Laurence M. Spear

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EDUCATION AND CERTIFICATION

Current Non-Degree Graduate Student (GIScience and Statistics), University of New Mexico
Statistics minor, University of New Mexico, 2008
GISP GIS Certification Institute, 2005, 2010, and 2015
M.A. Geography, University of New Mexico, 1982
B.A. Anthropology and Archeology with Geography minor, University of New Mexico, 1975

EMPLOYMENT and CONTINUING EDUCATION

2012 – 2020 **Graduate Studies** (Non-Degree), University of New Mexico (UNM) Departments of Geography and Environmental Studies and Statistics. Additional coursework in areas of geographic information science, statistics, data analysis, spatial statistics, spatial analysis, and geographic information systems. Primarily continuing education and non-funded research projects that improved quantitative, analytical, and computing (R, SAS, and Python) skills. See http://www.unm.edu/~lspear for more information.

2013 **GIT Analyst/Programmer** (on call, part-time), Earth Data Analysis Center (EDAC), University of New Mexico (UNM). From May through August preparing an extensive intersection database using both the New Mexico E911 county data files combined with the Division of Government Research (DGR, UNM) intersections maintained for the New Mexico Traffic Safety Bureau (NM TSB). SAS and ArcGIS were used to derive multiple aliases for most of the major roads throughout the state.

2010 – 2012 **Sr. Research Scientist 1** (GIS Manager, retired), Division of Government Research (DGR), University of New Mexico (UNM). Ongoing management and technical development of traffic safety GIS related projects. The research emphasis was on developing and applying observational statistical methods for the identification of problem intersections and road segments. Continued maintenance and update of interactive web mapping applications for traffic safety and census/demographic data using ESRI's ArcGIS Server (Flex, Silverlight and VB.Net). Continuing responsibilities for hiring, supervision, and training of staff and student employees. Additional responsibilities for the maintenance and administration of departmental PC's and Linux (with UNM's IT department) server plus various Microsoft Windows web servers used for interactive mapping.

1996 – 2009 **Program Manager** (GIS Manager), Division of Government Research (DGR), University of New Mexico (UNM). Management of various GIS related projects at DGR requiring the hiring and supervision of staff and student employees. Organized the development and application of the Geographic Road Network Database (GRNDB – SAS and PGPLOT) system for traffic safety mapping for New Mexico covering all rural and most urbanized areas of the state. Additional development of traffic safety mapping capabilities using ESRI's ArcGIS (dynamic segmentation), ArcIMS, and ArcGIS Server as a complement to the GRNDB system and for making dynamic maps of traffic crash data accessible on the web. Also worked on other GIS projects such as the development of a gravity model technique for measuring the geographic accessibility to health care facilities and providers, plus developing a dynamic mapping and data download web page for census and other demographic data in New Mexico. These projects required

substantial programming and systems design and maintenance efforts; statistical expertise; and continual learning and skill development with new and developing GIS and geospatial related software and techniques.

1988 – 1996 **Research Analyst** (GIS Analyst), Division of Government Research, University of New Mexico. Coordination of various GIS related projects at DGR requiring the hiring and supervision of staff and student employees. Supervised a major expansion of the Geographic Road Network Database (GRNDB – SAS and CA-DISSPLA) system for traffic safety mapping to include most of the urbanized areas in New Mexico. Participated with other UNM and state agencies in preparing a feasibility study and securing funding for the Resource Geographic Information System (RGIS) program. Project management, system design, and programming duties for phase II of the Census Bureau's Redistricting Data Program for New Mexico.

1982 – 1988 **Program Specialist** (GIS Specialist), Division of Government Research, University of New Mexico. Participated with other staff and students in various statistical and GIS related projects. Helped develop the Geographic Road Network Database (GRNDB – SAS and CA-DISSPLA) system for traffic safety mapping in New Mexico. Participated in developing a GRNDB system and the technology transfer of this system to the state of Nevada. Also performed project coordination duties for the New Mexico Voting Precinct Boundary Realignment Project – Phase I of the Census Bureau's Redistricting Data Program. This project entailed building a statewide GIS from digitized USGS 1:100,000 quadrangle maps and the acquisition of ESRI's new ArcInfo software to complete these tasks. DGR was an early ArcInfo users in New Mexico and among the first 100 users world-wide. This project resulted in the first complete digital database for the state.

1979 – 1982 **Research Assistant** (student position), Division of Government Research, University of New Mexico. Participation in a wide variety of projects such as: traffic safety analysis; maintenance of a political-demographic database and computer mapping system; and political redistricting. Assisted with the publication of several departmental newsletters and monographs.

1976 – 1979 **Laboratory Assistant / Cartographer** (student position), Office of Contract Archeology, University of New Mexico. Participated in all areas of archeological laboratory analysis and mapping. Operation and programming of the office's micro-computer system. Also conducted independent research concerning intra-site spatial analysis.

1975 – 1976 **Field Archeologist**, School of American Research. Archeological field work (excavation, data recording and mapping) of several archaic sites in Abiquiu, New Mexico.

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1975 **Field Archeologist**, Museum of New Mexico. Participated in all aspects of archeological field work at highway salvage projects for small pueblo sites in San Antonio and Carnue, New Mexico.

1973 and 1974 **Archeology Summer Field Schools**, University of New Mexico, Anthropology Department. Participated in excavations of a pueblo site in Tijeras, and archeological surveys of Tijeras Canyon, New Mexico.

Honors and Awards

M.A. with Distinction (UNM, 1982); ISSCO (CA-DISSPLA) Silver Medal – Computer Graphics Competition, 1985; FHWA Program Planning Award for GIS development, 1988; ESRI/SWUG - Winner poster competition (analytical content), 2002; Lifetime Achievement Award, New Mexico Geographic Information Council, 2019.

Professional Organizations

Member Urban Regional Information Systems Association (URISA, 1989-2015); Member New Mexico Geographic Information Council (NMGIC – since 1984, Elected board member 2007);
Member (nonvoting) New Mexico (state agency) Geospatial Advisory Committee (GAC, 2000 - 2012).

Thesis Committee

Chair: Dr. Bradley T. Cullen; Mr. Robert U. Anderson; Dr. Jerry L. Williams (all of UNM)

Specialized Skills

Database software: INFO, Microsoft Access, Microsoft SQL, MySQL, Postgre SQL, OpenOffice and LibreOffice Base, SAS, SAS Access and Proc SQL, SAS ArcGIS Bridge.

Geographical Information Software (GIS): ArcGIS Desktop(Arc/Info); ArcGIS Pro(arcpy); ArcGIS Online; ArcGIS API for Python; ArcGIS Server; ArcIMS, ArcView (3.x); ArcView Business Analyst (3.x); MapObjects ; QGIS(PyQGIS); R(GISTools and MapTools); AUTOMAP, SYMAP, CALFORM and ASPEX.

Graphics software: Adobe Illustrator and Photoshop, CA-DISSPLA, CA-TELLEGRAPH, PGPLOT, SAS/GRAPH, Macromedia Fireworks

Operating systems: DEC/VAX (VMS and UNIX) IBM (AIX, MVS/SP1, VSPC, MUSIC/SP, VM/CMS, TSO, and IBM-JCL), Linux (RedHat and Ubuntu), Microsoft (DOS, Windows NT and NT Server 2000 and 2003, Windows Server 2008 and 2010, Windows 7 - 10), Apple Mac OS, Google Chrome

Programming: ArcGIS/ArcInfo(AML, Python (arcpy, pandas, geopandas, scipy, and numpy), VBA, VB, and Visual Basic .Net); ArcIMS (AXL and Javascript); ArcView (Avenue); ArcGIS Server (Adobe Flex, Javascript, Microsoft Silverlight), Jupyter Notebook, PyCharm, BASIC, FORTRAN, PASCAL

Statistical Analysis and Software: Parametric, non-parametric; spatial statistics; SAS (SAS bridge for ArcGIS); SPSS; MINITAB; R (R Studio and ArcGIS Bridge); Python (Scikit-Learn); STATA; CrimeStat; GeoDa; PySAL

Web Software: HTML, HTML5 and XHTML, JavaScript, Macromedia DreamWeaver and Homesite

Relevant Publications and Presentations:

Davis, James W. and Laurence M. Spear. 2002. Measuring Geographic Access to Primary Care Physicians. Quick Facts 2003 Report, New Mexico Health Policy Commission, Santa Fe, New Mexico. pp.19-22.

Davis, James W. and Laurence M. Spear. 2002. Measuring Geographic Access to Primary Care Physicians in New Mexico (Poster). ESRI Southwest User's Group Meeting, Taos NM, October 2002.

Davis, James W. and Laurence M. Spear. 1993. Using TIGER to develop a Transportation GIS. Proceedings GIS-T 93. American Association of Highway and Transportation Officials, Albuquerque, NM.

Davis, James W. and Laurence M. Spear. 1986. ARC/INFO as a Tool in a Larger Tool-Box, Southwest ARC/INFO Users Conference 1986. University of New Mexico, Division of Government Research, Albuquerque.

Davis, James W. and Laurence M. Spear. 1986. Alcohol-Involved Crash Locations in New Mexico,

ARC/INFO Maps 1986. Poster presented at the 1986 ESRI's ARC/INFO Users Conference. Environmental Systems Research Institute, Redlands, California

Wandsnider, Luann. et. al. 1985. Transportation Applications of Computer Mapping in New Mexico. Transportation Research Record Number 1050: Data Collection Methods and Information Systems for State and Local Transportation Planning. National Research Council, Transportation Research Board, Washington D.C. pp. 24-31.

Cullen Bradley T. and Laurence M. Spear. 1985. Retail Coverage and Market Equilibrium: The Case of Food Stores in Albuquerque New Mexico. Proceedings of the Eighth Annual Applied Geography Conference. North Texas State University, Denton, Texas. pp. 358-272.

Davis James W. and Laurence M. Spear. 1985. Precinct Realignment and Geographic Information Systems Development in New Mexico. ESRI's ARC/INFO Users Conference 1985. Environmental Systems Research Institute, Redlands Calif. No page numbers.

Anderson, Robert U. et. al. 1985. Design and Use of the New Mexico Geographic Road Network Data Base (GRNDB). Proceedings of the 11th International Forum on Traffic Records Systems. National Safety Council, Traffic Records Committee, Chicago. pp. 279-290.

Spear, Laurence M. 1982. A Locational Analysis of Retail Food Stores with Respect to Residential Population Density in Albuquerque New Mexico 1970. Unpublished M.A. Thesis. University of New Mexico, Department of Geography, Albuquerque.

Spear, Laurence M. 1979. The Application of Statistical Mapping as an Initial Step in the Spatial Analysis of Archeological Distributions. In: Jan V. Biella and Richard C. Chapman (eds. Archeological Investigations in Cochiti Reservoir, New Mexico. University of New Mexico, Office of Contract Archeology, Albuquerque. Volume 4, pp. 319-338.

References: (on request)