

George Franklin Hepner, Professor Emeritus

<http://geog.utah.edu/>

Areas of Specialization

Land resources analysis and management
Geographic information science (GIS)
Geography of international terrorism
Remote sensing industry policy and workforce development

Professional Experience

University (courses taught)

Professor Emeritus awarded June, 2019

Professor, Department of Geography, The University of Utah, 1997-2019
(geographic information systems, geography of terrorism and homeland security, environmental management, GIS project management, spatial modeling, hyperspectral remote sensing, world regional geography).

Director of Undergraduate Programs 2014- 2019

Departmental Chair 2010- 2013

Chair RPT Committee 2004-2010

Director of Graduate Program 1999-2001

Departmental Chair 1990-1996

Foreign Faculty Appointments, Visiting Professor, Fall, 2013, Akita International University, Akita, Japan; Visiting Scholar, Summer, 2011, Chonnam National University, Gwangju, South Korea; - Visiting Professor, Summer 2008, Yonsei University, Seoul, South Korea, 2008

Associate Professor and Chair, Department of Geography, The University of Utah, 1990-1996.

Associate Professor, Department of Geography, The Florida State University, 1987-1990 (tenure granted 1988).

Assistant Professor, Department of Geography, The Florida State University, 1985-1986 (geographic information systems, land use planning, computer cartography).

Assistant Professor, Department of Geography, University of Southern Mississippi, 1984-1985, (cartography, world regional, map analysis).

Assistant Professor, Department of Geography, University of Kentucky, 1982-1983, (cartography, land use planning, and resource management).

Assistant Professor, Department of Geography, Western Michigan University,

1978-1982 (term appointment), (ecological problems of the world, conservation and resource management, environmental impact analysis and land use analysis and planning - participant faculty in interdisciplinary Center for Environmental Affairs, regional and rural planning issues).

Teaching Associate, Arizona State University, 1975-1977, (map reading, physical geography, and introductory cartography courses).

Teaching Assistant, University of Toledo, 1973-1975, (cartography and physical geography).

Research/Administrative Non-University

Director, NGA-USGS Academic Center of Excellence in Geospatial Sciences Initiative , 2015-2018

Director, Geospatial Intelligence Certificate Program, University of Utah, affiliated with the U.S. Geospatial Intelligence Foundation 2013-2018
<http://usgif.org/>

Associate Director, Institute of Public and International Affairs, University of Utah 2007- 2012

Member, Mapping Sciences Committee, National Research Council, National Academy of Science, 2007-2010.
<http://dels.nas.edu/global/besr/MS>

Director, University of Utah, Southwest Consortium for Environmental Research and Policy (SCERP), Consortium of five U.S. and four Mexican universities. 2000- 2013.

United States Geospatial Intelligence Foundation, Accreditation Panel to develop academic program standards in geospatial intelligence education. 2005-2011. www.usgif.org

Team Leader, Academic Component “Remote Sensing Industry Analysis and Forecast, 2000-2012” sponsored by the NGA, NASA, USGS, NOAA and ASPRS. This is a ten year rolling forecast of the remote sensing/GIS industry based on data from the academic, private and governmental sectors 1999-2012.

Program Reviewer, Geography and Geo-Information Science Programs
Geo-Information Science Graduate Program, Salem State College, MA.
Higher Ed. Coord. Committee, 1992, Project 2025, The Air University, USAF, 1996, Arizona State University, 2004 Western Michigan University Upjohn Center, 1992 and 2005, Rutgers University Biology, 2005, University of New Mexico 2008, Weber State University 2012, Internal program reviews for Anthropology and Mathematics (University

of Utah)
NASA-JPL, DOE-LLNL. U.S. Forest Service,

Consultant, US EPA Report on Environment, 2005, U.S. Forest Service, Review of *Monitoring the World's Forest Resources*, 2005, Hyperspectral Imagery Analysis of Abandoned Mine Sites, 2004.

Research Associate, Lawrence Livermore National Laboratory, October, 2003-March, 2004. Projects involving use of GIS for homeland security. (SEE Other Published Works)
<https://www.llnl.gov/>

National President, ASPRS, American Society for Photogrammetry and Remote Sensing (2001 –2002) <http://www.asprs.org/> Elected vice president in 1999 by ASPRS membership, served as president-elect 2000.

Editor, *Earth Interactions*, initial member of editorial team for collaborative establishment of electronic journal on global change, effort of the American Geophysical Union, American Meteorological Society and the Association of American Geographers, 1995 – 2002.
<http://www.EarthInteractions.org/>

Trustee, Board of the International Geographic Information Foundation 1995-1999
-Chair of Award Comm. ESRI/IGIF Scholarship.

Member, Board of Directors, University Consortium for Geographic Information Science (UCGIS) composed of leading research universities 1994-1997, member of Research Committee 1994
Co-host of 1998 Annual Meeting in Park City, Utah.

Visiting Scientist, Jet Propulsion Laboratory (JPL)/California Institute of Technology, AVIRIS/IFSAR imagery integration, GIS, October 1996-March 1997. <https://www.jpl.nasa.gov/>

Member, Steering Committee, GIS/LIS International Conference 1994-1997.

Organized workshop, "Use of GIS for Improving Community Access to U.S.-Mexico Border Environmental Data, with USEPA/SDSU, February 20-21, 1997.

Evaluator, Project 2025, The Air University, U.S. Air Force, 1996.

SBIR Program Reviewer, U.S. Department of Agriculture, Washington, D.C., 1994, 1995.

Member, Technical Coordinating Committee and Chair, hazardous materials thrust area, of the Southwest Center for Environmental Research and

Policy (composed of representatives from five U.S. and four Mexican Universities), U.S. EPA University Center, 1991-1995.

GIS Workshop for SEDESOL personnel, Mexico City, Feb. 22-26, 1993.

Consultant- Research Fellow, National Aeronautics and Space Administration, Jet Propulsion Laboratory (JPL), California Institute of Technology, GIS processing, artificial neural networks, 1989-1994.

Research Associate, Homer Hoyt Center for Land Economics and Real Estate, Creation of an automated urban infrastructure forecasting system, 1989-1990.

Project Director, "Utilization of Computer Mapping and Graphics to Promote Excellence in Mathematics, Science and Computer Education" project, 1985-1987.

Software Reviewer - Rand McNally Inc. Tested microcomputer mapping system, RANDMAP, beta version. 1986.

Investigator, "The Assessment and Study of Marina Needs and Locations on the Mississippi Gulf Coast, : under contract with the Mississippi Bureau of Marine Resources and the U.S. Office of Ocean and Coastal Resource Management, 1985.

Consultant, Arcadia Creek Associates, Kalamazoo, Michigan, central business district redevelopment.

Project Coordinator, Department of Geography, Western Michigan University, 1981-1982, Supervision of computer science personnel to implement computer mapping capability at WMU.

Researcher, "Urban Open Space Policy in Local Communities," NSF Science for Citizens Program, 1981-1982.

Field Research, University of Colorado, Mountain Research Station, Nederland, Colorado, July-August, 1980, environmental problems in alpine areas.

Consultant, City Manager, Bangor, Michigan, March, 1980, regionalization of area planning efforts.

Consultant, Environmental Board, Portage, Michigan, January, 1980, formulation of a local environmental impact statement ordinance.

Research Associate, Center for Environmental Studies, Arizona State University, 1977, micro-climate and land use field projects in San Juan Mountains, Colorado, and irrigated desert of Arizona directed by Dr. Melvin Marcus.

Research Assistant, "Migration and Non-metropolitan Growth," directed by Dr. Patricia Gober, July, 1976-September, 1976, computer data conversion and analysis of U.S. Census information.

Map Clerk, Arizona State University Library Map Service, 1976, map filing and customer service.

Research Associate, Business Research Institute, University of Toledo, 1974, analysis of the impacts of regional shopping centers on adjacent land use and valuation.

Planning Intern, Erie Township Planning Agency, Michigan, 1974, zoning survey and analysis of the effects of urbanization on a rural area.

Research Analyst, Austin Financial Associates, Ottawa Hills, Ohio, 1973, analysis of prospective branch bank locations.

Formal Education

Ph.D. Arizona State University, School of Geographical Sciences, December, 1979, Dissertation: A Directed Graph Approach to Rural-Urban Land Use Conversion.

M.S. The University of Toledo, August, 1975
Thesis: The Development of a Demand for Land Model for the Rural-Urban Fringe.

B.Ed. The University of Toledo, March, 1972

Recognitions and Honors

ASPRS Fellow- American Society for Photogrammetry and Remote Sensing -Selection in 2010

Environmental Systems Research Institute (ESRI) Award for Best Scientific Paper in GIS 1999- 3rd place. ASPRS Shared with Mark Finco.

Environmental Systems Research Institute, ESRI Award for Best Scientific Paper in GIS 1996 -1st place. ASPRS Shared with John Lowry and Harvey Miller.

AWU Research Fellowship, Support for research at Cal. Tech/JPL 1996-1997.

NASA-American. Society Engineering Educations Research Fellowship, California Institute of Technology, The Jet Propulsion Laboratory, 1987- 1988.

Award for Meritorious Performance, College of Arts and Sciences, Western Michigan University 1980-1981 academic year.

Publications

Journal Articles (refereed)

- Zhang, Y. and G.F. Hepner, “The Dynamic Time Warping-based k-means++ clustering and its Application to Phenoregion Delineation, International Journal of Remote Sensing, Vol.38 Issue 6 (2017) pp. 1720-1736.
- Zhang, Y. and G.F. Hepner, “Short-term Phenological Predeictions of Vegetation Abundance using Multivariate Adaptive Regression Spline in the Upper Colorado River Basin, “Earth Interactions, Vol. 21 (1) (2017) pp. 1-25.
- Zhang, Y., G.F. Hepner and P.E. Dennison, “Delineation of Phenoregions in Geographically Diverse Regions using k-means++ clustering: A case study in the Upper Colorado River Basin,”GIScience and Remote Sensing, 49, No.2 (2012) pp 163-181.
- Mondello, C., G.F. Hepner and S. Boerman, “ ASPRS Ten Year Remote Sensing Industry Forecast **Phase VI**,” Photogrammetric Engineering and Remote Sensing, (Nov. 2011) : pp. 1075-1089.
- Medina, R. L. K. Siebeneck & G. F. Hepner, “A Geographic Information Systems (GIS) Analysis of Spatiotemporal Patterns of Terrorist Incidents in Iraq 2004–2009”, Studies in Conflict & Terrorism, 34:11, (2011):pp. 862-882
- Medina, R. and G. F. Hepner, “Advancing the Understanding of Sociospatial Dependencies in Terrorist Networks, “Transactions in GIS,(2011), 15(5): 577-597.
- Siebeneck, L., R. Medina, I. Yamada, and G. Hepner, “Spatial and Temporal Analyses of Terrorist Incidents in Iraq, 2004-2006, Studies in Conflict and Terrorism, Vol. 32, (July-August, 2009) pp. 591-610.
- Mondello, C., G.Hepner and R. Medina, “Ten Year Forecast of the U.S. Remote Sensing Industry **Phase V**,” Photogrammetric Engineering and Remote Sensing, 74-11 (November, 2008) pp. 1297-1305.
- Mondello, C., G.Hepner and R. Williamson, “Ten Year Forecast of the U.S. Remote Sensing Industry **Phase IV**,” Photogrammetric Engineering and Remote Sensing, 72-9 (September, 2006) pp. 985-1000.
- Mondello, C., G.Hepner and R. Williamson, “Ten Year Forecast of the U.S. Remote Sensing Industry **Phases I-III**,” Photogrammetric Engineering and Remote Sensing, 70-1 (January, 2004) pp. 5-58.

- Chen, C., G. Hepner and R. Forster, "Fusion of Hyperspectral and Radar Data Using IHS to Enhance Urban Surface Features," ISPRS International Journal of Photogrammetry and Remote Sensing, "Algorithms and Techniques for Multi-Source Data Fusion in Urban Areas"-Special Issue.58:1/2. (April-May, 2003). pp. 19-30.
- Hepner, G.F., T. Cova, R. Forster and H. Miller, "Use of Remote Sensing and Geospatial Analysis for Transportation Hazard Assessment: an Integrated University, Government and Private Sector Consortium," IEEE/ISPRS Joint Workshop on Remote Sensing and Data Fusion over Urban Areas Proceedings, IEEE-01EX482,Rome, Italy (Nov. 2001), pp.241-244.
- Hepner, G. F., and R. Rabin. "Status Report on the Ten-year Forecast of the Remote Sensing Industry in the U.S.A.- A Joint NASA-ASPRS Effort," IEEE/ISPRS Joint Workshop on Remote Sensing and Data Fusion over Urban Areas Proceedings, IEEE-01EX482, Rome, Italy (Nov. 2001), pp.133-35.
- Hepner, G.F. "Individual and Societal Responsibility for the Future of Geospatial Information and Technology," Photogrammetric Engineering and Remote Sensing, 67-7 (July, 2001), pp. 791-2.
- Finco, M. and G. Hepner, "Industrial Location Comparison Using a GIS-based Model of Vulnerability," Cartography and Geographic Information Science, 26:4, (October,1999).
- Finco, M. and G. Hepner, "Modeling Agricultural Nonpoint Source Sediment Yield in the Imperial Valley, California," Photogrammetric Engineering and Remote Sensing,64-11 (November, 1998), pp. 1097-1105.
- Minton, D., M. Finco, G. Hepner, J. Gomez and K. Boardman, " Communication of US/Mexico Border GIS Research Through a Bilingual Multimedia Approach," Proceedings GIS/LIS 98 Proceedings (November, 1998), Ft. Worth, TX.
- Hepner, G. F.,"Understanding UCGIS" Photogrammetric Engineering and Remote Sensing, (September, 1998), pp. 869-872.
- Hepner, G.F., B. Houshmand, I. Kolikov and N. Bryant, "Investigation of the Integration of AVIRIS and IFSAR for Urban Analysis," Photogrammetric Engineering and Remote Sensing, 64-8 (August, 1998),pp 813-820.
- Lowry, J., H. Miller and G. Hepner "A GIS-based Community Vulnerability Analysis to Industrial contaminants on the Mexico/U.S. Border," Photogrammetric Engineering and Remote Sensing, Special GIS Issue 61:11, (November, 1995), pp. 1347-1359.

- Hepner, G.F. and M. Finco "Modeling Dense Gas Contaminant Pathways over Complex Terrain using a Geographic Information System," Journal of Hazardous Materials, No. 42, (June, 1995), pp. 187-199.
- Bowen, M., T. Kontuly and G. Hepner, "Estimating Maquiladora Hazardous Waste Generation on the U.S./Mexico Border," Journal of Environmental Management, 19:2, (April, 1995), 281-296.
- Finco, M.V., G.F. Hepner and H.J. Miller, "GIS Modeling of Contaminant Pathways and Human Exposure in the Nogales Region of the Mexico-U.S. Border," Proceedings GIS/LIS 1994, Phoenix, AZ, (October, 1994), 312-321.
- Hepner, G.F., "Use of GIS for Binational Environmental Assessment: Insights for Central Europe," Proceedings Environment and Quality of Life in Central Europe: Problems of Transition, IGU Conference, Prague, (August 23, 1994).
- Hepner, G.F. and H.J. Miller, "Using GIS for Environmental Assessment on the Mexico/U.S. Border," American Congress of Surveying and Mapping Bulletin, No. 146, (December, 1993), 42-46.
- Hepner, G.F. and R.T. Walker, "An Integrative Approach to Research of Deforestation under Concession Management," Technical Papers ASPRS-ACSM, Volume 3, (1991), 189-196.
- Ritter, N.D. and G.F. Hepner, "Application of an Artificial Neural Network to Land Cover Classification of Thematic Mapper Imagery," Computers and Geosciences, Special Issue: Artificial Intelligence Applications in Geoscience, 16 (6), (November, 1990), 873-880.
- Hepner, G.F., T. Logan, N. Ritter and N. Bryant, "Artificial Neural Network Classification Using a Minimal Training Set: Comparison to Conventional Supervised Classification," Photogrammetric Engineering and Remote Sensing, (April, 1990), 469-473.
- Hepner, G.F., T. Logan and N. Bryant, "Spatial Query For Decision Support of Cross-Country Movement," Photogrammetric Engineering and Remote Sensing, Special GIS Issue, (November, 1988), 1617-1621.
- Hepner, G.F. "The Role of the Land Supply Information System in Urban Land Management," Applied Geography Conference Proceedings, 10 (September, 1987), 39-42.
- Wales, R., G.F. Hepner and T. Hudson, "Marina Inventory and Berthing Supply Projections: Mississippi's Gulf Coast," Coastal Management, 15,2 (1987), 157-174.

- Hepner, G.F. and R. Wales, "Spatial Patterns of Recreational Boat Use: An Input to Coastal Management," Journal of Shoreline Management, 2,3 (1986), 199-206.
- Hepner, G.F. "Locational Factors and the Urban Fringe Land Market," Journal of Rural Studies, 1,4 (Nov.-Dec., 1985), 64-67.
- Hepner, G.F. "Considerations in the Development of a Computer Mapping Laboratory," Journal of Geography, 84,2 (April, 1985), 64-67.
- Hepner, G.F. "Use of Value Functions as a Possible Suitability Scaling Procedure in Automated Composite Mapping," The Professional Geographer, 36,4 (Nov., 1984), 468-472.
- Hepner, G.F. "An Analysis of Residential Developer Location Factors in a Fast Growth Urban Region," Urban Geography, 4,4 (Nov.-Dec., 1983), 355-363.
- Hepner, G.F. and Thomas Hodler, "The Role of Interactive Computer Mapping in the Science Curriculum," Journal of College Science Teaching, 6 (May, 1982), 367-9.
- Hepner, G.F. "Balancing Urban Development and Open Space: Methods and Policies for the Future," Applied Geography Conference Proceedings, 4 (Oct., 1981), 290-293.
- Hepner, G.F. "A Directed Graph Approach to Locational Analysis of Fringe Residential Development," Geographical Analysis, 13 (July, 1981), 276-283.
- Hepner, G.F. "Meso-Scale Facility Siting Using Composite Suitability Mapping," Environmental Impact Assessment Review, 2 (June, 1981), 201-2.
- Hepner, G.F. "Application of Directed Graph Modelling Procedures to Land Use Analysis," Applied Geography Conference Proceedings, 3 (Sept., 1980), 79-87.
- Hepner, G.F. "Determination of Stability of a Complex System Using Applied Graph Theory," Geographical Analysis, 10 (July, 1978), 292-5.

Books/Chapters

- R. Medina and G. Hepner, *The Geography of International Terrorism, An Introduction to Spaces and Places of Violent Non-state Groups*, Taylor and Francis/ CRC, pp. 258 hardback, 2013.
<http://www.routledge.com/books/details/9781439886861/>

- R. Medina and G. Hepner, "Geospatial Analysis of Dynamic Terrorist Networks," in *Values and Violence: Intangible Aspects of Terrorism*, pp. 151-168 (Springer) 2008 hardcover, paperback, 2009.
- Hepner, G.F., D.J. Wright, C.J. Merry, S.J. Anderson and S.D. DeGloria, 2005. "Remotely Acquired Data and Information in GIScience," Chapter 13, pp.351-64 in A Research Agenda for Geographic Information Science, R. McMaster and L. Usery, ed. CRC Press.
- Williamson, R., Morain, S., Budge, A. and G. Hepner, 2002. "Remote Sensing for Transportation Security," National Consortium for Safety, Hazards and Disaster Assessment (NCRST) Workshop Report, March 13-14, 2002. George Washington University, Washington, D.C. 28pp.
- Finco, M. and G. Hepner, "Environmental Hazards on the US-Mexico Border," in Geosystems Today: An Interactive Casebook, R. Ford and J. Hipple, eds., John Wiley and Sons (New York) 1999.
- Hepner, G. F. et al., Environmental Research on the US/Mexico Border Using Geographic Information Systems: An Electronic Notebook, Southwest Center for Environmental Research and Policy, (San Diego, CA) 1999.
- Wright, R.D., G.F. Hepner and C. Brown (eds), Geographic Information Systems for Mexico - United States Border Environmental Research and Management Workshop Proceedings, Institute for Regional Studies of the Californias, San Diego, CA (1994), 33pp.
- Megbolugbe, I., J. May, B. Ayeni and G. Hepner, Computerized Forecasting System For Planning Infrastructure, Office of Housing Policy Research, Fannie Mae, Washington, D.C. (1994), 214pp.
- Wright, R.D., G.F. Hepner, and C.G. Metzner (eds.), A U.S.-Mexico Border Environmental Geographic Information System, Proceedings, Institute For Regional Studies of the Californias, San Diego, CA (1993), 44pp.
- Hepner, G.F. and J. O. McKee. (eds.), World Regional Geography A Global Approach, West Publishing Inc., St. Paul (1992), 653pp.
- Hepner, G.F. Magnitude and Implications of Rapid Residential Development in the Phoenix, Arizona Rural-Urban Fringe, in Rural-Urban Fringe Perspectives in Urban Geography, C. Yadar, editor, Concept International Series in Geography, No. 3, New Delhi, (1987), 175-189.
- Wales, R. and G.F. Hepner, An Assessment of Recreational Marinas and Marina Needs on the Mississippi Gulf Coast, Prepared under contract with the Bureau of Marine Resources, (May 1985), 159pp.

Harris, L. and G.F. Hepner, Open Space and Land Development in Urban Communities. Science For Citizens Center, Western Michigan University, Kalamazoo, Michigan, (1983), 37pp.

Hepner, G.F., D.W. Lewis and W.G. Muraco. Locational Factors and the Demand for Land on the Rural-Urban Fringe, Regional Research Report Number 10, Business Research Institute, College of Business Administration, University of Toledo, (1976), 78pp.

Other Publications

Hepner, G. F. and R. Medina, "Understanding the Geography of Terrorism," Earth Imaging Journal, vol.9: 5, pp. 24-5 (Oct. 2012).

Hepner, G. F. review of Manual of Geographic Information Systems, M. Madden, ed, 1352pp., (2009), American Society for Photogrammetry and Remote Sensing, Photogrammetric Engineering and Remote Sensing, 75(11) p 1262. (Nov. 2009).

Mondello, C. G.F. Hepner and R.A. Williamson, "Remote Sensing Industry Expects Growth," Imaging Notes, Vol. 19, No.3 pp. 22-27 Summer, 2004.

Internal reports- Research Associate, Lawrence Livermore National Laboratory, 2003- 2004

- "Review and Evaluation of the LLNL SEARCHER Program to Estimate Health Risks in Urban Areas." -"Spatial Analysis Considerations for Refined Estimates of Health Risks with Higher Levels of Geo-locational Accuracy."

-"Potential for GIS use in Yucca Mountain transportation issues."

-"Selected spatial analysis and mapping issues related to LLNL site security – NARAC"

Hepner, G.F. and J. Plasker, "Imaging and Geospatial Information in the Management of U.S. Water Resources," U.S. Water Report, Saringa Group, San Francisco, (2000), pp.160-3.

Hepner, G.F. and M. Hodgson, "UCGIS Stakeholder Statement," National Imagery and Mapping Agency (NIMA)-DOD IPT Master Plan, , October, 1997.

Editor, ENCARTA 97-CD Encyclopedia, Microsoft Corporation, 1996-
Software Review of The Map Collection, The Professional Geographer, 1990, 42 (10), 125.

"Cross-Country Movement Analysis Using an Image-Based Geographic Information System," Published refereed abstract, International Cartographic Association Conference, Budapest, Hungary, 1989.

"Spatial Query as a Methodology for the Acquisition of Decision Support

Information," Published abstract in Integrating Technology and Geoscience Applications, GIS Symposium convened by the National Academy of Sciences, September, 1988.

Book Review, Integrated Impact Assessment, The Professional Geographer, 36 (May, 1984), 276-277.

"National Association of Geology Teachers Cooperative Dissemination Project (Report, J.R. Coash ed.). Journal of Geological Education, 30 (Nov., 1982), 268-282. (with D. Dickason and T. Hodler).

Contributor to Special Issue, "The Future of Agriculture in Arizona," Progressive Agriculture 31:4 pp. 10-11, Winter, 1981.

Grants and Awards

Bureau of Land Management, DOI, "Predicting Phenological Plant Stages in the Upper Colorado Basin," Principal Investigator (PI) \$249,516, 2006-12. Co-PI 2010- 2012.

British Gas International, "Environmental Analysis and Mapping of Stromatolithic Forms in the Great Salt Lake" PI, \$178,800, 2009-2012.

U.S. Environmental Protection Agency, Southwest Consortium for Environmental Research and Policy (SCERP), **Consortium Principal Investigator**, 2002-2005 ; **University of Utah Center Director**, 2002- 2012, Consortium of U.S. and Mexican universities. (Total consortium budget: FY 2000-2005, \$2.5 million per year.) University of Utah funding FY 2000- 2012 approx. \$.5 million per year, FY 2008-2012, \$.25 million per year.

Air Force Office of Scientific Research (AFOSR), "An Integrated Field-based System for Fusion of Hyperspectral and Interferometric Radar," DURIP instrumentation award PI, \$197,391 (2005-06).

Department of Energy, Lawrence Livermore National Laboratory, "Research on Homeland Security and Weapons Non-Proliferation Monitoring," Principal Investigator, \$40,078. (2003-04).

U.S. Department of Transportation, Research and Special Projects Administration, "University Center for Research on the Use of Geospatial Technologies in Transportation Related Hazards and Disaster Assessment," Principal Investigator, \$437,659 (2000-2004).

National Science Foundation, Ph.D. Dissertation Improvement Grant, "Assessing Connectivity Among Grizzly Bear Populations Near the U.S.-Canada Border," Project PI and Advisor for Vickie M. Backus, ABD. \$10,000 (2001-03).

U.S. Environmental Protection Agency. "Transborder Watershed Research Program-Tijuana River", Principal Investigator, \$29,451 (1998-1999), \$50,000(1999-2000). Project designated as a NSDI "Smart Growth Local Demonstration Project."

NASA, Center of Excellence, MTPE Program, "Enhancement of Capabilities in Hyperspectral and Radar Remote Sensing for Environmental Assessment and Monitoring," \$104, 162, Principal Investigator 1997-1998.

U.S. Environmental Protection Agency, "Enhancing Communication of Border GIS Databases and Analytical Products in a Binational Context," \$69,301. Principal Investigator, 1997-1999.

NASA Targeted Commercialization Program Support for research at Cal. Tech/JPL 1996-1997.

U.S. Environmental Protection Agency, 1991-1997"GIS Development for U.S./Mexico Border Region for Environmental Assessment, Principal Investigator.\$61,000 (1991), \$84,000 (1992), \$90,000 (1993), \$144,720 (1994) \$130,000 (1995), \$128,000 (1996), \$79,993 (1997).

Salt Lake Airport Authority, "Salt Lake City Airport GIS", \$100,000 (1993-94) \$100,000 (1994-95) co-PI with Brian Haslam.

University of Utah. Research Instrumentation Grant, University Research Committee, 31,640, 1993.

Florida High Technology Research Council, "Terrain Data Bases for Simulation," jointly with Dr. Thomas Clark, UCF, Institute for Simulation \$65,000 (1990) \$73,373 (1989).

Homer Hoyt Foundation for Research in Land Economics and Real Estate, investigator on project to create an automated urban infrastructure forecasting system, \$50,000, 1988-1991.

Travel Grant administered by the ACSM to attend the International Cartographic Association Conference Budapest, Hungary, August 1989.

FSU Council on Research and Creativity, Research Planning Grant, "Map/Image Feature Recognition Using and Artificial Neural Network Approach," \$2500, 1988-1989.

National Aeronautics and Space Administration, Summer Research Fellowship, research on geographic information systems at the Jet Propulsion Laboratory, California Institute of Technology, June-August, 1987 and June-August, 1988.

FSU Council on Research and Creativity, 1986 Summer Salary Award for

research on, "Use of Automated Information Systems for Land Development and Growth Management.

U.S. Department of Education, "Utilization of Computer Mapping and Graphics to Promote Excellence in Mathematics, Science and Computer Education \$19,848, Education for Economic Security Program, 1985-1987.

Exxon Educational Foundation, Support to participate in the program, "Fostering International Understanding through World Geography," 1985-1986.

National Science Foundation, Division of International Programs travel grant to attend NATO Advanced Study Institute - Environmental Impact Assessment, August 30-September 12, 1981 in Bonas, France.

Lucia Harrison Endowment Fund, "Purchase and Adaptation of Computer Graphics Software," \$2,622, April, 1981.

National Science Foundation Science for Citizens Program, "Achieving Balanced Open Space and Urban Land Development," \$5,310, February, 1981 (with L. Harris).

National Science Foundation ISEP grant, "Undergraduate Science Education in Automated Cartography and Geographic Analysis," \$48,515, October, 1980 (with T. Hodler and D. Dickason).

Michael Real Estate Research Fund, "Locational Factors and the Demand for Land on the Rural-Urban Fringe," awarded September, 1975.

Business Research Institute, The University of Toledo, Thesis Research Grant, February, 1975.

The University of Toledo, Board of Trustees Scholarship, August, 1973.

Professional Service

Professional Organizations

American Association for the Advancement of Science (ASPRS representative to Section E Geology and Geography) 2010-2015

International Editorial Board, *Journal of Geographical Research*, 2012-19

Association of American Geographers

Editorial Board, *The Professional Geographer*, 2005-2009.

AAG Representative on the GIS/LIS International Conference Steering Committee 1994-1997.

Chair, Rocky Mountain/Great Plains Region, 1994-1995.

-hosted regional meeting Salt Lake City

Vice Chair, Rocky Mountain/Great Plains Region, 1993-94.
AAG Committee on Career Development 1992-1994.
AAG Representative to the Local Arrangements Committee GIS/LIS
Orlando, FL 1989.
(Geographic Information Systems Specialty Group)
(Applied Geography Specialty Group)

American Society for Photogrammetry and Remote Sensing
Co-director, Sacramento National Conference April, 2012
National President- (2001-02).
Co-director, Reno National Conference, May, 2006
Elected National Vice President 2000, President-elect 2001
Intermountain Regional Director on ASPRS National Board 1995-2001.
Selection Committee, Intergraph Best Paper Award, 1998.
Member, ASPRS Strategic Planning Committee.
President, Intermountain Region, 1994-1995.
Vice President, Intermountain Region, 1993-94.

Pi Gamma Mu National Social Science Honorary Society

Utah GIS Advisory Committee to the State Information Technology Coordinator,
Governor's Office of Planning and Budget, 1993-2008.

Advisory Board Member, Senior Scholar Program, Salt Lake County Aging
Services, 1993- 1998.

Utah Geographic Information Council 1992- 2000.

Manuscript Reviewer for the National Research Council, Ecological Economics,
Photogrammetric Engineering and Remote Sensing, Environmental Management, Hawaii
International Conference on System Sciences, International Journal of Remote Sensing,
International Journal of Geographical Information Systems, Transactions in Geographic
Information Science, The Professional Geographer, The East Lakes Geographer, Urban
Geography , Journal of Planning Education and Research, Remote Sensing of
Environment, Oxford University Press, Journal of Borderland Studies.

Proposal Reviewer and Program Panel Member for the National Science
Foundation(NSF) Water and Watersheds Panel, National Research Council, NSF
Geography and Regional Science Program, U.S. Dept. of Agriculture SBIR Program,
National Geographic Society, and NASA.

Recent University/SBS College/Departmental Service

CSBS Curriculum Committee 2014- 2019
University International Studies Board 2009- .2011
Department of Geography, Chair RPT Committee and CSBS RPT representative,
2004- 2010.
University Cyberinfrastructure Council 2007- 2015.
Faculty Senate- SBS College Representative 1999-2005

University Research Committee- Funding Incentive Seed Grant Program
Comm.1998-00.
SBS Executive Committee 1997-2000
SBS Proposal Initiative Grant Comm. 1997-04.
SBS Teaching Award Comm. 1998.
SBS rep., Campus Quantitative Reasoning Requirements Committee 1997- .
U of U Campus GIS Advisory committee 1994 - .
U of U Long Range Planning Committee 1994- .
Food Services Review Committee 1994-1996.
University Academic Policy Advisory Committee 1992-1994.
Department of Anthropology Review Committee 1992.
Department of Geography Chairperson 1990-1996.
Director of Graduate Studies 1999-2002
Member of -Geographic Information Analysis Committee
- Chair of oversight committee for GIS/remote sensing lab (DIGIT)
Graduate Committee
College Research Award Committee

Graduate Student Supervision 1991-2019

(Year Degree Granted)

Master's degree (*Chair of committee)

Phyllis Bustamonte* 1992
Don Evans 1993
Gaute Langaas 1993
Natalie Kelsey 1994
Kent Williams* 1994
John Lowry 1994
Mace Bowen 1995
Joe Borgione*1995
Sean Cannon 1996
Eric Bishop 1997
Eric Swartling* 1997
G.J. LaBonty 1998
Jeni Seibeneck 2000
Kelly Boardman* 2000
Anjanette Bohn* 2000
Adam Sobek 2004
Wei Lun Chang 2004
Cindy Clark* 2005
James Bolser* 2005
Abigail Guess 2010
Thomas Springsteen*2009
Ian Housman* 2011
Thomas Zumbado* 2011

Ph.D. (*Chair)

Lallie Scott 1992
Carl Horton 1993
Youngsinn Sohn 1994

Devon Hansen 1999
Mark Finco* 1999
Jeremy Chen* 2001
Lynn Baumgras 2002
Nobbir Ahmed_2004
David Baxter
Lina Ciao 2010
Vicki Backus* 2006
Daphne White* 2006
Joo-Yup Han 2010
Chris Upchurch 2010
Zhenyu Jin 2011
Richard Medina* 2009
Tetsuo Kobayashi 2009
Thomas Springsteen 2009
Laura Siebeneck 2010
Suparna Das 2011
Elias Deeb 2012
Hao Huang , 2014
Heidi Hadley* 2012
Yuan Zhang*2013
Claire Weber 2017
Robert Baskin*2015

Personal Information

U.S.A. citizen

Married with one son

Avocations: hiking, camping, fine food and wine, travel