

Nicholas Ramsey Chrisman

Education

- 1979-82 University of Bristol (England), **Ph.D.** in geography
Thesis titled: *Methods of spatial analysis based on error in categorical maps*
- 1968-72 University of Massachusetts–Amherst, **B.A.**, *magna cum laude*, geography.
- 1970 Université de Strasbourg (France) auditeur libre

Employment

- 2005- Professeur titulaire, Université Laval, Sciences géomatiques
Directeur scientifique, Réseau GEOIDE Network
- 1999-2004 Professor, University of Washington, Department of Geography
- 1990-99 Associate Professor, University of Washington, Department of Geography
- 1987-90 Assistant Professor, University of Washington, Department of Geography
- 1982-87 Assistant Professor, University of Wisconsin–Madison
Department of Landscape Architecture & Institute for Environmental Studies
- 1972-82 Programmer/Analyst, Laboratory for Computer Graphics and Spatial
Analysis, Graduate School of Design, Harvard University

Research Interests

Geographic Information Systems (GIS): 39 year experience; output: 2 books; 100 scientific articles (over 65 reviewed outlets); h-index: 23 (*23 works with over 23 citations*)

Science and Technology Studies (STS): 10 year engagement
See Bibliography for titles and places of publication.

Science Management

GEOIDE Network (2005-present): Direction of interdisciplinary teams at 30 Canadian Universities (134 researchers, 247 students, 25M\$ from NCE & 9M\$ from others)

Personal Details

Born 18 September, 1950 in Northampton, Massachusetts USA; US Citizen
Permanent Resident of Canada, Citizenship applied for; fluent in French, middling oral Spanish.

Research Grants and Contracts

At Université Laval

- 2012-13 *GEOIDE Network Management Funds*, Networks of Centres of Excellence, 408,000\$
- 2009-12 *GEOIDE Network Phase IV*, Networks of Centres of Excellence, Scientific Director, 3,500,000\$CAD/ year; 1.3M\$/year non-NCE cash contributions
- 2008-12 *Situating geographic information analysis: Retrospective case studies*, Social Sciences and Humanities Research Council of Canada, PI, 25,000\$CAD /year
- 2005-09 *GEOIDE Network Phase III*, Networks of Centres of Excellence, Scientific Director, 3,500,000\$CAD/ year; 6,120,000\$ non-NCE funds (total)

At University of Washington

- 2000 Invited for 3 months as Chercheur associé, Unité Mixte de Recherche ESPACE, Centre Nationale de la Recherche Scientifique, Montpellier France.
- 1998-01 *Social Construction of GIS*, National Science Foundation, PI, \$84,000
- 1998-00 *Clearinghouse for GIS Data*, Olympic Natural Resource Center, US Forest Service, US Geological Survey, Co-PI (D. Peterson PI), \$43,000 + \$61,000
- 1995-96 *Social Practice of GIS: LLRW Siting*, Royalty Research Fund, \$12,000
- 1994-95 *Facilitating Collaborative Learning and Critical Thinking in a GIS Laboratory for Undergraduate Education*, National Science Foundation Instrumentation Grant, Timothy Nyerges, Principal Investigator, \$25,000
- 1994 *Issues in Data Quality*, Institut Géographique Nationale (France), \$3,000
- 1993-94 *Accuracy Study for California Timberland Task Force*, subcontract with University of California-Santa Barbara, Michael Goodchild PI, \$12,000
- 1988-91 *Modelling Error in Overlaid Categorical Maps*, National Science Foundation, Principal Investigator. \$80,000

At University of Wisconsin

- 1986-87 *Evaluate Alternatives for Conservation Planning*, USDA Hatch \$40,000
- 1985-86 *National Charting Accuracy Standards*, Charting and Geodetic Services, National Ocean Service, NOAA [sole principal investigator] \$68,000
- 1983-86 *Dane County Land Records Project*, cooperative project with LCC, other Dane County agencies, SCS, US GS, BLM, Wisc Depts of Ag and Natural Resources, USDA Hatch [with four others] \$100,000

At Harvard Laboratory for Computer Graphics

- 1979-81 *Countervailing Population Redistribution: Factors Influencing Inner-City Revitalization*, National Science Foundation, Geography Program [Brian Berry PI] \$100,000
- 1974-77 *Topological Information Systems for Urban and Environmental Research*, National Science Foundation, Computer Science Div., [named coprincipal] \$230,000

Professional Service

- 2011-12 member, Panel on Developing Science, Technology and Innovation Indicators for the Future, Committee on National Statistics, National Research Council (USA).
- 2011 member, Committee 09, Social Science and Humanities Research Council
- 2009-11 member (Board of Directors), Centre of Excellence for Integrated Resource Management (now Tecterra), Alberta (NCE-funded CECR)
- 2007-10 member Working Group on National Mapping Strategy, Canadian Council on Geomatics
- 2007-11 member, GeoBase Steering Committee, GeoConnections, Natural Resources Canada
- 2006-11 member, Science and Technology Committee, GEO Consortium, Geneva
- 2006 External reviewer, Université du Québec à Trois-Rivières, Masters in environmental sciences.
- 2004 Program Committee, Society of the Social Studies of Science, Paris.
- 2000-10 Program Review, GIScience 2000; 2004; 2006; 2008; 2010.
- 1999 Program Committee, GISOC, Minneapolis.
- 1998 Chair, Technical Programme Committee, Spatial Data Handling 98, Vancouver
- 1997-99 member, Mapping Sciences Committee, National Research Council
- 1997 Director, AUTO-CARTO 13
- 1995-7 Elected Chair, GIS Specialty Group, Association of American Geographers
- 1994 Local arrangements, *GIS and Society Workshop*. National Center for Geographic Information and Analysis.
- 1993 Peer Review Panel, National Research Council, Global Change Data and Information System
- 1993-99 Committee on Standards, Association of American Geographers
- 1993- Comité de Rédaction, **Revue Internationale de Géomatique**, Paris.
- 1993-99 Program Review, Conference on Spatial Information Theory 93; 95; 97; 99.
- 1992-94 Director, American Cartographic Association
- 1991-93 Technical Program Review, AUTO-CARTO 10; 11 (1993); 12 (1995)
- 1988-90 Editorial Board, **The American Cartographer**, American Congress on Surveying and Mapping
- 1987-88 Director, Specialty Group on GIS, Association of American Geographers
- 1987 Program Advisory Committee, International GIS Symposium, (AAG)
- 1986-87 Director, AUTO-CARTO 8 (awarded Presidential Citation by ASPRS)
- 1985-86 Subcommittee on Standards, Wisconsin Land Records Committee
- 1982-87 Chair, Working Group on Data Set Quality, National Committee for Digital Cartographic Data Standards (ACSM)
- 1983-85 Technical Program Advisor, AUTO-CARTO 6 & 7
- continual Review of research proposals for Canadian Research Councils, and those of France, USA, etc.

University Service

Université Laval

2008-14 membre, Commission de la recherche, Université Laval

2008-10 directeur (par intérim) Centre de recherche en géomatique

University of Washington

2001 Program Review, Department of Civil and Environmental Engineering (chair)

1999-00 Search Committee for Chair of Earth and Space Sciences (chair)

1998-00 Steering Committee, Interdisciplinary Group for PhD in Urban Design and Planning

1996-01 Faculty Senate

1994-04 State Environmental Policy Committee (reviews SEPA documents)

1993-99 President, UW Consortium for Geographic Information and Analysis

University of Wisconsin–Madison

1986-87 Computing Center Advisory Committee

1986 *ad hoc* Committee on the Mission of the Academic Computing Center

1982-87 Information Technology Committee, College of Agricultural & Life Sciences

Departmental Service

Université Laval

2010- Comité de programme deuxième et troisième cycles, département des sciences géomatiques

2005 Search Committee for Junior Chair of Canada position

University of Washington

1999-00 Strategic Planning Committee

1998-99 Outreach and Fund-raising Committee

1988-03 Graduate Admissions Committee

1997-98 Curriculum Committee

1994-95 Executive Committee

1991-92 Graduate Program Coordinator (chairs Admissions Committee; advises students)

Community Service

- 1991-92 Land Use Transition Advisory Committee, City of Bainbridge Island
1991 Environmentally Sensitive Advisory Committee, City of Bainbridge Island
1989-95 South Bainbridge Community Association: environmental advocacy

Technical Roles

- 1997-98 49th Parallel as cartographic construction, Public Defender, Whatcom County.
1991-94 Accuracy Assessment Task Force, California Forestry Dept. (UC Santa Barbara)
1991-95 Coastal Wetland Change Program, US National Marine Fisheries Service
1982-87 substantial interactions with local governments in Wisconsin
1971-72 Consultant to Bureau of Equal Educational Opportunities, Commonwealth of Massachusetts

Editorial Responsibilities

- 2012 co-editor, Proceedings volumes, Global Geospatial Conference 2012.
2009 Guest Editor, special issue of **Geomatica**, GEOIDE Student papers.
1998 Editor (with Thomas Poiker), **Proceedings Spatial Data Handling 98**.
1997 Editor, **Proceedings AUTO-CARTO 13**.
1996-99 Associate Editor, **Cartography and Geographic Information Systems**
1986-87 Editor, **Proceedings AUTO-CARTO 8**.
1983-85 Co-editor, **Wisconsin Land Information Newsletter**, (4 issues).
1977-81 Paper selection for 1977 Symposium on topological data structures and Harvard Graphics Weeks 1978-81.
Reviewing of articles for **Cartographica**, **International Journal of Geographical Information Science**, **Photogrammetric Engineering and Remote Sensing**, **Transactions in GIS**, **GeoInformatica**, **Annals AAG**, **Professional Geographer**, **Cartography and Geographic Information Systems**, **Geographical Analysis**, **Landscape Journal**, **Communications of the Association of Computing Machinery**, **IEEE Computer Graphics & Applications**, **Canadian Journal of Statistics**, **URISA Journal**, **Journal of Remote Sensing**, **Journal of Forestry**, **The Information Society**, etc.
Reviewing book manuscripts for Prentice Hall, Butterworth, Taylor Francis, Wiley, MIT Press.

Programming Experience

- Experience with compilers, graphics devices, packages on 18 operating systems.
1975-81 *ODYSSEY: a system for geographic information processing*
original design (with D. White), participated in pre-commercial development;
wrote *WHIRLPOOL: a program for polygon overlay* (with J. Dougenik)
1972-74 *POLYVRT: a program to convert geographic base files*

Consulting

- 2007 Kim Geomatics, evaluation of geomatics prospects for Québec region, Pole QCA
- 2002-03 Geotrac, Dublin OH: Natural Hazards risk models for insurance industry
- 1996-97 ESRI, Redlands CA: database design for synthetic environments
- 1995 ESRI, Redlands CA: database design strategies for Defense Mapping Agency
- 1993-94 GIS advice for China in Space and Time. (University of Washington CSDE)
- 1993 Bliss Riordan, Anchorage AK (law firm); data quality of nautical charts
- 1992 IRIS Data Management Center: applicability of GIS to seismology
- 1990-92 ESRI, Redlands CA: database design and quality assurance for Digital Chart of the World project for Defense Mapping Agency (DMA)
- 1989 Battelle, Pacific Northwest Lab Richland: peer review of environmental database management system for Hanford site cleanup
- 1988-89 King County WA, Planning Graphics: assist in selection of GIS software
- 1987-89 ESRI, Redlands CA: consulting on indexing methods and data quality

Short Courses, etc.

- 2011 Advantages of networking in geomatics, Semana geomatica, IGAC, Bogota, Colombia (1 day)
- 2005 GIS Analysis, GEOIDE Summer School (2 day)
- 2001 Technical issues in GIS, University of Redlands MGIS (1 week)
- 1996 Measurement Frameworks and Transformations, ESRI (2 day)
- 1996 Teaching GIS; Association of American Geographers, Charlotte (1 day)
- 1996 Cartography and GIS, Sylviculture Workshop, US Forest Service; (1 day)
- 1995 Visualization and Data Management, Sylviculture Workshop, US Forest Service; (half day)
- 1994 Data Quality in GIS; Swiss Computer Graphics Assoc., Zurich (2 day)
- 1993 Presentation on Digitizing and Data Quality; FORMEZ, Naples Italy (2 day)
- 1986 Course for state government officials on GIS & Natural Resources (week)
- 1983 Workshop on Alternative Land Registration Policies (week)
- 1981 GIS Workshop at Soil Survey, Rothampsted (UK) (day)
- 1980 Workshop on Topological Data Structures; Ordnance Survey UK (day)
- 1976 Workshop on GIS and Digital Cartography; Manila, Philippines
- 1973-5 Workshop on Topological Data Structures; Harvard Univ. (3 1-week courses)

Bibliography

Peer-reviewed works (sorted by date)

- Chrisman N.R. 2012: Has Moore's Law been protecting us from our lack of innovation? Invited lecture, AGILE 2012, Avignon, proceedings in press, Springer Lecture Notes in Geographical Information Science.
- Devillers, R, Stein, A, Bédard, Y, Chrisman, N, Fisher, P, Shi, W. 2010: *30 years of research on spatial data quality – Achievements, failure and opportunities*. **Transactions in GIS** 14 (4) 387-400, DOI: 10.1111/j.1467-9671.2010.01224.x
- Chrisman, N.R. 2007: *Living inside networks of knowledge*, ArcNews, Fall. Reprinted in Getis, A. ed. **Essays on Geography and GIS**, ESRI Press, 25-35.
- Poore, Barbara and Chrisman, N.R. 2006: *Order from Noise: Towards a social theory of information*, **Annals AAG** 96(3) 508–523.
- Chrisman, N.R. 2006: **Charting the Unknown: How computer mapping at Harvard became GIS**. ESRI Press. 240 pp.
- Chrisman, N.R. 2005: *Communities of Scholars: Places of Leverage in the History of Automated Cartography*. **Cartography and Geographic Information Science** 35(4) 425-433.
- Chrisman, N.R. 2005: *Full Circle: More than just Social Implications of GIS*. in Harvey, F. (special issue editor) **Cartographica** 40(4) 23-35.
- Chrisman, N.R. 2005 : *Traitement de la qualité: perspective historique*. Chapitre 2, p. 25-35 in Devillers, R. & Jeansoulin, R. (eds.) **Qualité de l'information géographique**, Hèrmes. also issued in English as *Fundamentals of Spatial Data Quality*.
- Chrisman, N.R. 2004: *Les SIG: un processus historique: Passé comme point d'appui vers le futur*. Chapter 1, p. 25-54 in Roche, S. and Caron, C. (editors), **Aspects organisationnelles des SIG**. Hèrmes.
- Harvey, Francis, and Chrisman, N. 2004: *The Imbrications of Geography and Technology: The Social Construction of Geographic Information Systems*. Chapter 4, pp. 65-80 in S. Brunn, S. Cutter & J. W. Harrington Jr. (editors), **Geography and Technology**. Kluwer Academic Publishers.
- Chrisman, N.R. 2002: *Revisiting Fundamental Principles*, Chapter 2, p. 9-18 In Kidner, Higgs and White (editors) **Innovations in GIS**, Taylor & Francis.
- Sismondo, Sergio and Chrisman, N. 2001: *Deflationary metaphysics and the natures of maps*, *Philosophy of Science* 68(3), Supplement: S38-S49.
- Chrisman, N.R., 2001: **Exploring Geographic Information Systems**. John Wiley. 270 pp. (Second edition)
- Chrisman, N.R. 1999: *Taxonomy of GIS Operations: A Transformational Approach*, **International Journal of GIS** 13(7) 617-637.
- Chrisman, N.R. 1999 *What does GIS mean?* **Transactions in GIS** 3(2) 175-186.
- Chrisman, N.R. 1999: *Speaking Truth to Power: An Agenda for Change*. Chapter 3, p. 27-31

- in K. Lowell & A. Jaton (editors) **Spatial Accuracy Assessment: Land Information Uncertainty in Natural Resources**, Ann Arbor Press.
- Chrisman, N.R., 1998: *Academic Origins of GIS*, Chapter 3, p. 33-44 in T. Foresman (ed.) **The History of Geographic Information Systems: Perspectives from the Pioneers**, Prentice Hall.
- Chrisman, N.R. 1998: *Rethinking Levels of Measurement in Cartography*. **Cartography and GIS**, 25 (4) 231-242.
- Harvey, Francis and Chrisman, N. 1998: Boundary objects and the social construction of GIS technology. **Environment and Planning A**, 30(9): 1683-1694.
- Chrisman, N. and Harvey, F. 1998: *Extending the classroom: Closed and open corpus hyper-media supported learning*. **Journal of Geography in Higher Education**, 22(1), 11-18.
- Chrisman, N.R., 1997: **Exploring Geographic Information Systems**. John Wiley. 298pp. (First edition)
- Chrisman, N.R., 1997: *Beyond the snapshot: Changing the approach to change, error and process*, In M. Egenhofer and R. Golledge (editors) **Spatial and Temporal Reasoning in Geographic Information Systems**, Oxford Univ. Press.
- Chrisman, N.R. 1997: *John Sherman and the Origin of GIS*. **Cartographic Perspectives**, (27) 8-13.
- Chrisman, N.R., 1994: *Metadata required to determine the fitness of spatial data for use in environmental analysis*, Chapter 12, p. 177-190 in Michener, Brunt and Stafford (editors) **Environmental Information Management and Analysis**, Taylor & Francis.
- Chrisman, N.R. and Lester, M.K., 1991: *A Diagnostic Test for Error in Categorical Maps*, **Proceedings AUTO-CARTO 10**, 330-348.
- Chrisman, N.R., 1991: *Determination de la Qualité des Données dans les S.I.G.*, **Bulletin de la Société Française de Photogrammétrie et Télédétection**, 122: 18-23.
- Chrisman, N.R., 1991: *The error component in spatial data*, Chapter 12, p. 165-174 in Maguire, D.J., Goodchild M.F. and Rhind, D.W. (editors) **Geographical Information Systems: Overview Principles and Applications**, Longmans.
- Chrisman, N.R., 1991: *Institutional and Societal Components of Cartographic Research*, Chapter 11 in Müller, J-C. (ed.) **Advances In Cartography**, Elsevier.
- Chrisman, N.R., 1990: *Deficiencies of Sheets and Tiles: Building Sheetless Data bases*, **International Journal of Geographical Information Systems**, 4: 157-167.
- Nyerges, T.L. and Chrisman, N.R., 1989: *A Framework for Model Curriculum Development in Cartography and Geographic Information Systems*, **Professional Geographer**, 41: 283-293.
- Chrisman, N.R., 1989: *Modelling error in overlaid categorical maps*, p. 21-34 in Goodchild, M.F. & Gopal, S. (editors) **Accuracy of Spatial Databases**, Taylor & Francis, London.
- Chrisman, N.R., Cowen, D.J., Fisher, P.F., Goodchild, M.F., and Mark, D.M., 1989: *Geographic Information Systems*, p. 776-796 in Gaile G.L. and Willmott, C.J. (editors) **Geography in America**, Merrill, Columbus.

- Chrisman, N.R., 1988: *The Risks of Software Innovation, a Case Study of the Harvard Lab*, **The American Cartographer**, **15**: 291-300.
- Langran, G. and Chrisman, N.R., 1988: *A Framework for Temporal Geographic Information*, **Cartographica**, **25**(3): 1-14.
- Chrisman, N.R. and Yandell, B.S., 1988: *Effects of Point Error on Area Calculations: A Statistical Model*, **Surveying and Mapping**, **48**: 241-246.
- Ventura, S.J., Chrisman, N.R., Connors, K., Gurda, R.F., and Martin, R.W., 1988: *A Land Information System for Soil Erosion Control Planning*, **Journal of Soil and Water Conservation**, **43**: 230-233.
- Beard, M.K., and Chrisman, N.R., 1988: *Zipper: a localized approach to edgematching*, **The American Cartographer**, **15**:163-172; earlier version 1986: *Zippering: software for merging maps*, **Proceedings ACSM**, **1**:153-161.
- Chrisman, N.R., 1987: *Design of information systems based on social and cultural goals*, **Photogrammetric Engineering and Remote Sensing**, **53**: 1367-1370; earlier version 1987: *Fundamental principles of geographic information systems*, **Proceedings AUTO-CARTO 8**: 31-40.
- Niemann, B.J. Jr., Sullivan, J.G., Ventura, S.J., Chrisman, N.R., Vonderohe, A.P., Mezera, D.F., and Moyer, D.D., 1987: *Results of the Dane County Land Records Project*, **Photogrammetric Engineering and Remote Sensing**, **53**: 1371-1378.
- Chrisman, N.R., 1987: *Accuracy of map overlays: a reassessment*, **Landscape and Urban Planning**, **14**:427-439. reprinted 1990: p. 308-320 in **Introductory Readings in Geographic Information Systems**, D. Peuquet & D. Marble (editors), Taylor Francis
- Chrisman, N.R., 1987: *A draft proposed standard for digital cartographic data quality*, in H. Moellering (ed.), **Report 8**, NCDCCDS, Columbus OH. [appeared unchanged, but unattributed in **The American Cartographer**, **15**(1)]
- Chrisman, N.R., 1987: *Efficient digitizing: advances in software and hardware*, **International Journal of Geographical Information Systems**: **1**: 265-277. reprinted 1990: p. 233-245 in **Introductory Readings in Geographic Information Systems**, D. Peuquet & D. Marble (editors), Taylor Francis. Earlier version: 1986: *Effective digitizing: advances in software and hardware*, **Proceedings ACSM**, **1**:162-171.
- Dougenik, J.A., Chrisman, N.R., Niemeier, D.R., 1985: *An algorithm to construct continuous area cartograms*, **Professional Geographer**, **37**:75-81.
- Chrisman, N.R., 1985: *An interim proposed standard for cartographic data quality*, 17-22 in H. Moellering (ed.), **Report 6**, NCDCCDS, Columbus OH; *Supporting documentation*, 113-134.
- Chrisman, N.R., 1984: *On storage of coordinates in geographic information systems*, **Geoprocessing**, **2**:259-270.
- Chrisman, N.R., Kaufman, J.L., Keifer, R.W., Lillesand, T.M., Mezera, D.F., Moyer, D.D., Muehrcke, P.C., Niemann, B.J., Scarpace, F.L., Scherz, J.P., Stanfield, J.D., Strasma, J.D., Vonderohe, A.P., Wolf, P.R., Woodward, D.A., 1984: *Land records modernization:*

- centers of excellence from a Wisconsin perspective*, **Computers, Environment and Urban Systems**, 9:219-227; later version with expanded authorship, 1984. **Wisconsin Land Information Reports: 2**, Institute for Envir. Studies, Madison.
- Chrisman, N.R., 1984: *Alternatives for specifying quality standards for digital cartographic data quality*, 43-71 in H. Moellering (ed.), **Report 4**, NCDCCDS, Columbus OH.
- Beard, M.K., Chrisman, N.R. and Patterson, T.D., 1984: *Integrating data for local resource planning: a case study of sand and gravel resources*, **Proceedings URISA**, 513-524. Reprinted in W. Ripple (ed.) 1987: **GIS for Resource Management: A Compendium**, American Society for Photogrammetry and Remote Sensing, 87-98.
- Chrisman, N.R., 1983: *The role of quality information in the long-term functioning of a geographic information system*, **Proceedings AUTO-CARTO 6**, 2:303-321; reprinted 1984: **Cartographica**, 21 (2&3):79-87 (Selected Papers from AUTO-CARTO 6).
- Chrisman, N.R., 1978: *Concepts of space as a guide to cartographic data structures*, 5: (19 pp.) in G. Dutton (ed.), **Harvard Papers on Geographic Information Systems**, Addison Wesley, Reading MA.
- Chrisman, N.R., 1978: *Comments on data structures to be discussed at an advanced study symposium on topological data structures for geographic information systems*, 1: 117-127 in G. Dutton (ed.), **Harvard Papers on Geographic Information Systems**, Addison Wesley, Reading MA.
- Peucker, T.K. and Chrisman, N.R., 1975: *Cartographic data structures*, **American Cartographer**, 2:55-69.

Proceedings or journals with competitive selection or invitation

- Chrisman, N.R. 2012: A deflationary approach to fundamental principles in GIScience, Invited 'Waldo Tobler Lecture', GIS Specialty Group, AAG, edited proceedings volume in press.
- Chrisman, N.R. 2011: Lessons learned from 14 years of the GEOIDE Network, Proceedings Colloque International Fonder les sciences du territoire, pp. 85-88, Paris.
- Chrisman, N.R. 2011: Mapping controversies: the case of low-level radioactive waste repositories. *Selected for Mapping Ethics, Lausanne; not presented.*
- Chrisman, N.R. 2011: In search of data alignment: When best available data overrides the real requirement, presented AGILE 2011, Utrecht.
- Samani, N., Delavar, M., Chrisman, N., Malek, M. 2011: An Ontology for Spatial Relevant Objects in a Location-aware System: Case Study- A Tourist Guide System, Proceedings UDMS-11.
- Samani, N., Delavar, M., Chrisman, N., Malek, M. 2011: Modeling Spatial Relevancy in Context-Aware Systems Using Fuzzy Intervals, Proceedings Geocomputation-11.
- Chrisman, N.R. 2010: GEOIDE Network: Thirteen years of innovation in Canada. Proceedings, Auto-Carto 2010.

- Nyaminani, E, and Chrisman, N. 2010: Geographical Information Systems and Site Selection for the Establishment of Refugee Camps in Wartime. Proceedings, AutoCarto 2010, Orlando.
- Chrisman, N.R. 2010: Detecting the social influences in GIS technology: Getting value from comparative retrospective studies, Proceedings GIScience 2010, Zurich. http://www.giscience2010.org/pdfs/paper_113.pdf
- Bédard, Y., Bernier, E., Badard, T., Chrisman, N., Roche, S., Edwards, G., Mostafavi, M.A., Pouliot, J., Gervais, M., Hubert, F., Larrivée, S., Proulx, M.-J., Rivest, S., Nadeau, M., Dubé, É., Brodeur, J. and Devillers, R. 2007: Research in Geographic Information Systems, Data Management and Dissemination, and New Geospatial Technologies. **Geomatica**, 61(3):299-314.
- Chrisman, N.R., Daniel, S., Roche, S., Santerre, R., Bédard, Y., Roy, F. 2007: Where is geomatics teaching going? Towards geospatial infrastructures for the instruction of geomatics. **Geomatica** 61(3):331-343.
- Chrisman, N.R. 2007: GEOIDE's Research Directions: A Network of Centres of Excellence across Canada, **Proceedings AGILE**, Aalborg, Denmark, May 2007 (extended abstract, 3 pages).
- Gervais, M., Y. Bédard, S. Larrivée, N. Chrisman, J. Levesque, and R. Devillers 2006: Auditing Spatial Data Suitability for Specific Applications: Professional and Technological Issues. paper presented at Workshop on Quality Assurance in Geographic Data Production, AGILE / EURO SDR, Marnes-la-Vallée, France.
- Cheyland, Jean-Paul and Chrisman, N.R. 2001: *Giving meaning to geographic information*. In Libourel, T. (ed) *Geomatics and Rural Space*, 189-202 (Proceedings Cassini).
- Chrisman, N.R. 2001: Configuring the User: Social Divisions of Labor in GIS Software, paper presented at Society and GIS Workshop, Columbus Ohio.
- Chrisman, N.R. 2000: Information flows in a distributed collective memory: the geography of land ownership recording. Distributed Collective Practices Workshop, Paris.
- Chrisman, N.R., 1997: *Understanding transformations of geographic information*, **Proceedings AUTO-CARTO 13**, 33-41.
- Chrisman, N.R., 1995: *Living with error in geographic data: Truth and responsibility*, **Proceedings GIS '95**, 12-17. [invited plenary session]
- Chrisman, N.R., 1995: *Beyond Stevens: A revised approach to measurement for geographic information*, **Proceedings Auto-Carto 12**, 271-280.
- Chrisman, N.R., 1993: *Beyond spatio-temporal data models: A model of GIS as a technology embedded in historical context*, **Proceedings Auto-Carto 11**, 23-32.
- Chrisman, N.R., 1992: *Ethics for the practitioners of Geographic Information Systems embedded in 'Real World' constraints of guilds, professions and institutional sponsorship*, **Proceedings GIS/LIS 92, 1**: 129-137.
- Chrisman, N.R, Dougenik, J.A and White, D., 1992: *Lessons for the design of polygon*

- overlay processing from the ODYSSEY WHIRLPOOL algorithm*, **Proceedings 5th International Symposium on Spatial Data Handling**, 2: 401-410.
- Lester, M.K. and Chrisman, N.R., 1991: *Not all slivers are skinny: A comparison of two methods for detecting positional errors in categorical maps*, **Proceedings GIS/LIS 91**, 2:648-658.
- Chrisman, N.R., 1991: *Building a Geography of Cartography: Cartographic Institutions in Cultural Context*, **Proceedings, 15th International Cartographic Association Conference**, 1: 83-92.
- Chrisman, N.R., 1989: *A Taxonomy of Cartographic Error applied to Categorical Maps*, **Proceedings, 14th International Cartographic Conference**, 82-83
- Chrisman, N.R., 1989: *Error in Categorical Maps: Testing versus Simulation*, **Proceedings AUTO-CARTO 9**, 521-529.
- Chrisman, N.R., 1987: *Challenges for Research in Geographic Information Systems*, **Proceedings 1**: 101-112, International GIS Symposium, AAG.
- Chrisman, N.R., 1986: *Obtaining information on quality of digital data*, **Proceedings AUTO-CARTO London 1**: 350-358.
- Chrisman, N.R., Mezera, D.F., Moyer, D.D., Niemann, B.J. Jr., Sullivan, J.G., and Vonderohe, A.P., 1986: *Soil erosion planning in Wisconsin: an application and evaluation of a multipurpose land information system*, **Proceedings ACSM**, 3:240-249; also in **Proceedings Fédération Internationale des Géomètres**, 7:279-290. [Reprinted p. 185-194 in Onsrud, H.J. and Cook, D.W. (editors) 1990: **Geographic and Land Informations Systems for Practicing Surveyors: A Compendium**, American Congress on Surveying and Mapping, Bethesda MD.]
- Chrisman, N.R., and Niemann, B.J. Jr., 1985: *Alternative routes to a multipurpose cadastre: merging institutional and technical reasoning*, **Proceedings AUTO-CARTO 7**, 84-94.
- Vonderohe, A.P., and Chrisman, N.R., 1985: *Tests to establish the quality of digital cartographic data: some examples from the Dane County Land Records Project*, **Proceedings AUTO-CARTO 7**, 552-559.
- Sullivan, J.G., Niemann, B.J., Chrisman, N.R., Moyer, D.D., Vonderohe, A.P., Mezera, D.F., 1984: *Institutional reform before automation: the foundation for modernizing land records systems*, 383-391 in A. Hamilton and J. McLaughlin (ed.), **The Decision Maker and Land Information Systems**, Federation International des Géomètres Symposium, Toronto; also in 1985: **Proceedings ACSM**, 116-125.
- Chrisman, N.R. and Moellering, H., 1983: *Issues involved in the development of national digital cartographic data standards*, **Proceedings Harvard Computer Graphics Conference**, 1:41-51.
- Chrisman, N.R., 1982: *A theory of cartographic error and its measurement in digital data bases*, **Proceedings AUTO-CARTO 5**, 159-168.
- Chrisman, N.R., 1975: *Topological data structures for geographic representation*, **Proceedings URISA**, 1:194-200; also **Proceedings AUTO-CARTO II**, 346-351.

Chrisman, N.R., 1974: *The impact of data structure on geographic information processing*, **Proceedings AUTO-CARTO I**, 165-177. expanded version printed as **Internal Report 74-4**, Harvard Laboratory for Computer Graphics.

Proceedings of meetings without selection

- Chrisman, N.R. 2011: Arguing for a spatial component in Science and Technology Indicators, Paper presented at 4S, Cleveland Ohio.
- Chrisman, N.R. 2011: What happened to Overlay Engines: A Story of Technological Shifts, paper presented at SKI Canada, Fernie BC. abstract: <http://rose.geog.mcgill.ca/ski/system/files/fm/2011/Chrisman.pdf>
- Chrisman, N.R. 2007: Interdisciplinary networks and the flavours of money, 4S Montréal.
- Chrisman, N.R. 2007: Networks make a difference: The GEOIDE Story. Proceedings IPY GeoNorth, Yellowknife, August 2007.
- Chrisman, N.R. 2006: Balancing the wet and the dry: STS researcher becomes science manager. Paper presented at 4S Vancouver.
- Chrisman, N.R. 2004: Snapshots from the oligopticon: more contributions to the geographic divisions of knowledge, Proceedings 4S/EASST, Paris, pp. 987-988.
- Chrisman, N.R. 2002: Paper presented at 4S Milwaukee.
- Chrisman, N.R. 2000: Geography of geographic information: Understandign the practices of situated knowledge in the emerging technosciences of geographic information systems, paper presented at 4S/EASST, Vienna.
- Norheim, R.A., Peterson, D.L., Alcock, T.Z., Chrisman, N.R. 2000: *Metadata SWAT Teams: A Success Story in Creating a Regional Clearinghouse Node*, Proceedings, ESRI 2000 User Conference, San Diego, June.
- Norheim, R.A., Peterson, D.L., Alcock, T.Z., Chrisman, N.R., and Schreiner, E.W. 1999: *Developing an NSDI and NBII Clearinghouse Node for the Olympic Peninsula, Washington State*. Proceedings ACSM Annual Meeting.
- Chrisman, N.R. 1999: Trading zones or boundary objects: Understanding incomplete translations of technical expertise, paper presented at 4S San Diego.
- Chrisman, N.R. and Harvey, F. 1998: Beyond the metaphor of mapping: searching for swocio-technical linkages in the use of GIS technologies, paper presented at 4S Halifax NS.
- Chrisman, N.R., Mezera, D.F., Moyer, D.D., Niemann, B.J. Jr., Sullivan, J.G., and Vonderohe, A.P., 1986: *Soil erosion planning in Wisconsin: order of mag nitude implications of integrating new technologies*, **Proceedings URISA**, 1:117-128. Awarded Honorable Mention in Horwood Critique Prize Competition
- Ventura, S.J., Sullivan, J.G., and Chrisman, N.R., 1986: *Vectorization of Landsat TM land cover classification data*, **Proceedings URISA**, 1:129-140.
- Chrisman, N.R., 1986: *Error in overlaid categorical maps*, presented at AAG meeting, abstract in proceedings.

- Sullivan, J.G., Chrisman, N.R., and Niemann, B.J. Jr., 1985: *Wastelands versus wetlands in Westport Township, Wisconsin*, **Proceedings URISA**, 1:73-85.
- Sullivan, J.G., Beard, M.K., Sonza-Novera, J., Chrisman, N.R., and Niemann, B.J. Jr., 1985: *Multipurpose land information systems: institutional innovations, technological trends, implications for landscape architecture education*, **Proceedings Council of Educators in Landscape Architecture**, 10-14.
- Chrisman, N.R., Mezera, D.F., Moyer, D.D., Niemann, B.J., Vonderohe, A.P., 1984: *Modernization of routine land records in Dane County, Wisconsin: Implications to rural landscape assessment and planning*, **URISA Professional Papers**, 84-1, (44 pp.).
- Chrisman, N.R., 1983: *Epsilon filtering: a technique for automated scale changing*, **Proceedings ACSM**, 322-341.
- Chrisman, N.R., 1982: *Beyond accuracy assessment: correction of misclassification*, **Proceedings International Society of Photogrammetry and Remote Sensing, Commission IV**, 24-IV:123-132.
- Chrisman, N.R., 1979: *Analyzing spatial coverages using the ODYSSEY system*, **Proceedings First International HBDS Seminar**.
- Marsh, P.E., and Chrisman, N.R., 1979: *The use of computer mapping in policy studies by state government*, vol. 3, 109-118 in P. Moore (ed.), **Harvard Library of Computer Graphics**, Harvard Laboratory for Computer Graphics, Cambridge MA.
- Goldberg, M.P., Schmidt, A.H., and Chrisman, N.R., 1979: *Integration and Analysis of Multiple Geographic Data Bases: An Application of ODYSSEY*, vol. 2, 81-98 in P. Moore (ed.), **Harvard Library of Computer Graphics**, Harvard Laboratory for Computer Graphics, Cambridge MA.

Reports and other publications

- Chrisman, N et Cotteret, G. 2009: *Avant-propos*. **Géomatica**, 63(4):311-312 , (GEOIDE Student special issue).
- Chrisman, N.R. 2007: *Réseau GEOIDE Network 2004-2007*, **Geomatica**, 61(2) p. 220, Canadian report to International Cartographic Association.
- Khorram, S., Biging, G.S, Chrisman, N.R., Colby, D.R., Congalton, R.G., Dobson, J.E., Ferguson, R.L., Goodchild, M.F., Jensen, J.R., and Mace, T.H. 1996: *Accuracy Assessment of Remote Sensing- Derived Change Detection*. Computer Graphics Center, North Carolina State University, Raleigh NC (also appeared as ASPRS Monograph).
- Chrisman, N.R. 1994: *Database design for chinese counties in time*. unpublished report submitted to China in Space and Time project.
- Chrisman, N.R. 1994: *Report to CITAS concerning the spatial data quality of China GIS data from the SIIASA project at Griffith University, Queensland*. unpublished report.
- Chrisman, N.R., Gurda, R., and Beard, M.K., 1987: *National Charting Quality Standards*, unpublished report (91 pp.).
- Ventura, S.J., Chrisman, N.R., and Vonderohe, A.P., 1986: *Quality analysis of digital line*

- graph data for the Dane County Land Records Project*, unpublished report (22 pp.).
- Chrisman, N.R., 1986: *Testing the interim proposed standard for digital cartographic data quality*, 53-55 in H. Moellering (ed.), **Report 7**, NCDCCDS, Columbus OH.
- Chrisman, N.R., 1986: *Quality report for Dane County soil survey digital files*, 78-88 in H. Moellering (ed.), **Report 7**, NCDCCDS, Columbus OH.
- Chrisman, N.R., 1983: *Issues in digital cartographic quality standards: a progress report*, 23-31 in H. Moellering (ed.), **Report 3**, NCDCCDS, Columbus OH.
- Chrisman, N.R., 1982: *Methods of spatial analysis based on error in categorical maps*, unpublished Ph.D. thesis, University of Bristol.
- Chrisman, N.R., 1980: *Assessing Landsat accuracy, a geographic application of misclassification analysis*, presented at Second Colloquium on Quantitative and Theoretical Geography, Cambridge, England.
- Chrisman, N.R., 1980: *Ensuring spatial content in analysis through the use of cartographic data bases*, presented at Social Science Research Council Symposium on Social Geography, Oxford, England.
- Chrisman, N.R., 1979: *A multi-dimensional projection of ODYSSEY*, Harvard Laboratory for Computer Graphics, Cambridge MA.
- Chrisman, N.R., 1976: *Local versus global: the scope of memory required for geographic information processing*, presented at Segment Oriented Referencing Systems Association; also **Internal Report 76-14**, Harvard Laboratory for Computer Graphics, Cambridge MA.

Book Reviews

- 2002: Review of *Multidimensional Geographic Information Science*, **International Journal of Geographical Information Science 16** : 203-204.
- 2001: Review of *Digital Places*, **Society and Space 19(2)**: 249-250.
- 1999: Review of *Geographic Objects with Indeterminate Boundaries*. **International Journal of Geographical Information Science 13**: 615-616.
- 1998: Review of *Elements of Data Quality*. **Cartography and GIS 25**: 259-260.
- 1994: Review of *Cadastral Maps in the Service of the State*, **Cartography & GIS, 21**: 100-101.
- 1990: Review of *Building Databases for Global Science*, **Annals AAG, 80**: 149-151.
- 1989: Review of *Measurements from Maps: Principles and Methods of Cartometry*, **Cartographica, 26**: no.3&4, 138-141.
- 1984: Review of *Cartographic Drawing with Computers*, **Cartographica, 21**:110-112.

Other Writing

- Chrisman, N.R. 2008: **4 articles** (*Scales of Measurement, Geometric Primitives, Polygon Operations, Harvard Lab for Computer Graphics*) in **Sage Encyclopedia of Geographic Information Science**, edited by Karen Kemp.
- Chrisman, N.R. 2000. Préface: Batir une géographie de l'information géographique. p. 5-6 In Roche, Stéphane **Les Enjeux des Systèmes d'Information Géographique: Les cas de la France et du Québec**. Paris: L'Harmattan
- Chrisman, N.R. 1999. Editorial: Object Dynamics. **Geoinformatica** 3(4) 303-304.
- Chrisman, N.R. 1997: **Leading an Exploration**. (Instructor's Manual for Exploring GIS), digital publication of John Wiley and Sons.
<http://www.wiley.com/college/chrisman/leading.html>
- Chrisman, N.R. 1996: *Risks of Reductionism*. **Geography: a newsletter for educators**, 6(4) 3-4, published by John Wiley and Sons.
- Chrisman, N.R. 1995: *Course content on the Internet*. **Geography: a newsletter for educators**, 5(2) 1-3, published by John Wiley and Sons.
- Chrisman, N.R. 1994: *A vision of digital libraries for geographic information or How I stopped trying to find the on-ramps to the information superhighway*. **GeoInfo Systems**, 4(4): 21-24. [In « Data Data » column edited by Nancy Tosta]
- Chrisman, N.R. 1993: *Cartography: Year in Review*. **ACSM Bulletin**, 141: 41-44.
- 1973-80 co-author or editor, manuals for POLYVRT, CALFORM, ASPEX, ODYSSEY

Appendix A: Professional Presentations

<i>Date</i>	<i>Conference or Organizer</i>	<i>Location</i>
2012	AAG, Invited Waldo Tobler Lecture, GIS SG	New York, NY
2011	CIST-GIS, sciences du territoire	Paris, France
2011	4S (Society for Social Studies of Science)	Cleveland, OH
2011	Géomatique 2011, ASCG Section Montréal	Montréal, QC
2011	Semana geomatica (IGAC)	Bogota, Colombia
2011	International Cartographic Congress	Paris, France
2011	AGILE Conference	Utrecht, NL
2011	SKI Canada	Fernie, BC
2010	Gravel Bed Rivers 7	Tadousac, QC
2010	GIScience 2010	Zurich, CH
2010	Auto-Carto 2010	Orlando, FL
2010	Dept Geomatics Seminar, University of Melbourne	Melbourne, Australia
2010	Canadian Geomatics Conference	Calgary AB
2010	Int. Society for Voronoi Diagrams	Québec, QC
2010	International Cluster Conference	Biloxi, MS
2009	International Cartographic Congress	Santiago, Chile
2009	Workshop on Earth Observation, Chilean Space Ag.	Santiago, Chile
2009	Centro-Geo	Mexico DF, Mexico
2009	CEAZA	La Serena, Chile
2009	Universidad de Concepcion	Concepcion, Chile
2009	Universidad Austral de Chile	Valdivia, Chile
2009	Universidad Catolica	Santiago, Chile
2008	CRCSI Annual Conference	Brisbane, Australia
2008	Invited Keynote, Temporal Workshop, GIScience 08	Park City, UT
2008	Invited, StratAG launch	Maynooth, Ireland
2008	Network for Networks workshop, ISPRS Congress	Beijing, China
2008	CAG Annual Convention	Québec QC
2008	Institute for Catastrophic Loss Reduction	Toronto, ON
2008	Spatial Knowledge and Information	Fernie, BC
2008	Korean Land Surveying, Geodesy and Cartography	Calgary, AB
2008	Ontario Centres of Excellence	Niagara College, ON
2007	4th jMap User Conference, Kheops Technologies	Montréal, QC
2007	4S (Society for Social Studies of Science)	Montréal QC
2007	AGILE Conference	Aalborg, Denmark
2006	PAIGH Council	Santiago, Chile
2006	4S	Vancouver, BC
2006	SARSCENE (Search & Rescue Canada)	Ottawa
2006	Geo-Tech 2006; invited panelist	Ottawa
2006	Software Human Resources Council	Ottawa
2006	Institut M. Lamontagne (DFO)	Mont Joli, QC
2006	Environmental Geomatics Lecture, Rutgers Univ.	New Brunswick, NJ
2005	PEER Geomatics Pillar Conference	Montpellier, France
2005	GSDI Seminar, Atlantic Institute, MIT	Cambridge, MA

2005	SAGEO 2005	Avignon, France
2005	Geo-Tech 2005	Vancouver, BC
2005	AUTO-CARTO 2005	Las Vegas, NV
2004	ACFAS	Montréal, QC
2004	US Geological Survey, EROS Data Center	Sioux Falls, SD
2004	4S/ EASST	Paris, France
2003	ICHC (Int Conference on History of Cartography)	Cambridge, MA
2002	4S	Milwaukee, WI
2001	4S	Cambridge, MA
2001	GISRUK 2001, Invited Speaker	Cardiff, Wales
2000	Distributed Collective Practices Workshop	Paris, France
2000	4S/ EASST	Vienna, Austria
2000	Journées Cassini	La Rochelle, France
2000	CIRAD	Montpellier, France
2000	UMR Espace	Avignon, France
2000	Dangermond Invited Lecture: University of Cal-SB	Santa Barbara CA
2000	Association of American Geographers	Pittsburgh PA
1999	Society for the Social Studies of Science (4S)	San Diego CA
1999	GISOC (Geographic Information and Society)	Minneapolis MN
1998	Society for the Social Studies of Science (two papers)	Halifax NS
1998	Third International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences (invited plenary)	Québec City, Qc
1998	Workshop on Geolibraries (National Academy of Sciences)	Washington DC
1998	Washington Chapter Urban and Regional Science Association	Tukwilla WA
1997	Swiss Federal Institute of Technology (public lecture)	Lausanne, CH
1997	Symposium on Accuracy of Spatial Data (Cassini / IGN)	Paris, France
1997	Association of American Geographers	Fort Worth TX
1997	Thirteenth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 13)	Seattle WA
1997	University of Hong Kong (two public lectures)	Hong Kong
1997	Hong Kong Polytechnic University (public lecture)	Hong Kong
1996	University of Oregon (Visiting Geographical Scientist Program, AAG)	Eugene OR
1996	Oregon State University (Visiting Geog. Scientist Program, AAG)	Corvallis OR
1996	Specialist Meeting, Initiative 19 (GIS and Society) National Center for Geographic Information and Analysis	South Haven MN
1996	"Social Practice of GIS" (public lecture) ESRI	Redlands CA
1996	Association of American Geographers	Charlotte NC
1995	GIS '95 (GIS World, Organizer) (Keynote Speaker)	Vancouver BC
1995	Twelfth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 12)	Charlotte NC
1994	"Is Climate Warming" seminar series, Quaternary Research Center	UW Seattle WA
1994	Natural Resource Refresher Workshop, National Park Service	Seattle WA
1994	GIS and Society Workshop (local organizer, paper) NCGIA	Friday Harbor WA
1994	University of Zürich (public lecture and workshop)	Zurich, Switzerland
1994	Institut Géographique Nationale (workshops and public lecture)	Paris, France
1994	Association of American Geographers	San Francisco CA
1994	Northwest Computer Aided Mapping Association (keynote)	SeaTac WA
1993	GIS Analysis Workshop (organized by UW grad students)	Seattle WA

1993	Association of American Geographers	Atlanta GA
1993	Eleventh International Symposium on Computer-Assisted Cartography (AUTO-CARTO 11)	Minneapolis MN
1992	GIS/LIS 92	San Jose CA
1992	5th International Symposium on Spatial Data Handling	Charleston SC
1992	Spatial Data Transfer Standard Implementation Workshop	Gaithersburg, MD
1992	Automated Mapping/ Facilities Management Ass. (panel moderator)	San Antonio TX
1991	International Cartographic Association 15th Conference	Bournemouth, UK
1991	Specialist Meeting, Initiative 7 (Visualization of Data Quality) National Center for Geographic Information and Analysis	Castine, ME
1991	Tenth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 10)	Baltimore, MD
1991	Association of American Geographers	Baltimore, MD
1990	Specialist Meeting, Initiative 10 (Remote Sensing & GIS) National Center for Geographic Information and Analysis	Sioux Falls, SD
1990	Colloque "Intégration de la Photogrammétrie et de la Télédétection dans les S.I.G." Société Française de la Photogrammétrie et Télédétection	Strasbourg, France
1989	International Cartographic Congress	Budapest, Hungary
1989	Ninth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 9)	Baltimore, MD
1988	Specialist Meeting, Initiative 1 (Accuracy of Spatial Databases) National Center for Geographic Information and Analysis	Santa Barbara, CA
1987	International Geographic Information System Symposium	Crystal City, VA
1987	Ohio State University, Department of Geodetic Sciences	Columbus, OH
1987	Eighth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 8)	Baltimore, MD
1987	Association of American Geographers	Portland, OR
1986	Université Laval (public lecture)	Québec, QC
1986	AUTO-CARTO London	London, UK
1986	Fédération Internationale des Géomètres	Toronto, ON
1986	American Congress on Surveying and Mapping	Washington, DC
1986	Association of American Geographers	Minneapolis, MN
1985	Digital Charting Data User's Workshop	Gaithersburg, MD
1985	Seventh International Symposium on Computer-Assisted Cartography (AUTO-CARTO 7)	Washington, DC
1985	American Congress on Surveying and Mapping	Washington, DC
1984	Urban and Regional Information Systems Association	Seattle, WA
1984	American Congress on Surveying and Mapping	Washington, DC
1983	Sixth International Symposium on Automated Cartography (AUTO-CARTO 6)	Ottawa, ON
1983	American Congress on Surveying and Mapping	Washington, DC
1983	Harvard Computer Graphics Conference	Cambridge, MA
1982	Fifth International Symposium on Computer-Assisted Cartography (AUTO-CARTO 5)	Crystal City, VA
1982	International Society of Photogrammetry and Remote Sensing (ISPRS) Commission IV Symposium	Crystal City VA
1982	Harvard Computer Graphics Conference	Cambridge, MA
1980	2 nd Colloquium on Quantitative and Theoretical Geography	Cambridge, UK

1980	Social Science Research Council Symposium on Social Geography	Oxford, UK
1979	Premier Seminaire Internationale HBDS	Lisbon, Portugal
1979	Harvard Graphics Week	Cambridge, MA
1978	Harvard Graphics Week	Cambridge, MA
1977	First International Advanced Study Symposium on Topological Data Structures for Geographic Information Systems	Dedham, MA
1975	Urban and Regional Information Systems Association	Seattle, WA
1975	International Symposium on Computer-Assisted Cartography (AUTO-CARTO II)	Reston, VA
1975	Northeast Regional Science Association	Amherst, MA
1974	International Conference on Automation in Cartography (AUTO-CARTO I)	Reston, VA