

Cynthia Ann Brewer

Curriculum Vitae, December 2009

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Employment

The Pennsylvania State University, Department of Geography:

Professor, 2007 to present
Associate Professor, 1998 to 2007
Assistant Professor, 1994 to 1998

Concurrent External Appointment:

Affiliate Faculty, Center of Excellence for Geospatial Information Science (CEGIS), U.S.
Geological Survey, Department of Interior, 2008 to present.

Concurrent Penn State Appointments:

Director, Peter R. Gould Center for Geography Education and Outreach, 2009 to present.
Associate Head, Department of Geography, PSU, 2006 to 2008
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).

Previous University Appointments:

San Diego State University, Department of Geography:

Assistant Professor, 1991 to 1994.

University of California at Santa Barbara, Department of Geography:

Visiting Lecturer, 1986/87.

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

ICC2009 International Cartographic Exhibition, second place jury award in **Globes and Atlases** category, 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 International Cartographic Association, 2009. (Atlas reference under *Other Publications and Resources*.)

Best of Show, CaGIS/ACSM Map Design Competition, awarded to *Census Atlas of the United States*. Awarded by the Cartography and Geographic Information Society, 2008.

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.

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*. (Paper reference under *Peer-Reviewed 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. (Atlas reference under *Other Publications and Resources*.)

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

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. (Paper 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. Buttenfield, **2009**, "Mastering Map Scale: Balancing Workloads Using Display and Geometry Change in Multi-scale Mapping," *Geoinformatica*. In press; published as Open Access: DOI 10.1007/s10707-009-0083-6.
2. Kern, J.P., and C.A. Brewer, **2008**, "Automation and the Map Label Placement Problem," *Cartographic Perspectives*, 60: 22-45.
3. Brewer, C.A., and B.P. Buttenfield, **2007**, "Framing Guidelines for Multi-Scale Map Design Using Databases at Multiple Resolutions," *Cartography and Geographic Information Science*, 34(1): 3-15.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. Brewer, C.A., **2001**, "Reflections on Mapping Census 2000," *Cartography and Geographic Information Science*, 28(4): 213-235.

10. 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.
11. Suchan, T.A., and C.A. Brewer, **2000**, "Qualitative Methods for Research on Mapmaking and Map Use," *The Professional Geographer*, 52(1): 145-154.
12. Brewer, C.A., and R.B. McMaster, **1999**, "The State of Academic Cartography," *Cartography and Geographic Information Science*, 26(3): 215-234.
13. 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.
14. 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.
15. 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.
16. Brewer, C.A., **1997**, "Spectral Schemes: Controversial Color Use on Maps," *Cartography and Geographic Information Systems*, 24(4): 203-220.
17. 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.
18. Brewer, C.A., **1997**, "Evaluation of a Model for Predicting Simultaneous Contrast on Color Maps," *The Professional Geographer*, 49(3): 280-294.
19. 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.
20. Brewer, C.A., **1996**, "Guidelines for Selecting Colors for Diverging Schemes on Maps," *The Cartographic Journal*, 33(2): 79-86.
21. 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.
22. 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.
23. Brewer, C.A., **1992**, "Review of Colour Terms and Simultaneous Contrast Research for Cartography," *Cartographica*, 29(3&4): 20-30.

24. Brewer, C.A., **1989-90**, "Color Chart Use in Map Design," *Cartographic Perspectives*, 4: 3-10.
25. 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.

Other Publications and Resources

1. Brewer, C.A., B.P. Battenfield, and E.L. Usery, **2009**, "Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map* of the United States," *Proceedings, 24th International Cartographic Conference (ICC2009)*, Santiago, Chile, November, 12 pp. (CD-ROM).
2. Brewer, C.A., and M.K. Akella, **2008**, "Multi-resolution Multi-scale Topographic Map Design: Toward a New Look for *The National Map*," *Proceeding of AutoCarto 2008*, Shepherdstown WV, September, 12 pp. (CD-ROM).
3. Stryker, M., R.E. Roth, and C.A. Brewer, **2008**, "ScaleMaster.org: Illustrating and Constructing the Multi-scale Mapping Process," *Proceedings of the 5th International Conference on Geographic Information Science (GIScience 2008)*, Park City UT, September.
4. Brewer, C.A., **2008-present**, <http://ScaleMaster.org>.
ScaleMaster is an online resource that offers a collection of presentations, publications, and interactive resources produced by B.P. Battenfield and C.A. Brewer as part of grant funded research from USGS-CEGIS and consulting for ESRI.
5. Brewer, C.A., **2008**, *Designed Maps: A Sourcebook for GIS Users*, ESRI Press, Redlands CA, 170 pp (ISBN 1-58948-160-2).
6. 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, an ICC2009 International Cartographic Exhibition jury award, 2009; AAG Globe Award, 2008; and Best of Show, CaGIS/ACSM Map Design Competition, 2008.
7. 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).

8. 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, 23rd International Cartographic Conference (ICC2007)*, Moscow, Russia, August, 10 pp. (CD-ROM).
9. 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).
10. Brewer, C.A., **2005**, *Designing Better Maps: A Guide for GIS Users*, ESRI Press, Redlands CA, 203 pp. (ISBN 1-58948-089-9).
11. Brewer, C.A., and C. Frye, **2005**, "Comparison of GIS and Graphics Software for Advanced Cartographic Symbolization and Labeling: Five GIS Projects," *Proceedings, 22nd International Cartographic Conference*, International Cartographic Association (ICA), A Coruña, Spain, July, 10 pp. (CD-ROM, ISBN 0-958-46093-0)
12. Suchan, T.A., C.A. Brewer, and A. Tait, **2005**, "Overview of *The Census Atlas of the United States*," *Proceedings, 22nd International Cartographic Conference*, ICA, A Coruña, Spain, July, 10 pp. (CD-ROM, ISBN 0-958-46093-0).
13. Brewer, C.A., **2005-present**, "Cartographic Design Using ArcGIS 9" online course, ESRI Virtual Campus.
14. 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:

15. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Socioeconomic Atlas for Flight 93 National Memorial and its Region.*
16. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Regional Socioeconomic Atlas for National Capital Parks.*
17. McKendry, J.E., C.A. Brewer, and S.D. Gardner, **2004**, *A Socioeconomic Atlas for Chicamauga and Chattanooga National Military Park and its Region.*
18. 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.*
19. 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.*
20. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Canyon de Chelly National Monument and its Region.*
21. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for Kings Mountain National Military Park and its Region.*

22. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for New River Gorge National River and its Region*.
23. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2004**, *A Socioeconomic Atlas for John Day Fossil Beds National Monument and its Region*.
24. McKendry, J.E., C.A. Brewer, and J.M. Staub, **2003**, *A Socioeconomic Atlas for Saguaro National Park and its Region*.
25. 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).
26. Brewer, C.A., T.A. Suchan and A. Tait, **2003**, "Mapping Census 2000 in the *Census Atlas of the United States*," *Proceedings, 21st International Cartographic Conference*, ICA, Durban, South Africa, August, 7 pp. (CD-ROM, ISBN 0-958-46093-0).
27. Brewer, C.A., **2002-2004**, "Cartographic Design" online course, PSU World Campus and ESRI Virtual Campus.
28. 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.
29. 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).
30. 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.
31. 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.
32. 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.
33. Brewer, C.A., **1999**, "Letter from the President," *Cartographic Perspectives*, 32: 1, 72.
34. 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.

35. Brewer, C.A., and E.A. Wentz, **1997**, "A Simplified GIS Interface for Learning Introductory Geomorphology," *Geocal*, 16: 6-10.
36. 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.
37. 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.
38. MacEachren, A.M., C.A. Brewer, and L.W. Pickle, **1995**, "Mapping Health Statistics: Representing Data Reliability," *Proceedings*, 17th 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.
39. 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.
40. 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.
41. 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.
42. Book review by C.A. Brewer, **1994**, of *Cartography: Thematic Map Design*, Third Edition, by B.D. Dent, in *Cartographic Perspectives*, 17: 26-27.
43. 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.

44. 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.
45. Book review by C.A. Brewer, **1992**, of *Envisioning Information*, by Edward R. Tufte in *Photogrammetric Engineering and Remote Sensing*, 58(5): 543-544.
46. Brewer, C.A., **1991**, "Modelling Surround-Induced Changes in Map Color Appearance," *Proceedings*, International Cartographic Association, Bournemouth, England, September, Vol. 1, pp. 522-526.
47. 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.
48. 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.
49. 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, "Symbol and Label Design Solutions for Electronic Topographic Mapping for *The National Map* of the United States," Cooperative Ecosystem Studies Unit (CESU) Cooperative Agreement, Department of Interior (U.S. Geological Survey), \$240,000, 2008-2010.

Principal Investigator, "Cartographic Enhancement for New Generation Topographic Map Graphics," CESU Cooperative Agreement, Department of Interior (U.S. Geological Survey), \$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, 2007-2008 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, 1996-1999 (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, 1995-1998.

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 Education with Advanced GIS Tools” (invited keynote presentation), **to be presented at** National Cartographic Conference GeoCart’2010, Auckland, New Zealand, September **2010**. •
2. “Designing USGS Topographic Mapping for Multiscale Online Use” (first author with B.P. Buttenfield and E.L. Usery), **to be presented at** ESRI International User Conference, San Diego CA, July **2010**. •
3. “Teaching Cartographic Design with GIS Tools” (first author with W.J. Stroh), **to be presented at** Association of American Geographers (AAG) annual meeting, Washington DC, April **2010**. •
4. “Map Design” (organizer for paper session), **to be held at** AAG annual meeting, Washington DC, April **2010**.
5. “Judy Olson Retires—Her Cartography Advisees Gather to Talk Shop” (panelist; co-organizer of panel session with A. Lobben), **to be presented at** AAG annual meeting, Washington DC, April **2010**. •
6. “Recommendations for Symbol and Label Design for Multiscale Online Topographic Mapping for *The National Map*” (briefing), USGS Headquarters, Reston VA, December **2009**. •
7. “Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map* of the United States” (refereed paper; first author with B.P. Buttenfield and E.L. Usery), 24th International Cartographic Conference (ICC2009), Santiago, Chile, November **2009**. •
8. “Designing *The National Map* by USGS for Multi-scale Online Use” (first author with B.P. Buttenfield and E.L. Usery), North American Cartographic Information Society (NACIS) annual meeting, Sacramento CA, October **2009**. •
9. “Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate” (second author with B.P. Buttenfield and E.L. Usery), North American Cartographic Information Society (NACIS) annual meeting, Sacramento CA, October **2009**.
10. “Topographic Map Design to Support Evaluation of Generalization Solutions” (invited presentation; co-presenter with B.P. Buttenfield), Center of Excellence for Geospatial Information Science (CEGIS), U.S. Geological Survey, Rolla MO, August **2009**. •
11. “Advanced Cartography within GIS: Research and Books ” (invited presentation), Departamento de Geografía y Ordenación del Territorio, Universidad de Zaragoza, Spain, May **2009**. •

12. “Cartographic Generalization by Physiographic Region” (fourth author with J. Wendel, B.P. Battenfield, and C. Anderson-Tarver), AAG annual meeting, Las Vegas NV, March **2009**.
13. “Redesigned Maps” (invited in-class presentation), Department of Geography, University of Colorado—Boulder, November **2008**. •
14. “ScaleMaster.org: Multi-scale Mapping Made Easy” (third author with R.E. Roth and M. Stryker), NACIS annual meeting, Missoula MT, October **2008**.

Two poster presentations: “Typology of Multi-scale Mapping Operators” (third author with R.E. Roth and M. Stryker)

15. NACIS annual meeting, Missoula MT, October **2008**.
16. GIScience 2008 (Fifth International Conference on Geographic Information Science), Park City UT, September **2008**.
17. “ScaleMaster.org: Illustrating and Constructing the Multi-scale Mapping Process” (refereed paper; third author with M. Stryker and R.E. Roth), GIScience 2008, Park City UT, September **2008**.
18. “Multi-resolution Multi-scale Topographic Map Design: Toward a New Look for *The National Map*,” (first author with M.K. Akella), AutoCarto 2008, Shepherdstown WV, September **2008**. •
19. “*Designed Maps: A Sourcebook for GIS Users*” (invited presentation for ESRI Press authors panel “Map Design with the User in Mind”), ESRI International User Conference, San Diego CA, August **2008**. •
20. “Multi-Resolution Multi-Scale Topographic Map Design” (Map Gallery poster; first author with M.K. Akella), ESRI International User Conference, San Diego CA, August **2008**. •
21. “Electronic Topographic Map Design” (invited presentation), CEGIS and National Geospatial Technical Operations Center (NGTOC), U.S. Geological Survey, Rolla MO, July **2008**. •
22. “Students Flourish by Mixing Research with Learning in GIS and Cartography” (invited presentation), Symposium on the Development of the Standard Curriculum for Geographic Information Science and Technology, University of Tokyo—Hongo, Japan, March **2008**. •
23. Podcast author interview on *Designed Maps: A Sourcebook for GIS Users*, February **2008**. •
www.esri.com/news/podcasts/audio/speaker/uc07press_brewer.mp3
24. “Cartographic Symbolization Principles Applied to Mapping Complicated Features” (invited presentation), National Geospatial-Intelligence Agency (NGA) Complicated Features Workshop, Warrenton VA, **2007**. •

25. "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), NACIS annual meeting, St. Louis MO, October **2007**. •
26. "Automating Label Placement in Dense Utility Maps" (second author with J.P. Kern), NACIS annual meeting, St. Louis MO, October **2007**.
27. "What is a Base Map?" (second author with B.P. Buttenfield, C. Frye and A. Buckley), NACIS annual meeting, St. Louis MO, October **2007**.
28. "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**. •
29. "Scalemaster: Multi-Scale Mapmaking from Multiple Database Resolutions and for Multiple Map Purposes," (refereed paper; first author with B.P. Buttenfield, C. Frye, and J. Acosta), 23rd International Cartographic Conference (ICC2007), Moscow, Russia, August **2007**. •
30. "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**. •
31. "Cartographic Inspirations for Designing Better Data Visualizations" (invited seminar and one-day workshop), Applied Information Management (AIM) Institute, Gallup Campus, Omaha NE, October **2006**. •
32. "Map Design through Scale Change and Varied Map Purpose" (first author with C. Frye and B.P. Buttenfield), NACIS annual meeting, Madison WI, October **2006**. •
33. "Cartography: Modeling GIS Data for Map Making" (invited presenter, with A. Buckley, C. Frye, and B.P. Buttenfield), Preconference Seminar, ESRI International User Conference, San Diego CA, August **2006**. •

Three related presentations: "Mastering Map Scale: Formalizing Guidelines for Multi-Scale Map Design"

34. Conference paper (first author with B.P. Buttenfield), AutoCarto 2006, Vancouver WA, June **2006**. •
35. Invited talk, Laboratoire COGIT (Conception Objet et Généralisation de l'Information Topographique), Institut Géographique National (IGN), Paris, France, May **2006**. •
36. Invited talk, UMR 8504 Géographie-cités: CNRS (Centre National de la Recherche Scientifique) and Universités Paris 1 and 7, Paris, France, May **2006**. •
37. "Color Research Applications in Mapping and Visualization" (invited talk), Laboratoire COGIT, IGN, Paris, France, May **2006**. •

38. “Innovative Integration of Professional and Research Experience into Undergraduate Mapping Courses” (invited Mitchell Award talk), College of Earth and Mineral Sciences, PSU, March **2006**. •
39. “Map Design for Demography” (invited presentation), Population Research Institute, Pennsylvania State University, February **2006**. •

Six related presentations: “Advanced Cartography within GIS”

40. Invited keynote speaker, ESRI Mid Atlantic User Group Conference, Philadelphia PA, November **2007**. •
41. Invited colloquium speaker, Department of Geography, Ryerson University, Toronto, November **2006**. •
42. Dangermond Lecture, Department of Geography, University of California—Santa Barbara, May **2006**. •
43. Dangermond Lecture, University of Redlands, May **2006**. •
44. Invited in-class presentation, Department of Geography, Michigan State University, December **2005**. •
45. Invited keynote speaker, 21st New York State GIS Conference, Rochester NY, October **2005**. •

Participation in NYS GIS also included poster competition judging, on-the-spot map critique session, and a ‘doctor’s office’ help session.
46. “Map Design Research and Teaching: MSU Beginnings” (invited colloquium for 50th anniversary celebration), Department of Geography, Michigan State University, December **2005**. •
47. “Map Design” (invited in-class presentation), Department of Geography, University of Colorado—Boulder, November **2005**. •
48. “The Future of Map Design: Two New Map Design Textbooks Critiqued” (invited panelist), NACIS annual meeting, Salt Lake City UT, October **2005**. •
49. “Cartographic Visualization” (invited keynote speaker), XXII Congresso Brasileira de Cartografia, SBC, Macaé, Brazil, September **2005**. •
50. “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**. •
51. “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**. •
52. “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**.

53. “Categories of Hypotheses Generated using Epidemiological Maps” (invited presentation), Geostatistical Analysis of Health Disparities Conference, sponsored by BioMedware, Ann Arbor MI, May **2005**. •
54. “Cartograms in Action: Electoral College Mapping used During the 2004 Election” (poster, first author with J.M. Olson), AAG annual meeting, Denver CO, April **2005**. •
55. “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 AZ, November **2004**. •
56. 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 CA, November **2004**.
57. “From GIS to Graphics Software: When Do You Bail?” (first author with C. Frye), NACIS annual meeting, Portland ME, October **2004**. •
58. “The NACIS Map-Off” (invited panel member for comparative map critique), NACIS annual meeting, Portland ME, October **2004**. •
59. “Socioeconomic Atlas Series for U.S. National Parks” (Map Gallery poster; first author with J.M. McKendry, J.S. Staub, and S.D. Gardner), selected for Conservation Hall, ESRI International User Conference, San Diego CA, August **2004**. •
60. “Tips and Tools for Color Symbolization in Mapping and Visualization” (invited colloquium), Hunter College, New York NY, May **2004**. •
61. “A Transition in Improving Maps: The ColorBrewer Example” (invited poster), American Congress on Surveying and Mapping (ACSM) annual meeting, Nashville TN, April **2004**. •
62. “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 PA, March **2004**.
63. “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**. •
64. “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 WA, August **2003**.
65. “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 LA, June **2003**.

66. “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**. •
67. “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**. •
68. “Using Color to Visualize Geographic Data” (invited keynote), III Colóquio Brasileiro de Ciências Geodésicas, Universidade Federal do Paraná, Curitiba, Brazil, May **2003**. •
69. “Using Color for Presentation and Exploration of Data” (invited paper), American Association for the Advancement of Science (AAAS) annual meeting, Denver CO, February **2003**. •
70. “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 MI, January **2003**. •
71. “Map Design Tools in ArcMap 8: What We Learned While Creating an Online Course” (first author with S.P. Faith), NACIS annual meeting, Columbus OH, October **2002**. •
72. “Mapping Census 2000: Evaluating an Atlas Designed to Accommodate Impaired Color Vision” (second author with G.W. Hatchard), NACIS annual meeting, Columbus OH, October **2002**.
73. “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 OH, October **2002**. •

Five related presentations with M.A. Harrower:

74. “ColorBrewer: A Web Tool for Selecting Color Schemes for Maps and Graphs” (invited paper, first author), ASA Joint Statistical Meetings, New York NY, August **2002**. •
75. “Using ColorBrewer to Design Color Schemes for Maps of Demographic Data” (invited technical exhibit, second author) ASA Joint Statistical Meetings, New York NY, August **2002**. •
76. Map Gallery poster, “ColorBrewer: A Web Tool for Selecting Color Schemes for Maps” (first author), ESRI International User Conference, San Diego CA, July **2002**. •
77. “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 CA, May **2002**. •
78. “Color for Dummies: Online Tools for Selecting Map Color Schemes,” (second author), AAG annual meeting, Los Angeles CA, March **2002**.

79. “Color as an Analytical Symbol for Data Representation” (invited host of luncheon roundtable), ASA Joint Statistical Meetings, New York NY, August **2002**. •
 80. “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**. •
 81. “Analytical Color Use in Visualization: Symbolizing Space-Time Data” (invited presentation), Space-Time Information Systems meeting sponsored by BioMedware, Ann Arbor MI, January **2002**. •
- Seven related presentations: “Mapping Census 2000: The Geography of U.S. Diversity”*
82. Invited colloquium, Department of Geography, University of Delaware, November **2002**. •
 83. Invited colloquium, Department of Geography, Syracuse University, September **2002**. •
 84. Invited colloquium, Department of Geography, State University of New York at Buffalo, March **2002**. •
 85. Invited colloquium, Department of Geography, Pennsylvania State University, September **2001**. •
 86. Paper (second author with T.A. Suchan), NACIS annual meeting, Portland OR, October, **2001**.
 87. Poster (first author with T.A. Suchan), NACIS annual meeting, Portland OR, October **2001**. •
 88. Map Gallery poster (second author with T.A. Suchan), ESRI International User Conference, San Diego CA, July **2001**. •
89. “Practical Approaches to Mapping Epidemiological Data” (invited presentation to staff), Medical Examiner’s Office, Delaware County PA, May **2001**. •
 90. “Prototype for a First Atlas of Census 2000” (first author with T.A. Suchan), AAG annual meeting, New York NY, February/March **2001**. •
 91. “Planning a First Atlas of Census 2000: *Mapping Change*” (poster, second author with T.A. Suchan), NACIS annual meeting, Knoxville TN, October **2000**. •
 92. “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 PA, April **2000**.
 93. “Evaluation of a Model for Predicting Simultaneous Contrast on Color Maps,” Inter-Society Color Council (ISCC) Second Panchromatic Meeting, Savannah GA, February **2000**. •

94. "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"

95. National Cancer Institute, Division of Cancer Control and Population Sciences, Bethesda MD, November **1999**. •
96. National Center for Health Statistics, Office of Research and Methodology, Bethesda MD, November **1999**. •
97. "Hypothesis Generation Using Visualizations of Health Data," ICA conference, Ottawa, Canada, August **1999**. •
98. "Color Use Guidelines for Data Representation" (invited paper), Section on Statistical Graphics, ASA Joint Statistical Meetings, Baltimore MD, August **1999**. •
99. "Selecting Hue Pairs for Maps using Color Naming and Color Vision Research," ISCC annual meeting, Vancouver, Canada, May **1999**. •
100. "Teaching Concepts in Geography with GIS-based Tools" (second author with E.A. Wentz), AAG annual meeting, Honolulu HI, March **1999**.
101. "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 PA, May **1998**. •
102. "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 MD, October **1998**.
103. "State of the Art in Academic Cartography" (first author with R.B. McMaster; invited by the Cartography Specialty Group), AAG annual meeting, Boston MA, April **1998**. •
104. 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 MA, April **1998**.
105. 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**.
106. "Revise and Resubmit: The Future of Cartographic Research Publications" (organizer and chair of panel discussion), NACIS annual meeting, Lexington KY, October **1997**.

107. "Designing Color Displays for Color Vision Impairments" (co-presenter with J.M. Olson; paper invited for education program), ISCC, Baltimore MD, September **1997**. •
 108. "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 TX, April **1997**. •
 109. "Qualitative Research Methods for Cartographers" (second author with T. Suchan), AAG annual meeting, Fort Worth TX, April **1997**.
 110. "Learning Advanced Mapping Methods in the *Applied Cartographic Design* Course at Penn State" (paper), NACIS annual meeting, San Antonio TX, October **1996**. •
 111. "Evaluation of Map Color Schemes for the NCHS Mortality Atlas" (first author with A.M. MacEachren and L.W. Pickle), AAG annual meeting, Charlotte NC, April **1996**. •
 112. Organized two sessions: "The NCHS *Atlas of United States Mortality*" and "Ninth Annual Student Honors Competition," AAG annual meeting, Charlotte NC, April **1996**.
- Three related papers:* second author with A.M. MacEachren and L.W. Pickle
113. "Assessing Methods for Depicting Data Reliability on Mortality Maps," AAG annual meeting, Charlotte NC, April **1996**.
 114. "Mapping Health Statistics: Representing Data Reliability," 17th ICA Conference, Barcelona, Spain, September **1995**.
 115. "Representing Uncertainty on Statistical Maps" (invited paper), Statistical Graphics Section of the ASA meeting, Orlando FL, August **1995**.
116. "Spectral Schemes: Controversial Color Use on Maps" (first author with A.M. MacEachren and L.W. Pickle), NACIS annual meeting, Wilmington NC, October **1995**. •
 117. "Question Construction Effects on Response-Time Results in Cartographic Color Research" (paper), AAG annual meeting, Chicago IL, March **1995**. •
 118. Discussant for session "Facing the Digital Map: A Discussion of Solutions to Computer Production and Publication Problems," AAG annual meeting, Chicago IL, March **1995**.
 119. "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 FL, February **1995**. •
 120. "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 MD, July **1994**. •
 121. "Teaching Cartography Today: From Crow Quill to Computer" (panel member), AAG annual meeting, San Francisco CA, March/April **1994**.

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

122. Invited talk, Department of Geography, University of California at Santa Barbara, October **1993**. •
123. Paper, Color Hard Copy and Graphic Arts III conference of IS&T and SPIE, San José CA, February **1994**. •

124. "Color Representation of Aspect and Slope Simultaneously" (first author with K.A. Marlow), Auto-Carto-11, Minneapolis MN, October/November **1993**. •

Two related presentations: "Color Selection for Geographic Data Analysis and Visualization"

125. Paper, GIS/LIS annual conference, San José CA, November **1992**. •
126. Invited talk, Department of Geography, Pennsylvania State University, January **1993**. •

127. "An Extension of the Hunt Model of Color Appearance to Predict Simultaneous Contrast Effects on Computer-Displayed Map Colors," ISCC annual meeting, Princeton NJ, June **1992**. •

128. "Prediction of Surround Effects on Map Color Appearance: Model Evaluation" (winning paper in Nystrom Competition), AAG annual meeting, San Diego CA, April **1992**. •

129. "Mapping with the Macintosh Computer" (workshop leader with D.E. Fitzsimons and E.J. Turner), AAG annual meeting, San Diego CA, April **1992**.

130. "Modelling Surround-Induced Changes in Map Color Appearance" (poster), ICA, Bournemouth, England, September **1991**.

131. "The Effect of Color on the Perception of Map Scale," AAG annual meeting, Toronto, Canada, April **1990**. •

132. "Color Chart Use in Map Design," NACIS annual meeting, Ann Arbor MI, October **1989**. •

133. "Use of Thematic Mapper Imagery for Updating a Vector-Based GIS," AAG annual meeting, Baltimore MD, March **1989**. •

134. "Maps for the Color Deficient: Experimental Results" (second author with J.M. Olson, J.B. Moore, and M.H. Martel), AAG annual meeting, Baltimore MD, March **1989**.

135. Color Education Panel (invited panel member), ISCC annual meeting, Chicago IL, April **1989**.

136. "Color in Cartography: Useful Theory for Production and Research" (workshop leader with J.M. Olson), AAG annual meeting, Portland OR, April **1987**.

137. "Printed Munsell Charts for Selecting Map Colors," AAG annual meeting, Minneapolis MN, May **1986**. •

138. “Color Harmony in Cartography,” AAG annual meeting, Detroit MI, April 1985. •

Teaching and Advising

Courses Taught

The Pennsylvania State University, Department of Geography, 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

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

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

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

Map Design
Introduction to Cartography

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

Introduction to Cartography
Production Cartography
Compilation and Cartographic Design

Graduate Advisees

PSU

Adrienne Gruver (MS), *Epidemiological Exploratory Data Analysis Tasks in a Geovisualization Environment*, 2009.

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

María Zúñiga Anton (University of Zaragoza, Spain, PhD), *Propuesta Cartográfica Para la Representación y Análisis de la Variable Población Mediante Sistemas de Información Geográfica e Infografía: El Caso Español* (Mapping Population), 2009.

Tom Auer (MS), *Explicitly Representing Geographic Change in Map Animations with Bivariate Symbolization*, 2009.

Anthony Robinson (PhD), *Design for Synthesis in Geovisualization*, 2008.

Tania del Mar López Marrero (PhD), *Adaptive Capacity and Resilience to Floods in the Caribbean: A Case Study of Two Flood-Prone Communities in Puerto Rico*, 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 (University of Marne-le-Vallée, France, 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.

Beverly 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

Selected Consulting

ESRI Inc.:

Multi-scale map design, with B.P. Buttenfield, 2005 to 2008.

Cartographic critique of ArcGIS 9.0, with B.P. Buttenfield, 2004/05.

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

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

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

Elected University and College Service Positions at Penn State

University Promotion and Tenure Committee:

Member, 2009 to 2011.

University Faculty Senate:

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.

College of Earth and Mineral Sciences:

Chair, Faculty Advisory Committee, 2004 to 2007.

Membership and Service to Professional Associations

National Research Council (NRC), National Academy of Sciences:

Member of Committee on Research Priorities for the USGS Center of Excellence for Geospatial Information Science, 2006/07.

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.

International Cartographic Association (ICA):

Judge, International Map Exhibition, 2003, 2005, 2007.

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

Webmaster for <http://www.usnc-ica.org>, 2004 to 2008.

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

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.

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 Systems*).

The British Cartographic Society (BCS):

Member of Editorial Board for *The Cartographic Journal*, August 2009 to present.

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

International Journal of Health Geographics

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.