

## *Resume - Earl F. Burkholder, PS, PE*

**Current:** Associate Professor President, Global COGO, Inc.  
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**Education:** University of Michigan: BS Civil Engineering, 1973 – graduated “cum laude”  
Purdue University: MS Civil Engineering (Geodesy), 1980  
University of Maine: (no degree) Study applications of global positioning systems (GPS) to surveying while on sabbatical leave during the 1990-91 academic year.

**Registration:** State of Michigan: Professional Surveyor '74 to '82, Professional Engineer since 1979.  
State of Oregon: Professional Land Surveyor and Professional Engineer 1981 to 1997.  
State of Ohio: Professional Surveyor and Professional Engineer since 1996 to 2004.  
...  
State of New Mexico: Professional Surveyor and Professional Engineer since 2000.

### **Experience:**

Currently tenured and holding an appointment as an Associate Professor, he has successfully taught a wide range of courses at NMSU including Surveying Fundamentals, Advanced Surveying for Civil Engineers, Fundamental Concepts for GPS, Spatial Data Concepts and Models, Construction Surveying, Field Surveying Techniques, Computer Applications to Surveying, Geodesy, Introduction to Satellite Geodesy (GPS surveying), U.S. Public Land Survey System Boundaries, Introduction to Survey Measurement, Analysis & Adjustment (statistics), Advanced Survey Measurement, Analysis, and Adjustment (least squares), Advanced Topics in Mapping Science (map projections), and Senior Seminar. At the request of the Surveying Engineering students, he serves as Faculty Advisor for the ACMS/NMPS Student Chapter. He has served on several College of Engineering Grade Appeal Committees (three times as Chair), two departmental search committees, and more recently, on the NMSU College of Engineering Dean Search Committee.

He was self-employed as a consultant from 1993 to August 1998 and offered services related to use of GPS data and Geographic Information Systems (GIS's). During that time he pulled together concepts from various disciplines to define a Global Spatial Data Model (GSDM) which utilizes a 3-dimensional BURKORD® database. The GSDM concepts are described in various papers and summarized in a report prepared for the Southeastern Wisconsin Regional Planning Commission, Waukesha, WI and published in 1997. He is currently writing a book on the 3-D GSDM.

He was at the Oregon Institute of Technology (OIT) from September 1980 to December 1993 where he taught upper division surveying courses including geodesy, astronomy, control surveying, state plane coordinates, least squares adjustment, computer applications to surveying, instrumentation, introduction to GIS, and global positioning system (GPS) surveying. In addition to serving several years as Surveying Program Coordinator, other administrative activities at OIT included service on the Faculty Senate, the institutional Curriculum Planning Commission, and (as a Full Professor) on the OIT Engineering Technology Division Tenure Review Committee – one term as Chair.

From 1973 to 1978 he was employed by Commonwealth Associates, Inc, Jackson, Michigan, as an Assistant Engineer and assigned to the Surveying Section of the Transmission Line Engineering Division. At Commonwealth, he became a Project Manager and participated as a member of multi-disciplinary teams in many different engineering projects located throughout the USA, one in South America, and one in Iran.

## Professional Activities:

Accreditation: Program evaluator for Accreditation Board for Engineering & Technology (ABET) 1990 to present. Member of Applied Science Accreditation Commission (ASAC – formerly the Related Accreditation Commission) 1994-1998, on the ASAC Executive Committee 1998-2002, and Chair of the ASAC 2000-2001.

Editor: 1985 to 1989 and 1992 to 1996 - Journal of Surveying Engineering, a refereed scholarly journal published by the American Society of Civil Engineers, Reston, VA.

NSF involvement: In the late 1980's he served as a reviewer for the National Science Foundation on two occasions for their Laboratory Improvement Grant Program. He also served as PI on two separate NSF grants – one was curriculum modification, the other was laboratory equipment improvement.

Peer Review: He has reviewed technical papers for the *Journal of the Urban and Regional Information Systems Association*, for the American Congress on Surveying & Mapping and their *Journal of Surveying and Land Information Systems*, and for the American Society of Civil Engineers' *Journal of Surveying Engineering*. Since 1994 he has reviewed five separate proposals for the Research Grants Council of Hong Kong (the most recent in 2003 and again in 2004).

Committee service; ASCE Surveying Engineering Division - Geodetic Surveying (Chairman 1985 & 1986), Education & Professional Practice Committee, Land Surveying Committee (1992-1994), Engineering Surveying Committee (1992-1996), ACSM Education Committee (2000 - 2003).

Chairman; 1989 to 1991; ASCE/ACSM/ASPRS Joint Committee - Definition of Terms Project to compile the Glossary of The Mapping Sciences published August, 1994.

Memberships; American Society of Civil Engineers, American Congress on Surveying & Mapping, American Society of Photogrammetry & Remote Sensing, American Geophysical Union, Institute of Navigation, American Society of Engineering Educators, and New Mexico Professional Surveyors.

New Mexico Professional Surveyors (NMPS): Served as Secretary for Southern Rio Grande Chapter NMPS 1999-2002. Named Director on NMPS Board of Directors by local chapter for 2004 and 2005. During 2006 he is President of the Southern Rio Grande Chapter NMPS.

Seminars: Prior to joining NMSU, a significant portion of his income was from seminars. The following is a summary of seminars presented since coming to NMSU in August 1998.

1. 1-day: Oklahoma City Oct 1998 Geodesy for Surveyors
2. 1-day: Oklahoma City Oct 1998 Integrating GPS & Terrestrial Survey Data
3. 1-day: Portland, OR May 1999 Geodesy, Photogrammetric Mapping & the GSDM
4. 1-day: El Paso, TX Oct 1999 Bringing GPS & Positional Tolerance into the Same Arena
5. 1-day: Albuquerque Feb 2000 Geodesy for Surveyors
6. 1-day: Albuquerque Feb 2000 Integrating GPS & Terrestrial Survey Data
7. ½ day: Providence, RI Dec 2000 Geodesy, Photogrammetric Mapping & the GSDM
8. 1-day: St. Louis, MO Apr 2001 Geodesy, Photogrammetric Mapping & the GSDM
9. 1-day: Rochester NY May 2001 Integrating GPS & Terrestrial Survey Data
10. 1-day: Wash. D.C. Apr 2002 Geodesy, Photogrammetric Mapping & the GSDM
11. 1-day: Denver, CO May 2004 A GSDM for the Digital Revolution
12. 1-day: Ruidoso, NM Aug 2005 Integrating GPS & Terrestrial Survey Data
13. 4-hr: Verona, NY Jan 2006 Using GPS for Reconnaissance in Boundary Surveying
14. 4-hr: Verona, NY Jan 2006 GPS Data Processing and Computations
15. 1-day: Boise, ID Mar 2006 The Impact of the Digital Revolution on Surveying

**Publications (partial listing) – for a web links see [www.globalcogo.com/refbyefb.html](http://www.globalcogo.com/refbyefb.html)**

28. “The Digital Revolution – Whither Now?,” May 2006, [www.globalcogo.com/Digital\\_RevR.pdf](http://www.globalcogo.com/Digital_RevR.pdf)
27. White paper, February 2006, “Need for and benefits of a Modern Spatial Reference Network in Southern New Mexico,” coauthored with Gilbert Chavez, Las Cruces City Surveyor and member New Mexico Board of Licensure for Professional Engineers and Professional Surveyors, [www.globalcogo.com/whitepaper.pdf](http://www.globalcogo.com/whitepaper.pdf)
26. “Geomatics Curriculum Design Issues” presented at XXth Surveying & Mapping Educators Conference, June, 2005, Corpus Christi, Texas.
25. “Accuracy of Elevation Reduction Factor,” *ASCE Journal of Surveying Engineering*, Vol.130, No. 3, August 2004.
24. “A 3D Datum for a 3D World,” *Geospatial Solutions*, Vol. 14, No. 5, May 2004, pp 38-41.
23. “Fundamentals of Spatial Data Accuracy and the Global Spatial Data Model (GSDM),” copyright filed with U.S. Copyright Office, April 2004. [www.globalcogo.com/fsdagsdm.pdf](http://www.globalcogo.com/fsdagsdm.pdf)
22. “Viewing Spatial Data from a 3-D Perspective,” (**Best Paper Award** for conference) Science, Engineering, and Technology Education (SETE) Conference, New Mexico State University, Las Cruces, NM, January 9, 2004.
21. “The Digital Revolution Begets the Global Spatial Data Model (GSDM),” *EOS Transactions*, American Geophysical Union, 15 April, 2003, pp 140-141.
20. “Elevations and the Global Spatial Data Model (GSDM),” presented at 58<sup>th</sup> Annual Meeting of Institute of Navigation, Albuquerque, New Mexico, June 25, 2002.
19. “The Global Spatial Data Model (GSDM): A New Paradigm for Spatial Information,” presented at the FIG International Surveyors Conference, Washington, D.C., April 2002.
18. “Spatial Data, Coordinate Systems and the Science of Measurement,” *ASCE Journal of Surveying Engineering*, November 2001, Vol. 127, No. 4, pp 143-156.
17. “The Global Spatial Data Model” presented at the International Conference on Discrete Global Grids hosted by the National Center for Geographic Information & Analysis, Santa Barbara, CA, March 26-28, 2000. See web book at [www.ncgia.ucsb.edu/globalgrids-book/spatialdata](http://www.ncgia.ucsb.edu/globalgrids-book/spatialdata).
16. “Geomatics Education and the Global Spatial Data Model” presented at the North American Surveying Teachers’ Conference, Purdue University, July, 1999.
15. “Spatial Data Accuracy as Defined by the Global Spatial Data Model (GSDM)”, *Surveying and Land Information Systems Journal*, Vol. 59, No. 1, March, 1999.
14. “3-D: A Challenge for Surveying in the 21st Century,” printed in The AGGIE Surveyor published by the NMSU Department of Surveying Engineering, Spring, 1999.

**Publications 14-26 were published since joining the NMSU faculty in 1998. The following publications were written prior to joining the Surveying Engineering Department at NMSU.**

13. "A Practical Global Spatial Data Model (GSDM) for the 21st Century," presented at Navigation 2000 - the ION National Technical Meeting, Long Beach, CA, 23 January 1998.
12. Professional Surveyor (series of three articles) -  
... October, 1997: "The Global Spatial Data Model: A Tool Designed for Surveyors"  
... Nov/Dec, 1997: "Using the Global Spatial Data Model (GSDM) in Plane Surveying"  
... Jan/Feb, 1998: "Positional Tolerance Made Easier with the GSDM"
11. "A 3-D Global Spatial Data Model (GSDM)," 1997 GIS/GPS Supplement of The Civil Engineering Surveyor, UK, pp 15-18.
10. "The 3-D Azimuth of a GPS Vector," *ASCE Journal of Surveying Engineering*, Vol. 124, No. 4, pp 139-146, November, 1997.
9. "Definition of a Three-Dimensional Spatial Data Model for Southeastern Wisconsin," May, 1997, a report published by the Southeastern Wisconsin Regional Planning Commission, Waukesha, WI.
8. "Definition and Description of a Global Spatial Data Model" registered with the U.S. Copyright Office, Washington, D.C., April, 1997. [www.globalcogo.com/gsdmdefn.pdf](http://www.globalcogo.com/gsdmdefn.pdf).
7. "The 3-D Geodetic Model as the Basis of a Global Coordinate System for Mobile Mapping," presented at the Mobile Mapping Symposium, Columbus, Ohio, May 23-26, 1995.
6. "GIS Applications of GPS Technology via Local Coordinate Systems: Past, Present, and Future," published in Technical Papers of ACSM/ASPRS Annual Meeting, March, 1995, Charlotte, NC.
5. "3-D Coordinates - A Universal Rectangular Coordinate System for a GIS and Other Spatial Databases" published in the Proceedings of the ASCE First Congress on Computing in Civil Engineering, June 20-24, 1994, Washington, D.C.
4. "Design of a Local Coordinate System for Surveying, Engineering, and LIS/GIS," *ACSM Surveying & Land Information Systems Journal*, Volume 53, No. 1, March, 1993.
3. "Using GPS Results in a True 3-D Coordinate System," *ASCE Journal of Surveying Engineering*, Volume 119, No. 1, February, 1993.
2. "Computation of Level/Horizontal Distance," *ASCE Journal of Surveying Engineering*, Volume 117, No. 3, August, 1991.
1. "Geometrical Parameters of the Geodetic Reference System 1980," *ACSM Surveying and Mapping Journal*, Vol. 44, No. 4, 1984, pp 339-340.