Information Systems (not funded).

Awarded \$ 4,944 total (\$2870 non-NAU) for Mapping Impacts Related to *Senecio fransicanus* Greene– Phase I by the United States Forest Service.

Applied for \$19,650 from the National Geographic Society along with Alton Byers and Donald Friend for “Human dimensions of glacial recession in the Mt. Everest Region, Nepal (not funded).

Awarded \$10,000 along with Charles C. Avery to investigate evapo-sublimation losses in Arizona by using cold chamber experiments Arizona Water Resources Research Center, University of Arizona.

Awarded \$195,000 along with Co-PI Rod Parnell, Matt Kaplinski and Alan Dale. Transition Monitoring of Sand Bar Stability Along the Colorado River Corridor, Grand Canyon, Arizona. Funded by the National Park Service as part of the Glen Canyon Environmental Studies.

Awarded \$56,000 along with co P.I. with Brian Cluer, G.C.E.S. to continue to monitor sandbar stability along the Colorado River Corridor in Grand Canyon National Park. U.S. National Park Service.

Applied for \$20,000 to develop a pilot Oak Creek Watershed Best management practice G.I.S. Data Base. Environmental Protection Agency (not funded).

Awarded \$ 193,723 along with Co-PI David Best for Networked G.I.S. Database Using the Sand Bar Monitoring Program as a Pilot Study. Funded by the National Park Service as part of the Glen Canyon Environmental Studies.

Awarded \$117,000 along with co P.I. with Brian Cluer, G.C.E.S. to monitor sandbar stability along the Colorado River Corridor in Grand Canyon National Park. U.S. National Park Service.

Proposed project with C. Avery, W. Delinger, A. Teclé in conjunction with Sedona Scientific to study snow evapo-sublimation as a component of global climate. \$165,000 requested funding from N.O.A.A. Climate and Global Change Program (not funded).

Awarded \$110,946 along with H. Campbell, J. Everret, D. Hartman, C. Hill, S. Howell and A. Lew for a Computer Aided Design Laboratory at N.A.U. funded through Academic Computing Services.

Proposed project with co P.I. with Joe Gust, College of Engineering. G.I.S. analysis of environmental data from the Glen Canyon Environmental Impact studies. Joe and I will administer the establishment of an Arc/Info data base for the beach erosion studies portion of the G.C.E.S. \$225,000 requested funding from Bureau of Reclamation (not funded).

Proposal submitted to N.A.U. Office for Professional Development for \$2,500 to support development of GGR 333, Survey of Geographic Information Systems (not funded).

Proposal submitted to Arizona Water Resources Research Center in conjunction with Charles C. Avery for \$70,188 to investigate improving inflow forecasting for Arizona reservoirs by adding an evapo- sublimation loss term (not funded).

Awarded \$478 from Center for Colorado Plateau Studies to obtain supplies for sublimation studies.

Awarded \$30,000 in conjunction with Charles Avery from the Salt River Project to study snow water losses via evapo-sublimation, SRP I and II, 1988-1989, (external contracts).

Awarded software grant worth \$10,500 for 15 copies of MapInfo, a PC based geographic information system.

Awarded monies from Academic Computing (approximately \$87,900) in conjunction with Clair Hill and others to upgrade the computer graphics lab.

Awarded software and training grant from G5 in conjunction with Alan Lew for Geo/SQL geographic information system and Geo/SQL training (approximate value \$40,000).

Proposal submitted to Organized Research in conjunction with Larry Agenbroad and others to initiate a quaternary studies data base for the Colorado Plateau region (not funded).

Proposal submitted in conjunction with Alan Lew to obtain computer equipment for GAPS laboratory (not funded).

Proposal submitted to C.S.U. Office of Professional Development for \$2010 to fund a study of rockfall onto mountain highways, 1988 (not funded).

Obtained \$4500 IBM Model 60 for G.I.S. use by the C.S.U. spatial analysis lab.

Awarded \$10,000 of lottery funds to obtain ARC/INFO -PC software, an industry standard geographic information system for the C.S.U. spatial analysis lab.

Awarded \$9750 grant to obtain a Macintosh II and Laserwriter for C.S.U. spatial analysis lab.

Awarded \$1900 lottery fund grant to obtain software to teach computer assisted cartography.

Research related experience and professional development activities:

Sabbatical, 2003-2004 academic year:

Obtained a research grant from the USFS to map impacts to *Senecio fransicanus*

Rock glacier field research and presentations

Digitized and attributed my 1981 Avalanche Map for the San Francisco Peaks

AAG poster presentation

Promoting mountain geography in the San Juan Mountains, an MSI position paper

Three on-line GIS/VB courses from ESRI

GIS programming for the City of Sedona

GIS flood modeling and mapping for Coconino County

Upgraded several classes to PowerPoint presentations

Taught GGR 480

Guest lecture for FOR 250

Participated in the Mountain Studies Institute retreat on the Advisory Board

Attended BOD meeting for the Center for Snow & Avalanche Studies

Continued to serve as NAU AGIC representative
Attended the 2003 AGIC conference, Prescott, Arizona

Sabbatical, 1995-96 academic year:

15 units of coursework, University of Arizona.
Travel to New Zealand and Australia.

Computer experience:

Mainframes, minicomputers and workstations: Cyber, Vax , Prime and Sun systems.
Microcomputers: CP/M, MS-PC DOS, Windows and Macintosh systems. Languages: Visual BASIC, BASIC, Fortran and C. General Software: Wordstar, WordPerfect, Word, Fullwrite, Macwrite, Lotus 123, Quattro Pro, Excel, Resolve, Wingz, DBASE, RBASE. Statistical software: SPSS, BMDP, Statview, Systat, Exstatitx. Graphics software: AutoCAD, Aldus Freehand, Superpaint, Canvas, MacDraft, MacDraw. Mapping Software: SYMAP, Surface II, Surfer, Mapmaker, The Map Collection, PCMAPRO, Versamap, MicroCAM, MicroDEM. G.I.S. software: GISTARS, MAP, OSU MAP, MAP II, Idrisi, Atlas GIS, GIS Plus, R.M.S., ArcGIS, Arc/Info, Arc/View
TerraModel Workshop, NAU, 2000
AutoCad Workshop, NAU 1992
Workstations workshop, N.A.U., 1990.
Graphics on the Macintosh, N.A.U., 1990.
Attended one week of Geo/SQL (geographic information system) training as part of a software grant, Feb, 1990.
Arc/Info training workshop, San Francisco State U., Jun. 17-22, 1989.
Arc/Info Introductory workshop, C.S.U. Northridge, Jun. 4, 1988.
Intro to SPSS PC workshop, C.S.U.S.B., Jun. 16, 1988.
Advanced workstation workshop, C.S.U.S.B., May 23, 1988.
Intro to SAS workshop, C.S.U.S.B. Apr. 22, 1988.
Intro to Prime workshop, C.S.U.S.B., Apr. 20, 1988.
Intro to WordPerfect workshop, C.S.U.S.B., Nov. 1987.
Consultant, CIRES - Univ. of Colorado, computer modeling of snowpacks, 1985-86.

Field experience:

Volunteer field technician, Glen Canyon Environmental Studies. Assisted with precision surveying of 30 beaches within Grand Canyon National Park to assess the effect of water releases from Glen Canyon Dam on the downstream environment (funded by Bureau of Reclamation), 1990.
P.S.I.A. Certification as mountain ski guide, 1983.
Ph.D. research, aspect and elevation effects on the structure of the seasonal snow cover in Colorado. Funded by grants from the Colorado Mountain Club and Univ. of Colorado Graduate School and by research assistant monies, C.I.R.E.S., Univ. of Colo., 1982-1986.

M.S. research, Snow avalanches on the San Francisco Peaks, Coconino County, Arizona, 1979-1981.

Associate, San Francisco Mountain Avalanche Project, 1977-1981.

Attended 1979 National Avalanche School and several Silverton Schools.

Attended A.A.I. advanced snow physics course, Silverton, Colorado, 1979.

Professional affiliations:

GISP Certified Professional, GISCI

Arizona Professional Land Surveyors, Geospatial member

Association of American Geographers.

American Geophysical Union.

Geological Society of America.

American Avalanche Association

Sigma Xi.

Tripoli / AHPRA

TEACHING

Courses taught: (F = Fall, W = Winter, S = Spring or Summer)

Northern Arizona University:

Physical Geography, GGR 250 on-line – S/08.

Weather for Teachers, GGR 599, Summer 06.

Winter Mountain Field Studies, GGR 499/599, S/05, S/07.

Snow and Ice in our Environment, GGR 451, S/93, S/95, S/97, S/99, S/01, S/02, S/03, S/06.

GIS Principles II: Project Design and Implementation (formerly Survey of Geographic Information Systems), GGR 433/533, F/91, F/92, F/93, F/94, F/96, F/97, F/98, F/99, F/00, F/01, F/02, F/03, S/05, S/06, S/07, S/08.

GIS Principles I: Foundations (formerly Analytical and Computer Cartography), GGR 331/531, S/90, S/91, S/92, S/93, S/94, S/95, S/97, S/98, S/99, S/00, S/01, S/02, S/03, F/04, F/05, F/06, F/07.

Mountain and Highland Geography, GGR 547, F/97, F/99, F/04.

Landforms and Physiographic Regions, GGR 251, F/94, F/96.

Weather and Climate I, GGR 461 (formerly GGR 361), F/93, F/98, F/00, F/02, F/04, F/07.

Applications in Climatology GGR 462 (formerly Weather and Climate II, GGR 362), S/99, S/01, S/05.

Landforms of North America, GLG 609, Summer/91.

Cartography, GGR 330, F/86, F/89.

Geography of the U.S., GGR 346, F/89, S/90, F/90, F/91, S/92.

Physical Geography, GGR 250, F/86, S/87, S/89, F/90, S/91, F/91, S/92, F/92, S/93, F/93, F/94, S/95, S/97, S/98, F/99, S/00, F/01, F/02.

Field Analysis, GGR 480 (421), S/87, F/90, F/92, Summer/99, Summer/00,
Summer/01, Summer/02, Summer/03, Summer/04, Summer/05, Summer/06, Summer 07.
Remote Sensing, GGR 417, F/86.
Geology of the National Parks, GLG 631, Summer 1986.
Geomorphology, GLG 430, S/87.
Geographic Information Systems FOR 525, SP/94.

California State University:

Physical Geography, GEOG 103, F/87, W/88, S/88, F/88, W/89, S/89.
Physical Geography Lab, GEOG 103L, F/87, W/88, S/88, F/88, W/89, S/89.
Cartography, GEOG 301, F/87, S/88, F/88.
Geomorphology, GEOG 390D, W/88.
Computer Assisted Cartography, GEOG 390G, S/89.

Total number of new class preparations: 21.
Total number of classes taught: 105.
Approximate number of students taught: 2500.

Thesis advisor for currently enrolled graduate students:

Grant Brummels
Olivia Markham
Bob Tusso
Vince Warner
Paul Lauck
Chris Brod

Advisor for completed theses:

Natasha Rigg
Sydney Schoepke
Kathy McBride
Merriane Etter
David Simeral
Ellen Soles
Mike List
Jeff Wilkerson
Glenn Dunno
John Douglass
Tony Ayres
Brent Kempton

Thesis committee member for:

Ph.D., Carlos Gustafo Ph.D, (Forestry) (S/06)
Ph.D., Karl Birkland, (A.S.U. Geography), F/92-97.
Ph.D., Bruce Gwilliam, (A.S.U. Geography), F/92-96.
Ph.D., Kelly Elder, (U.C.S.B. Geography), F/90-95.

M.A., Kerstin Stanford (IP)
M.A., Mark Manone (IP)
M.A., Kyle Bohnenstiehl (DNF)
M.A., Dan Morse (Forestry) F/99-S/01
M.A., Terrance Arundel (S/00)
M.A., Alison McComiskey F/95-S/97
M.A., Lisa Kenneway F/96-S/98
M.A., Barbara Kent F/95-S/97
M.A., Joy Wolf F/94-S/96
M.A., Scott Walker F/93-S/96
M.S., James Brooks (Earth Science) F/95-S/98
M.S., Laird Naylor (QSP)
M.S., Mitch Power (QSP), F/95-S/97
M.S., Peter Koehler, Quaternary Studies (QSP), F/91-S/94.
M.S., Gracie Coke-Rendon, Earth Science, F/91-S/93.
M.S., Peggy Benenati, Earth Science, F/91-S/93 .
M.S., Rick Fisher, Earth Science, F/91-S/92.
M.S., Jeff Simpson, Earth Science, F/91-S/91.
M.S., Ted Melis, Geology, S/89-F/90.
M.S., Tim Dolan, Quaternary Studies, S/89-S/93.

Other:

Mountain Geography for Teachers, A Mountain Studies Institute 4-day workshop for K-12 Colorado teachers. The curriculum included an Introduction to mountain geography, GIS techniques for teaching mountain geography, physical mountain geography, mountain ecosystems and cultural mountain geography. Silverton, Colorado, August, 2004 and August, 2005.

Pioneer Garden Siting Project for the Arboretum at Flagstaff. This original research project involved undergraduate students from GGR 362, Weather & Climate II, spring 2001 semester in all phases of an original research project including experimental design, field implementation, data acquisition, data reduction and analysis, report preparation and oral report delivery.

Numerous Independent Study students.

Worked with Alan Lew to develop the Geographic Information Management emphasis within the Department of Geography.

Developed Survey of Geographic Information Systems, GGR 433/533.

Developed Computer Assisted Cartography, GGR 331/531, a new course that included lecture, practical exercises and student projects run on a variety of hardware platforms.

Sent needs assessment survey to several local employers concerning skills they would like to see when hiring for entry level mapping positions.

Invited to attend TIPS alumni workshop at N.A.U., scheduled for November 1990.

Guest lecturer for several classes including: Arizona Forests and Wildlife, Carol Chambers & Robert Mathiason, Range Management, Dave Patton Watershed Hydrology, Chuck Avery, Weather Analysis and Forecasting, Diana Elder.

Awarded professional development funds to attend the first level TIPS workshop at N.A.U., November, 1989.

Computer mapping workshop, C.S.U. Northridge, Feb. 4-5, 1989. Advanced workshop for faculty in the C.S.U. system who are involved in teaching computer assisted cartography.

Computer mapping workshop, C.S.U. Northridge, Feb. 6-7, 1988. Limited to 20 faculty in the C.S.U. system that are involved in teaching computer assisted cartography. Each participant was given over \$500 worth of mapping software to assist with course development.

Teaching excellence workshop, C.S.U. San Bernardino, Feb. 3, 1988.

Revamped Physical Geography, GEOG 103, material into modular lecture blocks for improved organization and pacing of course. Added two computer assisted labs with hands-on student exercises. Streamlined lab grading and improved learning feedback by in-lab review of assignments.

UNIVERSITY AND/OR COMMUNITY SERVICE

National/International Committees:

Board of Directors, Center for Snow and Avalanche Studies 2003-2008

Advisory Board, Mountain Studies Institute 2002-2008

State Committees:

Charter Member and Board of Directors, Kachina Peaks Avalanche Center, 2005-2008

N.A.U. representative to the Arizona Geographic Information Council. A governor's select advisory council composed of members from federal, state, local and private organizations, 1998-2008

University Committees:

GPR promotion and tenure committee 2004-2008.

GPR graduate student admissions committee 2004-2008.

C.E.S.&M. policy committee, 1994-2003.

C.E.S.&M. computer committee, 1993-2003.

G&PP promotion and tenure committee 1992-2000

C.E.S.&M. promotion and tenure committee, 1992-1996

S.B.S. curriculum steering committee, 1990-1992.

Quaternary Studies steering committee, 1989-present.

University academic computing steering committee, 1989-1990.
Department search committees and curricular change committees, 1989-2008.
Ad hoc committee on American/Soviet exchange, 1989/1990.
Member, S.B.S. school computer committee, 1988-1989.
Liberal studies competency evaluator (C.S.U.), 1987-1989.

Other:

GIS Programs Coordinator, Department of Geography, Planning, and Recreation, 2001-2008
Coordinator and Principle Architect for the GPR GIS Certificate Program, 1999-2001
Graduate Program Coordinator, Department of Geography, 1996-1998
Mountain Campus Science Fair Presenter, 1996, 1997, 1998
Organizer of partnership with Arizona department of Environmental Quality to locate underground storage tanks in the Flagstaff Area using GPS units operated by NAU geography independent study students.
Independent work to assure the retention of Physical Geography (GGR 250) as a liberal studies science option. 1989/1990 and 1993.
Arranged for a campus visit of the Defense Mapping Agency representative, Dennis Drum, 1989.
Student advising N.A.U. and C.S.U.
Established the C.S.U. Geography Spatial Analysis Laboratory, 1987-1989.
Liberal studies advisor, C.S.U.
Organized geography/geology club field trips, C.S.U.

Community Service:

Member, Coconino County Comprehensive Plan GIS Team, 2002
Assist with winter alpine rescue as an adjunct member of the Coconino County Sheriff's Alpine Rescue Team (ART). Directly instrumental in rescue and/or body recovery pertaining to the following significant mountain accidents on the San Francisco Peaks:
1) The Guardian Medical Aircraft crash search and body recovery, 1996
2) Search for and recovery of the Fernandez brothers, 1979
3) Rescue and recovery of victims and survivors of the AMC Mt. Humphreys party, 1972
Technology advisor, Grand Canyon Wildlands Council, 1997 -1999.
Deposed expert witness in the case of Kite, et al v. Greely Gas Company (settled out of court)
Speaker at Macintosh Users Group meetings.
Speaker to M.N.A. docents.
Worked on environmental impact assessments for citizens of the city of Redlands.
Expert witness in the case of C. Miller, v. Arizona Snow Bowl.