

## Cynthia Ann Brewer

Curriculum Vitae, July 2008

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### *Employment*

The Pennsylvania State University,

Department of Geography: **Professor**, 2007 to present; **Associate Head**, 2006 to 2008;  
**Associate Professor**, 1998 to 2007; **Assistant Professor**, 1994 to 1998.

Administrative Fellow, Office of the Executive Vice President and Provost, 2003/04.

Faculty Associate, GeoVISTA Center (Geographic Visualization—Science, Technology,  
and Applications Center).

Faculty Associate, John A. Dutton e-Education Institute, College of Earth and Mineral  
Sciences (EMS).

San Diego State University, **Assistant Professor**, Department of Geography, 1991 to 1994.

University of California at Santa Barbara, **Visiting Lecturer**, Department of Geography,  
1986/87.

Michigan State University, **Graduate Assistant** and **Instructor**, Department of Geography,  
1983 to 1991.

### *Education*

**PhD**, Geography with emphasis in cartography, Michigan State University, 1986 to 1991.  
Dissertation: *Prediction of Surround-Induced Changes in Map Color Appearance*,  
advisor J.M. Olson.

**PhD coursework, visiting student**, Geography, University of California at Santa Barbara, 1986/87.

**MA**, Geography with emphasis in cartography, Michigan State University, 1983 to 1986.  
Thesis: *The Development of Process-Printed Munsell Charts for Selecting Map Colors*,  
advisor J.M. Olson.

**Honors BA** with distinction, Fine Arts major with Geography minor, University of Guelph  
(Ontario, Canada), 1979 to 1983.

**Honors BA coursework**, Fine Arts major, McMaster University (Ontario, Canada), 1978/79.

## **Awards**

**Best of Show**, CaGIS/ACSM Map Design Competition, awarded to *Census Atlas of the United States* (coauthored with T.A. Suchan, M.J. Perry, J.D. Fitzsimmons, A.E. Juhn, and A.M. Tait). Awarded by the Cartography and Geographic Information Society, 2008. (Reference under *Other Publications*.)

**2007 AAG Globe Book Award for Public Understanding of Geography**, awarded to *Census Atlas of the United States*. Awarded by the Association of American Geographers (AAG), 2008. (Reference under *Other Publications*.)

**Fellow**, American Congress on Surveying and Mapping (ACSM), 2007.

**Award of Distinction for Exceptional Professional Contributions to the Practice of Cartography**, Canadian Cartographic Association, 2006.

**G. Montgomery and Marion Mitchell Award for Innovative Teaching**, College of Earth and Mineral Sciences, PSU, 2005.

**Henry Johns Award**, British Cartographic Society, 2004, for most outstanding paper published in *The Cartographic Journal*. (Reference under *Other Publications*.)

**Blue Pencil Award**, First Place in the Report category awarded to *Mapping Census 2000: The Geography of U.S. Diversity* (coauthored with T.A. Suchan) for excellence in government communication. Awarded by the National Association of Government Communicators, 2001. (Reference under *Other Publications*.)

**Honorable Mention** awarded to *Mapping Census 2000: The Geography of U.S. Diversity* (coauthored with T.A. Suchan) in the 29<sup>th</sup> Annual Map Competition. Awarded by the American Congress on Surveying and Mapping, 2001. (Reference under *Other Publications*.)

**Contractor of the Year Award**, Population Distribution Branch, Population Division, U.S. Census Bureau, 2001.

**J. Warren Nystrom Award**, Association of American Geographers, 1992, for best paper and presentation based on recent Geography dissertation.

**Andrew McNally Award**, American Congress on Surveying and Mapping, 1990, for ACSM 1989 publication that contributed most to the theory and practice of cartography. (Reference under *Peer-Reviewed Publications*.)

**Student Honors Paper Award**, winner of third annual competition, Cartography Specialty Group, AAG, 1990.

**The National Geographic Society Award in Cartography**, 1983.

**Peer-Reviewed Publications**

1. Brewer, C.A., and B.P. Battenfield, **2007**, "Framing Guidelines for Multi-Scale Map Design Using Databases at Multiple Resolutions," *Cartography and Geographic Information Science*, 34(1): 3-15.
2. Brewer, C.A., **2006**, "Basic Mapping Principles for Visualizing Cancer Data Using Geographic Information Systems (GIS)," *American Journal of Preventive Medicine*, 30(2S): S25-S36.
3. Harrower, M.A., and C.A. Brewer, **2003**, "ColorBrewer.org: An Online Tool for Selecting Color Schemes for Maps," *The Cartographic Journal*, 40(1): 27-37.  
Winner of the British Cartographic Society's Henry Johns Award, 2004.
4. Brewer, C.A., **2003**, "A Transition in Improving Maps: The ColorBrewer Example" (invited), U.S. Report to the International Cartographic Association, special issue of *Cartography and Geographic Information Science*, 30(2): 155-158.
5. Brewer, C.A., G.W. Hatchard, and M.A. Harrower, **2003**, "ColorBrewer in Print: A Catalog of Color Schemes for Maps," *Cartography and Geographic Information Science*, 30(1): 5-32.
6. Brewer, C.A., and L.W. Pickle, **2002**, "Evaluation of Methods for Classifying Epidemiological Data on Choropleth Maps in Series," *Annals of the Association of American Geographers*, 92(4): 662-681.
7. Brewer, C.A., **2001**, "Reflections on Mapping Census 2000," *Cartography and Geographic Information Science*, 28(4): 213-235.
8. Eicher, C.L., and C.A. Brewer, **2001**, "Dasymetric Mapping and Areal Interpolation: Implementation and Evaluation," *Cartography and Geographic Information Science*, 28(2): 125-138.
9. Suchan, T.A., and C.A. Brewer, **2000**, "Qualitative Methods for Research on Mapmaking and Map Use," *The Professional Geographer*, 52(1): 145-154.
10. Brewer, C.A., and R.B. McMaster, **1999**, "The State of Academic Cartography," *Cartography and Geographic Information Science*, 26(3): 215-234.
11. Wentz, E.A., J.C. Vender, and C.A. Brewer, **1999**, "An Evaluation of Teaching Introductory Geomorphology using Computer-based Tool," *Journal of Geography in Higher Education*, 23(2): 167-179.
12. MacEachren, A.M., C.A. Brewer, and L.W. Pickle, **1998**, "Visualizing Georeferenced Data: Representing Reliability of Health Statistics" *Environment & Planning A*, 30(9): 1547-1561.

13. Brewer, C.A., and A.J. Campbell, **1998**, "Beyond Graduated Circles: Varied Point Symbols for Representing Quantitative Data on Maps," *Cartographic Perspectives*, 29: 6-25.
14. Brewer, C.A., **1997**, "Spectral Schemes: Controversial Color Use on Maps," *Cartography and Geographic Information Systems*, 24(4): 203-220.
15. Brewer, C.A., A.M. MacEachren, L.W. Pickle, and D.J. Herrmann, **1997**, "Mapping Mortality: Evaluating Color Schemes for Choropleth Maps," *Annals of the Association of American Geographers*, 87(3): 411-438.
16. Brewer, C.A., **1997**, "Evaluation of a Model for Predicting Simultaneous Contrast on Color Maps," *The Professional Geographer*, 49(3): 280-294.
17. Olson, J.M., and C.A. Brewer, **1997**, "An Evaluation of Color Selections to Accommodate Map Users with Color Vision Impairments," *Annals of the Association of American Geographers*, 87(1): 103-134.
18. Brewer, C.A., **1996**, "Guidelines for Selecting Colors for Diverging Schemes on Maps," *The Cartographic Journal*, 33(2): 79-86.
19. Brewer, C.A., **1996**, "Prediction of Simultaneous Contrast between Map Colors with Hunt's Model of Color Appearance," *Color Research and Application*, 21(3): 221-235.
20. Brewer, C.A., **1994**, "Color Use Guidelines for Mapping and Visualization," Chapter 7 (pp. 123-147) in *Visualization in Modern Cartography*, edited by A.M. MacEachren and D.R.F. Taylor, Elsevier Science, Tarrytown, NY.
21. Brewer, C.A., **1992**, "Review of Colour Terms and Simultaneous Contrast Research for Cartography," *Cartographica*, 29(3&4): 20-30.
22. Brewer, C.A., **1989-90**, "Color Chart Use in Map Design," *Cartographic Perspectives*, 4: 3-10.
23. Brewer, C.A., **1989**, "The Development of Process-Printed Munsell Charts for Selecting Map Colors," *The American Cartographer*, 16(4): 269-278.  
Winner of the Andrew McNally Award.

### ***Manuscripts in Progress***

Brewer, C.A., and B.P. Battenfield, "Mastering Map Scale: Balancing Workloads using Display and Geometry Change in Multi-scale Mapping," *GeoInformatica* (manuscript submitted Fall 2007).

Kern, J.P., and C.A. Brewer, "Automation and the Map Label Placement Problem, *Cartographic Perspectives* (manuscript submitted Fall 2007).

### ***Other Publications and Resources***

1. Brewer, C.A., **2008**, *Designed Maps: A Sourcebook for GIS Users*, ESRI Press, Redlands CA, 170 pp (ISBN 1-58948-160-2).
2. Suchan, T.A., M.J. Perry, J.D. Fitzsimmons, A.E. Juhn, A.M. Tait, and C.A. Brewer, **2007**, *Census Atlas of the United States*, U.S. Census Bureau, Census 2000 Special Report, Series CENSR-29, U.S. Government Printing Office, Washington DC, 302 pp, 12.5x15.5" (ISBN 1-58-769010-5).  
Winner, AAG Globe Award, 2008, and Best of Show, CaGIS/ACSM Map Design Competition, 2008.
3. National Research Council, **2007**, "A Research Agenda for Geographic Information Science at the United States Geological Survey," The National Academies Press, Washington DC.  
Report by Committee on Research Priorities for the USGS Center of Excellence for Geospatial Information Science (R. Denaro, K. Beard-Tisdale, C. Brewer, M. Domaratz, P. Gong, R. McMaster, M. Tsou, and J. Wilson).
4. Brewer, C.A., B.P. Battenfield, C. Frye, and J. Acosta, **2007**, "Scalemaster: Multi-Scale Mapmaking from Multiple Database Resolutions and for Multiple Map Purposes," Proceedings, 23<sup>rd</sup> *International Cartographic Conference (ICC2007)*, Moscow, Russia, August, 10 pp. (CD-ROM).
5. Brewer, C.A., and B.P. Battenfield, **2006**, "Mastering Map Scale: Formalizing Guidelines for Multi-Scale Map Design," *Proceeding of AutoCarto 2006*, Vancouver WA, June, 10 pp. (CD-ROM).
6. Brewer, C.A., **2005**, *Designing Better Maps: A Guide for GIS Users*, ESRI Press, Redlands CA, 203 pp. (ISBN 1-58948-089-9).
7. Brewer, C.A., and C. Frye, **2005**, "Comparison of GIS and Graphics Software for Advanced Cartographic Symbolization and Labeling: Five GIS Projects," *Proceedings, 22<sup>nd</sup> International Cartographic Conference*, International Cartographic Association (ICA), A Coruña, Spain, July, 10 pp. (CD-ROM, ISBN 0-958-46093-0)
8. Suchan, T.A., C.A. Brewer, and A. Tait, **2005**, "Overview of *The Census Atlas of the United States*," *Proceedings, 22<sup>nd</sup> International Cartographic Conference*, ICA, A Coruña, Spain, July, 10 pp. (CD-ROM, ISBN 0-958-46093-0).
9. Brewer, C.A., **2005-present**, "Cartographic Design Using ArcGIS 9" online course, ESRI Virtual Campus.

10. Brewer, C.A., **2004**, “Color Research Applications in Mapping and Visualization” (invited keynote), *Proceedings of IS&T/SID 12th Color Imaging Conference*, Society for Imaging Science and Technology, Springfield, VA, November, pp. 1-3.

*Series of ten atlases:* Each prepared as a booklet and CD-ROM pair for the National Park Service, Washington DC, and intended for use by each park for regional planning communication and collaboration:

11. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Socioeconomic Atlas for Flight 93 National Memorial and its Region.*
12. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Regional Socioeconomic Atlas for National Capital Parks.*
13. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Socioeconomic Atlas for Chicamauga and Chattanooga National Military Park and its Region.*
14. McKendry, J.E., C.A. Brewer, S.D. Gardner, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Big Thicket National Preserve and its Region.*
15. McKendry, J.E., C.A. Brewer, J.P. Harahush, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Rosie the Riveter/World War II Home Front National Historical Park and its Region.*
16. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Canyon de Chelly National Monument and its Region.*
17. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Kings Mountain National Military Park and its Region.*
18. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for New River Gorge National River and its Region.*
19. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for John Day Fossil Beds National Monument and its Region.*
20. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2003**, *A Socioeconomic Atlas for Saguaro National Park and its Region.*
21. Zhou, B., C.A. Brewer, and F. Hardisty, **2003**, “ColorBrewer in GeoVISTA Studio: Construction and Application of Bivariate Color Schemes,” *Proceedings of the American Statistical Association Joint Statistical Meetings*, August (CD-ROM).
22. Brewer, C.A., T.A. Suchan and A. Tait, **2003**, “Mapping Census 2000 in the *Census Atlas of the United States*,” *Proceedings, 21<sup>st</sup> International Cartographic Conference*, ICA, Durban, South Africa, August, 7 pp. (CD-ROM, ISBN 0-958-46093-0).
23. Brewer, C.A., **2002-2004**, “Cartographic Design” online course, PSU World Campus and ESRI Virtual Campus.
24. Brewer, C.A., **2002-present**, <http://ColorBrewer.org>.  
ColorBrewer is an online resource offering color specifications in multiple formats (RGB, CMYK, Hex, Lab) for color schemes suitable for thematic mapping; approximately 1200 unique users per week.

25. Brewer, C.A., and T.A. Suchan, **2001**, *Mapping Census 2000: The Geography of U.S. Diversity*, Census 2000 Special Report, Series CENSR/01-1, U.S. Government Printing Office, Washington DC, 108 pp.  
Reprinted by ESRI Press, 2001 (ISBN 1-58948-014-7).
26. Brewer, C.A., **2000**, "A Cognitive Study of Methods for Classifying Epidemiological Data on Choropleth Maps in Series," Final Report to the National Center for Health Statistics, Project No. RM98-203, May, 40 pp.
27. Brewer, C.A., **1999**, "Color Use Guidelines for Data Representation," *Proceedings of the Section on Statistical Graphics*, American Statistical Association, Baltimore, August, pp. 55-60.
28. Brewer, C.A., **1999**, "Preface: The State of U.S. Cartography" and editor of special issue "U.S. National Report to the International Cartographic Association," *Cartography and Geographic Information Science*, 26(3): 165-166.  
Preface reprinted in 1999 as "In the Journals," *ACSM Bulletin*, 179: 7-8.
29. Brewer, C.A., **1999**, "Letter from the President," *Cartographic Perspectives*, 32: 1, 72.
30. Book review by C.A. Brewer, **1998**, of *Number by Colors: A Guide to Using Color to Understand Technical Data*, by B. Fortner and T.E. Meyer, in *Color Research and Application*, 23(3): 190-191.
31. Brewer, C.A., and E.A. Wentz, **1997**, "A Simplified GIS Interface for Learning Introductory Geomorphology," *Geocal*, 16: 6-10.
32. DiBiase, D.W., and C.A. Brewer, **1997**, "A Strategy for Computer-Assisted Learning in a Large-Enrollment Course on Geographic Information," Internet Proceedings of the University Consortium for Geographic Information Science (UCGIS) 1997 Annual Assembly and Summer Retreat, Bar Harbor, June.
33. MacEachren, A.M., and C.A. Brewer, **1995**, "Reliability Representation for the NCHS Mortality Atlas," Final report to the National Center for Health Statistics, Project No. RM91.2, Task 3, August, 57 pp.
34. MacEachren, A.M., C.A. Brewer, and L.W. Pickle, **1995**, "Mapping Health Statistics: Representing Data Reliability," *Proceedings*, 17<sup>th</sup> International Cartographic Association Conference, Barcelona, September, pp. 311-319.  
Reprinted in 1995 in *Cognitive Aspects of Statistical Mapping*, Cognitive Methods Staff Working Paper Series, No. 18, edited by L.W. Pickle and D.J. Herrmann, NCHS Office of Research and Methodology, June, pp. 291-299.
35. Brewer, C.A., and A.M. MacEachren, **1995**, "Evaluation of Map Color Schemes for the NCHS Mortality Atlas," Final report to the National Center for Health Statistics, Project No. RM91.2, Task 2, June, 50 pp.

36. Brewer, C.A., A.M. MacEachren, and L.W. Pickle, **1995**, "Evaluation of Map Color Schemes for the NCHS Mortality Atlas," *Proceedings*, International Symposium on Computer Mapping in Epidemiology and Environmental Health, February (published April 1997), pp. 14-20.  
Reprinted in 1995 in *Cognitive Aspects of Statistical Mapping*, Cognitive Methods Staff Working Paper Series, No. 18, edited by L.W. Pickle and D.J. Herrmann, NCHS Office of Research and Methodology, June, pp. 191-200.
37. Brewer, C.A., **1994**, "Guidelines for Use of the Perceptual Dimensions of Color for Mapping and Visualization," *Color Hard Copy and Graphic Arts III*, edited by J. Bares, Proceedings of the International Society for Optical Engineering (SPIE), San José, February, Vol. 2171, pp. 54-63.
38. Book review by C.A. Brewer, **1994**, of *Cartography: Thematic Map Design*, Third Edition, by B.D. Dent, in *Cartographic Perspectives*, 17: 26-27.
39. Brewer, C.A., and K.A. Marlow, **1993**, "Color Representation of Aspect and Slope Simultaneously," *Proceedings*, Eleventh International Symposium on Computer-Assisted Cartography (Auto-Carto-11), Minneapolis, October/November, pp. 328-337.  
Maps from this research are cover art for *Visualization in Modern Cartography*, 1994, and *Research/Penn State*, September 1995.
40. Hypermedia review by C.A. Brewer, **1992**, of *Interactive Color: A Guide for Color in Computer Graphics*, by the San Diego Supercomputer Center, in *Cartographic Perspectives*, 12: 7-9.
41. Book review by C.A. Brewer, **1992**, of *Envisioning Information*, by Edward R. Tufte in *Photogrammetric Engineering and Remote Sensing*, 58(5): 543-544.
42. Brewer, C.A., **1991**, "Modelling Surround-Induced Changes in Map Color Appearance," *Proceedings*, International Cartographic Association, Bournemouth, England, September, Vol. 1, pp. 522-526.
43. Brewer, C.A., **1990**, "The Effect of Color on the Perception of Map Scale," *Student Honors Competition Winning Papers*, Proceedings edited by E. Wingert, Cartography Specialty Group Publication #3, AAG, Toronto, April, pp. 1-12.
44. Brewer, C.A., **1988**, "Pacific Travellers Supply Map of Santa Barbara, Goleta, Montecito and Carpinteria," Map Link, Santa Barbara, CA. Wall map is 24x74" (map production assisted by 8 students at UCSB).  
Updated and printed as a folded map in 1990 by C.A. Brewer, 24x41".  
Updated and reprinted in 1997 and 2000 by Map Link.
45. Book review by C.A. Brewer, **1987**, of *Southern Ontario Atlas of Agriculture*, by P.D. Keddie and J.A. Mage, in *Cartographica*, 24(3): 120-121.

### ***Grants and Contracts***

Principal Investigator, “Cartographic Enhancement for New Generation Topographic Map Graphics,” Cooperative Ecosystem Studies Unit (CESU) Cooperative Agreement, Department of Interior, \$25,000, 2008.

Research contract, “ESRI Project on Multi-scale Map Design and Data Modeling,” ESRI Inc., \$35,742, 2006-2007.

Research contract, “Development of a Socioeconomic Indicator Monitoring Protocol for the Eastern Rivers and Mountains Network,” National Park Service Cooperative Agreement, Department of the Interior, \$21,641, 2006-2007, and \$18,119, 2007-08 continuation.

Collaborator, “Geostatistical software for space-time analysis and detection of cancer disparities.” National Cancer Institute, Small Business Innovation Research (SBIR) grant Phase I, \$100,000 to BioMedware (PI is Pierre Goovaerts), Ann Arbor, MI, 2004-2006.

Co-Investigator with Jean McKendry (National Park Service), “NPS SocioEconomic Atlas Project,” Cooperative Ecosystem Studies Unit (CESU) Cooperative Agreement, Department of Interior, \$57,130 to PSU, 2003-2004.

Collaborator (expert panel member), “Stroodle: A GIS Foundation Class Library,” National Institute of Environmental Health Sciences, Small Business Innovation Research (SBIR) grant Phase II, \$800,000 to BioMedware (PI is Geoffrey Jacques), Ann Arbor, MI, 2001-2003.

Co-PI on “Quality Graphics for Federal Statistical Summaries,” NSF Digital Government Collaborative Research Grant with three PIs: Alan MacEachren (PSU), Daniel Carr (George Mason), and David Scott (Rice), \$330,706 to PSU, 2000-2003.

Research contract, National Center for Health Statistics, \$20,005, 1998 (for research on comparison of choropleth classifications for maps in series).

George H. Deike, Jr. Research Grant, College of Earth and Mineral Sciences, PSU, \$45,000, 1996 to 1999 (for research on using visualization in epidemiological research).

Faculty Investigator in the “Cognitive Analysis of Visualization in Education” group within *Visualizing Earth*, a \$1.8-million multidisciplinary research project funded by NSF with Co-PIs at PSU, SDSU, UCSD, and TERC in Boston. Received \$6,000 in summer salary, 1995 to 1998.

Funding awards for improvement of GEOG 115, “Landforms of the World:”

Wilson Education Grant, College of Earth and Mineral Science, PSU, \$7,500, 1996 (for assessment of computer-based laboratories, improvement of function of lab software, and support of undergraduate experience planning and taking georeferenced, oblique, aerial photos of landforms to improve lab software).

United Federal Bank Endowment and Fund for Improvement of Undergraduate Education grant, Instructional Development Program, PSU, \$3,000 in 1996 and \$1000 in 1995 (for graduate assistant funding for development of interactive teaching modules).

CAUSE grant, College of Earth and Mineral Science, PSU, \$5,000, 1995 (for initial preparation of course).

Office of Undergraduate Education and CAUSE grants, PSU, \$4,200, 1995 (purchase of 5 global positioning system (GPS) receivers for undergraduate teaching).

Research contract with A.M. MacEachren, National Center for Health Statistics, \$17,500, 1994 (for research on the design of color maps for the NCHS mortality atlas).

Research, Scholarship and Creative Activity grant and Affirmative Action Faculty Development Program grant, College of Arts and Letters, SDSU, \$3,100, 1991 (for additional research on dissertation topic).

Travel grant, U.S. National Committee for the ICA, \$1,500, 1991 (for presentation at the International Cartographic Association meeting in Bournemouth, UK).

Doctoral Dissertation Research Improvement Grant, National Science Foundation, \$8,500, 1989.

### ***Presentations***

*Oral paper presentations unless otherwise noted; • denotes Brewer was presenter*

1. “Cartographic Symbolization Principles Applied to Mapping Complicated Features” (invited presentation), National Geospatial-Intelligence Agency (NGA) Complicated Features Workshop, Warrenton VA, November **2007**. •
2. “ScaleMaster Characterization of Types of Design Change Through Scale for Mapping from Multi-Resolution Databases” (first author with J. Acosta, B.P. Buttenfield, C. Frye, and A. Buckley), North American Cartographic Information Society (NACIS) annual meeting, St. Louis, October **2007**. •
3. “Automating Label Placement in Dense Utility Maps” (second author with J.P. Kern), NACIS annual meeting, St. Louis, October **2007**.
4. “What is a Base Map?” (second author with B.P. Buttenfield, C. Frye and A. Buckley), NACIS annual meeting, St. Louis, October **2007**.
5. “A Research Agenda for Geographic Information Science at the United States Geological Survey,” (co-presenter with R. Denaro and R.B. McMaster), briefing at USGS Headquarters, Reston VA, September **2007**. •
6. “Scalemaster: Multi-Scale Mapmaking from Multiple Database Resolutions and for Multiple Map Purposes,” (first author with B.P. Buttenfield, C. Frye, and J. Acosta), 23<sup>rd</sup> International Cartographic Conference (ICC2007), Moscow, Russia, August **2007**. •
7. “Students Flourish by Mixing Research with Learning in GIS and Cartography” (invited co-presenter with B.P. Buttenfield), ESRI Education User Conference, San Diego CA, June **2007**. •

8. “Cartographic Inspirations for Designing Better Data Visualizations” (invited seminar and one-day workshop), Applied Information Management (AIM) Institute, Gallup Campus, Omaha, October **2006**. •
9. “Map Design through Scale Change and Varied Map Purpose” (first author with C. Frye and B.P. Buttenfield), NACIS annual meeting, Madison, October **2006**. •
10. “Cartography: Modeling GIS Data for Map Making” (invited presenter, with A. Buckley, C. Frye, and B.P. Buttenfield), Preconference Seminar, ESRI User Conference, August **2006**. •

*Three related presentations: “Mastering Map Scale: Formalizing Guidelines for Multi-Scale Map Design”*

11. Conference paper (first author with B.P. Buttenfield), AutoCarto 2006, Vancouver WA, June **2006**. •
12. Invited talk, Laboratoire COGIT (Conception Objet et Généralisation de l’Information Topographique), Institut Géographique National (IGN), Paris, May **2006**. •
13. Invited talk, UMR 8504 Géographie-cités: CNRS (Centre National de la Recherche Scientifique) and Universités Paris 1 and 7, Paris, May **2006**. •
14. “Color Research Applications in Mapping and Visualization” (invited talk), Laboratoire COGIT, IGN, Paris, May **2006**. •
15. “Innovative Integration of Professional and Research Experience into Undergraduate Mapping Courses” (invited Mitchell Award talk), College of Earth and Mineral Sciences, PSU, March **2006**. •
16. “Map Design for Demography” (invited presentation), Population Research Institute, Pennsylvania State University, February **2006**. •

*Five related presentations: “Advanced Cartography within GIS”*

17. Invited keynote speaker, ESRI Mid Atlantic User Group Conference, Philadelphia, November **2007**. •
18. Invited colloquium speaker, Department of Geography, Ryerson University, Toronto, November **2006**. •
19. Dangermond Lecture, Department of Geography, University of California—Santa Barbara, May **2006**. •
20. Dangermond Lecture, University of Redlands, May **2006**. •
21. Invited in-class presentation, Department of Geography, Michigan State University, December **2005**. •
22. Invited keynote speaker, 21<sup>st</sup> New York State GIS Conference, Rochester, October **2005**. • Participation in NYS GIS also included poster competition judging, on-the-spot map critique session, and a ‘doctor’s office’ help session.
23. “Map Design Research and Teaching: MSU Beginnings” (invited colloquium for 50<sup>th</sup> anniversary celebration), Department of Geography, Michigan State University, December **2005**. •

24. “Map Design” (invited in-class presentation), Department of Geography, University of Colorado—Boulder, November **2005**. •
25. “The Future of Map Design: Two New Map Design Textbooks Critiqued” (invited panelist), NACIS annual meeting, Salt Lake City, October **2005**. •
26. “Cartographic Visualization” (invited keynote speaker), XXII Congresso Brasileira de Cartografia, SBC, Macaé, Brazil, September **2005**. •
27. “Cartographic Design for GIS Mapmakers” (invited two-day short course), XXII Congresso Brasileira de Cartografia, Sociedade Brasileira de Cartografia, Geodésia, Fotogrametria e Sensoriamento Remoto (SBC), Macaé, Brazil, September **2005**. •
28. “Comparison of GIS and Graphics Software for Advanced Cartographic Symbolization and Labeling” (first author with C. Frye), International Cartographic Conference (ICC2005), A Coruña, Spain, July **2005**. •
29. “Overview of *The Census Atlas of the United States*” (second author with T.A. Suchan and A. Tait), International Cartographic Conference (ICC2005), A Coruña, Spain, July **2005**.
30. “Categories of Hypotheses Generated using Epidemiological Maps” (invited presentation), Geostatistical Analysis of Health Disparities Conference, sponsored by BioMedware, Ann Arbor, May **2005**. •
31. “Cartograms in Action: Electoral College Mapping used During the 2004 Election” (poster, first author with J.M. Olson), Association of American Geographers (AAG) annual meeting, Denver, April **2005**. •
32. “Color Research Applications in Mapping and Visualization” (invited keynote speaker), 12th Color Imaging Conference, IS&T (Society for Imaging Science and Technology) and SID (Society for Information Display), Scottsdale, November **2004**. •
33. Invited specialist participant in Focus Group 2 of “GIS Science Priorities for Comprehensive Cancer Control,” Division of Cancer Prevention and Control, Centers for Disease Control and Prevention (CDC) with RTI International and the National Center for Geographic Information and Analysis, Santa Barbara, November **2004**.
34. “From GIS to Graphics Software: When Do You Bail?” (first author with C. Frye), NACIS annual meeting, Portland, Maine, October **2004**. •
35. “The NACIS Map-Off” (invited panel member for comparative map critique), NACIS annual meeting, Portland, Maine, October **2004**. •
36. “Socioeconomic Atlas Series for U.S. National Parks” (poster; first author with J.M. McKendry, J.S. Staub, and S.D. Gardner), selected for Conservation Hall Map Gallery, ESRI User Conference, San Diego, August **2004**. •

37. “Tips and Tools for Color Symbolization in Mapping and Visualization” (invited colloquium), Hunter College, New York, May **2004**. •
38. “A Transition in Improving Maps: The ColorBrewer Example” (invited poster), American Congress on Surveying and Mapping (ACSM) annual meeting, Nashville, April **2004**. •
39. “University Collaboration in Production of a Socioeconomic Atlas Series for U.S. National Parks” (illustrated paper, second author with J.M. Staub and J.E. McKendry), AAG annual meeting, Philadelphia, March **2004**.
40. “Mapping Census 2000 in the *Statistical Atlas of the United States 2003*” (first author with T.A. Suchan and A. Tait), ICC2003, Durban, South Africa, August **2003**. •
41. “Java-based Visualization of Multivariate Geospatial Data” (invited paper, second author with B. Zhou and F. Hardisty), ASA (American Statistical Association) Joint Statistical Meetings, Seattle, August **2003**.
42. “Communication of Aquatic Condition and Stressor Data on a Watershed-scale: A Case Study in the Upper Juniata Watershed in Central Pennsylvania” (poster, third author with K. Hychka and R. Brooks), Society of Wetland Scientists, New Orleans, June **2003**.
43. “EM SC 300: An Undergraduate Course in Student e-Portfolio Design and Development” (co-presenter with G. Johnson, R. Orndorff), Colloquy IX, Schreyer Institute for Teaching Excellence, PSU, May **2003**. •
44. “Symbolization and Design of Thematic Maps of Epidemiological and Census Data” (invited two-day short course), III Colóquio Brasileiro de Ciências Geodésicas, Universidade Federal do Paraná, Curitiba, Brazil, May **2003**. •
45. “Using Color to Visualize Geographic Data” (invited keynote), III Colóquio Brasileiro de Ciências Geodésicas, Universidade Federal do Paraná, Curitiba, Brazil, May **2003**. •
46. “Using Color for Presentation and Exploration of Data” (invited paper), American Association for the Advancement of Science (AAAS) annual meeting, Denver, February **2003**. •
47. “A Tutorial on Color Symbolization and Data Classification for Mapping and Visualization” (invited presentation), Space-Time Information Systems II, meeting sponsored by BioMedware, Ann Arbor, January **2003**. •
48. “Map Design Tools in ArcMap 8: What We Learned While Creating an Online Course” (first author with S.P. Faith), NACIS annual meeting, Columbus, October **2002**. •
49. “Mapping Census 2000: Evaluating an Atlas Designed to Accommodate Impaired Color Vision” (second author with G.W. Hatchard), NACIS annual meeting, Columbus, October **2002**.

50. “ColorBrewer in Print: A Catalog of Color Schemes for Maps” (poster, first author with G.W. Hatchard and M.A. Harrower), NACIS annual meeting, Columbus, October **2002**. •

*Five related presentations with M.A. Harrower:*

51. “ColorBrewer: A Web Tool for Selecting Color Schemes for Maps and Graphs” (invited paper, first author), ASA Joint Statistical Meetings, New York, August **2002**. •
52. “Using ColorBrewer to Design Color Schemes for Maps of Demographic Data” (invited technical exhibit, second author) ASA Joint Statistical Meetings, New York, August **2002**. •
53. “ColorBrewer: A Web Tool for Selecting Color Schemes for Maps” (first author), ESRI User Conference, San Diego, July **2002**. •
54. “Demonstration of ColorBrewer: A Web Tool for Selecting Color Schemes for Maps” (demonstration, first author), dg.o2002, NSF National Conference for Digital Government Research, Los Angeles, May **2002**. •
55. “Color for Dummies: Online Tools for Selecting Map Color Schemes,” (second author), AAG annual meeting, Los Angeles, March **2002**.
56. “Color as an Analytical Symbol for Data Representation” (invited host of luncheon roundtable), ASA Joint Statistical Meetings, New York, August **2002**. •
57. “Tips and Tools for Color Symbolization in Mapping and Visualization” (invited IGERT colloquium—Integrative Graduate Education and Research Training), State University of New York at Buffalo, March **2002**. •
58. “Analytical Color Use in Visualization: Symbolizing Space-Time Data” (invited presentation), Space-Time Information Systems meeting sponsored by BioMedware, Ann Arbor, January **2002**. •

*Seven related presentations: “Mapping Census 2000: The Geography of U.S. Diversity”*

59. Invited colloquium, Department of Geography, University of Delaware, November **2002**. •
60. Invited colloquium, Department of Geography, Syracuse University, September **2002**. •
61. Invited colloquium, Department of Geography, State University of New York at Buffalo, March **2002**. •
62. Invited colloquium, Department of Geography, Pennsylvania State University, September **2001**. •
63. Paper (second author with T.A. Suchan), NACIS annual meeting, Portland, October, **2001**.
64. Poster (first author with T.A. Suchan), NACIS annual meeting, Portland, October **2001**. •
65. Poster (second author with T.A. Suchan), ESRI User Conference, San Diego, July **2001**. •
66. “Practical Approaches to Mapping Epidemiological Data” (invited presentation to staff), Medical Examiner’s Office, Delaware County, May **2001**. •

67. "Prototype for a First Atlas of Census 2000" (first author with T.A. Suchan), AAG annual meeting, New York, February/March **2001**. •
  68. "Planning a First Atlas of Census 2000: *Mapping Change*" (poster, second author with T.A. Suchan), NACIS annual meeting, Knoxville, October **2000**. •
  69. "A Cognitive Study of Methods of Classifying Epidemiological Data on Choropleth Maps in Series" (third author with E.B. Steiner, C.L. Eicher, and L.W. Pickle), AAG annual meeting, Pittsburgh, April **2000**.
  70. "Evaluation of a Model for Predicting Simultaneous Contrast on Color Maps," Inter-Society Color Council (ISCC) Second Panchromatic Meeting, Savannah, February **2000**. •
  71. "Recommendations for Redesign of the Net Assessment Map Series" (invited presentation and workshop participant), Net Assessment Map Workshop, International Research Institute for Climate Prediction (IRI), Lamont-Doherty Earth Observatory of Columbia University, Palisades NY, January **2000**. •
- Two invited presentations: "A Cognitive Study of Methods of Classifying Epidemiological Data on Choropleth Maps in Series"*
72. National Cancer Institute, Division of Cancer Control and Population Sciences, November **1999**. •
  73. National Center for Health Statistics, Office of Research and Methodology, Bethesda, November **1999**. •
  74. "Hypothesis Generation Using Visualizations of Health Data," ICA conference, Ottawa, August **1999**. •
  75. "Color Use Guidelines for Data Representation" (invited paper), Section on Statistical Graphics, ASA Joint Statistical Meetings, Baltimore, August **1999**. •
  76. "Selecting Hue Pairs for Maps using Color Naming and Color Vision Research," ISCC annual meeting, Vancouver, May **1999**. •
  77. "Teaching Concepts in Geography with GIS-based Tools" (second author with E.A. Wentz), AAG annual meeting, Honolulu, March **1999**.
  78. "Evaluation of Map Color Schemes for the NCHS Atlas of U.S. Mortality" (invited paper, first author with A.M. MacEachren and L.W. Pickle), Sixth Annual Pennsylvania Geographic Information Systems Conference (PAGIS), Harrisburg, May **1998**. •
  79. "Cognitive Aspects of Statistical Map Design: II. Specific Map Elements" (fourth author with L.W. Pickle, D.J. Herrmann, and A.M. MacEachren), International Health Geographics Conference, Baltimore, October **1998**.
  80. "State of the Art in Academic Cartography" (first author with R.B. McMaster; invited by the Cartography Specialty Group), AAG annual meeting, Boston, April **1998**. •

81. Organized session: "State of the Art in Cartography: Can Anyone Make Any Map?" sponsored by the Cartography Specialty Group and requested by AAG for the annual meeting, Boston, April **1998**.
  82. Invited participant in GIS and Epidemiology Workshop, sponsored by the National Center for Geographic Information and Analysis (NCGIA), State University of New York at Buffalo, November **1997**.
  83. "Revise and Resubmit: The Future of Cartographic Research Publications" (organizer and chair of panel discussion), NACIS annual meeting, Lexington, October **1997**.
  84. "Designing Color Displays for Color Vision Impairments" (co-presenter with J.M. Olson; paper invited for education program), ISCC, Baltimore, September **1997**. •
  85. "Student Use of Simplified GIS Interface for Learning Introductory Geomorphology" (first author with E.A. Wentz and J.C. Vender), AAG annual meeting, Fort Worth, April **1997**. •
  86. "Qualitative Research Methods for Cartographers" (second author with T. Suchan), AAG annual meeting, Fort Worth, April **1997**.
  87. "Learning Advanced Mapping Methods in the *Applied Cartographic Design* Course at Penn State" (paper), NACIS annual meeting, San Antonio, October **1996**. •
  88. "Evaluation of Map Color Schemes for the NCHS Mortality Atlas" (first author with A.M. MacEachren and L.W. Pickle), AAG annual meeting, Charlotte, April **1996**. •
  89. Organized two sessions: "The NCHS *Atlas of United States Mortality*" and "Ninth Annual Student Honors Competition," AAG annual meeting, Charlotte, April **1996**.
- Three related papers:* second author with A.M. MacEachren and L.W. Pickle
90. "Assessing Methods for Depicting Data Reliability on Mortality Maps," AAG annual meeting, Charlotte, April **1996**.
  91. "Mapping Health Statistics: Representing Data Reliability," 17th ICA Conference, Barcelona Spain, September **1995**.
  92. "Representing Uncertainty on Statistical Maps" (invited paper), Statistical Graphics Section of the ASA meeting, Orlando, August **1995**.
  93. "Spectral Schemes: Controversial Color Use on Maps" (first author with A.M. MacEachren and L.W. Pickle), NACIS annual meeting, Wilmington, October **1995**. •
  94. "Question Construction Effects on Response-Time Results in Cartographic Color Research" (paper), AAG annual meeting, Chicago, March **1995**. •
  95. Discussant for session "Facing the Digital Map: A Discussion of Solutions to Computer Production and Publication Problems," AAG annual meeting, Chicago, March **1995**.

96. "Evaluation of Map Color Schemes for NCHS Mortality Atlas" (first author with A.M. MacEachren and L.W. Pickle), International Symposium on Computer Mapping in Epidemiology and Environmental Health, Tampa, February **1995**. •
97. "Geographic Visualization: Understanding Map Reliability and Making Reliable Maps" (invited video-taped lecture presented with A.M. MacEachren), NCHS Cartography Guest Lecture Series to the Department of Health and Human Services, National Center for Health Statistics/CDC, Hyattsville, July **1994**. •
98. "Teaching Cartography Today: From Crow Quill to Computer" (panel member), AAG annual meeting, San Francisco, March/April **1994**.

*Two related presentations: "Guidelines for Use of the Perceptual Dimensions of Color for Mapping and Visualization"*

99. Invited talk, Department of Geography, University of California at Santa Barbara, October **1993**. •
  100. Paper, Color Hard Copy and Graphic Arts III conference of IS&T and SPIE, San José, February **1994**. •
  101. "Color Representation of Aspect and Slope Simultaneously" (first author with K.A. Marlow), Auto-Carto-11, Minneapolis, October/November **1993**. •
- Two related presentations: "Color Selection for Geographic Data Analysis and Visualization"*
102. Paper, GIS/LIS annual conference, San José, November **1992**. •
  103. Invited talk, Department of Geography, Pennsylvania State University, January **1993**. •
  104. "An Extension of the Hunt Model of Color Appearance to Predict Simultaneous Contrast Effects on Computer-Displayed Map Colors," ISCC annual meeting, Princeton, June **1992**. •
  105. "Prediction of Surround Effects on Map Color Appearance: Model Evaluation" (winning paper in Nystrom Competition), AAG annual meeting, San Diego, April **1992**. •
  106. "Mapping with the Macintosh Computer" (workshop leader with D.E. Fitzsimons and E.J. Turner), AAG annual meeting, San Diego, April **1992**.
  107. "Modelling Surround-Induced Changes in Map Color Appearance" (poster), ICA, Bournemouth, England, September **1991**.
  108. "The Effect of Color on the Perception of Map Scale," AAG annual meeting, Toronto, April **1990**. •
  109. "Color Chart Use in Map Design," NACIS annual meeting, Ann Arbor, October **1989**. •
  110. "Use of Thematic Mapper Imagery for Updating a Vector-Based GIS," AAG annual meeting, Baltimore, March **1989**. •

111. "Maps for the Color Deficient: Experimental Results" (second author with J.M. Olson, J.B. Moore, and M.H. Martel), AAG annual meeting, Baltimore, March **1989**.
112. Color Education Panel (invited panel member), ISCC annual meeting, Chicago, April **1989**.
113. "Color in Cartography: Useful Theory for Production and Research" (workshop leader with J.M. Olson), AAG annual meeting, Portland, April **1987**.
114. "Printed Munsell Charts for Selecting Map Colors," AAG annual meeting, Minneapolis, May **1986**. •
115. "Color Harmony in Cartography," AAG annual meeting, Detroit, April **1985**. •

### ***Teaching and Advising***

#### **Courses Taught**

Department of Geography, The Pennsylvania State University, 1994 to present:

- Cartography—Maps and Map Construction
- Applied Cartographic Design
- Seminar in Cartography
- Introduction to Geographic Research
- Professional e-Portfolio Development
- Landforms of the World

Department of Geography, San Diego State University, 1991 to 1994:

- Maps and Graphic Methods
- Automated Cartography
- Intermediate Cartography (map design)
- Advanced Automated Cartography

Department of Geography, University of California at Santa Barbara, 1986/87:

- Introduction to Cartography
- Production Cartography
- Compilation and Cartographic Design

Department of Geography, Michigan State University, 1990/91:

- Map Design
- Introduction to Cartography

#### **Graduate Advisees**

##### **PSU**

Mamata Akella (MS), *First Responders and Crisis Map Symbols: Making Communications Clearer*, 2008.

Jill Phelps Kern (MGIS), *Automating Label Placement in Dense Utility Maps*, 2007.

Alistair Geddes (PhD), *Statistically Modified Farming: The Spatial Politics in Scottish Farming Statistics*, 2006.

Steven Gardner (MS), *Evaluation of the ColorBrewer Color Schemes for Accommodation of Map Readers with Impaired Color Vision*, 2005.

- Sohyun Park (MS), *Comparison of Detailed and Generalized Maps for Campus Wayfinding with a Pocket PC*, 2005.
- Amy Trauger (PhD), *Social, Economic and Environmental (In)Justice: A Network Analysis of Sustainable Agriculture in Pennsylvania*, 2005.
- Geoffrey Hatchard (MS), *A Study of Road Network Representation on a Typical Highway Map*, 2003.
- Erik Steiner (MS), *Region Representation and Cognitive Distance Distortion*, 2001.
- Michael DeGennaro (MS), *Mapping with Chorodots: An Examination of Methods and their Effects on Geographic Data Interpretation*, 2000.
- Shaun Faith (MS), *Effective Monochromatic Maps and Graphics: Perceptual Grayscales, Ruling, and Xerographic Reproduction*, 1999.
- Cory Eicher (MS), *The Implementation and Evaluation of Dasymetric Mapping Methods*, 1999.
- Elizabeth Fauerbach (MS), *Examining Electronic Atlases: A Definition and Case Study*, 1997.
- David Barnes (MS), *Hypsometric Colors and Hill-Shading for Base Maps and Relief Representation: An Historical Perspective*, 1997 (two MS papers).

#### **SDSU**

- Robert Marin (MS), *Evaluating Three-Dimensional Digital Terrain Maps for Visual Interpretation of Thematic Data*, 1994.
- Laura Edgeman (MS), *Teaching Successional Vegetation Dynamics: An Evaluation of the Effectiveness of Animated and Static Graphics*, 1994.
- Cheryl Rogers (MS), *Evaluation of the Use of Color Saturation to Depict Data Uncertainty on Digital Maps*, 1994.
- Caroline Sallaway (MS), *Evaluation of the Effectiveness of Perceptually Ordered Color Schemes for Maps*, 1994.

#### **Graduate Committee Member**

- Anthony Robinson (PhD), *Design for Synthesis in Geovisualization*, 2008.
- Jamison Conley (PhD), *Automated Hypothesis Generation of Processes Causing Clusters in Geographic Datasets*, 2008.
- Liv Detrick (MS), *A Comparative Usability Study of GIS for K-12 Education*, 2007.
- Latika Bharadwaj (PhD in Agricultural, Environmental and Regional Economics), *Work Participation, Motivation, and Benefit Receipt from Off-Farm Work on U.S. Farms: A Household Bargaining Approach*, 2007.
- Elisabeth Chesneau (Université de Marne-le-Vallée PhD), *Modèle d'Amélioration Automatique des Contrastes de Couleur en Cartographie: Application aux Cartes de Risque (Model for the Automatic Improvement of Color Contrasts in Cartography: Application to Risk Maps)*, 2006.
- Anthony Robinson (MS), *Assessing Geovisualization in Epidemiology: A Design Framework for an Exploratory Toolkit*, 2005
- Biliang Zhou (MS), *Constructing Bivariate Color Schemes in CIECAM02 Color Space for Geovisualization Applications*, 2004.
- Joel Staub (MS), *Re-Creating Hollow Landscapes: The Former Shenandoah National Park Residents*, 2004.
- Amy Griffin (PhD), *Understanding How Scientists Use Data-Display Devices for Interactive Visual Computing with Geographical Models*, 2004.

Latha Baskaran (MS), *Analyzing the Effect of Topography on Remote Sensing Imagery*, 2003.

Steven Norman (PhD), *Legacies of Anthropogenic and Climate Change in Fire Prone Pine and Mixed Conifer Forests of Northeastern California*, 2002.

Trudy Suchan (PhD), *Categories in Geographic Representation*, 1998.

Beverley Evans (MS), *Cartographic Display of Data Reliability: Does it Benefit the Map User?* 1995.

Anne Gibson (Clark University PhD), *A Model for Parallel Data/Color Structuring in the Context of the Choropleth Map*, 1995 (external reviewer).

Michele Limoges (SDSU MS), *Applying Cartographic Expertise to Determine Tolerance Values for Automated Simplification of Linear Features*, 1994.

## ***Consulting and Service***

### **Consulting**

ESRI Inc., Multi-scale map design, with B.P. Battenfield, 2005 to 2008.

ESRI Inc., Cartographic critique of ArcGIS 9.0, with B.P. Battenfield, 2004/05.

Population Distribution Branch, Population Division, U.S. Census Bureau:

Planned and produced diversity atlas of Census 2000 during 2000/01 sabbatical leave.

Design and analysis consulting for comprehensive second atlas, 2002 to 2007.

### **Elected University and College Service Positions at PSU**

University Faculty Senate, 2004 to 2008:

Chair of Senate Faculty Affairs Committee, 2006 to 2008.

Chair of Promotion, Tenure, Appointments and Leaves subcommittee of Faculty Affairs, 2005/06.

Member of Senate Faculty Affairs Committee, 2004/05.

University Faculty Senate Committee on Faculty Rights and Responsibilities, 2005 to 2007.

Chair, Faculty Advisory Committee, College of Earth and Mineral Sciences, 2004 to 2007.

### **Membership and Service in Professional Associations**

**Association of American Geographers (AAG) member:**

Member of Editorial Board for *The Professional Geographer*, 2008 to present, and 1997 to 2000.

Member of Nominating Committee, 2001/02.

Academic Director of Cartography Specialty Group, 1994 to 1996.

Local Arrangements Committee, 1992.

Student Director of Cartography Specialty Group, 1984.

**North American Cartographic Information Society (NACIS) member:**

Vice President 1997/98, President 1998/99, and Past President 1999/2000.

Organized Annual Meeting, Milwaukee, October 1998.

Member of Board of Directors, 1995 to 1997.

Member of Editorial Board for *Cartographic Perspectives*, 1992 to 1997.

**American Congress on Surveying and Mapping (ACSM) and  
Cartography and Geographic Information Society (CaGIS) member:**

Fellow of ACSM, 2007 to present.

Chair, U.S. National Committee to the International Cartographic Association, 2004 to 2008.

Webmaster for <http://www.usnc-ica.org>, 2004 to present.

Member, U.S. National Committee to the International Cartographic Association, 2003/04.

Member of Editorial Board for *Cartography and Geographic Information Science*, January 2000 to present.

Invited guest editor for 1999 U.S. National Report to the International Cartographic Association (Special Issue of *Cartography and Geographic Information Science*).

**Canadian Cartographic Association (CCA) member.**

**Inter-Society Color Council (ISCC) member:**

Member of Awards Committee, 2002 and 2004.

Organized 2nd Panchromatic Conference on "Color in its Surround," February 2000.

Member of Board of Directors, 1995 to 1999.

**Peer Review**

Reviewed manuscripts for:

*Annals of the Association of American Geographers*

*The Professional Geographer*

*Cartography and Geographic Information Science (The American Cartographer)*

*Cartographica*

*Cartographic Perspectives*

*International Journal of Geographical Information Science*

*Computers & Geosciences*

*Journal of Computational and Graphical Statistics*

*Color Research and Application*

*Journal of Experimental Psychology: Applied*

*Research in Geographic Education*

*Regional Studies*

*EOS*

Served on NSF and NIH panels.

Reviewed proposals from NSF, NIH, NOAA, and NOW Exacte Wetenschappen.

Reviewed cartography textbook revisions for Wm. C. Brown and John Wiley & Sons.

**Other Service**

**National Research Council**, National Academy of Sciences: member of Committee on Research Priorities for the USGS Center of Excellence for Geospatial Information Science, 2006/07.

**Modern Language Association (MLA)**: member of Advisory Committee to the MLA Language Map, 2005/06, [http://mla.org/census\\_map](http://mla.org/census_map)

**University Consortium for Geographic Information Science (UCGIS)**: member of Phase II Advisory Board, GIScience Body of Knowledge, Model Curricula Project, 2005.