

## Dr. Barbara Pfeil Buttenfield

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University of Colorado  
Boulder, Colorado 80309

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Internet <https://spot.colorado.edu/~babs/index.htm>

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### RESEARCH INTERESTS

*Geographic Information Science*: data generalization and modeling, multi-scale geospatial databases, data harmonization and integration

*Environmental Modeling*: terrain modeling, dasymetric models, accuracy / error assessment in spatial data

*Scientific visualization*: topographic and thematic information design, representations of uncertainty, graphical interface design & usability evaluation

*Spatial data infrastructures*: socio-technical impacts of data production, delivery, access and use

### TEACHING EXPERTISE

Cartography, Information Design and Uncertainty Representation  
Geographic Information Science  
Spatial Data Modeling and Multi-Scale Database Design

### EDUCATION

Ph.D University of Washington, 1984, Geography  
Thesis: Line Structure in Graphic and Geographic Space (Advisor: John C. Sherman)

M.A University of Kansas, 1979, Geography  
Thesis: Grid Representations of Sketch Map Distortion (Advisor: George F. Jenks)

B.A Clark University, 1974, Geography

#### Training Programs:

U. Colorado Boulder Faculty Teaching Excellence Program (FTEP), Summer Institute (1998)

#### Environmental Systems Research Institute, Redlands, CA

2 day Python programming course (Aug 2006, Denver CO)

3 day Geodatabase v.8 training course (Dec 2003, Denver, CO)

4 day ArcInfo v.8 training course (March 2000, Boulder, CO)

1 day GIS Design training course (Nov 1998, Boulder, CO)

1 week Spatial Analyst training course (Jan. 1998, Boulder, CO)

1 week ARC/INFO training course (Dec. 1996, Boulder, CO)

1 week Avenue Programming course (Aug. 1996, Boulder, CO)

1 week training course on Expert Systems and GIS (1991, Redlands CA)

2 week ARC/INFO training course (1985, Madison, WI)

#### Conflict Management Skills for Women, Sterling VA

Six credit hour training course, certified by National Task Force on Continuing Education.  
SkillPath Inc. (1994)

#### Defense Mapping Agency Aerospace Center, St. Louis, MO

12 week training in photogrammetry, photointerpretation, mapping, charting skills  
(1978, St Louis, MO)

## PROFESSIONAL AND EMPLOYMENT HISTORY

2020	Professor Emerita, Department of Geography, University of Colorado-Boulder
2018-2020	Parliamentarian, College of Arts & Sciences Faculty Council, University of Colorado-Boulder
2016-pres.	Faculty Affiliate and Advisory Board Member, Rocky Mountain Census Research Data Center (RMRDC), University of Colorado – Boulder (a U.S. Census Secure Data Center)
2008- pres.	Research Faculty Affiliate, USGS Center for Excellence in Geospatial Information Science (CEGIS)
2005 – 2007	Chair, College of Arts & Sciences Faculty Council, University of Colorado-Boulder
2003 – 2005	Associate Chair and Director of Graduate Studies, Department of Geography, University of Colorado-Boulder
2001 – pres.	Professor, Department of Geography, University of Colorado-Boulder Director, Meridian Research Lab
1997	
1996 - 2001	Associate Professor, Department of Geography, University of Colorado-Boulder
1996 - 1997	Director, Ken Erickson Spatial Data Analysis Lab, University of Colorado-Boulder
1995 - 1998	Member of the Graduate Faculty, Department of Spatial Information Science and Engineering, University of Maine-Orono
1993 - 1994	Research Scientist, U.S. Geological Survey, National Mapping Division, Reston, Virginia (on sabbatical leave)
1991 - 1995	Associate Professor, Department of Geography, SUNY-Buffalo
1988 - 1996	Research Scientist, National Center for Geographic Information and Analysis (NCGIA)
1987 - 1991	Assistant Professor, Department of Geography, SUNY-Buffalo
1987 - 1990	Director, Geographic Information and Analysis Lab Department of Geography, SUNY-Buffalo
1984 – 1987	Assistant Professor, Department of Geography, University of Wisconsin - Madison
1984-1987	Member Faculty Consortium on Land Records Modernization Institute for Environmental Studies, University of Wisconsin
1982-1984	Acting Assistant Professor, Department of Geography University of California - Santa Barbara
1981-1982	Staff Consultant for Computer Graphics, Center for Social Science Computation and Research (CSSCR), University of Washington

- 1981 Instructor, Department of Geography, University of Washington  
Graphics Programmer, Morgan-Fairchild Group, Seattle, Washington
- 1980 Research Assistant, redistricting project (R.L. Morrill, P.I.)  
Department of Geography, University of Washington
- 1979-1980 Cartographic Aide, Bureau of the Census, Seattle Regional Office
- 1978-1979 Cartographer, Scientific Data Division,  
Defense Mapping Agency Aerospace Center, St. Louis, Missouri
- 1978 Research Assistant, satellite image processing project (T.H. Lee Williams, P.I.),  
Department of Geography, University of Kansas
- 1977 Research Assistant, health services project (R.T. Aangeenbrug, P.I.),  
Department of Geography, University of Kansas
- 1975-1977 Teaching Assistant, Department of Geography, University of Kansas
- 1974-1975 Cartographic Artist, Kansas Applied Remote Sensing Lab,  
Center for Research, University of Kansas

#### AWARDS AND HONORS

- 2023 Distinguished Career Award, Cartography and Geographic Information Society (CaGIS)
- 2022 Recognized Fellow, Cartography and Geographic Information Society (CaGIS)
- 2020 Distinguished Teaching Honors Award, American Association of Geographers (AAG)
- 2014 Editor's Choice Award, *Demographic Research*  
Ruther M, Maclaurin G, Leyk S, Buitenfield BP, and Nagle NN. 2013 Validation of Spatially  
Allocated Small Area Estimates for 1880 Census Demography. *Demographic Research* 29  
(22): 579-616. DOI: 10.4054/DemRes.2013.29.22
- 2013 Elected Fellow, University Consortium of Geographic Information Science (UCGIS)
- 2013 One of nine women cartographers whose career is highlighted in *Map Worlds: History of  
Women in Cartography* by WC van den Hoonard. Wilfrid Laurier University Press.
- 2010 Top Four Short Papers GIScience Conference, Zurich, Switzerland.  
Buitenfield, BP, Stanislawski, LV and Brewer, C.A. Multiscale Representations of Water:  
Tailoring Generalization Sequences to Specific Physiographic Regimes. *GIScience Short  
Paper Proceedings* [http://aci.ign.fr/2010\\_Zurich/genemr2010\\_submission\\_11.pdf](http://aci.ign.fr/2010_Zurich/genemr2010_submission_11.pdf)
- 2010 Elected to Membership in the Society of Women Geographers
- 2007 LEAP Research Fellow (NSF ADVANCE Program "Leadership Education for  
Advancement and Promotion" at CU-Boulder) – Fall semester
- 2001 Inaugural Recipient National Award for GIScience Educator of the Year, University  
Consortium for GIScience (UCGIS)

- 1999 Best Research Paper of the Year, Geoscience Information Society (affiliate of the Geological Society of America)  
Buttenfield, B. P. 1998 Looking Forward: Geographic Information Services and Libraries in the Future. *Cartography and GIScience*, vol. 25(3): 161-171.
- 1997 Elected Fellow, American Congress on Surveying and Mapping
- 1975 Recipient Keuffel & Esser Fellowship in Surveying and Cartography

### **Invited Keynote Lectures**

- 2022 USGS Center for Excellence in Geospatial Information Science Annual Research Meeting, Rolla Missouri 2-4 August 2022
- 2013 12<sup>th</sup> Annual Symposium for GIS Day, University of Kansas – Lawrence  
Science Literacy Boot Camp for Librarians Conference, Boulder Colorado
- 2011 USGS First National Conference on *The National Map*, Denver Colorado
- 2009 ESRI Southwest GIS User Group Annual Meeting, Pueblo, Colorado
- 2005 Reginald Golledge Distinguished Lecture, University of California – Santa Barbara
- 2004 John Treacy Memorial Lecture Scholar, University of Wisconsin-Madison
- 2001 First GIS and Bioinformatics Conference, Virginia Polytechnic University, Blacksburg, VA
- 2000 GIS in Education Conference, San Bernardino, California  
Midwest States GIS Conference, Kansas City, Missouri
- 1999 State of Kentucky GIS Conference, Frankfort, Kentucky
- 1998 State of Michigan IMAGIN Conference (Improving Michigan’s Access to Geographic Information Networks), Lansing, Michigan
- 1995 Buttenfield, BP. Generalization and Scalability of Digital Libraries.  
Closing Keynote Address, *Proceedings 32<sup>nd</sup> Annual Clinic of Library Applications of Data Processing*, 1-4 April, Champaign-Urbana, Illinois
- 1994 National Geographic Society Conference on GIS and Education

### **COURSES TAUGHT**

### **University of Colorado – Boulder (1996 – present)**

3053	Cartography 1 - Visualization and Information Design
4053/5053	Cartography 2 - Dynamic Mapping: Animation and Hypermedia
4103/5103	GIS 1 Introduction to Geographic Information Science
4203/5203	GIS 2 Modeling Applications
4303/5303	GIS 3 Programming and Spatial Analysis
4503/5503	GIS Project Management (Spring 2016, Spring 2018)
4120	Special Topics: GIS and Spatial Databases (Spring, 1998)
5003	Elements of Geographic Information Systems
5113	Graduate Seminar in Geographic Information Science
	Topics – Integrating Data Across Space and Time (Spring 2015)
	Theoretical and Applied Research in GIScience (Spring 2006)
	GeoVisualization and Knowledge Discovery (Spring 2004)
	UCGIS Virtual Seminar (Fall 1997)
	Empirical Research in Cartography and GIScience (Fall 1996)
5100/6180	GIS Geospatial Reading Seminar (Fall 2002; Spring 2003; Spring 2005)

### **State University of New York – Buffalo (1987 – 1995)**

120	Maps and Mapping
381	Cartographic Design
485/551	Computer Cartography
487/557	Thematic Cartography
450/550	Advanced Topics in Cartographic Design
	Topics (various years) -- Map Animation
	Multimedia and GIS
	Analytical Cartography
650	Graduate Seminar in Cartography
	Topics -- Information Design for GIS (Fall, 1995)
	Digital Libraries: Data Browsing and Access (Spring 1995)
	GIS and Knowledge Representation (Spring 1993)
	Formalizing Rules for Map Design (Spring 1991)
	Human Factors in Cartography (Fall 1990)
	Map Generalization (Spring 1989)

### **University of Wisconsin – Madison (1984 – 1987)**

170	Map Reading and Interpretation
360	Quantitative Analysis in Geography
376	Analytical Cartography
570	Special Topics in Cartography - Graphical Analysis
576	Coordinate Systems and Map Transformations

### **University of California - Santa Barbara (1982 – 1984)**

118A	Introductory Cartography
118B	Three-Dimensional Cartographic Representation
118C	Cartographic Production
125	Introductory Computer Cartography
234	Special Topics: Cartographic Generalization
284	Computer Graphics Programming

### **University of Washington (1981)**

258	Maps and Map Reading
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### **MENTORING ACTIVITIES**

## Post-Doctoral Supervision

- 2016 – 2017 Qiang, Yi (Ph.D. 2012, Geography, Ghent University, Belgium)  
Currently Assistant Professor of Geography, University of South Florida
- 2012 – 2014 Ruther, Matthew H. (Ph.D. 2012 Sociology, University of Pennsylvania)  
(co-supervised with Professor Stefan Leyk, Geography Dept, U. Colorado)  
Currently Associate Professor of Urban and Public Affairs, University of Louisville and  
Executive Director of the Kentucky State Data Center
- 1993 – 1995 Weber, Christopher (Ph.D. Geography, SUNY-Buffalo) Spatial database consultant and current  
Music Director, Camerata di Sant' Antonio Symphonic String Ensemble, Buffalo NY

## Graduate Student Supervision

### Chair of the following Ph.D. Committees

- Charisoulis, Georgios (ongoing) U. Colorado - Boulder (entered the program Fall 2016)  
*Siting Anaerobic Digestion Facilities in the Face of Missing and Sparse Information*  
Dissertation Proposal defended June 2020
- Guler, Dogus 2019-2020 Faculty Mentor for visiting doctoral researcher on leave from  
Department of Geomatics Engineering, Istanbul Technical University, Istanbul, Turkey  
*Location-Allocation Modeling of Biogas Anaerobic Digesters in Turkey*
- Ghandehari, Mehran 2018 U. Colorado – Boulder  
*Cross-Scale Analysis of Surface-Adjusted Measurement Variations in Digital Elevation Models*  
Dissertation defended 2 November 2018
- Anderson-Tarver, Christophe 2015 U. Colorado - Boulder  
*Crisis mapping the 2010 Earthquake in Haiti: Impact of Environmental Crises on Volunteered  
Geographic Information Databases*  
Dissertation defended 12 March 2015
- Wendel, Jochen 2013 U. Colorado - Boulder  
*Explicit and Implicit Indexing Schemas and Organizational Frameworks for Multiple Data Types*  
Dissertation defended 6 June 2013  
Currently Data Scientist at Karlsruhe Institute of Technology, Germany
- Viger, Roland 2011 U. Colorado - Boulder  
*Reasoning About Geoprocessing Concepts Using Implicit Keywords*  
Dissertation defended 17 May 2011  
Currently Senior Research Hydrologist, USGS - Denver
- Hamerlinck, Jeffrey 2010 U. Colorado - Boulder  
*Planning Support Systems Implementation in Rural Local Government*  
Dissertation defended 18 November 2010  
Currently Director, University of Wyoming Geographic Information Science Center

(Did not recruit doctoral students while serving in Department-, College- and Campus-level faculty governance and administrative positions)

Tsou, Ming-Hsiang      2000 U. Colorado-Boulder  
*Dynamic Architecture for Distributing GIS Services*  
Dissertation defended 12 July 2000  
Currently Professor of Geography and Director, Center for Human Dynamics in the Mobile Age  
San Diego State University

Fabrikant, Sara      2000 U. Colorado-Boulder  
*Spatial Metaphors for Browsing Large Data Archives*  
Dissertation defended 14 July 2000  
Currently Professor, University of Zurich, Switzerland

Skupin, Andre      1998 SUNY-Buffalo  
*Organizing and Visualizing Hypermedia Information Spaces*  
Dissertation defended 17 August 1998  
Currently Professor of Geography and Co-Director, Center for Information Convergence and Strategy, San Diego State University

Plewe, Brandon      1997 SUNY-Buffalo  
*Cartographic and GIS Representations of Gradation*  
Dissertation defended 24 March 1997  
Currently Professor of Geography, Brigham Young University

Leitner, Michael      1996 SUNY-Buffalo  
*The Impact of Data Quality Displays on Spatial Decision Support*  
Dissertation defended 14 October 1996  
Currently Professor, Department of Geography and Anthropology, Louisiana State University

Weber, Christopher      1993 SUNY-Buffalo  
*Sonic Enhancement of Map Information: Experiments Using Harmonic Intervals*  
Dissertation defended 28 October 1993  
Currently a DBMS consultant in Buffalo, NY and Music Director, Camerata di Sant' Antonio Symphonic String Ensemble, Buffalo NY

Wu, C. Victor      1993 SUNY-Buffalo  
*Object-Based Queries on Spatial Data Quality*  
Dissertation defended 16 August 1993  
Currently GIS and Asian Studies faculty at California State University – Sacramento

Saga, Sven Arve      1992-1993 SUNY-Buffalo  
*Scale-Dependence and Map Generalization Algorithms*  
Supervised PhD program academic year 1992 - 1993 while he was on leave from U. Trondheim  
Currently Research Scientist, Norwegian Mapping Authority

Supervised Master's degrees (Colorado), defense date in parentheses

Tyler, Kathryn      (March 2022)      Bus Network Analysis: Vulnerability and Suitability Modelling in Four Western U.S. Cities  
(defended 14 March 2022)

Carlson, Kate	(July 2021)	Wetland Classification Accuracy and Scale: Visualizing Uncertainty Metrics Across Multiple Resolutions
Sauer, Dietmar (Foreign Exchange student working in Boulder)	(April 2015)	Automated Selection of Primary Paths in Stream Networks (degree conferred by Karlsruhe University, Germany; co-advised with Heinz Saler)
Stauffer, Andrew	(Nov 2013)	Impacts of Iterative Filtering and Resampling on Resolution of Digital Terrain Models
Gleason, Michael	(Nov 2012)	Filtering T-LIDAR Point Clouds for DEM Interpolation
Uhl, Johannes (Foreign Exchange student working in Boulder)	(Aug 2011)	Limiting and Related Variables for Dasymetric Analysis of U.S. Census Demography (degree conferred by Karlsruhe University, Germany; co-advised with Heinz Saler)
Parsons, Mark Anderson-Tarver, Chris (Feb 2010)	(Sept 2010)	Data Infrastructures for Cryospheric Science Communities Generalizing a Swamp-Marsh Database Using Texture
Yamashita, Kiyoshi	(April 2008)	Spatial and Aspatial Prediction Methods for Modeling Urban Fire Risk
Ballagh, Lisa	(April 2007)	Validation of Sea Ice Data by Sparse Interpolation (co-supervised w/ Roger Barry)
Kern, Robert Hultgren, Torrin	(May 2005) (May 2005)	Symbol Design for Mapping Uncertainty About Wildland Fires Map Algebra for Areal Interpolation (co-supervised w/ Jeremy Mennis)
Heithoff, Erin Petrik, Kevin	(Dec 2002) (May 2002)	National Atlas Design on the Internet Internet-Based GIServices in College Classrooms
Huff, Russell	(Oct 2001)	Data Models for Temporal Data Handling in GIS
Rock, Michael Cameron, Dick	(Nov 2000) (Feb 2000)	Modeling User Navigation Through a Digital Library Sensitivity of Forest Fragmentation to Ecological Scale
Gayon, Tina Norman, Lamont	(Dec 1998) (Jan 1998)	Geographic Information and Technology in Public Libraries GIS Expert System to Model Ponderosa Pine Diffusion

Supervised Graduate Research Assistant (Colorado)

Vatsal Verma May-August 2023 Surface-Adjusted Distance Metrics for Terrain Analysis  
(funded by NSF GSS 17-566 BCS Geography and Spatial Sciences)  
Vatsal is a Masters student in Computer Science at CU Boulder

Supervised Master's degrees (Buffalo)

Rooney, Paul (Aug 1997) Geography 2000 Standards in an Inner City Magnet School Curriculum (co-advised w/ Jim McConnell)



Janak, Jeff	(Jan 1996)	Rules for Automatic Generalization of Vector Map Data
Ricci, Victor	(Jan 1996)	Legal Impediments to the Structure of Digital Information
Tsou, Ming H.	(Dec 1995)	Object-Oriented Tools for Spatial Data Browsing
Kracker, Laura	(Oct 1995)	Analyzing Inconsistencies in Wetlands Mapping Using GIS
Kick, John	(Aug 1995)	Refinement of Soils Model Parameters Using GIS
Plewe, Brandon	(Jan 1995)	The GEOWEB Project: Map Tiling for Distributed Data
Parkansky, Steven	(Jan 1995)	Digital Basemap Registration for Natural Gas Wellsites
Wieshofer, Markus	(May 1994)	Dynamic and Temporal Aspects of GIS
Gorski, Jill	(June 1994)	Evaluating US/Canadian Census TIGER Prototype Datasets (co-advised w/ Jim McConnell)
Fly, Paul	(Jan 1993)	Hypermedia and Ethics in Cartography
Leitner, Michael	(Mar 1993)	Multi-Scale Inventory of a Topographic Map Series
Schwartz, Paul	(Aug 1993)	Digital Typography in Cartographic Design
Carey, David	(May 1992)	Use of Federal Digital Data Products with ARC/INFO
McKinney, Jim	(Jan 1992)	Evaluation of Visual Tools for Location Modeling
Soltyka, Nicole	(Jan 1992)	Comparing Raster and Vector GIS with Digital Terrain
Wright, Geoff	(Jan 1992)	GIS Adoption in Third World Village Planning
Kress, Tom	(Nov 1991)	Visualization of Spatial Data Quality
Fico, Frank	(Aug 1991)	Generalization of the Digital Chart of the World
Weber, Chris	(Jan 1991)	Map Animation of Climatic Change
Willer, David	(Sept 1990)	A Spatial Decision Support System for Bank Location
Jasinski, Marcin	(Jan 1990)	Comparing Complexity Measures for Cartographic Lines
DeLotto, Joseph	(Aug 1989)	The Role of Scale in Automated Terrain Classification
Wu, C. Victor	(Aug 1989)	Verification of Rules for Cartographic Name Placement

Supervised Master's degrees: (Wisconsin)

Baures, Jamie	(June 1987)	A Raster Line Generalization Algorithm
Ries, Thomas	(June 1987)	Profile Identification Tasks on Contour Displays
Leonard, Jeff	(June 1987)	An Equal-Value Perceptual Gray Scale for Laser Printers

Member of the following Doctoral Committees

Jaffe, Sarah (ongoing) *Human Wildlife Conflicts in the Colorado Front Range*  
Department of Environmental Studies, University of Colorado-Boulder  
Advisor – Carol Wessman  
Comprehensive Exams completed 2019

Mommandi, Wagma (ongoing) *Student Access to Charter Schools in Denver, Colorado*  
School of Education, University of Colorado-Boulder  
Advisor – Michelle Moses

- Chapman, Theresa (2020) *Effects of Disturbance Patterns on Montane and Subalpine Forests in Colorado* Dept. Geography, University of Colorado- Boulder  
 Advisor – Tom Veblen  
 Dissertation Defense May 2020  
 Currently GIS Project Manager, The Nature Conservancy
- Rodman, Kyle (2019) *Forest Change and Post-Fire Response in the Southern Rocky Mountains*  
 Department of Geography, University of Colorado-Boulder  
 Advisor – Tom Veblen  
 Dissertation defense May 2019
- Uhl, Johannes (2019) *Machine Learning and Recognition Approaches to Improve and Extend Multi-Temporal Built-up Land Layers*  
 Department of Geography, University of Colorado-Boulder  
 Advisor – Stefan Leyk  
 Dissertation defense April 2019  
 Currently Postdoctoral Researcher, University of Colorado-Boulder
- Cunningham, Angela (2019) *Community Impacts on WWI Veterans in Denver Colorado*  
 Department of Geography, University of Colorado-Boulder  
 Advisor – Bill Travis Defended 10 January 2019  
 Currently Post-doctoral researcher, Centre for Contemporary and Digital History, University of Luxembourg
- Amante, Christopher (2018) *Spatiotemporal Uncertainty of Sea Level Rise Inundation Modeling*  
 Department of Geography, University of Colorado-Boulder  
 Advisor – Waleed Abdalati  
 Dissertation Defense April 2018  
 Currently Research Data Scientist, NOAA, Boulder Colorado
- MacFerrin, Michael (2017) *Arctic Sea Ice Thickness Estimation from Satellite Altimetry*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Waleed Abdalati; Defended 27 Nov 2017
- Zoraghein, Hamidreza (2017) *Spatiotemporal Population Modeling Based on Refined Areal Interpolation*  
 Department of Geography, University of Colorado-Boulder  
 Advisor – Stefan Leyk; Dissertation Defended June 2017  
 Currently research associate are the Population Council in New York City
- Norlund, Petra (did not finish) *GIS Modeling of Childhood Diarrhea in Mexico*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Stefan Leyk  
 Proposal Defended 9 December 2013; dropped out of the program May 2017
- Tuff, Ty (2016) *Relative Motion as an Ecological Mechanism for Seasonal Bird Migration*  
 Department of Ecological and Evolutionary Biology, U. Colorado-Boulder  
 Supervisor – Brett Melbourne  
 Currently geospatial researcher at Earth Lab, University of Colorado - Boulder
- Petchprayoon, Pakorn (2015) *Climate Change Impact on Surface Energy Balance of Lake Huron*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Peter Blanken  
 Currently Geospatial Research Scientist for the Myanmar Government

- Smith, Jeremy (2012) *Tree Mortality and Climate Variation in Colorado Front Range*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Tom Veblen  
 Currently Associate Professor at University of Nevada - Reno
- Bevc, Christine (2010) *Spatial Modeling of Social Networks and Social Services in New York City During and After September 11, 2001*. Dept. Sociology, U. Colorado-Boulder  
 Supervisor: Kathleen Tierney Currently Research Associate, Preparedness and  
 Emergency Response Research Center, University of North Carolina Chapel-Hill
- James, Katherine (2010) *Arsenic Contamination, Drinking Water and Birth Rates in Commerce City, CO*  
 Department Preventative Medicine and Biometrics, U. Colorado-Health Sciences  
 Supervisor - Jim Ruttenber (deceased)  
 Currently Assistant Professor Family Medicine, Univ. Colorado Denver (Anschutz)
- Sonia Talwar (2008) *Spatial Dimensions of Science and Technology Studies: Exploring Roles for GIS and Interactive Social Research*  
 Department of Geography, University of British Columbia, Vancouver, BC  
 Supervisor – John Robinson  
 Currently Research Scientist, Natural Resources Canada
- Galadari, Abdullah (2008) *Modeling Costs for Alternative Transportation*  
 Department of Civil Engineering, Univ. Colorado - Denver  
 Supervisor – Bruce Janson Currently Assistant Professor Engineering Systems  
 and Management, Masdar Institute of Science and Technology, Abu Dhabi
- Vidal, Arwen (2008) *Postulating Planetary Hydrology on Mars*  
 Department of Geology, University of Colorado- Boulder  
 Supervisor – Karl Mueller
- Steiniger, Stefan (2007) *Enabling Pattern-Aware Automated Map Generalization*  
 Department of Geography, University of Zurich, Switzerland  
 Supervisor – Robert Weibel. Currently Research Associate of Transportation  
 Engineering, Pontifica Universidad Catolica de Chile
- Witmer, Frank (2006) *Effects of War on Landuse/Landcover Change in Northeast Bosnia*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – John O’Loughlin  
 Currently Assistant Professor of Computer Science, University of Alaska
- Hope, Susannah (2005) *Decision Making Under Spatial Uncertainty*  
 Department of Applied Science, University of Melbourne, Australia  
 Supervisor – Gary Hunter
- Janke, Jason (2004) *Rock Glaciers in the Front Range: An Analysis of Distribution, Topoclimatic Variables, Permafrost, and Flow*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Nel Caine  
 Currently Professor Earth and Atmospheric Sciences, Metro State University, Denver

- Platt, Rutherford (2004) *Wildfire Mitigation and Ecological Restoration in the Wildland-Urban Interface*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Tom Veblen  
 Currently Chair Environmental Studies Dept, Gettysburg College, Pennsylvania
- Sheriff, Rosemary (2004) *Historic Range of Variability of Ponderosa Pine in the Northern Colorado Front Range: Past Fire Types and Fire Effects*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Tom Veblen  
 Currently Professor, Geography, Humboldt State University, California
- Liu, Fengjing (2004) *Hydrological Controls on Streamflow Chemistry in Alpine Catchments*  
 Institute of Arctic and Alpine Research, University of Colorado- Boulder  
 Supervisor – Mark Williams
- McLean, Mark (2003) *Spatial Pattern in the Understory: Disturbance Legacy and Environmental Variation*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Susan Beatty
- Reinke, Karin J. (2002) *Communicating Thematic Uncertainty in Spatial Databases*  
 Department of Geography, University of Melbourne, Australia  
 Supervisor Gary Hunter
- Kulakowski, Dominik (2002) *Interactions among Natural Disturbances in Subalpine Forests in Northwestern Colorado*. Dept of Geography, University of Colorado- Boulder  
 Supervisor – Thomas T. Veblen  
 Currently Professor Geography, Clark University, Worcester Massachusetts
- Cossmann, Ron (2001) *Secular Trends and Spatial Clusters of Inequality in U.S. Metropolitan Areas, 1970 to 1990* Department of Geography, University of Colorado- Boulder  
 Supervisor – James O. Huff      Currently Associate Research Professor and Director,  
 Social Science Research Center, Mississippi State University
- Little, Jani (2000) *Segregation in U.S. Major Metropolitan Areas*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Andrei Rogers  
 Currently Senior Research Associate, Institute of Behavioral Sciences, CU
- Antle, Alissa (2000) *Interactive Visualization Tools for Spatial Data and Metadata*  
 Department of Geography, U. British Columbia, Victoria Canada  
 Supervisor Brian Klinkenberg
- Kerski, Joseph (2000) *Implementation of GIS Technology and Methods in Secondary Education*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – A. David Hill (deceased)  
 Currently Education Manager, Envir. Systems Research Institute (ESRI)
- Davinroy, Tom (2000) *Biogeochemical processes and hydrologic characteristics of alpine talus*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – Mark Williams

- Solem, Michael (2000) *Adoption of the Internet in U.S. College Geography*  
 Department of Geography, University of Colorado- Boulder  
 Supervisor – A. David Hill (deceased)  
 Currently Educational Affairs Director, Assn. American Geographers (AAG)
- Deakin, Ann (1996) *Impact of the 1994 Northridge Earthquake on Los Angeles Motorists*  
 Department of Geography, SUNY-Buffalo  
 Supervisor – David Mark
- Gluck, Myke (1996) *Communication and International Development*  
 Department of Geography, Syracuse University  
 Supervisor – Michael Nilan
- Hassen, Khaled (1995) *Reference Grid: A Tool for Viewing Positional Accuracy of Spatial Data*  
 Department of Spatial Information Engineering, University of Maine  
 Supervisor – Kate Beard
- Zhan, Feibing (Ben) (1994) *Spatio-Temporal Location Models of Mobile Trading and the Organization of Periodic Market Places*  
 Department of Geography, SUNY-Buffalo  
 Supervisor – David Mark
- Gould, Michael (1993) *Map Use, Spatial Decision-Making, and Spatial Language in English and Spanish*  
 Department of Geography, SUNY-Buffalo. Supervisor – David Mark  
 Director Education Industry Solutions, Envir. Systems Research Institute (ESRI)
- Langran, Gail (1989) *Temporality in Geographic Information Systems*  
 Department of Geography, University of Washington  
 Supervisor – Nick Chrisman
- Mower, James (1988) *The Selection, Implementation and Evaluation of Heuristics for Automated Cartographic Name Placement*  
 Department of Geography, SUNY-Buffalo  
 Supervisor – David Mark  
 Currently Professor of Geography, State University of New York at Albany
- Beard, M. Kate (1987) *Multiple Maps from a Detailed Data Base: A Scheme for Automated Generalization*  
 School of Land Resources, University of Wisconsin-Madison  
 Supervisor – Nick Chrisman  
 Currently Professor Computing and Information Science, University of Maine

Member of the following Masters Committees (only completed degrees are listed)

- Ren, Yuying U. Colorado – Boulder – Geography (defended February 2021)  
 Principal Advisor – Stefan Leyk
- Tuccillo, Joseph U. Colorado – Boulder – Geography (defended May 2015)  
 Principal Advisor – Seth Spielman
- Bock, Andrew U. Colorado – Boulder – Geography (defended November 2010)  
 Principal Advisor – Stefan Leyk

Motta, David	U. Colorado – Boulder – Computer Science (defended April 2008) Principal Advisor – Tamara Sumner
Petchprayoon, Pakorn	U. Colorado – Boulder – Geography (defended January 2008) Principal Advisor – Peter Blanken
Krasnow, Kevin	U. Colorado – Boulder – Geography (defended April 2007) Principal Advisor – Tom Veblen
Holmberg, Molly	U. Colorado – Boulder – Geography (defended April 2007) Principal Advisor – Ken Foote
Bauman, Vanessa	U. Colorado – Boulder – Geography (defended April 2004) Principal Advisor – Ken Foote
Viger, Roland	U. Colorado – Boulder – Geography (defended May 2004) Principal Advisor – Jeremy Mennis
Witmer, Frank	U. Colorado – Boulder – Geography (defended May 2003) Principal Advisor – John O’Loughlin
Haessig, Jennifer	U. Colorado-Boulder Museum Studies (defended March 2003) Supervisor - Linda Cordell
Sibold, Jason	U. Colorado – Boulder – Geography (defended April 2001) Principal Advisor – Tom Veblen
Platt, Rutherford	U. Colorado – Boulder – Geography (defended May 2001) Principal Advisor – Jim Huff
James, Katherine	U. Colorado - Denver - Preventative Medicine and Biometrics (M.S. Public Health - defended June 2000) Principal Advisor - Jim Ruttenber (deceased)
Bialecki, Adam	U. Colorado – Boulder – Geology (defended October 1997) Principal Advisor - Karl Mueller
Rokoske, Keith	U. Colorado-Boulder (defended May 1997) Principal Advisor - Mark Kumler
Talbot, Paul	U. Colorado-Boulder Geography (defended April 1996) Supervisor - John O’Loughlin
Gluck, Myke (1992)	School of Information Studies, Syracuse University Supervisor – Michael Eisenberg

Graduate Recruitment from Federal Agencies: (funded by agencies, working toward degrees)

Sven Arve Saga (1992)	Norwegian Federal Mapping Agency, Trondheim, Norway
John Kick (1991)	USDA Natural Resources Conservation Service
David Carey (1990)	Defense Mapping Agency (DMA)
Frank Fico (1990)	DMA (1 yr. Funding DMA Long Term Instruction Program)

Thomas Kress (1990) DMA (1 yr. Funding DMA Long Term Instruction Program)  
 Michael Mulligan (1990) DMA (1 yr. Funding DMA Long Term Instruction Program)

## **Undergraduate Student Mentoring**

### Supervised Undergraduate Honor's Thesis (Colorado)

Sycuro, Jesse Mar 2000 Spatial Error Propagation and Production in GIS

### Member of Undergraduate Honor's Thesis (Colorado)

Krueger, Rachel April 2015 Sedimentology of the Codell Sandstone in Northern Colorado  
 (Geology, David Budd Advisor)

Meluso, Anthony April 2015 Reinvention: A Spatial History of Westwood [Colorado]  
 (Geography, Bill Travis Advisor)

Erin Arnold April 2010 Effects of Area and Isolation on *Bartonella* Species Richness in  
 Black-Tailed Prairie Dog (*Cynomys ludovicianus*) Colonies  
 (Ecology and Evolutionary Biology, Andrew Martin Advisor)

### Supervised Undergraduate Research Assistant (Colorado)

Meg Brantley June-August 2016 Surface-Adjusted Distance Metrics for Terrain Analysis  
 (funded by CU Grand Challenge "Earth Lab")

### Undergraduate Teaching Interns:

Each semester I invite undergraduate majors who have completed one of the lab courses (Cartographic Design or Introductory GIScience or GIS Modeling) to work the following semester as undergraduate teaching interns. This gives extra assistance for students enrolled in the course, and gives the teaching interns additional experience in problem-solving in a GIS environment. Some of these students are working towards teaching careers and this provides an opportunity for in-service learning.

2020

Spring Semester GEOG 4103 (GIS Spatial Analytics) Matt Arnold, Buddy Collins, Hannah Walters

2019

Spring Semester GEOG 4103 (GIS Spatial Analytics) Zehra Cheatham, Angela Gonzalez, Will Keenan

2018

Fall Semester GEOG 4103 (Intro. GIScience) Britton Sears, Ryno DeVilliers, Dylan Murphy  
 GEOG 4203 (GIS Modeling) Calvin Lietz

Spring Semester GEOG 4103 (Intro. GIScience) Brian Lane, Yvonne Krumrey, Calvin Lietz

2017

Fall Semester GEOG 3053 (Cartographic Design) Taylor Chouinard, Brian Schleckser,  
 Brian Lane, Katie Gannon

Spring Semester GEOG 3053 (Cartographic Design) Andrew Tripp, Reid Blankenship,  
 Claudia Shealy

2016		
Fall Semester	GEOG 3053 (Cartographic Design)	Kelsey Rodriguez, Ben Shipley, Mackenzie Johnson
	GEOG 4103 (Intro. GIScience)	Blake Bullard, Nick Venzke, Nick Whittemore
Spring Semester	GEOG 4103 (Intro. GIScience)	Caitlin McShane, Josh Patterson, Kate Gregory, Meg Brantley
	GEOG 3053 (Cartographic Design)	Brooke Long, Josh Temes, Meg Brantley, Pete Albertson
2015		
Fall Semester	GEOG 4103 (Intro. GIScience)	Kate Gregory, Emily Gulick, Jesse Nestler
	GEOG 3053 (Cartographic Design)	Brett Heitshusen, Garrick Northup, Brent Denys, Andy Eaman
Spring Semester	GEOG 4103 (Intro. GIScience)	Molly Graber, Anthony Meluso, Hannah Smith
	GEOG 3053 (Cartographic Design)	Caitlin McShane, Anthony Stone
2014		
Fall Semester	GEOG 4103 (Intro. GIScience)	Luke Schmitt, Patrick Sine
	GEOG 3053 (Cartographic Design)	Jenny Bloom
Spring Semester	GEOG 4103 (Intro. GIScience)	Costa Raptis, Will Rempel
	GEOG 3053 (Cartographic Design)	Eva Adler, Jenny Bloom, Mackenzie Boshier
2013		
Fall Semester	GEOG 3053 (Cartographic Design)	Jessica Bobeck, Will Rempel
Spring Semester	GEOG 3053 (Cartographic Design)	Bryan Hankinson, Whit Wilson
2012		
Fall Semester	GEOG 3053 (Cartographic Design)	Michal Fagrelus, Dan Snyder
Spring Semester	GEOG 3053 (Cartographic Design)	Alex Miller, Lisa Weber, Ben Bellman
2011		
Fall semester	GEOG 3053 (Cartographic Design)	Robert Arntz, Thomas Lees
	GEOG 4103 (Intro. GIScience)	Joanna Pearce, Denise Yogerst
Spring semester	GEOG 3053 (Cartographic Design)	Tom Brennan, Nathan Martin
	Lab Exercise Conversion to Arc 10	Marc Miller, Nate Diaz
2010		
Fall semester	GEOG 3053 (Cartographic Design)	Tomas Pilius
Spring semester	GEOG 3053 (Cartographic Design)	Mike Laxer, Nick Ray
	GEOG 4103 (Intro. GIScience)	Theo Spinelli
2009		
Fall semester	GEOG 3053 (Cartographic Design)	Julie Cuypers, Julie Hayes
Spring semester	GEOG 3053 (Cartographic Design)	Stacy Smith
2008		
Fall semester	GEOG 4103 (Intro. GIScience)	Alex Durant
Spring semester	GEOG 4103 (Intro. GIScience)	Janel Day
2005 - 2007	Reduced Teaching Load due to Administrative Duties	
2004		
Fall semester	GEOG 4103 (Intro. GIScience)	Anna Milan, Josh Magarek
Spring semester	GEOG 4103 (Intro. GIScience)	Luke Zukiewicz



2003		
Fall semester	GEOG 4103 (Intro. GIScience)	Miranda Lavrakis
Spring semester	GEOG 4103 (Intro. GIScience)	Luke Zukiewicz

**PUBLICATIONS** (\* student co-authors; <sup>Ω</sup> postdoctoral co-authors)

**Books**

- 2004 Bishop, A, Van House, N, and Buttenfield, BP. (Eds.) *Digital Library Use: Social Practice in Design and Evaluation*. Cambridge, Mass.: MIT Press
- 1991 Buttenfield, BP and McMaster, R.B. (Eds.) *Map Generalization: Making Rules for Knowledge Representation*. New York: Longman. (1<sup>st</sup> Printing, 1991; 2<sup>nd</sup> Printing 1994 Longman Scientific; 3<sup>rd</sup> printing 1999 Internet-Print-on-Demand: Wiley & Sons)

**Articles in Refereed Journals**

- 2023 \*Charisoulis G , Buttenfield BP and <sup>Ω</sup>Qiang Y. Twenty-Five Miles From Home: Adjusting Shortest Path Distance Metrics to Mountainous Terrain. Manuscript submitted for peer review to *Computers, Environment and Urban Systems*( 22 June 23)
- 2023 \*Carlson K, Buttenfield BP and <sup>Ω</sup>Qiang Y. Wetland Classification Accuracy and Scale: Visualizing Uncertainty Metrics Across Multiple Resolutions. Manuscript under review for submission to *International Journal of Geographic Information*
- 2023 \*Tyler, K and Buttenfield BP. Better Bus Networks: Identifying Priority Areas for Service Adjustments Using GIS. Submitted to *Journal of Transport Geography* (Jan 2023; under review)
- 2023 Stanislawski LV, Kronenfeld, BJ, Shavers EJ, and Buttenfield BP. At What Scales Does a River Meander? Scale-Specific Sinuosity (S3) Metric for Quantifying Stream Meander Size Distribution. *Geomorphology* <https://doi.org/10.1016/j.geomorph.2023.108734>
- 2022 \*Guler D, Buttenfield BP, \*Charisoulis G, and Yomralioglu T. An International Comparative Analysis of Bioenergy Potential and Suitability Modeling. *Sustainable Energy Technologies and Assessment* 53(Part C) DOI: <https://doi.org/10.1016/j.seta.2022.102626>
- 2022 Cao G and Buttenfield BP. Pattern Recognition and Matching. *Geographic Information Science & Technology Body of Knowledge*, (Ed.) Wilson JP. University Consortium for Geographic Information Science Entry AM-38. <https://gistbok.ucgis.org/bok-topics/pattern-recognition-and-matching> DOI: <https://doi.org/10.22224/gistbok/2022.2.10> (invited submission)
- 2022 <sup>Ω</sup>Qiang Y, Buttenfield BP, and Xu J. Analyzing Multi-Scale Spatial Pattern in a Pyramid Modeling Framework. *Cartography and Geographic Information Science*. <https://doi.org/10.1080/15230406.2022.2048419>
- 2021 \*Guler D, \*Charisoulis G, Buttenfield BP, and Yomralioglu T. Suitability Modeling and Sensitivity Analysis for Renewable Energy Facilities in Turkey. *Clean Technologies and Environmental Policy*. 17pp. <https://doi.org/10.1007/s10098-021-02126-8>

- 2021 Buitenfield BP and \*Charisoulis G. Cartographic Modeling. *Geographic Information Science & Technology Body of Knowledge*, (Ed.) Wilson JP. University Consortium for Geographic Information Science Entry AM-12. <https://gistbok.ucgis.org/bok-topics/cartographic-modeling> DOI <https://doi.org/10.22224/gistbok/2021.1.13> (invited submission)
- 2020 Kronenfeld, BJ, Buitenfield BP, and Stanislawski LV. Map Generalization for the Future. *International Journal of Geographic Information* 9: 468. DOI:10.3390/ijgi9080468
- 2020 <sup>Ω</sup>Qiang Y, Buitenfield BP and Joseph M. How to Measure Distance on a Digital Terrain Surface and Why it Matters in Geographical Analysis. *Geographical Analysis* 53(3): 588-622. <http://dx.doi.org/10.1111/gean.12255>
- 2019 Buitenfield BP, <sup>Ω</sup>Qiang Y, \*Ghandehari M and \*Charisoulis G. The Earth is Not Flat: Surface-Adjusted Terrain Metrics to Refine Geospatial Models. *Cartography and Geographic Information Science*, Special Issue for the U.S. National Report: 47-50. [https://cartogis.org/wp-content/uploads/2019/07/2019\\_US\\_National\\_Report.pdf](https://cartogis.org/wp-content/uploads/2019/07/2019_US_National_Report.pdf)
- 2019 Kronenfeld BJ, Stanislawski LV, Buitenfield BP, and Brockmeyer T. Simplification of Polylines by Segment Collapse: Minimizing Areal Displacement While Preserving Area. *International Journal of Cartography* 6(1): 22-46. <https://doi.org/10.1080/23729333.2019.1631535>.
- 2019 \*Ghandehari, M, Buitenfield BP, and Farmer CJQ. Comparing the Accuracy of Interpolated Terrain Elevations Across Spatial Resolution. *International Journal of Remote Sensing* 40(13): 5025-5049. <https://doi.org/10.1080/01431161.2019.1577581>
- 2018 Stanislawski LV, Finn MP, and Buitenfield BP. Classifying Physiographic Regimes on Terrain and Hydrologic Factors for Adaptive Generalization of Stream Networks. *International Journal of Cartography*: 1-17. <http://dx.doi.org/10.1080/23729333.2018.1443759>
- 2017 Stanislawski LV, Liu Y, Wendel J, and Buitenfield BP. An Open Source Solution to High Performance Processing for Extracting Surface Water Drainage Networks from Diverse Terrain Conditions. *Cartography and GIScience* 45(4): 319-328. <http://dx.doi.org/10.1080/15230406.2017.1337524>
- 2017 <sup>Ω</sup>Ruther MH, Leyk S, and Buitenfield BP. Deriving Small Area Mortality Estimates Using a Probabilistic Reweighting Method. *Annals, American Association of Geographers* 107(6):1299-1314. <http://dx.doi.org/10.1080/24694452.2017.1320213>
- 2017 \*Stum, AK, Buitenfield BP, and Stanislawski LV. Partial Polygon Pruning of Hydrographic Features in Automated Generalization. *Transactions in GIScience*: 21(5): 1061-1078 <https://doi.org/10.1111/tgis.12270>
- 2016 \*Zoraghein H, Leyk S, <sup>Ω</sup>Ruther M, and Buitenfield BP. Exploiting Temporal Information in Parcel Data to Refine Small Area Population Estimates. *Computers Environment and Urban Systems* 58(July): 19-28. DOI: <http://dx.doi.org/10.1016/j.compenvurbsys.2016.03.004>
- 2016 \*Wendel J, Buitenfield BP, and Stanislawski LV. An Evaluation of Unsupervised and Supervised Learning Algorithms for Clustering Landscape Types in the United States. *Cartography and GIScience* 43(3): 233-249. DOI:10.1080/15230406.2015.1067829

- 2015 Stanislawski LV, Falgout, J and Buttenfield BP. Automated Extraction of Natural Drainage Density Patterns for the Conterminous United States through High Performance Computing. *The Cartographic Journal* 52(2): 185-192. <https://doi.org/10.1080/00087041.2015.1119466>
- 2015 Stanislawski LV, Buttenfield BP, and Doumbouya A. A Rapid Approach for Automated Comparison of Independently Derived Stream Network Data. *Cartography and GIScience* 42(5): 435-448. DOI:10.1080/15230406.2015.1060869
- 2015 Buttenfield BP, <sup>Ω</sup>Ruther MH, and Leyk, S. Exploring the Impact of Dasymetric Refinement on Spatiotemporal Small Area Estimates. *Cartography and GIScience* 42:5, 449-459. DOI: 10.1080/15230406.2015.1065206
- 2015 <sup>Ω</sup>Ruther MH, Leyk S. and Buttenfield BP. Comparing the Effects of an NLCD-Derived Dasymetric Refinement on Estimation Accuracies for Multiple Areal Interpolation Methods. *GIScience and Remote Sensing* 52(2):158-178. DOI: 10.1080/15481603.2015.1018856
- 2014 \*James, KA, Meliker, JR, Buttenfield, BP, Byers, T, Ozerbe, GO, Hokanson, JE, and Marshall, JA. Predicting Arsenic Concentrations in Groundwater of San Luis Valley: Implications for Individual Level Lifetime Exposure Assessment. *Environmental Geochemistry and Health* 36: 773-782; <http://dx.doi.org/10.1007/s10653-014-9595-6> .
- 2014 Leyk, S, <sup>Ω</sup>Ruther, MH, Buttenfield, BP, Nagle, NN and \*Stum, AK. Modeling Residential Developed Land in Rural Areas: A Size-Restricted Approach Using Parcel Data. *Journal of Applied Geography* 47: 33-45. <http://dx.doi.org/10.1016/j.apgeog.2013.11.013>
- 2014 Nagle NN, Buttenfield BP, Leyk S and Spielman SE. Dasymetric Modeling and Uncertainty. *Annals of the Association of American Geographers*, 104(1): 80-95 <http://dx.doi.org/10.1080/00045608.2013.843439>
- 2013 <sup>Ω</sup>Ruther, M, \*Maclaurin, G, Leyk, S, Buttenfield, BP, and Nagle, NN. Validation of Spatially Allocated Small Area Estimates for 1880 Census Demography. *Demographic Research* 29 (22): 579-616. <http://dx.doi.org/10.4054/DemRes.2013.29.22> Editor's Choice Award
- 2013 Brewer, CA, Stanislawski, LV, Buttenfield, BP, \*Sparks, K, \*McGilloway, J and \*Howard, MA. Automated Thinning of Road Networks and Road Labels for Multiscale Design of *The National Map* of the United States. *Cartography and Geographic Information Science* 40(4): 259-270. DOI: 10.1080/15230406.2013.799735
- 2013 Leyk, S, Buttenfield, BP, Nagle, NN, and \*Stum, AK. Establishing Relationships between Parcel Data and Land Cover for Small Area Estimation. *Cartography and Geographic Information Science* 40(4): 305-315, DOI: 10.1080/15230406.2013.782682
- 2013 Leyk, S, Buttenfield, BP and Nagle, NN. Modeling Ambiguity in Census Microdata Allocations to Improve Demographic Small Area Estimates. *Transactions in Geographic Information Science* 17(3): 406-425. DOI: 10.1111/j.1467-9671.2012.01366.x/pdf
- 2013 Leyk, S, Nagle, NN and Buttenfield, BP. Maximum Entropy Dasymetric Modeling for Demographic Small Area Estimation Under Uncertainty. *Geographical Analysis* 45(3): 285-306 <https://doi.org/10.1111/gean.12011>
- 2011 Buttenfield, BP, Stanislawski, LV and Brewer, CA. Adapting Generalization Tools to Physiographic Diversity for the USGS National Hydrography Dataset. *Cartography and GIScience* 38(3): 289-301. <https://doi.org/10.1559/15230406382289>

- 2011 Stanislawski, LV and Buttenfield, BP. Hydrographic Generalization Tailored to Dry Mountainous Regions. *Cartography and GIScience* 38(2): 117-125  
<https://doi.org/10.1559/15230406382117>
- 2011 \*Anderson-Tarver C, Leyk S, Buttenfield BP. Fuzzy Modeling of Geometric Textures for Identifying Archipelagos in Area-Patch Generalization. *Cartography and GIScience* 38(2): 137-145 <https://doi.org/10.1559/15230406382137>
- 2010 Brewer, CA and Buttenfield, BP. Mastering Map Scale: Balancing Workloads Using Display and Geometry Change in Multi-Scale Mapping. *Geoinformatica* 14(2):221-239  
DOI 10.1007/s10707-009-0083-6
- 2009 \*Wendel, J, Buttenfield, BP, and \*Smith, J. Spatializing a GIS Software Toolbox. *Kartographische Nachrichten* 5: 257-263
- 2007 Brewer, CA, and Buttenfield, BP. Framing Guidelines for Multi-Scale Map Design Using Databases at Multiple Resolutions. *Cartography and GIScience* 34(1): 3-15
- 2002 \*Tsou, MH, and Buttenfield, BP. A Dynamic Architecture for Distributed Geographic Information Services. *Transactions in GIS* 6(4): 355- 381
- 2002 Buttenfield, BP and Reitsma, R. Loglinear and Multidimensional Scaling Models of Digital Library Use. *International Journal of Human-Computer Systems* 57: 101-119
- 2001 \*Fabrikant, SI and Buttenfield, BP. Formalizing Semantic Spaces for Information Access. *Annals, Association of American Geographers*, 91(2): 263–280
- 2000 \*Leitner, M and Buttenfield, BP Guidelines for the Display of Attribute Certainty. *Cartography and GIScience* 27(1): 3-14. <https://doi.org/10.1559/152304000783548037>
- 1999 Harvey, F, Buttenfield, BP and Lambert, SC. Integrating Geodata Infrastructures from the Ground Up. *Photogrammetric Engineering and Remote Sensing*, Special Issue on GIS and Local Government (James Merchant, Ed.): 1287-1291
- 1999 Buttenfield, BP. Usability Evaluation of Digital Libraries. *Science and Technology Libraries*, 17(3/4): 39-59
- 1998 Buttenfield, BP. Looking Forward: Geographic Information Services and Libraries in the Future. *Cartography and GIScience* 25(3): 161-171.  
<http://dx.doi.org/10.1559/152304098782383124>
- 1997 Buttenfield, BP Talking in the Tree House: Communication and Representation in Cartography. *Cartographic Perspectives*, 27(1): 20-23
- 1996 \*Zhan, F and Buttenfield, BP Multi-Scale Representations of Digital Cartographic Lines. *Cartography and GIScience*, 23(4): 206 – 228
- 1995 \*Leitner, M and Buttenfield, BP. Acquisition of Procedural Cartographic Knowledge by Reverse Engineering. *Cartography and GIScience*, 22(3): 232-241
- 1995 \*Zhan, F and Buttenfield, BP. Knowledge-Based Selection of Map Design Symbols. *International Journal of Geographic Information Systems*, 9(3): 293-315

- 1995 DeCola, L and Buttenfield, BP. Multiscale Mapping for the NSDI: Data Modeling and Representation. *International Journal for Geomatics*, 9(3): 6-9
- 1994 Buttenfield, BP. Representing Spatial Data Quality. *Cartographica*, 30(2/3): 1-7
- 1994 Buttenfield, BP and \*Weber, CR Proactive Graphics for Exploratory Visualization of Biogeographical Data. *Cartographic Perspectives*, 19(3): 8-18
- 1994 Kottman, C. and Buttenfield, BP. Standards for Spatial Data Use: Similes Improve Understanding. *Cartography and GIScience*, 21(3): 140-144
- 1994 \*Wu, C.V. and Buttenfield, BP. Spatial Data Quality and its Evaluation. *Computers, Environment and Urban Systems*, 18(3): 153-165
- 1993 \*Weber, CR and Buttenfield, BP. A Cartographic Animation of Average Yearly Surface Temperatures for the 48 Contiguous United States: 1897-1986. *Cartography and GIS*, 20(3): 141-150
- 1992 Weibel, WR and Buttenfield, BP. Improvement of GIS Graphics for Analysis and Decision-Making. *International Journal of Geographic Information Systems*, 6(3): 223-245
- 1992 Buttenfield, BP. An Analysis of American Cartographic Association (ACA) Membership Survey Responses. *Cartography and GIScience*, 19(1): 48-51
- 1990 \*Wu, CV and Buttenfield, BP. Reconsidering Rules for Point Feature Name Placement. *Cartographica*, 27(4): 10-27
- 1989 Buttenfield, BP. Scale-Dependence and Self-Similarity in Cartographic Lines. *Cartographica*, 26(1): 79-100 <https://doi.org/10.3138/4678-60MR-M036-4732>
- 1989 \*Leonard, JJ and Buttenfield, BP. An Equal Value Gray Scale for Laser Printer Output. *The American Cartographer*, 16(2): 97-109
- 1987 Buttenfield, BP. Automatic Identification of Cartographic Lines. *The American Cartographer*, 14(1): 7-20. DOI 10.1559/152304087783875372
- 1986 Buttenfield, BP. Comparing Distortion on Sketch Maps and MDS Configurations. *Professional Geographer* 38(3): 238-246. <https://doi.org/10.1111/j.0033-0124.1986.00238.x>
- 1985 Buttenfield, BP. Treatment of the Cartographic Line. *Cartographica*, 22(2): 1-26

### Book Chapters

- 2022 Buttenfield BP. GIScience Through the Looking Glass. Invited Chapter for Rey S and Franklin R (Eds) *Handbook of Spatial Analysis in the Social Sciences*. New York: Edward Elgar. <https://play.google.com/books>
- 2021 Buttenfield BP, Stanislawski LV, Kronenfeld BJ and Shavers E. The 4<sup>th</sup> Paradigm in Generalization and Multiple Representation: Modernizing the National Geospatial Data Infrastructure. Chapter 23 for Werner M and Chiang YY (Eds) *Handbook of Big Geospatial Data*. Berlin: Springer Verlag: 589-618. <https://doi.org/10.1007/978-3-030-55462-0>

- 2015 Buttenfield BP. Representing Uncertainty and Reliability. In: Monmonier, M.S. (ed.) *Cartography in the Twentieth Century*, Volume Six of the *History of Cartography* (Edney, M, Woodward, D. and Harley, B. (series eds.). Madison, WI: University of Wisconsin Press: 1642-1644. Invited submission.
- 2014 Stanislawski, LV, Buttenfield, BP, Bereuter, P, Savino, S and Brewer CA. Generalization Operators. Chapter 6 in: Burghardt, D, Duchêne, C and Mackaness, WA. (Eds.) *Abstracting Information in a Data Rich World: Methodologies and Applications of Map Generalization*. Berlin: Springer Lecture Notes in Geoinformation and Cartography: 157-195. DOI [10.1007/978-3-319-00203-3](https://doi.org/10.1007/978-3-319-00203-3)
- 2014 Duchêne C, Baella B, Brewer CA, Burghardt D, Buttenfield BP, Gaffuri J, Kauferle D, Lecordix F, Maugeais E, Nijhuis R, Pla M, Post M, Regnauld N, Stanislawski LV, Stoter J, Toth L, Urbanke S, van Altena V, Wiedemann A. Generalization in Practice Within National Mapping Agencies. Chapter 11 in: Burghardt, D, Duchêne, C and Mackaness, WA. (Eds.) *Abstracting Information in a Data Rich World: Methodologies and Applications of Map Generalization*. Berlin: Springer Lecture Notes in Geoinformation and Cartography: 329-391. DOI [10.1007/978-3-319-00203-3](https://doi.org/10.1007/978-3-319-00203-3)
- 2013 Buttenfield, BP. Whatever Happened to the Statistical Surface? Chapter 9 in: Barry Wellar (Ed.) *AutoCarto Six Retrospective*. Ottawa, Canada: Information Research Board: 71-78. [http://www.wellar.ca/wellarconsulting/AutoCarto\\_Six\\_Retrospective.pdf](http://www.wellar.ca/wellarconsulting/AutoCarto_Six_Retrospective.pdf)
- 2006 Edsall, R, Buttenfield, BP, Andrienko, G and Andrienko, N. Interactive Maps for Exploring Spatial Data. In Madden, M. (ed.) *2006 Manual of GIS*. Washington DC: American Society for Photogrammetry and Remote Sensing
- 2004 Yuan, M, Buttenfield, BP, Gahegan, M, and Miller, H. Geospatial Data Mining and Knowledge Discovery. Chapter 14 in: McMaster, R.B. and Usery, E. L. *A Research Agenda for Geographic Information Science*. New York: CRC Press
- 2004 Buttenfield, BP. Allometric Models of Knowledge Accumulation. In: Baillie, C, Dunn, E and Zheng, Y. (Eds.) *Traveling Facts: The Social Construction, Distribution and Accumulation of Knowledge*. St. Martin's Press <http://www.colorado.edu/geography/babs/papers/allometry.html>
- 2003 Van House, N Bishop, A and Buttenfield, BP. Digital Libraries as Sociotechnical Systems. In: Bishop, A, Buttenfield, BP and Van House, N. (Eds.) *Digital Library Use: Social Practice in Design and Evaluation*. Cambridge, Mass.: MIT Press: 1-21
- 2000 Buttenfield, BP. Visualizing Ecological Uncertainty. Chapter 6 in Hunsaker, C, Goodchild, M.F, Friedl, M. and Case, T. (Eds.) *Uncertainty in Spatial Data for Ecological Analyses*. New York: Springer-Verlag: 115-132. <http://www.colorado.edu/geography/babs/papers/nceas.html>
- 1999 Beard, MK and Buttenfield, BP. Detecting Errors by Graphical Methods. Chapter 15 in Longley, Goodchild, Maguire and Rhind (Eds) *Geographical Information Systems: Principles, Techniques, Management and Applications*. London: Longman: 219-233
- 1997 McMaster, RB and Buttenfield, BP. Formalizing Cartographic Knowledge. In: Craglia, M. and Couclelis, H. (Eds) *Geographic Information Research: Bridging the Atlantic*. London: Taylor and Francis: 205-223

- 1996 Buttenfield, BP. Scientific Visualization for Environmental Modeling: Interactive and Proactive Graphics. In: Goodchild, MF, Steyaert, LT, Parks, BO, Johnston, C, Maidment, D, Crane, M and Glendenning, S. (Eds.) *GIS and Environmental Modeling*. Fort Collins, CO: GIS World Books: 463-469
- 1996 Buttenfield, BP. GIS and Digital Libraries: Issues of Size and Scalability. In Smith, L.C. and Gluck, M. (eds.) *GIS and Libraries: Patrons, Maps and Spatial Data*. Champaign-Urbana: University of Illinois Press: 69-80
- 1996 Kumler, MP and Buttenfield, BP. Gender Differences in Map Reading Abilities: What Do We Know? What Can We Do? To appear in Wood, C. H. and Keller, C.P. (Eds.) *Cartographic Design: Theoretical and Practical Perspectives*. Toronto: John Wiley and Sons: 125-137
- 1995 Buttenfield, BP. Object-Oriented Map Generalization: Modeling and Cartographic Considerations. In: Muller, J.C, Lagrange, J.P. and Weibel, R (Eds.) *GIS and Generalization: Methodology and Practice*. London: Taylor and Francis, GISDATA Series volume 1: 91-105
- 1993 Buttenfield, BP and \*Weber, CR. Visualization and Hypermedia in GIS. Invited Chapter in Medyckyj-Scott, D. and H. Hearnshaw, (Eds.) *Human Factors in Geographic Information Systems*. London: Belhaven Press: 136-147
- 1993 Goodchild, MF, Buttenfield, BP, and Wood, J. Issues of Data Validity. In Hearnshaw, HM and Unwin, DJ. (Eds.) *Visualization in Geographic Information Systems*. London: Belhaven Press: 141-149
- 1993 Buttenfield, BP and Beard, MK. Graphic and Geographic Components of Data Quality. In Hearnshaw, HM and Unwin, DJ (Eds.), *Visualization in Geographic Information Systems*. London: Belhaven Press: 150-157
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- 1997 \*Leitner, M and Buttenfield, BP. Cartographic Guidelines for Visualizing Attribute Accuracy. *Proceedings, AUTO-CARTO 13*, Seattle, WA, April, 1997: 184-194
- 1997 \*Skupin, A and Buttenfield, BP. Spatial Metaphors for Display of Information Spaces. *Proceedings, AUTO-CARTO 13*, Seattle, Washington, April, 1997: 116-125
- 1996 Buttenfield, BP and Larson, S. Building a Digital Library for Earth System Science: The Alexandria Project. *Proceedings Geological Society of America Meetings*, Denver Colorado, November 1996: 23-27

- 1996 Buttenfield, BP and Goodchild, MF. The Alexandria Digital Library Project: Distributed Library Services for Spatially Referenced Data. *Proceedings, GIS/LIS '96*, Denver, Colorado, November 1996: 76-84
- 1996 \*Leitner, M and Buttenfield, BP. The Impact of Data Quality Displays on Spatial Decision Support. *Proceedings, GIS/LIS '96*, Denver, Colorado, November 1996: 882-894
- 1996 \*Skupin, A and Buttenfield, BP. Spatial Metaphors for Visualizing Very Large Data Archives. *Proceedings, GIS/LIS '96*, Denver, Colorado, November 1996: 607-617
- 1996 \*Tsou, MH and Buttenfield, BP. A Direct Manipulation Interface for Geographical Information Processing. *Proceedings 6<sup>th</sup> International Symposium on Spatial Data Handling*, Delft, The Netherlands, August 1996: 13B.37 – 13B.47
- 1996 Buttenfield BP and McLafferty, S. Spatial Data in the Classroom: A Vision for Education. *Proceedings, Conference on The Future of Spatial Data and Society*. Washington, DC: National Academy of Sciences, Mapping Science Committee, and Federal Geographic Data Committee, 24-25 April, 1996. Paper on the Web at <http://greenwich.colorado.edu/babs/>
- 1996 Buttenfield, BP and Kumler, MP. "Tools for Browsing Environmental Data: The Alexandria Digital Library Interface." *Proceedings 3rd International Conference on Integrating Geographic Information Systems and Environmental Modeling*. Santa Fe, New Mexico, January 21-26, 1996 (no page numbers). Paper on the Web at [http://www.ncgia.ucsb.edu/conf/santa\\_fe\\_cd-rom/sf\\_papers/buttenfield\\_babs/babs\\_paper.html](http://www.ncgia.ucsb.edu/conf/santa_fe_cd-rom/sf_papers/buttenfield_babs/babs_paper.html)
- 1995 Buttenfield, BP. Scientific Visualization for Environmental Modeling: Interactive and Proactive Graphics. *Proceedings, 2<sup>nd</sup> International Conference on Integrating GIS and Environmental Modeling*, 26-30 September, Breckenridge, Colorado (no page numbers)
- 1995 Buttenfield, BP. User Evaluation for the Alexandria Digital Library Project. *Proceedings, "How We Do User-Centered Design and Evaluation of Digital Libraries: A Methodological Forum"*. Allerton, Illinois: Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign. <http://edfu.lis.uiuc.edu/allerton/95/s2/buttenfield.html>
- 1995 Buttenfield, BP. Generalization and Scalability of Digital Libraries. Closing Keynote Address, *Proceedings 32<sup>nd</sup> Annual Clinic of Library Applications of Data Processing*, 1-4 April, Champaign-Urbana, Illinois
- 1995 Buttenfield, BP. Evaluating User Requirements for a Digital Library Testbed. *Proceedings, AUTO-CARTO 12*, Charlotte, North Carolina, 27 February – 1 March: 207-214. Also on the World Wide Web at <http://www.odyssey.maine.edu/gisweb>
- 1995 \*Weber, CR, Buttenfield, BP and Jelinski, DL. A Case Study for Hypermedia Cartography: Radial Growth in Trembling Aspen at Waterton Lakes National Park. *Proceedings, AUTO-CARTO 12*, Charlotte, North Carolina, 27 February – 1 March: 32-40
- 1994 Buttenfield, BP. Visualization in Geographic Education. *Proceedings First Annual Conference on Education and GIS*, sponsored by National Science Foundation and National Geographic Society, 24-27 January, 1994, Washington DC
- 1994 DeCola, L and Buttenfield, BP. Multiscale Mapping for the NSDI: Data Modeling and Representation. *Proceedings, GIS/LIS '94*, Phoenix, Arizona, 25-27 October 1994: 870-880



- 1994 \*Leitner, M. and Buttenfield, BP. Acquisition of Prototype Rules for Automated Map Generalization. *Proceedings, Second International Conference on GIS*, Salzburg, Austria, 6-8 July 1994: 419-428.
- 1994 \*Leitner, M and Buttenfield, BP. Representation of Data Quality in the Digital Cartographic Process. *Proceedings, Second International Conference on GIS*, Salzburg, Austria, 6-8 July 1994: 429-433.
- 1993 Buttenfield, BP. Proactive Graphics for GIS: Prototype Tools for Query, Modeling and Display. *Proceedings AUTO-CARTO 11*, Minneapolis, Minnesota, 30 Oct - 1 Nov: 377-385
- 1993 Buttenfield, BP. Research Agenda for Formalizing Cartographic Knowledge. *NCGIA Research Initiative 8 Specialist Meeting*, Buffalo New York, 24-27 October 1993
- 1993 Buttenfield, BP. Scientific Visualization for Environmental Modeling: Interactive and Proactive Graphics. *Proceedings, 2<sup>nd</sup> International Conference on Integrating GIS and Environmental Modeling*, 26-30 September, Breckenridge, Colorado
- 1993 \*Leitner, M and Buttenfield, BP. The Dasyetric Technique: A Cartographic Approach to Map Overlay. *Proceedings, 1st International Conference on GIS*, Salzburg, Austria, July 1993: 89-96
- 1993 Dutton, G and Buttenfield, BP. Scale Change Via Hierarchical Coarsening: Cartographic Properties of Quaternary Triangular Meshes. *Proceedings, 16<sup>th</sup> Conference of the International Cartographic Association*, 3-8 May 1993, Cologne, Germany, vol. 2: 847-862
- 1993 Buttenfield, BP. Formalizing Rules for Gray Tone Selection in Computer Mapping. *Proceedings, ACSM/ASPRS Annual Convention*, 16-18 February, New Orleans, Louisiana, vol.1: 52-61
- 1992 Beard, MK and Buttenfield BP. Spatial, Statistical, and Graphical Dimensions of Data Quality. *Proceedings, Visualization '92 Conference*, College Station Texas, March 19-21
- 1991 Buttenfield, BP, \*Weber, CR, \*Leitner, M, \*Phelan, JJ, \*Rasmussen, DM, and \*Wright, GR. How Does a Cartographic Object Behave? Computer Inventory of Topographic Maps. *Proceedings, GIS/LIS '91*, Atlanta, Georgia, November 1991, vol. 2: 891-900
- 1991 Mackaness, WA and Buttenfield, BP. Incorporating Time in Geographic Process: A Framework for Analyzing Process in GIS. *Proceedings 15<sup>th</sup> Conference of the International Cartographic Association*, Bournemouth England September, 1991, vol. 2: 565-574
- 1991 Buttenfield, BP. Visualizing Cartographic Metadata. *Proceedings, NCGIA Specialist Meeting on Visualizing the Quality of Spatial Data*, June 1991, Castine, Maine: 19-28
- 1991 Buttenfield, BP and Beard, MK. Visualizing the Quality of Spatial Information. *Proceedings, AUTO-CARTO 10*, Baltimore, Maryland, March, 1991 vol. 6: 423-427
- 1990 Buttenfield, BP and \*Ganter, JH. Visualization and GIS: What Should We See? What Might We Miss? *Proceedings, 4<sup>th</sup> International Symposium on Spatial Data Handling*, Zurich Switzerland, July 1990, vol. 1: 307-316
- 1990 Mark, DM, Buttenfield, BP, Calkins, HW, Goodchild, MF, and Onsrud, H. Geographical Research Findings at NCGIA During Year 1: Summary and Implications for GIS. *Proceedings, Canadian National Conference on Geographical Information Systems: Challenge for the 90's*. Ottawa, Canada, 5 – 9 March: 1145-1160

- 1989 Buttenfield, BP. Texture and Value Relations of Computer-Generated Gray Tones. *Proceedings, International Cartographic Association Conference*, Budapest, Hungary, August 1989: 458
- 1988 Weibel, WR and Buttenfield BP. Map Design for Geographic Information Systems. *Proceedings, Third International Geographical Information Systems Symposium (GIS/LIS 88)*, November 1988, Baltimore, MD. Vol.1: 350-359
- 1988 Mark, DM and Buttenfield, BP. Expert System for Cartographic Design. *Proceedings, 8<sup>th</sup> International Workshop on Expert Systems and Their Applications*, vol. 2: 413-425
- 1987 \*Langran, GL and BP. Buttenfield, Formatting Geographical Data to Enhance Manipulability. *Proceedings, AUTO-CARTO 8*: 201-210
- 1986 Buttenfield, BP. Digital Definitions of Scale-Dependent Structure. *Proceedings, AUTO-CARTO LONDON*, vol.1: 497-506
- 1983 Buttenfield, BP. Topology and the Concept of the Statistical Solid. *Proceedings, AUTO-CARTO 6*, vol.1: 323

### Monographs

- 2013 Clarke, K, Anselin, L, Bayen, AM, Black, GC, Buttenfield, BP, Carley, KM, Jensen, JR, Langley, RB, Mikhail, EM, Shekar, S, Solem, MN, Stephan, P, Yuan, M, Zyda, MJ. *Future U.S. Workforce for Geospatial Intelligence*. National Research Council Monograph. Washington, D.C.: National Academy Press
- 2005 Clarke, K, Buttenfield, BP, Armstrong, MA, Bhudendhra, B, Gahegan, M, Jackson, M, Shakar, S and Tucker, C. *Priorities for Geospatial Science Research at the National Geospatial Intelligence Agency*. National Research Council Monograph. Washington, D.C.: National Academy Press
- 2002 Graf, W, Buttenfield, BP, Harden, CP, Jensen, J, Malanson, GP, MacDowell, PF, McLafferty, S, Psuty, NP, Vaux, HJ. *Research Priorities in Geography for the U.S. Geological Survey*. Washington, D.C.: National Research Council Monograph. Washington, D.C.: National Academy Press
- 2000 Yuan, M, Buttenfield, BP, Gahegan, M, and Miller, H. *Geospatial Data Mining and Knowledge Discovery. UCGIS White Paper*, accepted by Council vote June 2000, Washington: DC. Available on the Web at <http://www.ucgis.org/emerging/gkd.pdf>
- 1999 Goodchild, MF, Buttenfield, BP, Adler, P, Krygiel, A, Onsrud, H, and Kahn, R. *Distributed Geolibraries*. National Research Council Monograph. Washington, D.C.: National Academy Press, 119 pp
- 1997 Mackaness, WA, Weibel, R and Buttenfield, BP. *Research Progress in Map Generalization*. Santa Barbara, California: *NCGIA Technical Report 97-3*. 17 pp. Also available on the Web at <http://www.geo.unizh.ch/ICA/>
- 1997 Buttenfield, BP and Hill, L. *Alexandria Design Review Workshop: Report on the Second Meeting*. Santa Barbara, California: *Technical Report*, Alexandria Digital Library Project, March 1997. 41 pp. <http://alexandria.sdc.ucsb.edu/public-documents/papers/adr2/>

- 1997 National Research Council Mapping Science Committee, Sugarbaker, LA, Chair, *The Future of Spatial Data and Society: Summary of a Workshop*. Washington, D.C.: National Academy Press. 67 pp
- 1996 Basili, V, Buttenfield, BP, Duncan, G, Jacobs, GA, Guckenhiemer, J, McRae, GJ, Paynter, HM, Pregibon, D, Starr, SL, and Zadeh, L. *Machinery for Predictability of Complex Systems*. Arlington, VA: National Science Foundation, Division of Mathematical Sciences, Strategic Activities and Special Projects (Al Thaler, Program Director)
- 1996 Buttenfield, BP and \*Dibble, C. *NCGIA Research Initiative 8, Formalizing Cartographic Knowledge: Scientific Report for Specialist Meeting*. Santa Barbara, California: *NCGIA Technical Report 95-15*. 39 pp
- 1995 National Science Foundation Panel *Connecting and Collaborating: Issues for the Sciences*. Arzberger, P and Maisel, M (Eds.) Workshop sponsored by the National Science Foundation (NSF) and held at Scripps Institution of Oceanography, University of California, San Diego, June 22-24, 1995. ([http://www.sdsc.edu/projects/CC/Paper/white\\_paper.html](http://www.sdsc.edu/projects/CC/Paper/white_paper.html))
- 1995 National Research Council Mapping Science Committee, Sugarbaker, LA, Chair, *Data Foundation for the National Spatial Data Infrastructure*. Washington, D.C.: National Academy Press. 50 pp
- 1994 National Research Council Mapping Science Committee, Sugarbaker, LA, Chair, *Promoting the National Spatial Data Infrastructure Through Partnerships*. Washington, D.C.: National Academy Press. 112 pp
- 1994 Beard, MK, Buttenfield, BP and Mackaness, WA. *Closing Report for NCGIA Research Initiative 7: Visualizing the Quality of Spatial Information*. Santa Barbara, California: *NCGIA Closing Report*. 32 pp
- 1994 Mackaness, WA, Beard, MK, and Buttenfield, BP. *Bibliography on Visualizing Spatial Data Quality*. Santa Barbara, California: *NCGIA Technical Report*. 45 pp
- 1993 National Research Council Mapping Science Committee, Bossler, JD, Chair, *Toward a Coordinated Spatial Data Infrastructure for the Nation*. Washington, D.C.: National Academy Press. 171 pp
- 1993 Buttenfield, BP. Closing Report for NCGIA Research Initiative 3: Multiple Representations. Santa Barbara, California: *NCGIA Technical Report 93-11*. 26 pp
- 1991 Beard, MK, Buttenfield, BP and Clapham, SB. *Scientific Report for Specialist Meeting on NCGIA Research Initiative 7, Visualizing the Quality of Spatial Information*. Santa Barbara, California: *NCGIA Technical Report 91-26*. 170 pp
- 1991 Buttenfield, BP, \*Weber, CR, \*MacLennan, M and \*Elliott, JD. *Bibliography on Animation of Spatial Data: A Guide to Literature, Video and Movie Media*. Santa Barbara, California: *NCGIA Technical Report 91-22*. 33 pp
- 1990 \*DeLotto, JS, Buttenfield, BP and Broome, F, *NCGIA/U.S. Census Multiple Representations Data Set Pilot Project: Lee County, Florida*. Santa Barbara, California: *NCGIA Report 90-4*. 35 pp

- 1989 Buttenfield, BP, \*DeLotto, JS, and \*McKinney, JV. *Bibliography on Multiple Representations*. Santa Barbara, California: NCGIA Report 89-11. 47 pp
- 1989 Buttenfield, BP and \*DeLotto, JS. *Scientific Report for Specialist Meeting on NCGIA Initiative 3, Multiple Representations*. Santa Barbara, CA: NCGIA Report 89-3. 87 pp
- 1984 Buttenfield, BP et al. (31 authors), *Land Records Modernization: Centers of Excellence from a Wisconsin Perspective*. Madison, Wisconsin: *University of Wisconsin Land Information Report* No. 2. 33 pp
- 1983 Buttenfield, BP and Kohlenberg, EG (Eds). *DATAMAN: Guide to Computer-Assisted Data Analysis at the University of Washington*. Seattle: Center for Social Science Computation and Research. 115 pp

### Invited Lectures and Colloquia

- 2023 I-GUIDE Summer School, National Center for Atmospheric Research, Boulder Colorado  
Ethics in Cartography Panelist, *Annual Meetings of the Association of American Geographers, March 2023, Denver Colorado*.
- 2022 USGS Center for Excellence in Geospatial Science Annual All-Hands Meeting, Rolla MO
- 2019 Technology, Cybersecurity and Policy Program, College of Engineering, University of Colorado - Boulder
- 2016 School of Geographical Science and Urban Planning, Arizona State University
- 2015 University Consortium for GIScience (UCGIS) Annual Assembly
- 2013 GIS Day Symposium, University of Kansas, Lawrence  
Science Literacy Boot Camp for Librarians Conference, Boulder Colorado
- 2011 USGS First National Map Users Conference, Denver Colorado
- 2010 Department of Geography, Penn State University  
<http://e-education.mediasite.com/mediasite/Viewer/?peid=7fe32293be1a445f98418f9b274a1fb4>  
Generalization and Data Integration. University of Zurich, Switzerland  
[http://ica.ign.fr/2010\\_Zurich/slides/2010-ICAWSGene-Invited-Buttenfield.pdf](http://ica.ign.fr/2010_Zurich/slides/2010-ICAWSGene-Invited-Buttenfield.pdf)
- 2009 ESRI Southwest Users Group Conference
- 2006 Department of Geography, University of Colorado  
Department of Geography, Simon Fraser University, Vancouver Canada  
USGS, Denver, Colorado  
National Snow and Ice Data Center, University of Colorado-Boulder  
Department of Geography, University of Arizona
- 2005 Department of Geography, U. California – Santa Barbara  
Western Association of Map Libraries Annual Meeting, Boulder Colorado

- 2004 Department of Geography, University of Wisconsin-Madison  
Invited Speaker, 29<sup>th</sup> Workshop on Hazards Research and Applications, Boulder Colorado  
USGS GIScience 2004, Denver, Colorado  
GEOIDE invited week-long lecture series on Cartography and Geospatial Information Design,  
Carleton University, Ottawa, Canada
- 2003 (with Joel Morrison) Invited Workshop on Cartographic Visualization, GIS-T 2003  
(Annual Conference of State Transportation Agencies), Colorado Springs, CO  
Department of Geosciences, University of Oregon (AAG Visiting Scholar Program)  
Department of Geography, Oregon State University (AAG Visiting Scholar Program)
- 2002 National Center for Atmospheric Research, Boulder Colorado  
National Geography Faculty Development Alliance, Boulder Colorado  
CSISS Summer Institute, University of California Santa Barbara
- 2001 Teaching with Technology Program, University of Colorado  
CSISS Summer Institute, University of California Santa Barbara
- 2000 ICA Workshop on Internet Cartography, Knoxville, Tennessee  
Internet-based GIS for the Rest of Us: The ATLAS Project, EDUCAUSE, Nashville
- 1999 Department of Geography, University of Colorado  
Department of Geography, University of Georgia  
FGDC National Geodata Forum, Washington D.C.
- 1998 Information Science Department, University of Colorado Business School
- 1997 Spatial Data and Visualization Center, University of Wyoming  
National Snow and Ice Data Center (NSIDC)  
Institut für Geomatik und Geoinformation, Technische Universität Wien  
Institut für Geographie, Universität Wien  
Department of Geography, University of California – Santa Barbara
- 1995 Information Technology Lecture Series, University of Missouri-Columbia  
Department of Geography, University of Washington, Seattle  
Department of Geography, University of Colorado-Boulder  
Department of Geography, State University of New York at Buffalo
- 1994 Department of Geography, University of Minnesota-Minneapolis  
Department of Geography, University of Maryland-College Park  
Department of Geography and Earth Science, George-Mason University
- 1993 Department of Geography, University of Zurich, Switzerland  
USGS National Mapping Division Fortnightly Seminar Series, Reston VA  
International Cartographic Assn. Working Group on Generalization, Cologne, Germany
- 1992 Department of Geography, University of Leicester, UK  
Department of Communication, SUNY-Buffalo
- 1989 Department of Geography, University of Washington  
Department of Geography, Syracuse University  
Battelle Research Institute, Seattle, Washington  
National Geodetic Survey, NOAA, Rockville Maryland

- 1988 Department of Geography, Kent State University  
Faculty of Social Sciences Teaching Assistant Workshop, SUNY-Buffalo
- 1987 Department of Geography, University of South Carolina  
Department of Geography, University of North Carolina
- 1986 Land Resources Program, University of Wisconsin
- 1985 Wisconsin State Historical Society, Madison, Wisconsin
- 1984 Department of Geography and Urban Planning, Rutgers University  
Department of Geography, University of Colorado-Boulder  
Department of Geography, University of Wisconsin-Madison
- 1982 Department of Psychology, University of Washington  
Department of Geography, University of California – Santa Barbara

### **Conference Presentations Not Published in Proceedings or Journal Articles**

- 2024 Stanislawski LV, Kronenfeld BJ, Buttenfield BP, and Shavers E. Assessment of Density Pattern Retention for Generalized Data. *Annual Meetings of the Association of American Geographers, 16-20 April 2024, Honolulu HI.*
- 2024 Kronenfeld BJ, Stanislawski LV, Buttenfield BP, Shavers E and Kang Y. Exact Computation of Hausdorff and Average Distance Between Polylines to Support Intelligent Multiscale Mapping. *Annual Meetings of the Association of American Geographers, 16-20 April 2024, Honolulu HI.*
- 2023 Buttenfield BP. Geovisualization: What Should Be Seen? What Might Be Missed? *I-GUIDE Summer School, National Center for Atmospheric Research, Boulder CO (7-11 August 2023)*
- 2023 Buttenfield BP, Kronenfeld, BJ, Stanislawski LV Shavers, Ethan and Camerer A. Scale Specific Sinuosity (S3) and Why It Matters. *USGS Center for Excellence in Geospatial Science Annual Research Meeting (CEGIS 2023), Rolla Missouri 1-3 August. (Virtual, 2 August)*
- 2023 Stanislawski LV, Kronenfeld, BJ, Buttenfield BP and Shavers EJ. Generalization Metrics in the Age of Big Geospatial Data. *Annual Meetings of the Association of American Geographers, March 2023, Denver Colorado.*
- 2023 Charisoulis G, Buttenfield BP and Qiang Y. Stochastic Simulation and Probabilistic Location-Allocation Modeling for a Case Study of Missing Source Points. *Annual Meetings of the Association of American Geographers, March 2023, Denver Colorado*
- 2022 Buttenfield BP. The Trouble with Geospatial Science: Unsolved Problems, Unresolved Obstacles. *USGS Center for Excellence in Geospatial Science Annual Research Meeting (CEGIS 2022), Rolla Missouri 2-4 August. (Virtual, 2 August)*
- 2022 Charisoulis G and Buttenfield BP. Uncertainty and Error in Locational Allocation Modeling and Route Networking. *Annual Meetings of the Association of American Geographers, 25 February – 1 March 2022 (Virtual, 25 Feb)*

- 2022 Qiang Y, Buttenfield BP and Sitchinava N. CroScalar: An Integrated Framework for Cross-Scale Spatio-Temporal Modeling. *Annual Meetings of the Association of American Geographers, Special Session: Symposium on Scale in Spatial Analytics and Modeling: Multi-Scale Visualization, Analytics and Modeling*, 25 February – 1 March 2022 (Virtual, 26 Feb).
- 2022 Stanislawski LV, Shavers EJ, Duffy A, Kronenfeld BJ, Buttenfield BP, and Thiem P. Assessment of Vector Hydrography Derived from Deep Learning of Remotely Sensed Data. *Annual Meetings of the Association of American Geographers*, 25 February – 1 March 2022 (Virtual, 26 Feb)
- 2021 Stanislawski LV, Shavers E, Kronenfeld BJ and Buttenfield BP. Stream Meander Pattern Analysis of National Hydrography Flowlines for Geomorphic Classification. *Annual Meetings of the Association of American Geographers*, 7-11 April 2021 (virtual presentation)
- 2021 \*Charisoulis G and Buttenfield BP. Network-Based Routing in Rough and Smooth Terrain. Presented at Annual Symposium of the University Consortium of Geographic Information Science (UCGIS), held virtually in June 2021.
- 2020 \*Carlson K and Buttenfield BP. Integrating Visualizations of Spatial and Temporal Uncertainty. *GIS in the Rockies (GISITR\_2020)*, 7-9 October 2020. (Meeting held virtually due to COVID-19)
- 2020 \*Carlson, K, Buttenfield BP, and <sup>Ω</sup>Qiang Y. Integrating Visualizations of Spatial and Temporal Uncertainty. *Annual Meetings of the Association of American Geographers*, Denver CO, 6-10 April 2020. (Meeting cancelled due to COVID-19)
- 2020 \*Charisoulis G, Buttenfield BP and \*Guler, D. Location Allocation Modelling for Renewable Technologies in the Face of Uncertainty. *Annual Meetings of the Association of American Geographers*, Denver CO, 6-10 April 2020. (Meeting cancelled due to COVID-19)
- 2020 \*Guler D, \*Charisoulis G, Buttenfield BP, and Yomralioglu T. Biomass Facility Suitable Location Selection with Open-Source GIS and MCDM. *Annual Meetings of the Association of American Geographers*, Denver CO, 6-10 April 2020. (Meeting cancelled due to COVID-19)
- 2020 Shavers, EJ, Stanislawski LV, Buttenfield BP, and Kronenfeld BJ. Preserving Meander Bend Geometry Through Scale. *Symposium on Scale, and Spatial Analytics*, Arizona State University, February 2020.
- 2019 \*Charisoulis G and Buttenfield BP. Siting Anaerobic Digestion Facilities in the Face of Missing and Sparse Information. *GIS in the Rockies (GISITR\_2019)*, Denver CO, 17-19 September 2019.
- 2019 Stanislawski LV, Brockmeyer T, Shavers E, Buttenfield BP and Kronenfeld BJ. Geomorphic Classification to Support Hydrographic Feature Extraction. *Annual Meetings of the Association of American Geographers*, Washington DC, 3-6 April 2019.
- 2017 Buttenfield BP, <sup>Ω</sup>Qiang, Y, Farmer C. and \*Ghandehari, M. Cross-Scale Analysis of Surface-Adjusted Elevation and Distance Measurements. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, 14 June
- 2017 <sup>Ω</sup>Qiang, Y, Buttenfield BP, Joseph M, and Farmer CJQ. A Systematic Evaluation of Surface-Adjusted Distance Measurements Using an HPC-Enabled Monte Carlo Simulation. *Annual Meetings of the Association of American Geographers*, Boston, Massachusetts, 5-9 April 2017

- 2017 Stanislawski LV, Buttenfield BP, and Wendel J. Deriving a Surface-Water Drainage Network That the Terrain Can Support. *Annual Meetings of the Association of American Geographers*, Boston Massachusetts, 5-9 April 2017
- 2016 \*Ghandehari M, Buttenfield BP, and Farmer CJQ. What if the Earth is Not Flat? Cross-Scale Analysis of Sub-Pixel Variations in Digital Elevation Models. Poster Presentation, *American Geophysical Union Annual Meeting*, San Francisco 12-16 December
- 2016 \*Ghandehari M and Buttenfield, BP. Hydrologic Flow Accumulation Modeling Using Surface Area. *GIS in the Rockies Annual Meeting*, Denver Colorado 21-21 September
- 2016 Buttenfield BP, \*Ghandehari M and \*Brantley ME. Surface-Adjusted Distance Comparison for Multi-Scale Terrain Analysis. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, 29 June
- 2016 Stanislawski LV, Buttenfield BP and \*Raposo P. Assessment of Hydrographic Line Feature Geometry to Support Multi-Scale Representation. *Annual Meetings of the Association of American Geographers*, San Francisco California, 29 March – 2 April
- 2015 Buttenfield BP and \*Sauer D. Automatic Selection of a Scale-Appropriate UDA Threshold for Delineating Primary Paths through Stream Networks. *USGS-CEGIS (Ctr. For Excellence in Geospatial Science) Annual Research Meeting*, Rolla Missouri, 10 June 2015.
- 2015 Buttenfield BP. Data Integration and Data Science: Research Priorities for GIScience. *University Consortium for GIScience (UCGIS) Annual Assembly*, Alexandria VA, May 2015.
- 2015 \*Ghandehari, M and Buttenfield BP. Density-Based Stream Network Extraction from Digital Elevation Models. Poster presentation, *10<sup>th</sup> Annual Hydrologic Sciences Research Symposium on Water*, Boulder, Colorado. First place award for Best Poster.
- 2013 Buttenfield, BP and Stanislawski, LV. Through the Looking Glass: Designing a Multi-Scale National Hydrographic Database. *12<sup>th</sup> Annual Symposium for GIS Day*, University of Kansas – Lawrence, November.
- 2012 Buttenfield, BP, \*Gleason, MJ and \*Anderson-Tarver, C. Automatic Delineation of Primary Channels through Braided Stream Networks for Cartographic Generalization. *North American Cartographic Information Society (NACIS 2012)*, Portland, Oregon, October.
- 2012 Buttenfield, BP, \*Anderson-Tarver, C, \*Gleason, MJ, and Stanislawski, LV. Level of Detail (LoD) Hydrography Databases for the USGS National Map. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, June.
- 2012 \*Stauffer, A and Buttenfield, B.P Iterative Filtering of DEMs and Effects on Hillshading. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, June.
- 2012 Stanislawski, LV, \*Howard, M, Briat, MO, Punt, E, Brewer, CA and Buttenfield, BP. Density Stratified Thinning to Support Automated Generalization of Transportation. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, June.
- 2012 Stanislawski, LV, \*Raposo, P, Howard, M and Buttenfield, BP. Automated Metric Assessment of Line Simplification in Humid Landscapes. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, June.



- 2012 \*Wendel, J, Buttenfield, BP, and Stanislawski, LV. Comparison of Unsupervised Learning Algorithms for Physiographic Classification of U.S. Landscape Types. *Annual Meetings of the Association of American Geographers*, New York City, February.
- 2012 Nagle, NN, Buttenfield, BP and Leyk, S. Accounting for Uncertainty in Small Area Estimation with Random Effects. *Annual Meetings of the American Geographers*, New York City, February.
- 2011 \*Gleason, MJ, Pitlick, J and Buttenfield, BP. Filtering Raw Terrestrial Laser Scanning Data for More Efficient and Accurate Use in Geomorphologic Modeling. *American Geophysical Union Annual Meetings*, San Francisco, CA, December.
- 2011 Buttenfield, BP. Automated Methods for Simplifying Surface Water Features: Flowlines, Waterbodies and Centerlines. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17.
- 2011 Buttenfield, BP and \*Gleason, MJ. Automatic Identification of Islands in the National Hydrography Dataset. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17.
- 2011 Buttenfield, BP and Stanislawski, LV. Generalization for the National Map. *USGS-CEGIS Annual Research Meeting*, Rolla Missouri, June.
- 2011 Buttenfield, BP. Multiple Representations of Geospatial Data: A Cartographic Search for the Holy Grail? *The National Map 2011 Users Conference*, Denver Colorado, May.
- 2011 Leyk, S and Buttenfield, BP and Nagle, NN. Choosing Related Variables in Dasymeric Modeling to Refine Microdata Allocations. *Annual Meetings of the Association of American Geographers*, Seattle Washington, April.
- 2011 Nagle, NN, Leyk, S and Buttenfield, BP. Constructing Small Area Estimates with Uncertain Census Data. *Annual Meetings of the Association of American Geographers*, Seattle Washington, April.
- 2011 Nagle, NN, Buttenfield, BP and Leyk, S. Integrating Microdata with Census Summary Files. *ICC Census Working Group Workshop*, Seattle Washington, April.
- 2010 Brewer, CA, Buttenfield, BP and Usery, EL. Designing USGS Topographic Mapping for Multiscale Online Use. *ESRI User Conference*, San Diego CA, July. Also presented *International Cartographic Symposium on Cartography for Australasia and Oceania (GeoCart 2010)*, Auckland, New Zealand, September. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_ESRI-UC\\_Multiscale-Topo\\_July2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_ESRI-UC_Multiscale-Topo_July2010.pdf)
- 2010 Buttenfield, BP, Stanislawski, LV, and Brewer, CA. Generalization to Support the National Map. *USGS-CEGIS Annual Research Meeting*, Denver CO, June.
- 2010 Brewer, CA, Buttenfield, BP and Stanislawski, LV. Progress on Electronic Topo Map Design Decisions. *USGS-CEGIS Annual Research Meeting*, Denver CO, June. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk1\\_Overview-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk1_Overview-Topo_CEGIS-AllHands_June2010.pdf)
- 2010 Brewer, CA, \*Hanchett, CL Buttenfield, BP and Stanislawski, LV. Evaluation of Map Symbols by Screen Resolution and File Format through Scale. *USGS-CEGIS Annual Research Meeting*, Denver CO, June. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk2\\_Eval-Multiscale-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk2_Eval-Multiscale-Topo_CEGIS-AllHands_June2010.pdf)

- 2010 \*Haemerlinck, JD and Buttenfield, BP. Planning Support System Implementation in Rural Local Governments. *Annual Meetings Association of American Geographers*, Washington D.C, April.
- 2010 \*Wendel, J and Buttenfield, BP. Guidelines for Self-Organizing Maps. *Annual Meetings Association of American Geographers*, Washington D.C, April.
- 2010 \*Anderson-Tarver, C and Buttenfield, BP. Generalizing a Swamp-Marsh Database Using Texture. *Annual Meetings Association of American Geographers*, Washington D.C, April.
- 2009 Nagle, NN, Buttenfield, BP and Leyk, S. Simulating Spatially Explicit Populations: Combining Public Microdata and Summary Files. Invited Presentation, *Geographic Information Science and Technology Series Oak Ridge National Laboratory*, , 13 November.
- 2009 Buttenfield, BP, Brewer, CA, and Usery, EL. Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate. *North American Cartographic Information Society (NACIS 29)*, Sacramento, California, October.
- 2009 Brewer, CA, Buttenfield, BP and Usery, EL. Designing The National Map Produced by USGS for Multi-Scale Online Use. *North American Cartographic Information Society (NACIS 29)*, Sacramento, California, October. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer-et-al\\_NACIS\\_2009.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer-et-al_NACIS_2009.pdf)
- 2009 Buttenfield, BP, Stanislawski, LV and Brewer, CA. NHD Generalization and Multiscale Topographic Map Design. *USGS Center for Excellence Annual Research Meeting*, Rolla Missouri, August.
- 2009 \*Wendel, J, Buttenfield, BP Anderson-Tarver, C and Brewer, CA. Cartographic Generalization by Physiographic Region. *Annual Meetings Association of American Geographers*, Las Vegas, Nevada, April.
- 2009 \*James, K, Byers, T, Marshall, J, Meliker, JR, Zerbe, G, Buttenfield, BP and Hokanson, J. Association between arsenic exposure through drinking water and coronary heart disease and diabetes mellitus. *137<sup>th</sup> Annual Meeting of the American Public Health Association*, Philadelphia, PA 7-11 Nov 2009.
- 2008 Buttenfield, BP and Frye, C. Simplifying Hydrography by Shape and Texture. *North American Cartographic Information Society (NACIS 28)*, Missoula, Montana, October.
- 2008 Buttenfield, BP. Hydrographic Generalization: Problems to Solve for *The National Map*. *USGS Center for Excellence Annual Research Meeting*, Rolla Missouri.
- 2008 \*Viger, R Buttenfield, BP. Semantics for Integrating Hydrologic Models. *USGS Symposium on GIS Research*, USGS Headquarters, Reston Virginia, September.
- 2008 \*Wendel, J, Buttenfield, BP, \*Viger, R and \*Smith, J. Spatializing GIS Commands with Self-Organizing Maps. *Annual Meetings Association of American Geographers*, Boston, Massachusetts, April.
- 2007 \*Ballagh, LM, Meier, WN, Barry, RA, and Buttenfield, BP. Evaluating Derived Sea Ice Thickness Estimates from Two Remote Sensing Data Sets. *Annual Meeting of the American Geographical Union*, San Francisco, California, December.

- 2007 Buttenfield, BP, Brewer, CA, Frye, C and Buckley, A. What is a Base Map? *North American Cartographic Information Society (NACIS 27)*, St. Louis Missouri, October.
- 2007 Brewer, CA, \*Acosta, J, Buttenfield, BP, and Frye, C. ScaleMaster characterization of types of design change through scale for mapping from multi-resolution databases. *North American Cartographic Information Society (NACIS 27)*, St. Louis Missouri, October.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_NACIS\\_2007\\_ScaleMasterII.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_NACIS_2007_ScaleMasterII.pdf)
- 2007 \*Wolf, EB and Buttenfield, BP. A Hierarchical Vector Data Model for Distributed Geospatial Processing. *Annual Meetings Association of American Geographers*, San Francisco California, April 17-21, 2007.
- 2006 Buttenfield, BP. Searching for the Golden Feature in MRDBs. *North American Cartographic Information Society (NACIS 26)*, Madison Wisconsin, October 20.
- 2006 Buttenfield, BP. Filling in the DLG Gap: A Data Thesaurus Experiment. *USGS National Conference on GIS (GIS-2006)*, Denver, Colorado, March 18.
- 2005 Buttenfield, BP. The Map in Your Mind: What Goes on *Before* You Make the Map. *North American Cartographic Information Society (NACIS 25)*, Salt Lake City October 13.
- 2005 Buttenfield, BP and Buckley, A. Multi-Scale, Multi-Purpose Geodatabase Modeling. *ESRI User Conference*, San Diego California, July 14.
- 2005 Buttenfield, BP and Mennis, J. Data Resolution as a Possible Bias in Association Rule Mining. *Annual Meetings Association of American Geographers*, Denver Colorado, April 8.
- 2005 Buttenfield, BP. GeoVisualization and GIS Modeling for Earth Sciences. *Western Association of Map Libraries Annual Meeting*, Boulder Colorado, March 25.
- 2004 Buttenfield, BP. Internal and Relative Topologies for Vector Geospatial Data. *Third International GIScience Conference (GIScience 2004)*, Maryland, October.
- 2004 Buttenfield, BP. Strategies for Achieving a Multi-Scale, Multi-Purpose Geospatial Database Using a Relational Data Architecture. *North American Cartographic Information Society (NACIS 24)*, Portland, Maine, October.
- 2004 Buttenfield, BP. GIS Technology and Barriers to Adoption in Wildland Fire Management Invited presentation, *29<sup>th</sup> Workshop on Hazards Research and Applications*, Boulder Colorado.
- 2004 Buttenfield, BP. A Topologically Correct Multi-Resolution Vector Data Architecture. *USGS National Conference on GIS (GIS-2004)*, Denver, Colorado.
- 2002 Buttenfield, BP. Transmitting GIS Vector Data on the Internet. *National Meetings, Association of American Geographers*, Los Angeles California, March 2002.
- 2001 Buttenfield, BP and \*Huff, R. GIS Data Models and the Representation of Time. *North American Cartographic Information Society (NACIS)*, Portland, Oregon, October, 2001.
- 2000 Buttenfield, BP. Monitoring Student Use of GIS Exercises on the Internet. *ICA Commission Workshop on Maps and the Internet*, Knoxville Tennessee, October 11, 2000.

- 2000 Buttenfield, BP. ATLAS Distance Learning Activities in Geography. *EDUCAUSE 2000*, Nashville, Tennessee, October 13, 2000.
- 2000 Buttenfield, BP, \*Tsou, MH, and \*Petrik, K. GIS for the Rest of Us: Internet Delivery of Earth Science Class Exercises. *National Meetings, Association of American Geographers*, Pittsburgh, Pennsylvania, April 2000.
- 1999 Buttenfield, BP. Monitoring Use of Online Services for Distance Learning. *Varenius Workshop "Transitions from Childhood to the Workforce"*, Santa Barbara California, 9-11 September.
- 1999 Buttenfield, BP. Progressive Transmission of Vector Data on the Internet: A Cartographic Solution. *3rd Workshop on Progress in Automated Map Generalization*, Ottawa, Canada, 12-15 August.
- 1999 Buttenfield, BP. Studying User Navigation Through a Web Site With Spatial Interaction Models. *National Meetings, Association of American Geographers*, Honolulu, Hawaii, March 1999.
- 1998 Buttenfield, BP. Automated Metadata Collection for Historical Ground Photos. *GIS/LIS '98*, Fort Worth Texas, 11-15 November, 1998.
- 1998 Buttenfield, BP. The Digital Map Library as a Moving Target: Evaluaton of Technology and Knowledge. *North American Cartographic Information Society (NACIS 18)*, Milwaukee, Wisconsin, October, 1998.
- 1998 Buttenfield, BP. Scale and Detail in the Cognition of Geographic Information. *NCGIA Varenius Meeting on Scale and Cognition*, Santa Barbara, California, 14-16 May 1998.
- 1997 Buttenfield, BP. Metadata in Principle and in Practice. *GIS/LIS '97*, Cincinnati, Ohio, 27-29 November, 1997.
- 1997 Buttenfield, BP. Cartographic Metaphors for Browsing Very Large Data Archives. Presented 17<sup>th</sup> Annual Meeting of the North American Cartographic Information Society (NACIS), Lexington, Kentucky.
- 1997 Buttenfield, BP. Principles for Visual Representations of Metadata. *Symposium on the Accuracy of Ecological Data*, National Center for Ecological Analysis and Synthesis, Santa Barbara, California.
- 1997 Buttenfield, BP. Map Design and Visualization. Invited Presentation, *UCGIS Annual Assembly*, Bar Harbor, Maine, June.
- 1997 Buttenfield, BP. Encapsulated Operators for Processing Geographic Information. *Workshop on Progress in Automated Map Generalization*, Gaevle, Sweden, 19-21 June.
- 1996 Buttenfield, BP. The Human Component of an Internet Digital Map Library: Re-Thinking User Interface Evaluation. *North American Cartographic Information Society (NACIS 16)*, San Antonio, Texas, October.
- 1996 Buttenfield, BP. Self-Similarity and Scale-Dependence of Geographic Data. *NSF Workshop on Machinery for Predictability of Complex Systems*. Arlington, Virginia, September.
- 1996 Buttenfield, BP. GIS in Schools and Libraries. *URISA Annual Conference*, Salt Lake City Utah, July. (invited presentation)

- 1996 Buttenfield, BP. Visualizing Spatial Uncertainty *Second International Symposium on Spatial Accuracy Assessment*, Fort Collins, Colorado, May.
- 1996 Buttenfield, BP. Cartography in the Next Millennium: Interface Design and Evaluation. *American Society for Photogrammetry and Remote Sensing (ASPRS)*, Baltimore Maryland, April.
- 1996 Buttenfield, BP. Real-Time Transaction Logging for Interface Evaluation. *Digital Libraries '96* (Sponsor Association for Computing Machinery), Bethesda Maryland, March.
- 1995 Buttenfield, BP, \*Weber, CR. \*Tsou, MH. \*Trawinski, P and \*Ricci, V. Putting Cartography on the Internet: The Alexandria Digital Library Project. *Annual Meetings, North American Cartographic Information Society (NACIS)*, Wilmington North Carolina, 27 October.
- 1995 Buttenfield, BP. User Evaluation for the Alexandria Digital Library Project. *Thirty-Seventh Allerton Institute*, University of Illinois-Champaign-Urbana, 30 October.
- 1995 Buttenfield, BP. Formalizing Cartographic Knowledge: A Review of NCGIA Research Initiative 8. *International Workshop on Progress in Generalization*, Barcelona, Catalunya, Spain, 30 August – 2 September.
- 1995 Buttenfield, BP. Alexandria Digital Library Project. *Annual Meetings, Computer Human Interaction (CHI'95)*, Denver, Colorado, 10 May.
- 1995 Buttenfield, BP. Evaluating an Interface Design with Multimedia Tools. *Annual Meetings, Association of American Geographers*, Chicago, Illinois, March.
- 1995 Buttenfield, BP. User Evaluation of the Alexandria Digital Libraries Project. *Annual Meetings, Association of American Geographers*, Chicago, Illinois, March.
- 1995 Buttenfield, BP. Teaching Map Animation and Hypermedia Programming. *Annual Meetings, Association of American Geographers*, Chicago, Illinois, March.
- 1995 Buttenfield, BP. Challenges of Distributing Spatial Data on Internet. *AUTO-CARTO 12*, Charlotte, North Carolina, 27 February.
- 1994 Buttenfield, BP. Cartography and Visualization: Lessons Learned. *Annual Conference on Environmental Data*, Crystal City, Virginia, 8 June.
- 1994 Buttenfield, BP. Hypermedia and Interactive Visualization of Growth in Trembling Aspens. *Annual Meetings, Association of American Geographers*, San Francisco, California, April.
- 1994 Buttenfield, BP. Object-Oriented Map Generalization: Multi-Scale Representation of Digital Line Graph (DLG) Data. *Annual Meetings, Association of American Geographers*, San Francisco, California, April.
- 1994 Buttenfield, BP. A Data Model for Mapping at Multiple Scales. Presented Mid-Atlantic Association of American Geographers Meeting, Fort Meyer, Virginia, March.
- 1993 Buttenfield, BP. Formalizing Cartographic Knowledge: Prioritizing a Research Agenda. Invited Presentation, *16<sup>th</sup> International Cartographic Association Conference*, Cologne, Germany, May.

- 1993 Buttenfield, BP. Hypermedia and Sonification in GIS. *Annual Meetings, Association of American Geographers*, Atlanta, Georgia, April.
- 1992 Buttenfield, BP. Hypermedia Tools for Data Quality Displays. *Annual Meetings, Association of American Geographers*, San Diego, California, April.
- 1991 Buttenfield, BP. Rule Based Generalization of Topographic Maps. Invited Presentation 15<sup>th</sup> *International Cartographic Association Meetings*, Bournemouth, UK, September.
- 1991 Buttenfield, BP. Automatic Scale-Changing and Rule-Based Systems *Canadian Cartographic Association Conference*, Buffalo, New York, June.
- 1990 Buttenfield, BP., Scale Dependence and Cartographic Behavior: Attaching Meaning to Objects” *GIS/LIS '90* Anaheim, California, November.
- 1988 Buttenfield, BP. Visualizing the Quality of Cartographic Data. *Third International Geographical Information Systems Symposium (GIS/LIS 88)*, San Antonio, Texas, November.
- 1988 Buttenfield, BP. The Geometry of Cartographic Lines. *Annual Meetings, Association of American Geographers*, Phoenix, Arizona, April.
- 1987 Buttenfield, BP. Sequential Versus Hierarchical Treatment of Cartographic Lines. *Annual Meetings, Association of American Geographers*, Portland, Oregon, April.
- 1984 Buttenfield, BP. An Automated Method for Cartographic Line Discrimination. *Annual Meetings, Association of American Geographers*, Washington, D.C., March.
- 1982 Buttenfield, BP. Re-Exploring the Graphic Essay: The Map as an Analytic Tool. *Annual Meetings, Association of American Geographers*, San Antonio, Texas.
- 1981 Buttenfield, BP. So How Do We Get At the Spatial Image? Comparison of Tangible Representations. *Annual Meetings, Assn American Geographers*, Los Angeles, California.
- 1978 Williams, THL and Buttenfield, BP. Land Cover, Land Use, and LANDSAT. *Kansas Academy of Science*, Lawrence, Kansas.
- 1978 Buttenfield, BP. Cartographic Representation of Health Service Areas. *Annual Meetings, American Congress on Surveying and Mapping*, Washington, D.C.
- 1978 Buttenfield, BP. Analysis of Sketch Map Distortion. *Annual Meetings, Association of American Geographers*, New Orleans, Louisiana.
- 1977 Buttenfield, BP. Manual Interpolation of Deformation Grids. *Annual Meetings, Association of American Geographers*, Salt Lake City, Utah.
- 1975 Buttenfield, BP. You Can't Get There From Here: A Methodology for Comparing Cognitive Maps. *Annual Meetings, American Congress on Surveying and Mapping*, Phoenix, Arizona.

#### **GRANT SUPPORT**

- 2023 Generalization Quality Assessment Tools (GCAT = “Gee-cat”) for Geospatial Data  
USGS Community for Data Integration (CDI) \$ 55,000

	Project Period May – September 2023 Project Director Larry Stanislawski, USGS Co-PI (as independent contractor) – BP Buttenfield; Subcontract amount \$6,875	
2019-2022	Cross-Scale Spatio-Temporal Modeling Using an Integrated Data Framework. NSF GSS 17-566 BCS Geography and Spatial Sciences Project Period Sept 2019 – July 2023 Project Director Yi Qiang, U. South Florida; PI for U. Colorado subcontract - BP Buttenfield Subcontract Amount \$178,790	\$ 350,000
2017- 2022	TRELIS-GS: Training and Retaining Leaders in STEM- Geospatial Sciences. National Science Foundation Project Period October 2017 – September 2022 Project Directors MK Beard, U. Maine and L Ramasubramanian, San Jose State U. Co-PIs D Sinton Cornell, BP Buttenfield U. Colorado, E. Wentz Arizona State U., K. Kemp independent researcher, S. Battersby ESRI. One year extension with additional funding approved July 2021	\$ 358,301
2010-2016	Collaborative Research: Putting People in Their Place: Constructing a Geography for Census Microdata. National Science Foundation BCS-0961598. Project Period October 2010 – March 2016 Project Director BP Buttenfield; co-PI Stefan Leyk; PI for Tennessee NN Nagle	\$ 747,788
2008-2014	Generalization and Data Modeling for <i>The National Map</i> USGS Center for Excellence in GIScience (CEGIS) Faculty Affiliate Program Project Period July 2008 – June 2014. Award No. 04121HS029 Project Director BP Buttenfield	\$ 650,016
2008	Cartographic Enhancement for New-Generation Topographic Maps. US Geological Survey, National Geospatial Program Office (under the Cooperative Ecological Studies Unit Program) Project Period Jan –Dec 2008 Project Director BP Buttenfield	\$ 27,798
2007	GEOLEM: Integrating Geographic Information in Environmental Modeling Through Semantic Interoperability. U.S. Geological Survey, Center of Excellence for Geospatial Information Science (CEGIS). Project Director Roland Viger; Co-Investigator at CU-Boulder BP Buttenfield	\$ 27,946
2006	Data Modeling for Multi-Scale Mapping. Environmental Systems Research Institute (ESRI) Professional Services Agreement B6345-7 (continuation) Project Director BP Buttenfield	\$ 60,000
2005	Multiscale Geodatabase Design for Base Cartographic Data. Environmental Systems Research Institute (ESRI) Professional Services Agreement B6345-7 (continuation) Project Director BP Buttenfield	\$ 70,000
2005	Internal and Relative Topologies for Multi-Resolution Vector Data NSF Geography and Regional Science Proposal BCS-04-51509. Project Period 2005-2008. Project Director BP Buttenfield	\$ 179,400

2004	Development and Application of Temporal Map Algebra Concepts for Creation and Analysis of Multi-temporal Raster Composites. Mississippi State University, Proposal # 0704.40.1233B; Project Director BP Buttenfield.	\$ 40,000
2004	Database and Cartographic Tools for Multiscale Mapping. Environmental Systems Research Institute (ESRI) Professional Services Agreement B6345-7	\$ 30,000
2001	Progressive Transmission of Vector Data. (Project Director BP Buttenfield) The Niwot Ridge Long Term Ecological Research (LTER) Program 1998-2004: Alpine and Subalpine Ecosystems of the Colorado Front Range. NSF award DEB-98-10218.	\$ 13,360
2000	Time, GIS Models and Biological Data US Geological Survey, Biological Resources Division. (Project Director BP Buttenfield)	\$ 49,806
2000	GIS Models of Small Mammal Habitat University of Colorado Undergraduate Research Opportunities Program (UROP) (Project Director BP Buttenfield)	\$ 2,160
1998	Sensitivity of Ecological Models to Data Resolution (Project Director BP Buttenfield) The Niwot Ridge Long Term Ecological Research (LTER) Program 1998-2004: Alpine and Subalpine Ecosystems of the Colorado Front Range NSF award DEB-98-10218	\$ 61,592
1998	Distributing Geographic Information Systems for Environmental Applications Alliance for Technology, Learning, and Society (ATLAS) Project Director BP Buttenfield (no indirect costs assessed)	\$ 32,000
1996-1998	The Alexandria Project: Digital Libraries Initiative Proposal. Project Director for Colorado subcontract B. P. Buttenfield National Science Foundation (NSF IRI-94-11330) Project Director T.R. Smith	\$ 400,000
1995	Access to Large Image Archives: User Requirements Study and User Interface Design. Project Co-PI with M.F. Goodchild Lockheed Missiles and Space Company, Inc	\$ 68,600
1994-1996	The Alexandria Project: Digital Libraries Initiative Proposal. Project Director for Buffalo subcontract BP Buttenfield National Science Foundation (NSF IRI-94-11330) Project Director T.R. Smith	\$ 160,000
1993-1996	National Center for Geographic Information and Analysis Co-PI for SUNY-Buffalo subcontract with M. Batty, D.M. Mark National Science Foundation (SES 88- 10917 continuation) Project Director - M.F. Goodchild	\$ 1.3 million
1993	Digital Base Map Registration (Project Director BP Buttenfield) Empire Exploration (subsidiary of National Fuel Corp, NY State's natural gas utility)	\$ 22,723
1992	Constructing Digital Representations of the Buffalo Metropolitan Area Buffalo World University Games (Project Director BP Buttenfield)	\$ 42,635



1990	Resource Inventory and Soil Surveys Using Geographic Information Systems. (Project Director BP Buttenfield) USDA Soil Conservation Service	\$ 47,500
1989	Automating Cartographic Line Distinctions. US Geological Survey National Mapping Division. Project Director BP Buttenfield	\$ 39,071
1988	National Center for Geographic Information and Analysis Co-P.I. for SUNY-Buffalo subcontract with R.D.MacKinnon, D.M.Mark National Science Foundation (SES 88- 10917) Project Director DS.Simonett Total funding (UCSB, SUNY-Buffalo, U.Maine) \$ 5.5 million (5 years)	\$ 1.5 million
1988	Registration of Historic Maps and Charts Old Fort Niagara State Historical Museum Project Director BP Buttenfield	\$ 1,500
1988	Automated Methods for Cartographic Line Distinction SUNY Faculty of Social Sciences Research Development Fund	\$ 1,700
1987	Faculty Development Award New York State / United University Professions Professional Development Committee	\$ 750
1987	Automating Cartographic Distinctions Wisconsin Alumni Research Fund (money returned upon resignation from UW faculty)	\$ 18,000
1985	Map Animation Courseware (Project Director BP Buttenfield) IBM Trochos Grant Wisconsin matching funds	\$ 65,000 \$ 27,000
1985	Stochastic Modeling of Cartographic Lines Wisconsin Alumni Research Fund	\$ 15,000
1983	Interactive Graphical Analysis UCSB Instructional Improvement Grant	\$ 2,600

### **Conferences and Workshops Organized**

2020	Managing and Resolving Conflicts: A Workshop for Women in Geospatial Science. Workshop organizers BP Buttenfield and L Ramasubramanian. <i>Annual Meetings of the Association of American Geographers</i> , Denver CO, 6-10 April 2020. (Workshop cancelled due to COVID-19)	
2018-2022	TRELIS-GS: Training and Retaining Leaders in STEM- Geospatial Sciences. National Science Foundation, (4 annual workshops in Madison WI, Washington DC, Minnowbrook NY, and a virtual meeting during COVID). D Sinton, MK Beard, BP Buttenfield, L Ramasubramanian, E. Wentz, Karen Kemp, Sarah Battersby (also listed under Grant Support)	\$ 358,301
2010	GDI 2010: Generalization and Data Integration. USGS CEGIS Symposium, 20-22 June 2010, Boulder CO. Funding: USGS \$40k, ESRI \$10k	\$ 50,000

2005	International Summer Symposium on Graduate Research in Earth and Social Science. August, 2005, Boulder Colorado. Workshop funded by University of Vienna, Austria w/ US local hosts Geography Depts. at UCSB, Utah, CU-Boulder Project Director H. Prof. Wolfgang Kainz, U. Vienna	
2003	Knowledge Discovery and Data Visualization. University Consortium of Geographic Information Science Workshop funded by Advanced Research and Development Activities (ARDA), Washington DC 18-20 November 2003.	\$ 47,500
1997	Second Alexandria Design Review. National Science Foundation Digital Libraries Initiative, 19-21 February, Santa Barbara, CA	\$ 27,000
1995	First Alexandria Design Review. National Science Foundation Digital Libraries Initiative, 7-8 September, Leesburg, VA	\$ 25,000
1995	Progress in Map Generalization. NCGIA Research Initiative 8 European Closing Meeting, 30 Aug - 2 Sept, Barcelona, Catalunya, Spain co-sponsored by Int'l Cartographic Assn, Institut Geographique National (Paris), Canada Centre for Mapping, and NCGIA	\$ 30,000
1993	Formalizing Cartographic Knowledge NCGIA Research Initiative 8, 24-27 Oct, Buffalo, NY	\$ 26,000
1991	Visualizing the Quality of Spatial Information NCGIA Research Initiative 7, June 8-12, Castine, Maine	\$ 17,000
1990	Towards a Rule Base for Map Generalization April 12-15, Syracuse, NY Jointly funded by NCGIA - Buffalo and Dept Geography, Syracuse University	\$ 8,000
1990	Introduction to Geographic Information Systems New York State Public Employees Training Program March 5-7, SUNY - Buffalo GIA Lab	\$ 1,400
1989	Multiple Representations Specialist Meeting NCGIA Research Initiative 3, February 18-21, Buffalo, NY	\$ 10,600

### **Equipment Grants Received**

1995	An Intergraph Center of Excellence Laboratory in the Mapping Sciences at the State University of New York at Buffalo Intergraph Corporation (two phases of donation) co-PI with C Brunskill and J Bis	\$ 138,000 \$ 102,000
1990	University Computing Services, SUNY-Buffalo Provost Office Ethernet Boards and Novell Networking software provided to support telecommunications in new department facility	\$ 20,450
1990	Proposal for an Electronic Research and Instructional Facility at the Buffalo Site of NCGIA (Phase 2) PRIME Computer co-PI with RD MacKinnon, PJ Densham, and HW Calkins	\$ 120,000

1989 Proposal for an Electronic Research and Instructional Facility  
at the Buffalo Site of NCGIA (Phase 1) SUN Microsystems \$ 99,400  
co-PI with RDMacKinnon, PJ Densham, and HW Calkins

## **OTHER PROFESSIONAL ACTIVITY**

### **Journal Editor**

2019 - 2020 *ISPRS International Journal of Geo-Information*  
Guest Editor, Special Issue Generalization for Mapping, Modeling and Analytics  
Kronenfeld BJ, Buttenfield BP and Stanislawski LV.

1997 *Cartographic Perspectives* 27(1)  
Guest Editor, Special Issue: Festschrift for John C. Sherman

1994 *Cartography and Geographic Information Systems* 21(3)  
Guest Editor, Special Issue on Spatial Data Standards

1993 - 1996 *Cartography and Geographic Information Systems*  
Associate Editor

1993 *Cartographica* 30:2/3  
Guest Editor, Special Issue on Mapping Data Quality

### **Editorial Boards**

2019 – present *International Journal of Geographic Information (IJGI)*  
International Society for Photogrammetry and Remote Sensing (ISPRS)

1999 - present *Cartography and Geographic Information Systems*  
(Cartography and Geographic Information Society)

2008 - 2012 *URISA Journal*  
Urban and Regional Information Systems Association

2008 – 2010 *Cartographic Perspectives*  
North American Cartographic Information Society

2004 – 2007 *Cartographica*  
Canadian Cartographic Society

2001 – 2005 *Annals of the Association of American Geographers*  
(Methods, Models and Geographic Information Science)

2000 – 2004 *URISA Journal*  
(Urban and Regional Information Systems Association)

1997 – 2001 *Cartographic Perspectives*  
(North American Cartographic Information Society)

1996 – 1998 *Applied Geographic Studies* (Wiley and Sons, Inc.)

- 1995 – 2002 *Transactions on GIS*  
(GeoInformation International, formerly Longman Scientific)
- 1994 – 2002 *West Indian Journal of Engineering*  
(Council of Caribbean Engineering Organizations)
- 1991 – 1996 *Cartography and Geographic Information Systems*  
(American Congress on Surveying and Mapping)
- 1991 – 1994 *AAG Resource Publication Series*  
(Association of American Geographers)
- 1989 – 1997 *Computers, Environment and Urban Systems*  
(Pergamon Press)

### **Leadership on National Committees**

- 2017-2018 Convener and Chair, Census Science Advisory Committee (CSAC) Working Group on Administrative Records, U.S. Bureau of the Census
- 2004 - 2006 Chair, Association of American Geographers Data Standards Committee
- 1998 - 2002 Board of Directors, University Consortium for Geographic Information Science (UCGIS)
- 1996-1998 Chair, Strategic Planning Committee  
University Consortium for Geographic Information Science (UCGIS)
- 1995-1996 President, American Cartographic Association (ACA)  
(now the Cartography and Geographic Information Society - CaGIS)
- 1989 - 1991 Chair, Ad Hoc Committee on GIS, American Cartographic Association
- 1988 Chair, Nominating Committee, Association of American Geographers

### **Membership in National Committees**

- 2016 – 2020 Delegate for University of Colorado to  
University Consortium for Geographic Information Science (UCGIS)
- 2016 - 2020 Nominating Committee, UCGIS  
Research Award Committee, UCGIS  
Fellows Committee, UCGIS
- 2012 – 2019 Census Science Advisory Committee (CSAC), U.S. Bureau of the Census
- 2011- 2013 National Research Council Panel on the Future U.S. Workforce for Geospatial Intelligence

2011- 2015 2nd Delegate for University of Colorado to  
University Consortium for Geographic Information Science (UCGIS)

2007 - 2009 Board of Directors, North American Cartographic Information Society (NACIS)

2005- 2006 Advisory Board Member, GIS “Body of Knowledge” (BoK) Curricula Project  
University Consortium for Geographic Information Science (UCGIS)

2005 Education Awards Committee  
University Consortium for Geographic Information Science (UCGIS)

2004 – 2005 National Research Council, Panel on Theoretical and Applied Research Priorities for the  
National Geospatial Intelligence Agency

2004 – 2005 Member, Strategic Planning Committee, Cartography and Geographic Information  
Society (CaGIS)

2004 – 2010 Primary Delegate for University of Colorado to  
University Consortium for Geographic Information Science (UCGIS)

2002 – 2004 Secondary Delegate for University of Colorado to  
University Consortium for Geographic Information Science (UCGIS)

2001 - 2004 Evaluation Advisory Board for DLESE (Digital Library for Earth System Education),  
National Science Foundation Online Community Center

2001- 2002 National Research Council, Panel on Research Priorities for the U.S. Geological Survey

2000 - 2003 Long-Range Planning Committee, Association of American Geographers

1999 – 2003 National Advisory Board for VISIT (Virtual Immersion in Science Inquiry  
for Teachers), a National Science Foundation Online Collaboratory sited in Michigan

1997 - 1999 National Research Council, Distributed Geolibraries Panel

1996 - 2002 Primary Delegate for University of Colorado to  
University Consortium for Geographic Information Science (UCGIS)

1992 - 1998 National Research Council, Mapping Science Committee  
1995 - 1997 Board of Directors, North American Cartographic Information Society

1995 - 1997 Education Committee,  
University Consortium for Geographic Information Science (UCGIS)

1995 - 1996 NCGIA Science Policy Committee

1994 - 1997 Board of Directors, American Cartographic Association

1994 - 1995 Second Delegate for SUNY-Buffalo to  
University Consortium for Geographic Information Science (UCGIS)

1990 - 1992 Board of Directors, American Cartographic Association

- 1988 - 1993 NCGIA Science Policy Committee
- 1989 NCGIA Liaison, Geographic Information Management Systems Joint Committee, American Congress on Surveying and Mapping and American Society for Photogrammetry and Remote Sensing.
- 1987 – 1989 Academic Director, Cartography Specialty Group, Assn of American Geographers.
- 1983 Nominating Committee, Cartography Specialty Group, Assn of American Geographers.
- 1980 Student Representative, Cartography Specialty Group, Assn of American Geographers.

### Other Professional Service

- 2024 Session Co-Organizer “Multiscale Mapping That Works: Harnessing Intelligent Methods for Cartographic Display and Analysis”. *Annual Meetings of the Association of American Geographers, April 2024, Honolulu Hawaii..* Organizer Kronenfeld BJ; other Co-organizers Stanislawski LV, Wang S, Shavers EJ and Kang Y. Part of the AAG 2024 Symposium on Geospatial Data Science for Sustainability.
- 2023 Mentor, Technical Expert and Convergence Fellow, I-GUIDE Summer School, National Center for Atmospheric Research, Boulder CO (7-11 August 2023)
- Session Organizer “The Revenge of Unintended Consequences: Impacts of Managing and modeling Geospatial Big Data”. *Annual Meetings of the Association of American Geographers, March 2023, Denver Colorado.* Co-organizers Stanislawski LV, Wang, S, Kronenfeld BJ, and Shavers, EJ. Part of the AAG 2023 Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions.
- 2022 Member Scientific Program Ctte, AutoCarto 2022, Redlands CA
- 2020 Member Scientific Program Ctte, 20<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, held virtually from Delft, the Netherlands  
External Reviewer, Proposal for PhD Program in GIS, Department of Geography and Urban Sustainability, United Arab Emirates University, Al Ain, UAE
- 2019 Member Scientific Program Ctte, 29<sup>th</sup> Int’l Cartographic Congress (ICC 2019), Tokyo Japan  
Member Scientific Program Ctte for 20<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, Tokyo Japan  
Member Scientific Program Ctte for ABS2019 (International Workshop on Abstraction, Scale and Perception)
- 2018 Member Scientific Program Ctte for 10<sup>th</sup> International Conference on Geographic Information Science (GIScience’18), Melbourne Australia, 28-31 August 2018  
Member Scientific Program Ctte for AutoCarto 2018 Conference, Madison WI  
Member Scientific Program Ctte for 29<sup>th</sup> International Cartographic Congress (ICC 2019), Tokyo Japan  
Member Scientific Program Ctte for 20<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, Tokyo Japan
- 2017 Member Scientific Program Ctte for 28<sup>th</sup> International Cartographic Congress (ICC

- 2017), Washington DC  
 Member Scientific Program Ctte for 19<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, Washington DC
- 2016 Member Scientific Program Ctte for GIScience 2016 Conference, Montreal, Canada  
 Member Scientific Program Ctte for AutoCarto 2016 Conference, Albuquerque NM  
 Member Scientific Program Ctte for 18<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, Helsinki Finland
- 2015 Member Scientific Program Ctte for 27<sup>th</sup> International Cartographic Congress (ICC 2015), Rio de Janeiro, Brazil  
 Member Scientific Program Ctte for 17<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, , Rio de Janeiro, Brazil  
 Member Scientific Program Committee for Vespucci 2015 Symposium on Geographic Analysis, Castine, Maine
- 2014 Member Scientific Program Ctte for GIScience 2014, Vienna Austria  
 Member Scientific Program Ctte for AutoCarto 2014, Pittsburgh, Pennsylvania
- 2013 Member Scientific Program Ctte for 16<sup>th</sup> ICA Workshop on Generalization and Multiple Representations, Dresden Germany
- 2012 Member Scientific Program Ctte for GIScience 2012, Columbus Ohio
- 2012 Member Scientific Program Ctte for 15<sup>th</sup> ICA Workshop on Generalisation and Multiple Representations, Istanbul, Turkey
- 2011 Member Scientific Program Ctte for 14<sup>th</sup> ICA Workshop on Generalisation and Multiple Representations, Paris, France
- 2009 - 2018 Reviewer for the National University Research Grants Committee, Hong Kong, PRC (1-2 proposals per year).
- 2008 - 2010 Regular Review Panel, NSF Geography and Spatial Sciences Division (met 2x/year)
- 2007 External Reviewer, National Research Council Panel on Research Agenda for USGS Center for Excellence in Geographic Information Science (CEGIS)
- 2006 External Review Coordinator, National Research Council Panel on Floodplain Mapping Technologies
- 2005 External Evaluator, Program Review, Dept. Geography, University of Zurich, CH
- 2003 – pres. Reviewer for NSF Geography and Regional Science Division (~ 1-2 proposals per year)
- 2000 Reviewer for NSF Digital Government Initiative
- 1999 Reviewer for NSF Geography and Regional Science Division Enhancing Infrastructure for the Social and Behavioral Sciences
- 1998 - 2005 Reviewer for the National University Research Grants Committee, Hong Kong, PRC (2-3 proposals per year).

- 1997 External Reviewer, Department of Geography, St. Cloud State University.  
St. Cloud, Minnesota
- 1995 Reviewer for NSF Geography and Regional Science Dissertation Awards Program
- 1994 Review panel member for NSF Environmental Biology Division  
Special Competition for the National Center for Ecological Analysis and Synthesis
- 1992-1994 Review panel member for NSF Geography and Regional Science  
Division Dissertation Grant Program
- 1991 Panel Chair, review panel for NSF Instrumentation and Lab Improvement Program
- 1990 Review panel member for NSF Instrumentation and Lab Improvement Program
- 1988 Faculty Group Leader, SUNY-Buffalo Teaching Assistant Workshop

### **Professional Affiliations**

American Association of University Women (AAUW)  
 American Cartographic Association (ACA; now CaGIS)  
 American Civil Liberties Union (ACLU)  
 American Congress on Surveying and Mapping (ACSM)  
 Association of American Geographers (AAG)  
 Cartography and Geographic Information Society (CaGIS; formerly ACA)  
 International Cartographic Association (ICA)  
 League of Women Voters  
 National Geographic Society  
 National Organization of Women (NOW)  
 North American Cartographic Information Society (NACIS)  
 Smithsonian Institution Associates  
 Society of Woman Geographers (SWG)

### **University Service**

#### **University of Colorado – Boulder System**

- 2016 External (CU System) Reviewer for Department of Geography and Environmental  
Science, University of Colorado – Colorado Springs

#### **Campus**

- 2019-2020 Academic Review, Planning and Advisory Committee (ARPAC) member
- 2018 ARPAC Internal Reviewer (Alliance for Technology, Learning and Society – ATLAS)
- 2016 ARPAC Internal Reviewer (Department of Art and Art History)
- 2011 - 2012 Associate Vice Chancellor's Research Data Management Task Force
- 2011 Reviewer for campus proposal for 2012 NSF Sustainability Research  
Networks Competition



2010	Primary Unit Evaluation Committee (PUEC) for promotion of Bruce Montgomery, CU Libraries, to Full Professor (PUEC Chair)	
2009	Vice Chancellor's Academic Affairs Budget Advisory Committee (AABAC) Provost's Steering Committee for Re-Accreditation	
2009	ARPAC Internal Reviewer (Department of Spanish and Portuguese)	
2008 - 2009	Flagship 2030 Faculty Taskforce (Co-Chair with Prof. Uriel Nauenberg, Physics)	
2007 - 2010	Graduate School Executive Advisory Committee member	
2006	Search Committee for Provost	
2005 - 2010	Boulder Faculty Assembly (BFA)	Vice Chair 2008-2009; Member 2005-2010
	BFA Grievance Process Committee	Chair 2007-2008
	BFA Bylaws Committee 2008	Chair 2008-2009
	BFA Executive Committee	Member 2005-2009
	BFA Budget Committee	Member 2008-2010
2004 - 2005	University Graduate School Fellowship Committee	
2002 - 2004	CU- Boulder Campus LEAP Program Coach (NSF ADVANCE: Leadership Education for Advancement and Promotion)	
2002 - 2007	CU-Boulder Geospatial Data Brownbag Colloquium Series (Coordinator)	
2001	Internal Review Committee, Institute for Behavioral Sciences	
1997 - 2000	Alliance for Technology, Learning and Society (ATLAS Campus Initiative), Committee on Multidisciplinary Research	

### **College of Arts & Sciences**

2020	Ad hoc Committee on Teaching in the College of Arts and Sciences	
2018 – 2020	Arts and Sciences Council (ASC) Parliamentarian	
2017- 2020	Arts and Sciences Council (ASC) ASC Diversity Committee	
2013 - 2016	Arts and Sciences GIScience Advisory Board (Chair)	
2008 - 2011	Advisory Board member, A&S Community Involvement (ASCI) Program	
2004 – 2007	Arts and Sciences Council (ASC)	Chair, 2005- 2007 Member 2004-2005
	ASC Executive Committee	Chair, 2005- 2007 Member, 2004-2005
	ASC Budget Committee	Member, 2005 – 2007

	ASC Diversity Committee	Chair, 2005-2006 Member, 2006-2007
2002 – 2005	Arts and Sciences Personnel Committee	Chair, 2004-2005 Associate Chair, 2003-2004 Member, 2002-2003
2001 – 2002	Arts and Sciences Dean Search Committee	

## Department of Geography

2019-2020	Search Committee (Chair), GIS & Spatial Analysis Faculty Hire PUEC Member for Professor Stefan Leyk Promotion to Full Professor Graduate Committee member
2018-20	Graduate Committee member Primary Unit Evaluation Committee (PUEC) Chair for Instructor Sarah Kelly (reappointment)
2017-2018	Fundraising Committee
2016-2017	Search Committee (Chair), GIS Instructor Hire Faculty Coordinator, Undergraduate Certificate in GIS and Computational Science (F16, S17)
2015-2016	Computer Committee (Chair) Primary Unit Evaluation Committee (PUEC) Chair for Professor Seth Spielman Tenure and Promotion Search Committee (Chair), GIS Instructor Hire Awards Committee Chair, Digital Globe Undergraduate Award Competition Faculty Coordinator, Undergraduate Certificate in GIS and Computational Science
2014-2015	Search Committee (Chair), GIS & Spatial Analysis Faculty Hire Search Committee (Chair), GIS Instructor Hire Computer Committee (Chair) Undergraduate Committee (Member) Awards Committee Chair, Digital Globe Undergraduate Fellowship Competition Faculty Coordinator, Undergraduate Certificate in GIS and Computational Science
2013-2014	PUEC Chair for Professor Stefan Leyk Tenure and Promotion PUEC Chair for Professor Seth Spielman Reappointment PUEC member for Professor Elisabeth Root Reappointment Departmental Executive / Personnel Committee member Graduate Committee member Awards Committee Chair, Digital Globe Undergraduate Fellowship Competition
2011-2012	Departmental Executive / Personnel Committee member PUEC Chair for Professor Stefan Leyk Reappointment Awards Committee Chair, GeoEye Undergraduate Fellowship Competition
2010 - 2011	Search Committee Chair, System Administrator Hire

- Awards Committee Chair, GeoEye Undergraduate Fellowship Competition
- 2009 - 2010 Geography Computing Committee Chair  
 Post-Tenure Review Committee Chair for Professor Susan Beatty  
 Post-Tenure Review Committee Chair for Professor Bill Travis  
 Search Committee member (Spatial Analysis Faculty Hire)
- 2008 - 2009 Geography Computing Committee Chair  
 Reappointment Review Committee Chair for Professor Nicholas Nagle
- 2007 - 2008 Geography Computing Committee Chair  
 Post-Tenure Review Committee Chair for Professor John O'Loughlin
- 2006 - 2007 Search Committee Chair (GIS Faculty hire)  
 Geography Computing Committee (member)
- 2005 - 2006 Geography Computing Committee Chair  
 Post-Tenure Review Committee for Professor Ken Foote
- 2004 - 2005 Associate Chair and Graduate Director  
 Faculty Search Committee (Spatial Analysis hire)  
 PUEC Committee member for Susan Beatty promotion to Full Professor
- 2003 – 2004 Associate Chair and Graduate Director  
 PUEC Committee member for Lynn Staeheli promotion to Full Professor  
 Post-Tenure Review Committee for Professor John Pitlick (Committee Chair)
- 2002 - 2003 Graduate Committee member  
 Post-Tenure Review Committee for Professor Nel Caine (Committee Chair)
- 2001 - 2002 Search Committee Chair (GIS Special Opportunity Faculty hire)
- 2000 - 2002 Department Executive (Personnel) Committee member
- 1999 Departmental Program Review (PRP) Committee member
- 1997 Departmental Strategic Planning Committee member
- 1996 - 2000 Computer Committee Chair

**SUNY-Buffalo**

**Campus**

- 1994 - 1995 President's Advisory Committee for Graduate Student Grievances  
 1992 - 1993 Provost's Graduate School Futures Committee  
 1991 – 1992 Provost's Graduate Program Evaluation Committee

**College**

- 1994 - 1995 Faculty of Social Science Budget Committee  
 1992 - 1995 Faculty of Social Science Policy Committee  
 1991 – 1993 Faculty of Social Science Curriculum Committee

**Department**

- 1987 - 1992 Policy Committee for Geographic Information and Analysis Lab  
(Chair, 1987-1989)  
1987 Ad Hoc Committee on Revising Graduate Core Curriculum

**University of Wisconsin**

**Department**

- 1986 Graduate Admissions Committee (Geography)  
Curriculum Committee (Institute for Environmental Studies)  
Computers and Computing Committee (Geography)  
Faculty Sponsor, Women in Geography
- 1985 Undergraduate Advisor (Geography)  
Cartography Lab Governing Board  
Computers and Computing Committee (Geography)  
Faculty Sponsor, Women in Geography
- 1984 Undergraduate Advisor (Geography)  
Speakers and Honors Committee (Geography)  
Faculty Sponsor, Women in Geography

**University of California - Santa Barbara Department of Geography**

- 1982-1983 Undergraduate Advisor