

**Education**

- 1986 University of California, Santa Barbara, Bachelor of Arts with Honors in Geography
- 1987 University of California, Santa Barbara, Master of Arts in Geography
- 1992 University of California, Santa Barbara, Ph.D. in Geography

**Employment**

Desert Research Institute, Division of Earth and Ecosystem Sciences, Reno, Nevada

1998 - present: Associate Research Professor

1994 - 1998: Assistant Research Professor

Remote Sensing Research Unit, Geography Department, University of California, Santa Barbara

1993 - 1994: Assistant Researcher

1991 - 1992: Staff Research Associate IV

1986 - 1991: Graduate Student Assistant

Martin Marietta Data Systems, San Diego, California

1988 - 1990: Subcontractor

**Expertise**

Experience with a broad range of academic and applied issues in physical geography, including energy and water balance, vegetation analysis, scale dependence of patterns and processes, and relationships between environment and public health. Extensive knowledge of scientific techniques required for mapping, monitoring, and modeling of cultural and environmental systems. Extensive experience with remote sensing/image processing for land cover mapping, invasive species, ecosystem health, estimation of land surface parameters, and data visualization. Extensive experience in GIS database development and analysis for the environmental sciences, public health, natural resources and facilities management, hazardous waste site characterization, habitat analysis, and biodiversity. Strong computing skills.

**Committee Memberships and Invited Presentations**

Arid Lands Research Center, Tottori University, Japan, Invited lectures on remote sensing, 2008.

National Aeronautics and Space Administration, Workshop for federal invasive species managers, invited presentation, March 2007.

United Nations/China National Space Agency meeting on Tele-Health (Guangzhou, China), invited lecture, 2005.

United Nations/European Space Agency Workshop on the Use of Space Technology for Human Health (Cordoba, Argentina), invited lecture, 2005.

University and Community College System of Nevada, Advanced Computing in the Environmental Sciences (ACES), NSF-funded project, Science Steering Committee, 2002-2005.

Tahoe Regional Planning Agency, Tahoe Integrated Information Management System (TIIMS) Technical Advisory Committee, member, 2001-2002.

National Aeronautics and Space Administration. EO-1 satellite mission science validation team member, 2000-2002.

National Center for Ecological Analysis and Synthesis, Spatial Ecology of Infectious Disease, workshop participant, 2000.

National Center for Ecological Analysis and Synthesis, Quantification of Uncertainty in Spatial Data for Ecological Applications, workshop participant, 1997.

Desert Research Institute, Faculty Senate. 1995-1998. Vice-chair 1996-97. Chair 1997-98.

National Center for Geographic Information and Analysis, Remote Sensing Core Curriculum, steering committee, 1995.

International Geosphere/Biosphere Programme. IGBP 1km Global Land Cover Validation Working Group, invited presentations, Cambridge, England 1994 & Ispra, Italy 1995.

National Center for Geographic Information and Analysis, member of Initiative 15 specialist meetings: Roles of GIS in the U.S. Global Change Research Program. 1995.

United Nations Environment Programme, member of North American UNEP/GRID Users' Meeting, 1994.

National Aeronautics and Space Administration. Landsat Pathfinder Program Science Working Group, 1991-1997.

Indian Institute of Technology, Bombay, India. Invited lectures on Accuracy Issues and New Research Areas in Geographic Information Systems, sponsored by a grant from UNESCO, 1993.

National Center for Geographic Information and Analysis. Member of initiative 12 specialist meetings: Integration of Remote Sensing and GIS. 1990-1991.

### **Peer-Reviewed Journal Publications**

T.J. Fudge, E. Steig, B. Markle, K. Taylor, J. McConnell, E. Brook, T. Sowers, J. White, S. Schoenemann, R. Alley, H. Cheng, G. Clow, J. Cole-Dai, H. Conway, K. Cuffey, J. Edwards, L. Edwards, R. Edwards, J. Fegyveresi, and others, 2013, Deglacial warming in West Antarctica driven by both local orbital and Northern Hemisphere forcing, *Nature*, DOI: 10.1038/nature12376.

Morton, C., J. Huntington, G. Pohl, R. Allen, K. McGwire, S. Bassett, 2013, Assessing calibration uncertainty and automation for estimating evapotranspiration from agricultural areas using METRIC, *Journal of the American Water Resources Association*, 49(3):549-562.

Sigl, M., J.R. McConnell, L. Layman, O. Maselli, D. Pasteris, K. McGwire, D. Dahl-Jensen, J.P. Steffensen, B. Vinther, R. Edwards, R. Mulveney, Sepp Kipfstuhl, 2013, A new bi-polar ice core record of volcanism from WAIS Divide and NEEM and implications for climate forcing of the last 2000 years, *Journal of Geophysical Research*, DOI:10.1029/2012JD018603.

McGwire, K.C., M. Wertz, J. Finzel, C. Morris, L. Fenstermaker, and David McGraw, 2012. Multiscale assessment of green leaf area in a semi-arid rangeland with a small unmanned aerial vehicle, *International Journal of Remote Sensing* 34(5):1615-1632, DOI:10.1080/01431161.2012.723836.

Thomas, S.A., K.C. McGwire, J. Thomas, C. Kratt, A.Lutz, W.A. McKay, and E.J. Trammell, 2012. Geospatial and regression tree analysis to map groundwater depth for manual well drilling suitability in the Zinder Region of Niger, *Journal of Hydrology* 446-447:35-47.

Snyder, K.A., R.L. Scott, and K.C. McGwire, 2012. Multiple year effects of a biological control agent (*Diorhabda carinulata*) on *Tamarix* (saltcedar) ecosystem exchanges of carbon dioxide and water, *Agriculture and Forest Meteorology* 164:161-169. DOI:10.1016/j.agrformet.2012.03.004.

Lee, B.S., K. McGwire, and C.H. Fritsen, 2011. Identification and quantification of aquatic vegetation with hyperspectral remote sensing in western Nevada rivers, USA, *International Journal of Remote Sensing* 32(24):9093-9117, DOI:10.1080/01431161.2010.549850.

McGwire, K., K. Taylor, and R. Banta, 2011. Identifying annual peaks in dielectric profiles with a selection curve, *Journal of Glaciology* 57(204):763-769.

McGwire, K., T. Minor, and B. Schultz, 2011. Progressive Discrimination: an automatic method for mapping individual hyperspectral targets, *IEEE Transactions on Geoscience and Remote Sensing* 49(7):2674-2685, DOI: 10.1109/TGRS.2011.2108304.

- McGwire, K.C., J.R. McConnell, R.B. Alley, J.R. Banta, G.M. Hargreaves, and K.C. Taylor, 2008. Dating annual layers of a shallow Antarctic ice core with an optical scanner, *Journal of Glaciology* 54(188):831-838.
- McGwire, K.C., G.M. Hargreaves, R.B. Alley, T.J. Popp, D.B. Reusch, M.K. Spencer, K.C. Taylor, 2008. An integrated system for optical imaging of ice cores, *Cold Regions Science and Technology* 53(2):216-228, DOI:10.1016/j.coldregions.2007.08.007.
- McGwire, K., Boone, J., and S. St. Jeor, 2006. Field sampling design for zoonoses with geospatial technologies, *Sociedad Especialistas Latinoamericana en Percepción Remota (SELPER)*, special edition on remote sensing applications to health, June, 2006, pp. 52-56, ISSN 0717-2915.
- McGwire, K., E. Segura, M. Scavuzzo, and M. Lamfri, 2006. Spatial pattern of infestation by *Triatoma infestans* in Chancani, Argentina following insecticide treatment, *Journal of Vector Ecology* 31(1):17-28.
- Fairbanks, D. and K. McGwire, 2004. Patterns of floristic richness and diversity in vegetation communities of California: regional scale analysis with multi-temporal NDVI, *Global Ecology and Biogeography* 13:221-235.
- Boone, J., K. McGwire, R. DeBaca, E. Kuhn, E. Otteson, and S. St. Jeor, 2002. Infection dynamics of sin nombre virus following a widespread decline in density of host populations, *American Journal of Tropical Medicine and Hygiene*, 67(3):310-318.
- Fairbanks, D. and K. McGwire, 2000. Coarse-scale gradient analysis of environmental factors in relation to plant species diversity for vegetation communities of California, *Geographic Information Sciences* 6(1):48-60.
- Boone, J., K. McGwire, E. Otteson, P. Villard, J. Rowe, and S. St. Jeor, 2000. GIS-based assessment of relationships between environment and hantavirus prevalence in rodents, *Emerging Infectious Diseases* 6(3):248-258.
- McGwire, K., T. Minor, and L. Fenstermaker, 1999. Hyperspectral mixture modeling for quantifying sparse vegetation cover in arid environments, *Remote Sensing of Environment* 72:360-374.
- Husak, G., B. Hadley, and K. McGwire, 1999. Registration accuracy of high-resolution satellite data used in the IGBP validation, *Photogrammetric Engineering and Remote Sensing* 65(9):1033-1039.
- Boone, J., E. Otteson, P. Villard, K. McGwire, J. Rowe, and S. St. Jeor, 1998. Ecology and demography of hantavirus infections in rodent populations in the Walker River Basin of Nevada and California, *American Journal of Tropical Medicine and Hygiene* 59(3):445-451.
- McGwire, K, 1998. Improving Landsat scene selection systems, *Photogrammetric Engineering and Remote Sensing* 64(7):717-722.
- McGwire, K, 1998. Mosaicking airborne scanner data with the multiquadric rectification technique, *Photogrammetric Engineering and Remote Sensing* 64(6):601-606.
- McGwire, K., 1996. Cross-validated geometric accuracy assessment, *Photogrammetric Engineering and Remote Sensing* 62(10):1179-1187.
- Frohn, R., K. McGwire, J. Estes, and V. Dale, 1996. Using satellite remote sensing analysis to evaluate a socioeconomic and ecological model of land-use change in Rondônia, Brazil, *International Journal of Remote Sensing* 17(16):3233-3255.
- McGwire, K., J. Estes, and J. Star, 1996. A comparison of maximum likelihood-based supervised classification strategies, *GeoCarto* 11(2):3-13.
- Ehrlich, D., J. Estes, J. Scepan, and K. McGwire, 1994, Agricultural crop area monitoring with an advanced agricultural information system, *GeoCarto* 4:31-42.

- McGwire, K., M. Friedl, and J. Estes, 1993, Spatial structure, sampling design, and scale in remotely sensed imagery of a California savanna woodland, *International Journal of Remote Sensing* 14:2137-2164.
- McGwire, K., 1992, Analyst variability in labeling of unsupervised classifications, *Photogrammetric Engineering and Remote Sensing* 58(12):1673-1677.
- Lunetta, R., R. Congalton, L. Fenstermaker, J. Jensen, K. McGwire, and L. Tinney, 1991, Remote sensing and geographic information system data integration: error sources and research issues, *Photogrammetric Engineering and Remote Sensing* 57(6):677-687.
- Friedl, M., K. McGwire, & J. Star, 1989, MAPWD, An interactive mapping tool for accessing geo-referenced data sets, *Computers in Geoscience* 15(8):1203-1220.
- Estes, J., K. McGwire, G. Fletcher, & T. Foresman, 1987, Coordinating hazardous waste monitoring activities using geographic information systems, *International Journal of Geographic Information Systems* 1(4):359-377.

### **Books / Book Chapters**

- Boone, J.D., K.C. McGwire, and S.C. St. Jeor, 2005. Mapping the distribution and Sin Nombre Virus infections in deer mice using remote sensing and geographic information systems, in *Wildlife Diseases: Landscape Epidemiology, Spatial Distribution, and Utilization of Remote Sensing Technology*, S.K. Majumdar, J.E. Huffman, F.J. Brenner, and A.I. Panah (eds.), The Pennsylvania Academy of Science. pp. 448-458.
- McGwire, K. and P. Fisher, 2001. Spatially variable thematic accuracy: beyond the confusion matrix, a chapter in *Spatial Uncertainty in Ecology: Implications for Remote Sensing and GIS Applications*, Springer Verlag, pp. 308-329.
- Friedl, M., K. McGwire, and D. McIver, 2001. An overview of uncertainty in optical remotely sensed data for ecological applications, a chapter in *Spatial Uncertainty in Ecology: Implications for Remote Sensing and GIS Applications*, Springer Verlag, pp. 258-283.
- Star, J., J. Estes, and K. McGwire (eds.), 1997. *Integrating Geographic Information Systems and Remote Sensing*, Cambridge University Press, New York.
- McGwire, K. and M. Goodchild, 1997. Accuracy, a chapter in *Integrating Remote Sensing and Geographic Information Systems*, J. Star, J. Estes, and K. McGwire (eds.), Cambridge University Press, New York.
- Estes, J., J. Star, and K. McGwire, 1997. Integration of geographic information systems and remote sensing: a background to NCGIA Initiative 12, a chapter in *Integrating Remote Sensing and Geographic Information Systems*, J. Star, J. Estes, and K. McGwire (eds.), Cambridge University Press, New York.
- McGwire, K., N. Chagnon, and C. Brewer, 1996, Empirical and methodological problems in developing a GIS database for Yanomamö tribesmen living in remote locations, in *Anthropology through Geographic Information and Spatial Analysis*: Oxford University Press, New York.
- McGwire, K., 1996. Geographic information systems, in the *Encyclopedia of Earth Sciences*, MacMillan, New York.

### **Conference Papers / Presentations / Technical Reports**

- Justin Huntington, Charles Morton, Ken McGwire, Andy Joros, Sarah Peterson, Noel Gorelick, David Thau, Rick Allen, Utilizing cloud computing of Landsat imagery and gridded weather data for evaluating groundwater dependent ecosystems in Nevada, Great Basin Consortium Conference: Great Basin: A Landscape Under Fire, Dec. 9-10, 2013, Reno, NV, USA

- Halfen, A.F., N. Lancaster, K. McGwire, and J.J. Feddema, 2013. Monitoring Vegetated Dune Fields for Threshold Responses to Climate Extremes, 125<sup>th</sup> Annual Meeting of the Geological Society of America, Oct. 27-30, 2013, Denver, CO.
- McGwire, K., J. McConnell, K. Taylor, Multi-parameter selection curves for machine-assisted annual layer interpretations of the WAIS-Divide Core, WAIS Divide Science Meeting, Sept. 11-12, 2012, San Diego, CA.
- Fudge, T.J., Ken Taylor, Ken McGwire, Ed Brook, Todd Sowers, Eric Steig, Jim White, Bruce Vaughn, Joe McConnell, Ryan Bay, Ed Waddington, Howard Conway, Gary Clow, Kurt Cuffey, Jeff Severinghaus, 2012. A 62ka record from the WAIS Divide ice core with annual resolution to 30ka, European Geosciences Union, General Assembly 2012, April 22-27, Vienna, Austria.
- McGwire, K., 2011. Documenting the seasonal and interannual variability of algal blooms in the South Fork Reservoir with Landsat data, Final Report, Nevada Division of Environmental Protection DEP-S 09-038, Desert Research Institute, Reno, Nevada.
- Fudge, T.J., K. Taylor, K. McGwire, H. Conway, E. Waddington, T. Neumann, J. White, B. Vaughn, J. Johnson and M. Koutnik, 2011. WDC06A-5: An annually resolved timescale to ~40ka and a case for a high basal melt rate, Annual Meeting of the National Science Foundation's WAIS-Divide project, Oct. 1-3, 2010, La Jolla, CA.
- Taylor, K. ; Fudge, T. ; McConnell, J.; McGwire, K. ; Banta, R. ; Hargreaves, G. ; Waddington, E., 2010. First effort to develop a timescale and accumulation record to 2,000 m. Annual Meeting of the National Science Foundation's WAIS-Divide project, Sept. 28-29, 2010, La Jolla, CA.
- McGwire, K. and T. Minor, 2010. Hyperspectral research and development for invasive species detection and mapping, Final Report, National Aeronautics and Space Administration grant NNS06AA91G, Desert Research Institute, Reno, Nevada.
- McGwire, K., 2010. Optical imaging support for the National Ice Core Laboratory, Final Report, National Science Foundation grant OPP 0637004, Desert Research Institute, Reno, Nevada.
- Taylor, K., R. Banta, and K. McGwire, 2008. Dating the core with annual layers, Annual Meeting of the National Science Foundation's WAIS-Divide project, Oct. 1-3, 2008, Denver, CO.
- Lee, B.S. and K. McGwire, 2008. Identification and quantification of aquatic vegetation with hyperspectral remote sensing in Western Nevada Rivers, USA, Final Report, Task C-1, USEPA Environmental Systems Monitoring Laboratory X-83277801, Desert Research Institute, Reno, Nevada.
- McGwire, K. and G. Hargreaves, 2008. Optical dating of ice cores from WAIS-Divide, Annual Meeting of the National Science Foundation's WAIS-Divide project, Oct. 1-3, 2008, Denver, Colorado (<http://www.waisdivide.unh.edu/>).
- McGwire, K. and C. Garner, 2008. Comparing effective shade and water temperature on the Carson River, Final Report, Nevada Department of Environmental Protection, DEP 07-013, Desert Research Institute, Reno, Nevada.
- McGwire, K., 2007. Airborne Hyperspectral research and development for invasive species detection and mapping, NASA workshop for Federal program managers, Washington DC, March 2007.
- McGwire, K., 2007. Invasive species mapping in northern Nevada using airborne hyperspectral imagery, Nevada Weed Management Association, Las Vegas, NV, October 2007.
- McGwire, K., 2007. Development of a tool for motion analysis and sub-pixel registration of high-speed image time-series, Final report, subcontract 07-43, University of Nevada, Reno (for USDOE Special Technologies Laboratory).

- Lee, B.S. and K. McGwire, 2007. Testing hyperspectral remote sensing for aquatic vegetation monitoring in western Nevada, Truckee River Symposium, Reno, Nevada, Oct. 16-18, 2007, Nevada Water Resources Association.
- Garner, C., K. McGwire, J. Brock, and A. McKay, 2007. Modeling the effect of riparian shading on water temperature for portions of the Carson River, western Nevada, USA, Final Report, USEPA CR-83160001-0, Desert Research Institute, Reno, Nevada.
- Garner, C. and K. McGwire, 2007. Modeling the effect of riparian shading on water temperature for portions of the Carson River, Western Nevada, USA, Annual meeting, American Society of Limnology and Oceanography, Santa Fe, New Mexico, Feb. 4-9, 2007.
- Hargreaves, G., K. McGwire, K. Taylor, R. Alley, T. Dupont, D. Reusch, 2005. Digital imaging of ice cores, early results, poster, Annual Meeting of the American Geophysical Union, San Francisco, December 2005.
- McGwire, K., 2005. Geographical strategies in field sampling of host / vector species, UN-OOSA/UN-ESCAP/China Workshop on Tele-Health Development in Asia and the Pacific Region, Guangzhou, China, 5-9 December 2005
- McGwire, K., J. Boone, S. St Jeor, 2005. Remote Sensing and GIS in the sampling and analysis of prevalence and transmission of zoonotic diseases, Proceedings of United Nations/European Space Agency Workshop on the Use of Space Technology for Human Health, Cordoba, Argentina.
- McGwire, K., 2002. Hyperspectral mapping of *Tamarix ramosissima*, NASA EO-1 Science Validation Team Meeting, Hilo, HI.
- McGwire, K., 2002. Identifying *Tamarix ramosissima* with EO-1 Hyperion imagery, NASA EO-1 Science Validation Team Meeting, NASA Goddard Space Flight Center, Greenbelt, MD.
- McGwire, K. and S. Livingston, 2002. Online visualization and measurement of museum specimens, Annual Meeting of Society of American Archeologists, Denver, CO.
- McGwire, K., 2001. Application of Hyperion to invasive species, NASA EO-1 and SAC-C Science Validation Team Meeting, Buenos Aires, Argentina.
- McGwire, K. and S. Livingston, 2001. Virtual paleontological specimens: networking museum collections to promote science and education, North American Paleontological Conference, Berkeley, CA.
- McGwire, K., 2000. TRPA data management requirements for environmental thresholds, Report for the Tahoe Regional Planning Agency, South Lake Tahoe, CA.
- McGwire K., J. Boone, and S. St. Jeor, 2000. Remote sensing of factors affecting the distribution of hantavirus in the Great Basin, 53<sup>rd</sup> Annual Meeting of the Society for Range Management, Boise, ID.
- McGwire K., J. Boone, and S. St. Jeor, 2000. Spatial simulation modeling of hantavirus transmission in an open ecosystem, Keystone Conference on Emerging Infectious Diseases, Santa Fe, NM.
- McGwire, K., 1999. Interview: Hantavirus project, public radio program: The Environment Show.
- McGwire, K., 1999. Integrating reservoir studies and GIS in predictive models of infection dynamics, Annual Meeting of the American Society for Tropical Medicine and Hygiene, Washington, D.C.
- McGwire, K., S. St. Jeor & J. Boone, 1998. Spatial dynamics of hantavirus in host populations, International Conference on Emerging Infectious Diseases, CDC, Atlanta, GA.
- McGwire, K. and G. Mah, 1996. The NASA Landsat Pathfinder Global Land Cover Test Sites Project, in Proceedings: Pecora 13, Sioux Falls, SD, September, 1996.

- Goodchild, M., J. Estes, K. Beard, T. Foresman, J. Robinson, and K. McGwire, 1995. Research Initiative 15: multiple roles for GIS in U.S. global change research, Report of the First Specialist Meeting, National Center for Geographic Information and Analysis, Santa Barbara.
- Frohn, R., K. McGwire, V. Dale, and J. Estes, 1996. Testing a model of deforestation with remote sensing, GIS, and landscape metrics, in Proceedings: GIS 97, Vancouver, Canada, GISWorld.
- Frohn, R. and K. McGwire, 1996. Testing a land cover simulation model using improved landscape metrics with remote sensing, Proc. ASPRS/ACSM Annual Convention, Baltimore, American Society for Photogrammetry and Remote Sensing, Bethesda, MD, pp. 13-21.
- Fairbanks, D., K. McGwire, K. Cayocca, J. Lenay, and J. Estes, 1996. Sensitivity of floristic gradients in vegetation communities to climate change, *GIS and Environmental Modeling: Progress and Research Issues*, GIS World Books, Fort Collins, CO.
- McGwire, K., D. Fairbanks, K. Cayocca, and J. Estes, 1993, Modeling and monitoring regional floristic diversity using environmental measures, Proceedings of the 25th International Symposium, Remote Sensing and Global Environmental Change, Graz, Austria, Environmental Research Institute of Michigan, Ann Arbor.
- Cayocca, K., K. McGwire, D. Fairbanks, and J. Estes, 1993. Map assisted spectral characterization of an ecotone for long term monitoring, Proceedings of the 8th International Symposium on Geographic Information Systems in Forestry, Environmental, and Natural Resource Management, Bowne Printers, Vancouver, pp. 643-650.
- McGwire, K., D. Fairbanks, and J. Estes, 1992, Examining regional vegetation associations using multi-temporal AVHRR imagery, Proceeding of the ASPRS-ACSM Annual Convention, Albuquerque, NM. American Society for Photogrammetry and Remote Sensing, Bethesda, MD.
- McGwire, K. and J. Estes, 1991, The class dependent nature of error in machine assisted land cover classification, in *The Integration of Remote Sensing and Geographic Information Systems*, J. Star (ed.), American Society for Photogrammetry and Remote Sensing, Falls Church, VA.
- McGwire, K., & J. Estes, 1987, Interpolation and uncertainty in GIS modeling, Proceedings of the International Geographic Information Systems Symposium, Crystal City, VA, published by National Aeronautics and Space Administration, Washington, D.C.

### **Teaching Experience**

- Curriculum development and teacher training: Integrating math and geoscience education (IMAGE), a NASA-funded project for enhancing STEM education in Nevada middle schools.
- Lecture: Studying spatial variability of green leaf cover in western rangelands with helicopter-based vegetation surveys, Geog 604, Geography Dept., University of Nevada, Reno.
- Lecture: Towards end-user analysis of hyperspectral imagery, Geog 219 (Advanced GIS), Geography Dept., University of Nevada, Reno.
- Lecture Series: Introduction to remote sensing, Arid Lands Research Center, Tottori University, Tottori, Japan.
- Lecture: Spatial analysis of infestation by *Triatoma infestans*, Geog 219 (Advanced GIS), Geography and Planning Dept., California State University, Chico.
- Lecture: Spatial statistics, Geog 409/609 (Advanced GIS), Geography Dept., University of Nevada, Reno.
- Curriculum development: Interface of remote sensing and geographic information systems, an online educational module for the Remote Sensing Core Curriculum project.
- Seminar: Geog 215, Graduate remote sensing seminar, Geography Dept., University of California, Santa Barbara.

Remote sensing and GIS short course, U.S. Marine Corps, Lakehurst, NJ.

### **Additional Training**

International Ground Water Modeling Center, Butler University, 1986. Fundamentals of computerized ground water modeling.

USDA Natural Resources Conservation Service, 2013, Short course on the APEX model.

US Bureau of Land Management, 2013, Interpreting and Measuring Indicators of Rangeland Health.

### **Funding History (only projects with leadership roles are shown)**

Co-Investigator, Continued Owens Lake research, Great Basin Unified Air Pollution Control District, 2013-2014, \$75,000.

Co-Principal Investigator, Identifying riparian habitats within Nevada utilizing Landsat imagery, US Bureau of Land Management, 2013-2018, \$826,268.

Principal Investigator, Quantifying Soil Erosion and Runoff from Western Rangelands, Cooperative Agreement, USDA Agricultural Research Service, 2013-2015, \$122,000 + subsequent tasks.

Principal Investigator, Multi-parameter selection curves for machine-assisted annual layer interpretations of the WAIS-Divide Core, National Science Foundation, 2012-2013, \$50,000.

Principal Investigator, Integrating math and geoscience education (IMAGE): Improving STEM education in Nevada with compelling Earth science imagery, National Aeronautics and Space Administration, 2011-2013, \$125,000.

Principal Investigator, Characterization of periphyton and macronutrients in the South Fork of the Humboldt River and limnological assessment of the South Fork Reservoir, NV, Nevada Dept of Environmental Protection, 2009-2010, \$205,000.

Principal Investigator, Optical imaging for the National Ice Core Lab, National Science Foundation, 2007-2009, \$148,000.

Co-Principal Investigator, Carson River thermal assessment, Nevada, Division of Environmental Protection, 2007, \$43,000.

Principal Investigator, Sub-pixel registration of HIRIS imagery, U.S. Department of Energy, Special Technologies Laboratory, 2007, \$20,600.

Principal Investigator, Airborne hyperspectral research & development for invasive species detection and mapping, National Aeronautics and Space Administration, 2006-2008, \$496,000.

Co-Principal Investigator, Regionally-based clean water activities, U.S. Environmental Protection Agency, 2005-2011, \$1,936,500.

Co-Principal Investigator, Source assessment and preliminary modeling of thermal loading in the Carson River basin, Western Nevada, U.S. Environmental Protection Agency, 2004-2006, \$218,000.

Principal Investigator, Collaborative research: digital optical imaging of ice cores for curation and scientific applications, National Science Foundation, 2003-2006, \$469,000.

Co-Investigator, Real-time monitoring system for phytoremediation optimization, ADA Technologies, U.S. Department of Energy SBIR program, 2002-2003, \$26,000.

Co-Investigator, Host/vector/environmental interactions in epizootic bovine abortion, U.S. Department of Agriculture, 2002-2004, \$37,500.

Principal Investigator, Hyperspectral monitoring of invasive, non-native plant species with EO-1 Hyperion imagery, National Aeronautics and Space Administration, 2000-2002, \$125,000.

Principal Investigator, Developing digital paleontological archives, National Science Foundation, 1998-2001, \$570,000.

Principal Investigator, TRPA data management requirements for environmental thresholds, Tahoe Regional Planning Agency, 2000, \$10,000.

Principal Investigator, Spatial modeling of hantavirus host populations, National Institutes of Health, 1996-2000, \$390,000.

Co-Investigator, Center for excellence in hyperspectral and multispectral remote sensing, U.S. Department of Energy, 1998-1999, \$180,000.

Subcontract, Accuracy Assessment of the IGBP fast-track 1km land cover dataset, National Aeronautics and Space Administration, 1997-1999, \$27,000.

Collaborator, McMurdo Dry Valleys Long Term Ecological Research Site, National Science Foundation, 1996-1997, \$60,000 (data management component).

Principal Investigator, Global land cover test sites, National Aeronautics and Space Administration, 1994-1998, \$310,000.

Co-Principal Investigator, Remote sensing information sciences research group, National Aeronautics and Space Administration, 1994, \$120,000.