

# ELISABETH S. NELSON

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## Education

University of South Carolina	1992-1995	Ph.D.	Geography
University of South Carolina	1987-1989	M.S.	Geography
University of North Carolina at Charlotte	1983-1987	B.S.	Geography

## Academic Employment History

UNC-Greensboro	Associate Professor	2002 – present
UNC-Greensboro	Director of Graduate Studies	2003 - 2007
UNC-Greensboro	Assistant Professor	1999 - 2002
San Diego State University	Assistant Professor	1996 - 1999
San Diego State University	Lecturer	1995-1996
University of South Carolina	Teaching Assistant	1994-1995

## Research and Teaching Interests

Cognitive and Perceptual cartography  
Thematic cartography and map design  
Geographic Information Science

## Publications

### Books

- 2016 *Exploring Geospatial Technology*. 3<sup>rd</sup> edition. Dubuque, Iowa: Kendall Hunt. Co-author: James A. Nelson (in progress)
- 2014 *Exploring Geospatial Technology*. 2<sup>nd</sup> edition. Dubuque, Iowa: Kendall Hunt. Co-author: James A. Nelson
- 2013 *Exploring Geospatial Technology*. Dubuque, Iowa: Kendall Hunt. Co-author: James A. Nelson

### Articles in Refereed Journals

- 2012 *Landscape Controls over Major Nutrients and Primary Productivity of Arctic Lakes*. **Cartography and Geographic Information Science**. 39:4. Co-authors: Prasad Pathak, Roy Stine, Anne Hershey, Stephen Whalen, Zhi-Jun Liu.

- 2008 *Amending the North Carolina Constitution: Spatial and Political Enfranchisement as Portrayed by Delegate Votes and Voter Representation in 1835*, **North Carolina Geographer**, v. 16: 36-49. Co-author: James C. Burke
- 2007 *Face Symbols: Research Issues and Cartographic Potential*, **Cartographica**, v. 42(1): 53-64
- 2006 *The Battle of Guilford Courthouse: Using Cartographic Animation to Enhance Understanding of Historic Landscapes*, **Research in Geographic Education**, v. 8: 73-89. Co-authors: R. Stine and M. Swaim
- 2002 *The Impact of Bivariate Symbol Design on Task Performance in a Map Setting*, **Cartographica**, v. 37(4): 61-78 (issue is dated 2000, but article submitted and printed in 2002).
- 2001 *Visualizing Data Uncertainty: A Case Study using Graduated Symbol Maps*, **Cartographic Perspectives**, no. 38: 19-36. Co-author: Laura Edwards.
- 2000 *Designing Effective Bivariate Symbols: The Influence of Perceptual Grouping Processes*, **Cartography and Geographic Information Science**, v. 27(4): 261-278.
- 1999 *Using Selective Attention Theory to Design Bivariate Point Symbols*. **Cartographic Perspectives**, No. 32: 6-28.
- 1998 *Using Flow Maps to Visualize Time-Series Data: Comparing the Effectiveness of a Paper map Series, a Computer Map Series, and Animation*. **Cartographic Perspectives**, No. 30: 47-64. Co-author: H. Johnson.
- 1997 *Visual Search Processes and the Multivariate Point Symbol*. **Cartographica**, v.34(4):19-33. Co-authors: D. Dow, C. Lukinbeal, R. Farley.
- 1996 *Cognitive Maps: Encoding and Representing Spatial Information within the Mind*. **Cartography and Geographic Information Systems**, v. 23(4): 229-247.
- 1996 *Males, Females, and Maps: Evaluating Spatial Encoding Strategies*. **Cartographic Perspectives**, no. 25: 3-18.
- 1994 *Colour Detection on Bivariate Choropleth Maps: The Visual Search Process*. **Cartographica**, v. 31(4): 33-43.
- 1990 *Map Communication on High Resolution CRT's: The Effects of Number of Classes and Hue in the Interpretation of Choropleth Maps*. **Cartographica**, v. 26(2): 40-52. Co-author: P. Gilmartin.

#### Chapters in Books

- 2010 *Dasymetric Maps*. In Barney Warf (ed.), **Encyclopedia of Geography**. Sage Publications.
- 2008 *Instructional Geographic Information Science: A Multidisciplinary Framework for Geospatial Technologies in Education*, In A. Milson and M. Alibrandi (Eds), **Digital Geography: Geo-spatial Technologies in the Social Studies**

**Classroom.** Greenwich, CT: Information Age Publishing. Co-authors: Bunch, R. Lloyd, R., Kane, M., and Tricot, T.

- 1996 *An Evaluation of Multivariate, Quantitative Point Symbols for Maps.* In Clifford H. Wood and C. Peter Keller (eds.), **Cartographic Design: Theoretical and Practical Perspectives.** England: John Wiley & Sons, Ltd. Co-author: Patricia Gilmartin.

#### Professional Magazines

- 2006 *Geographic Information Science in Health: Priming the Pump, Directions Magazine,* May 31, 2006. <<http://www.directionsmag.com>>. Co-authors: Rick L. Bunch, Jeffrey C. Patton, Carly L. Hertz, and Roy S. Stine
- 2006 *Academic Publishing and the Role of Open Access, ACSM Bulletin.*

#### Book Reviews

- 1996 A review of *How Maps Work: Representation, Visualization, and Design* by Alan M. MacEachren. In **Cartographic Perspectives**, no. 24 (Spring): 27-30.

#### Software Reviews

- 1997 A review of *MAPublisher 2.0* by Avenza Software. In **GeoInfo Systems**, April 1997: 51-52.

#### Unpublished Manuals

- 2006 *Graduate Student Handbook*, 2<sup>nd</sup> edition. Department of Geography, University of North Carolina at Greensboro.
- 2005 *GIS and Public Health: A GIS Workbook.* Department of Geography, University of North Carolina Greensboro. 76 pages. Co-authors: R. Bunch, and R. Stine.
- 2005 *GIS and Public Health: A GIS Primer.* Department of Geography, University of North Carolina at Greensboro, 46 pages. Co-authors: R. Bunch and R. Stine.
- 2004 *Graduate Student Handbook.* Department of Geography, University of North Carolina at Greensboro.

### **Professional Presentations**

- 2005 *Map Prototype: Experts and Novices*, Annual Meeting of the Association of American Geographers, Chicago, IL. Co-authors: J. Patton (presenter), R. Bunch, R., and R. Williams.
- 2005 *GIS and the Dasymetric Map: A Cartography Lab Exercise*, National Council for Geographic Education, 2005 Annual Meeting, October 12-15, Birmingham, Alabama.

- 2004 *Defining the Map Prototype*, North American Cartographic Information Society, 24<sup>th</sup> Annual Meeting, October 6-9, Portland, Maine. Co-authors: R. Williams, J. Patton (presenter), R. Bunch.
- 2001 *Bivariate Symbol Design for Thematic Maps: Concepts and Guidelines*, Southeastern Division of the Association of American Geographers, 21<sup>st</sup> Annual Meeting, November 18-20, Lexington, Kentucky.
- 2001 *The Impact of Bivariate Symbol Design on Task Performance in a Map Setting*, North American Cartographic Information Society, 21<sup>st</sup> Annual Meeting, October 3-6, Portland, Oregon.
- 2000 *Visualizing Data Uncertainty on Graduated Symbol Maps*, Association of American Geographers Southeastern Division, 55<sup>th</sup> Meeting, November 18-21, 2000.
- 1999 *Creating 2-d and Interactive 3-d Maps for Web-based Delivery*, Applied Geography Conference, October 13-16, Charlotte, North Carolina.
- 1999 *Selective Attention and the Design of Map Symbols*, Association of American Geographers, 95<sup>th</sup> Annual Meeting, March 23-27, Honolulu, Hawaii.
- 1998 *Symbol Functionality and the Role of Selective Attention in Cartographic Design*, North American Cartographic Society, 18<sup>th</sup> Annual Meeting, October 7-10, Milwaukee, Wisconsin.
- 1998 *Search Processes and Multivariate Symbols: A Case Study using Chernoff Faces*, Association of American Geographers, 94<sup>th</sup> Annual Meeting, March 25 - 29, Boston, Massachusetts (with D. Dow, C. Lukinbeal, R. Farley).
- 1997 *Visualizing Flow Lines through Time: A Comparison of Animated Maps and Chess Maps*, North American Cartographic Society, 17<sup>th</sup> Annual Meeting, October 1-4, Lexington, Kentucky (with H. Johnson).
- 1997 *Visualizing the Tijuana River Watershed for Environmental Research and Education*, GIS/LIS, October 28-30, Cincinnati, Ohio (with R. Wright and H. Johnson).
- 1997 *Search Processes and Multivariate Symbols: A Case Study using Chernoff Faces*, Colloquium, Department of Geography, University of California -Santa Barbara, December 4, Santa Barbara, California (with D. Dow, C. Lukinbeal, R. Farley).
- 1996 *Orienteering in the United States: Geographic Patterns of Participation*, North American Cartographic Information Society, 16<sup>th</sup> Annual Meeting, October 2 - 5, San Antonio, Texas.
- 1996 *Gender Differences in Encoding Spatial Information*, Association of American Geographers, 92<sup>nd</sup> Annual Meeting, April 9 - 13, Charlotte, North Carolina.
- 1995 *Assessing Theories of the Mental Representations of Map Knowledge*, Association of American Geographers, 91<sup>st</sup> Annual Meeting, March 14 - 18, Chicago, Illinois.
- 1994 *An Evaluation of Multivariate, Quantitative Point Symbols for Maps*, Symposium on Cartographic Design and Research, August 7-8, Ottawa, Ontario, Canada (with P. Gilmartin).

- 1994 *Color Identification in the Visual Search Process*, Association of American Geographers, 90th Annual Meeting, March 29 - April 2, San Francisco, California.
- 1988 *The Image Mapping Process*, South Carolina Academy of Sciences, March 1988, Orangeburg, South Carolina.

## **Grants**

- 2011 **Online Course Development**. UNCG College of Arts and Sciences: \$5000.00
- 2005 **GIS and Public Policy Dimensions: Emerging and Merging Solutions to Bioterrorism**. Funding Agency: *NC Department of Health and Human Services*. (Co-principal investigators: R. Stine and R. Bunch). Funding Amount: \$15,000.
- 2000 **Using Bivariate Maps to Test Selective Attention Theory**. Funding Agency: *UNC-Greensboro*, New Faculty Grant. Funding Amount: \$2,170.
- 1999 **The Development of Bivariate Crop Rotation Maps**. Funding Agency: *NOVARTIS*. (Co-principal investigators: R. Stine and J. Patton). Funding Amount: \$10,000.
- 1999 **Protocols for Translating Hierarchical Databases to Relational Databases for GIS**. Funding Agency: *NOVARTIS*. (co-principal investigators: R. Stine and J. Patton). Funding Amount: \$10,000.
- 1998 **The Transborder Watershed Research Program**. Funding Agency: *Southwest Center for Environmental Research and Policy*. (Co-Principal Investigators: W. Brady, R. Gersberg, S. Guhathakurta, G. Hepner, J. Stromberg, A. Sweedler, G. Whysong, and R. Wright). Funding Amount: \$750,000.
- 1997 **A Study of Selective Attention for Graphic Variables Used in Cartographic Symbolization**. Funding Agency: *San Diego State University Foundation*, Faculty Grant-in-Aid. Funding Amount: \$6500.
- 1996 **Tijuana River Watershed GIS Education Materials**. Funding Agencies: *National Oceanic and Atmospheric Administration* and *San Diego Association of Governments*. (Co-Principal Investigator: R. Wright). Funding Amount: \$16,800.
- 1994 **Doctoral Dissertation**. Funding Agency: *National Science Foundation*, SBR-9500196. (Co-Principal Investigator: P. Gilmartin). Funding Amount: \$4,874. May 1995 - May 1996.

## **Maps and Graphic Design**

- 2008 **AutoCarto Conference Logo**, 2009
- 2008 **Auto Carto Final Program Design**, 2008
- 2007 **Map Series**. Anderson, J. *The Rebel Den of Nung Tri Cao*, University of Washington Press.

## Awards

- 2013 PowerUp Online Teaching Workshop Stipend
- 1998 **Faculty Fellow**, Education Center for Computational Science and Engineering, San Diego State University
- 1994 Sigma Xi Grants-in-Aid of Research
- 1994 Educational Foundation Student Research Fund, University of South Carolina
- 1994 Cartography Specialty Group Honors Paper Competition Winner, AAG
- 1987-89 Rhude Patterson Fellowship, University of South Carolina
- 1986 Honorable Mention, ACSM Map Design Contest
- 1983 -87 Colvard Academic Scholarship, University of North Carolina at Charlotte

## Advising

### Doctoral (\* indicates committee chair)

- 2016 Abee, Michelle. *The Mercator Projection in Science* (in progress)
- 2014 Altaher, A. *To Dream the American Dream: A Spatial Assessment of Developing-Country Immigrants' Housing Choices and Quest for Upward Mobility* (in progress)
- 2013 Campbell, R. *Transformations in the Belize Sugar Industry: From Colonial Plantations to a Vital Tourist Industry*.
- 2013 Gramopadhye, J. *Quantitative Analysis of Resource Conflict and Urban Sustainability – A GIScience Based Approach*.
- 2012 Watson, C. *Analysis of urban heat island climates along the I-85/I-40 corridor in central North Carolina*.
- 2010 Tricot, T. *Instructional Geographic Information Science: Map Overlay and Spatial Abilities*.
- 2009 Williams, R. *Nineteenth Century Bird's Eye Views in America: Defining Sense of Place*.
- 2008 Burke, J. *The Railroads of Antebellum North Carolina: A Study in Historical and Political Geography*.
- 2001 Dow, D. *The Effects of Symbolic Iconicity on Grouping and Pattern Recognition in Virtual Environments*. (San Diego State University).

### Masters (\* indicates committee chair)

- 2016 Molina, Ale. *Defining the Map Prototype*. (in progress)
- 2014 Sinykin, Alex. *Urban Vegetation and the Environmental Health of Sixteen Global Cities*.
- 2013\* Gallaway, D. *Teaching GISc Concepts Using Multimedia Learning Modules Created from Cognitive Load Theory Guidelines*. Non-thesis option.

- 2012 Hedgpeth, J. *Creating a Social Vulnerability Index for the Piedmont Triad Region*. Internship option
- 2011 Edwards, S.J. *Geographic Information Systems in the Social Sector: Trends, Opportunities, Barriers, and Best Practices*. Thesis option.
- 2011\* Doss, K. *Parcel Mapping Applications*. Non-thesis option.
- 2008\* Henderson, A. *GIS Server Administration Guide for Piedmont Triad Council of Governments*. Internship option.
- 2007 Cox, C. *Exploring CCD Imaging*. Non-thesis option.
- 2007 Chance, G. *The Effects of Mason Inlet's Movements on the Shell Island Holiday Resort*. Non-thesis option.
- 2006 Hertz, C. *The Role of Geographic Information Systems in Epidemiology and Public Health*. Internship option.
- 2006 Sattler, L. *U.S. Department of Housing and Urban Development: Funding and Minority Homeownership in North Carolina*. Internship option.
- 2006\* Inscore, B. *Exploring the Appropriateness of Porter's Diamond Model; Standard Operating Procedures for Stormwater Infrastructure and Conveyance System Inventory Project: Data QA/QC Corrections to Consultant-Delivered Citywide Dataset*. Non-thesis option.
- 2006\* Horney, J. *Urban Poverty and Regional Inequity: Is Sprawl to Blame?* Non-thesis option.
- 2005 Bruton, C. *Greensboro Comprehensive Parks and Recreation Master Plan Update*. Internship Option
- 2005 McGinn, C. *Cape Fear Council of Governments Region "O" Open Space Inventory and Strategy*. Internship Option.
- 2005\* Brown, D. *Determining Park Visitor Profiles Using a Geographic Approach*. Internship Option.
- 2005 Armbruster, A. *The Role of Environmental Education in Fostering Pro-environmental Behavior Change*. Internship Option.
- 2004 Williams, R. *Panoramic Maps: A Bird's Eye View of the American Town*. Thesis Option.
- 2004 Brown, E. *An Analysis of the City of Greensboro SafeLight Program*. Internship option.
- 2003\* Renken, R. *The Geography of Low-weight Births in Guilford County, 2000-2002*. Internship Option.
- 2001\* Barden, S. *Adolescent Pregnancy in North Carolina: An Interactive Map Display*.
- 1999\* Edwards, L. *Representing Data Uncertainty on Graduated Symbol Maps* (Thesis; SDSU)
- 1999\* Zmudka, T. *The Effects of Terrain Representation on the Interpretation of Recreational Trails Maps*. (Thesis; SDSU).

- 1998\* Bost, A. *Assessing Efficiency Differences for Common Spatial Tasks: A Comparison between Screen-based Maps and Paper Maps*. (Thesis; SDSU).
- 1997\* Johnson, H. *Visualizing Flow Lines: A Comparison of Animated Maps and Chess Maps*. (Thesis; SDSU).

## **Service**

### Participation in Professional Associations

- 2006 – 2009 **Editor**, *Cartography and Geographic Information Science*
- 2005 – 2008 **Member, Board of Directors**, *Cartography and Geographic Information Society*
- 2001 – 2007 **Member**, *Cartographic Perspectives* **Editorial Board**
- 2000 - 2002 **Secretary/Treasurer**, *Cartography Specialty Group*, Association of American Geographers
- 2002 **Member**, *Resolutions Committee*, Association of American Geographers, Southeastern Division
- 1998 – 2000 **Academic Director**, *Cartography Specialty Group*, Association of American Geographers
- 1997 - 2000 **Cartographic Advisor**, *Professional Geographer*
- 1997 - 1999 **Member, Board of Directors**, *North American Cartographic Information Society*
- 1994 - 1995 **Student Director**, *Cartography Specialty Group*, Association of American Geographers

### Participation in the Unpublished Review Process: Manuscripts and Proposals

- 2013 *Professional Geographer*
- 2008 *Cartography and Geographic Information Science*
- 2007 *Cartography and Geographic Information Science*
- 2006 *Cartographic Perspectives*
- 2005 *Cartographic Perspectives, National Science Foundation*
- 2004 *National Science Foundation*
- 2003 *Psychonomic Bulletin, Cartographic Perspectives*
- 2003 *Cartographic Perspectives*
- 2002 *Cartographica, Cartographic Perspectives*
- 2001 *Cartography and Geographic Information Systems, Professional Geographer, Cartographica*
- 2000 *Cartographic Perspectives, Cartographica*
- 1999 *Professional Geographer, Southeastern Geographer, GEOMATICA*
- 1998 *John Wiley & Sons, Inc., Professional Geographer, Cartography Specialty Group – Master’s Research Grant Proposals*
- 1997 *Journal of Geography, Prentice-Hall, Inc.*
- 1996 *Cartographica, National Science Foundation*



### Participation in Professional Conferences

- 2006 *Registration Desk*, AutoCarto 2006, June 25 – 28, Vancouver, Washington.
- 2006 *Session Chair*, AutoCarto 2006, June 25 – 28, Vancouver, Washington.
- 2006 *The Cartography and Geographic Information Society Board Meeting*, American Congress on Surveying and Mapping Annual Conference, April 22-25, Orlando Florida.
- 2005 *The Cartography and Geographic Information Society Board Meeting*, American Congress on Surveying and Mapping Annual Conference, March 19-23, Las Vegas Nevada.
- 2003 *Paper Discussant*, 58th Annual Meeting of the Southeastern Division of the Association of American Geographers, Charlotte, North Carolina.
- 2003 *Editorial Board Meeting*, 23<sup>rd</sup> Annual Meeting of the North American Cartographic Information Society, Jacksonville, Florida.
- 2001 *Cartography Specialty Group Board and Business Meetings*, 98<sup>th</sup> Annual Meeting of the Association of American Geographers, Los Angeles, CA.
- 2001 *Cartography Specialty Group Board and Business Meetings*, 97<sup>th</sup> Annual Meeting of the Association of American Geographers, New York, New York.
- 2000 Organized and chaired a session on *Spatial Cognition*, 55<sup>th</sup> Meeting of the Association of American Geographers, Southeastern Division
- 1999 Chaired a session on *Tourist Mapping*, 19<sup>th</sup> Annual Meeting of the North American Cartographic Information Society, Williamsburg, Virginia.
- 1998 Chaired a session on *Technical Aspects of Map Construction*, 18<sup>th</sup> Annual Meeting of the North American Cartographic Information Society, Milwaukee, Wisconsin
- 1997 Chaired a session on *Designing Maps with Today's Technologies*, 17<sup>th</sup> Annual Meeting of the North American Cartographic Information Society, Lexington, Kentucky.
- 1996 Organized and chaired a session on *Spatial Cognition*, 92<sup>nd</sup> Annual Meeting of the Association of American Geographers, Charlotte, North Carolina.

### Professional Memberships

Association of American Geographers  
Southeastern Division, Association of American Geographers  
American Congress on Surveying and Mapping  
Canadian Cartographic Association  
North American Cartographic Information Society

### Participation at the University Level

2015 – 2016	<b>Chair</b> , University <i>Award for Outstanding Thesis/Master’s Production Committee</i>
2015-2016	<b>Member</b> , Departmental <i>Graduate Studies Committee</i>
2013-2014	<b>Member</b> , Departmental <i>Personnel Committee</i>
2012-2013	<b>Member</b> , Departmental <i>Graduate Studies Committee</i>
2010 – 2012	<b>Member</b> , University <i>Award for Innovative Use of Technology in a Thesis/Master’s Production or Dissertation Committee</i>
2010 – 2011	<b>Member</b> , UNCG <i>Faculty Professional Development and Welfare Committee</i>
2009- 2010	<b>Member</b> , Departmental <i>Space Committee</i>
2007- 2008	<b>Member</b> , College of Arts and Sciences <i>Curriculum &amp; Teaching Committee</i>
2006 - 2013	<b>Member</b> , Departmental <i>Curriculum Committee</i>
2006 - 2011	<b>Member</b> , Departmental <i>Personnel Committee</i>
2006 - present	<b>Member</b> , <i>Center for Geographic Information Science</i>
2006 - 2008	<b>Chair</b> , Departmental <i>Graduate Studies Committee</i>
2005	<b>Member</b> , Departmental search committee, <i>GIS/Urban position</i>
2004	<b>Member</b> , Departmental search committee, <i>GIS/Public Policy</i>
2004	Departmental web development, <i>Graduate Studies pages</i>
2004 – 2007	<b>Chair</b> , Departmental <i>Graduate Admissions Committee</i>
2003 – 2007	<b>Director</b> – Department of Geography <i>Graduate Studies</i>
2001 - 2002	<b>Member</b> , UNCG <i>Instructional Technology Committee</i>
2001 - 2002	Departmental <i>Library Liaison</i>
2000- 2005	<b>Member</b> , UNCG <i>General Education Core Global and Nonwestern Perspectives Committee</i>
1999 - 2001	<b>Member</b> , College of Arts and Sciences <i>Harriet Elliot Lecture Committee</i>
1998 - 1999	<b>Member</b> , Departmental <i>Policy Advisory Committee (SDSU)</i>
1998 - 1999	<b>Member</b> , Departmental <i>Curriculum Committee (SDSU)</i>
1996 - 1998	<b>Chair</b> , Departmental <i>Internal Resources Committee (SDSU)</i>
1995 - 1996	<b>Member</b> , Departmental <i>Internal Resources Committee (SDSU)</i>

### Participation within the Community

2005	Director, GIS and Public Health: Workshop Series, Summer 2005. co-directors: R. Bunch and R. Stine.
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