

# Lance David Yarbrough

*Curriculum Vitae, February 2009*

---

## **Office:**

Dept. Geology and Geological Engineering  
University of North Dakota  
101 Leonard Hall  
81 Cornell Street, Stop 8358  
Grand Forks, ND 58202-8358  
(tel) 701-777-2131  
(fax) 701-777-4449  
lance.yarbrough@und.edu

## **Personal:**

81 Cornell Street, Stop 7038  
Grand Forks, ND 58202-7038  
Tel: 662-801-7432  
Lance@Yarbrough.com  
www.Lance.Yarbrough.com

## EDUCATION

- Ph.D. Engineering Science—emphasis in geological engineering, The University of Mississippi, December 2006
- M.S. Engineering Science—emphasis in geological engineering, The University of Mississippi, May 2000
- B.S. Geological Engineering, University of Missouri-Rolla, May 1995

## PROFESSIONAL CERTIFICATION AND REGISTRATIONS

Professional Engineer, Mississippi #18022  
Registered Professional Geologist, Mississippi #0725

## TEACHING AND RESEARCH INTERESTS AND EXPERIENCE

- A. Geographic Information Science and Technology (GIS&T) with emphasis in application and integration of technologies and methods with currently accepted techniques. I am an Authorized ESRI instructor (ATP#349129).
- B. Remote sensing applications using multispectral and hyperspectral sensors for detecting target signatures that are used as a segregate for engineering and geological properties.
- C. Effects of bandwidth selection on data visualization and compression within eigenspace using multispectral and hyperspectral sensors.
- D. Slope stability modeling and the reinforcing effects of roots from woody and herbaceous vegetation.
- E. Near-shore and shallow water radiative transfer theory. Determining water quality, properties, depth and bottom type characteristics through the use of remotely sensed data.

## EMPLOYMENT

- A. Present Position: **Assistant Professor**, Department of Geology and Geological Engineering, The University of North Dakota (August 2008–Present)

- B. **Visiting Assistant Professor**, Department of Geology and Geological Engineering, The University of Mississippi (July 2005–August 2008)

I developed and taught courses at the freshmen level introductory geology course and graduate level courses using spatial analysis and remote sensing techniques and theories. Focus on science, technology, engineering, and mathematics (STEM) integration into coursework and community outreach.

- B. **Graduate Research Assistant/Graduate Instructor**, Department of Geology and Geological Engineering, The University of Mississippi (January 1998–Present)

I planned, executed and evaluated the laboratory exercises for freshman, senior and graduate level courses. I collaborated with course professors to create exercises that would parallel actual project requirements in the environmental, construction, mining, petroleum and remote sensing industries. The exercises focused on teamwork, quality of execution, communication and client satisfaction. While employed, I extensively used Arc/INFO, ArcView, ArcGIS suites, RSI/ENVI, and ERDAS Imagine software.

- C. **Hydrologic Technician (GS-04)**, United States Department of Agriculture, National Sedimentation Laboratory, Oxford, Mississippi (February 1998–April 1999)

I gathered analyzed and interpreted data for the Channel and Watershed Projects Research Section. I performed slope stability investigations of riparian zones in incised stream systems. Typical tasks involved survey of sites; database management of many data sources; development of publishing-quality graphics; assisted with many simultaneous long-term research efforts (field and laboratory based). Much of my tenure involved the work that laid the foundation of my Master's thesis research.

- D. **Project Manager/Project Engineer**, Environmental Monitor Systems Corp.-Environmental Construction Division, Indianapolis, Indiana, (March 1997–January 1998)

I was responsible for site supervision of remedial construction sites. My principle tasks involved the scoping, estimating, scheduling and other critical front-end project management and construction management activities in preparation for a bid submittal. I routinely prepared technical proposals, project scopes and project approach reports. I also organized and maintained a corporate-wide health and safety program.

- E. **Geological Engineer/Site Superintendent**, Sverdrup Environmental, Inc., St. Louis, Missouri (May 1995–February 1997)

I was responsible for site supervision of remedial construction and environmental investigation sites. I carried out the scoping, scheduling, site supervision, health and safety oversight, CAD deliverables and client relations for RCRA and general construction projects. Some projects involved innovated enzyme treatment method of petroleum hydrocarbon contaminated soils that achieved cleanup levels 90% faster than conventional biological treatments. Estimation of multi-million dollar bids for corrective actions at RCRA and CERCLA sites nationwide. I attended extensive training in project management, client relations, quality management, health and safety and marketing strategies.

- F. **Hydrologic Aid (GS-03)**, United States Geological Survey-Water Resources Division, Rolla, Missouri (September 1990–May 1995)

I gathered verified and updated analytical results of surface water samples for the USGS's national NASQAN database. I utilized remote sampling techniques for NPDES permitting projects at military installations and conducted subsurface explorations and

water quality surveys at CERCLA site in southeastern Missouri. I worked collaboratively with others in producing the annual report of water data for the Missouri District of the USGS.

## CONSULTING

- A. I am the owner of a consulting company. I currently have an active contract with the Department of Energy and Sandia National Laboratory to supply geospatial data products to researchers at the Waste Isolation Pilot Plant (WIPP) in southeast New Mexico. Additionally, I have several private clients I serve as a geospatial expert and integration of geospatial technologies with current products offered by said companies. One private client focusing on collateral side of the mortgage process uses my expertise in geocoding and spatial error analysis.
- B. I have assisted in the inspection of water impoundments and analyzed these impoundments for breach potential using hydrologic and hydraulic models. These results were used as a basis for State mandated Emergency Actions Plans. These EAPs are used by local emergency responders in the event the dam is breached.

## PROFESSIONAL AFFILIATIONS

American Geophysical Union  
American Society for Photogrammetry and Remote Sensing  
The Association of Engineering Geologists  
American Society for Engineering Education

## AWARDS AND HONOR SOCIETIES

- First place “Best Poster Award” (co-authored with Greg Easson) for a poster presented at the annual joint conference of the Association of Engineering Geologists and the American Institute Professional Geologists, 2001.
- Society of the Sigma Xi; Associate Member, The University of Mississippi, 2003–Present

## PROFESSIONAL DEVELOPMENT

- ESRI 3-day Introduction to ArcGIS II, St. Paul, Minnesota, 2008
- Project Manager 3-day Training for International Charter for Disasters and Remote Sensing, Kansas City, Kansas, 2008
- Pictometry imagery training 1-day, The University of Mississippi-UMGC, 2008
- ESRI Authorized ArcGIS I Instructor #349129, 2006
- ESRI 2-day Introduction to ArcGIS I, San Antonio, Texas, 2006
- ESRI 3-day Introduction to ArcGIS II, San Antonio, Texas, 2006
- FEMA 2-day HAZUS-MH training, Indiana Department of Homeland Security, 2006
- ESRI 5-day Introduction to ArcObjects, MARIS, 2005
- Electronic Imaging Conference 1-day Introduction to Image Processing and Recognition using Neural Networks, Wavelets and Statistical Techniques, San Jose, California, 2004
- ERDAS 5-day Imagine 8.x training, The University of Mississippi-UMGC, 2000
- ESRI 3-day ArcView 3.x training, MARIS, 1999
- OSHA 29 CFR 1926, 10 Hour Construction Safety and Health, April 1996
- California Institute of Technology, 5-day Project management course, February 1996
- OSHA 29 CFR 1910.120, 8 Hour Supervisor Training, June 1995
- OSHA 29 CFR 1910.120, 40 Hour Hazardous Materials Training, May 1992

## PROFESSIONAL SERVICE

### National Council of Examiners for Engineering and Surveying (NCEES)

Volunteered as Fundamental of Engineering (FE) exam review instructor, 2006–2008  
FE exam development volunteer, 2008–2009

### Reviewer

Geocarto International  
Remote Sensing of Environment  
Photogrammetric Engineering and Remote Sensing (PE&RS)  
NASA National Space Grant College and Fellowship Program proposals, 2008–2009  
2008 IEEE International Geoscience & Remote Sensing Symposium abstracts

### Mississippi Academy of Sciences

Chairperson, Poster Program Committee, Annual Meeting, 2005

### American Society of Photogrammetry and Remote Sensing

Technical Session Moderator, Regional, Fall meeting, 2008  
Technical Session Moderator, National, Fall meeting, 2004  
Student volunteer, Annual meeting, 2000

### The Association of Engineering Geologist

Student volunteer, Annual meeting, 1994  
President, Student Chapter, University of Missouri-Rolla, 1994  
Vice-President, Student Chapter, University of Missouri-Rolla, 1993  
Treasure, Student Chapter, University of Missouri-Rolla, 1992  
Publicity Officer, Student Chapter, University of Missouri-Rolla, 1991

## UNIVERSITY SERVICE

### Program Committees

Geology and Geological Engineering-Geological Engineering Curriculum, 2008–Present  
Education Sub-committee on the development of graduate degree programs in Geospatial Information Science and Technology at the University of Mississippi, 2007

### Position Search Committees

I have served as committee member or chair on four (4) research faculty and staff positions at The University of Mississippi, 2006–2007

### Program Assessment Committees

Geology and Geological Engineering-ABET, 2008–Present  
Geology and Geological Engineering-Assessment, 2008–Present

### Mid-South Area Engineering and Sciences Conference

I have served as session chair for *Geospatial Analysis in Engineering Applications*, 2007

## TEACHING EXPERIENCE

### Thesis Supervision

M.S. Project Committee, Michael J. McDaniel, A Study of the Ground Water Resources in De Soto County, Mississippi: Department of Civil Engineering, The University of Mississippi, 2007.

### University Courses (Instructor of Record)

The University of North Dakota, Department of Geology and Geological Engineering:

Earth Dynamics (3-hr, freshman level), 2008  
Engineering Geology (3-hr, upper level), 2009  
Engineering Design (3-hr, Capstone), 2009

The University of Mississippi, Department of Geology and Geological Engineering:  
Advanced Remote Sensing (3-hr, graduate level), 2006, 2007  
Earth Dynamics (4-hr, freshman level), 2005  
Engineering Geology (3-hr, upper level), 2008  
Introductory Remote Sensing (3-hr, upper level and graduate), 2006, 2007  
Introduction to Geographic Information Systems (3-hr, upper level and graduate), 2006, 2007  
Spatial Analysis (3-hr, graduate level), 2005, 2006  
Physical Geology (3-hr, freshman level), 2001  
Historical Geology (3-hr, freshman level), 2000

#### University Courses (Co-Taught or Guest)

The University of Mississippi, School of Engineering:  
Introduction to Engineering (3-hr, freshman level), 2006, 2007

#### Invited Talks and Workshops

Mississippi Junior Academy of Sciences, Research Poster Workshop, 2005, 2006, 2007.

#### Short Courses

**ESRI's ArcGIS Training (authorized).** A 2-day course taught by ESRI certified instructor. I have taught this course numerous times to over 120 students.  
Primary instructor-2006, 2007, 2008

**Introduction of GIS and GPS Workshop.** A 1-day workshop with a “hand-on” approach to instruct individuals on the theory, setup, uses, data download, and limitations of the GPS technologies. Taught eight times and to approximately 85 participants.  
Primary instructor-2000, 2001, 2004, 2006  
Assistant instructor-1999

**ESRI's ArcView Training (authorized).** A 2-day course taught by ESRI authorized instructor.  
Assistant-1999, 2000, 2002, 2003, 2004

#### Student Teaching Assistantships

The University of Mississippi, Department of Geology and Geological Engineering:  
Historical Geology Laboratories, 1999  
Physical Geology Laboratories, 1998–1999  
Geomechanics Engineering Laboratories, 1998–1999  
Introduction to Geographic Information Systems Laboratories, 1998–2003  
Introduction to Remote Sensing Laboratories, 2000–2005  
Earth Dynamics (Introductory geology for majors) Laboratories, 1998–2004

University of Missouri-Rolla, Department of Geological Engineering:  
Subsurface Exploration Laboratories, 1994–1995

#### FUNDED RESEARCH

**NASA Applied Sciences Program-Rapid Prototyping Capability for Earth-Sun Systems Sciences,** *Integration of Global Precipitation Measurement Data Product with the Hydrologic Engineering Center-Hydrologic Modeling System*, \$272,335 award, 2007–2008, PI-Yarbrough.

**NASA Applied Sciences Program-Rapid Prototyping Capability for Earth-Sun Systems Sciences**, *Evaluation for the Integration of a Virtual Evapotranspiration Sensor Based on VIIRS and Passive Microwave Sensors into the Annualized Agricultural Non-Point Source (AnnAGNPS) Pollution Model*, \$275,667 award, 2007–2008, PI-Yarbrough..

**The University of Mississippi Enterprise for Innovative Geospatial Solutions Research Fellowship**, \$25,000 award, 2000–2005, PI-Easson.

**Mississippi Space Commerce Initiative Research Fellowship**, \$24,000 award, 2003–2004, PI-Easson.

#### UNFUNDED RESEARCH PROPOSALS

**Department of Homeland Security (DHS), Southeast Regional Research Initiative (SERRI)**, Real-Time Levee Analysis and Data Management System, \$86,260.49 requested, 2008, Unfunded.

**Department of Homeland Security (DHS), Southeast Regional Research Initiative (SERRI)**, Development of a rapid levee assessment classification and the Levee Analyst software and data model, \$47,074.02 requested, 2008, Unfunded.

#### BIBLIOGRAPHY

##### Manuscripts in preparation

Yarbrough, L.D., G. Easson, and J.S. Kuszmaul, DN Based Tasseled Cap Transform Coefficients for the ASTER Sensor Level 1-B Data. *manuscript in preparation*, For submission to IEEE Geoscience and Remote Sensing Letters.

Yarbrough, L.D., J.S. Kuszmaul and G. Easson, , *manuscript in preparation*, Identification of bias for improved Kauth-Thomas Transform derivations.

##### Articles (peer-reviewed)

Rahman, S., A. C. Bagtzolgo, F. Hossain, L. Tang, L. D. Yarbrough, and G. Easson, *in press*. Investigating Spatial Downscaling of Satellite Rainfall Data for Stream Flow Simulation in a Medium-sized Basin, *Journal of Hydrometeorology*.

Harris, A. , S. Rahman, F. Hossain, L. D. Yarbrough, A. C. Bagtzolgo and G. Easson, 2007. Satellite-based Flood Modeling using TRMM-based rainfall products and Statistical Downscaling, *Sensors*, **7**, pp. 3416–3427.

Easson, G.L., F. Faruque and L.D. Yarbrough, 2005. Rating the Shrink/Swell Behavior of the Porters Creek Formation, *Environmental & Engineering Geoscience*, **11** (2), pp. 171–176.

Easson, G.L. and L.D. Yarbrough, 2002. The Effects of Riparian Vegetation on Bank Stability. *Environmental & Engineering Geoscience*. **8** (4), pp. 247–260.

##### Papers and other articles

Yarbrough, L.D. and G. Easson, 2005. Eye of the Storm—Google Earth Assists Katrina Response and Recovery, *GeoWorld*, **18** (11), pp. 24–27.

Yarbrough, L.D. and G. Easson, 2005. Eye of the Storm—Google Earth Assists Katrina Response and Recovery (reprint), *Geomatica*, **59** (4), pp. 451–453.

Yarbrough, L.D., G. Easson, and J.S. Kuzmaul, 2005. Tasseled Cap Coefficients for the QuickBird2 sensor: A comparison of methods and development, *presented at* Pecora 16-American Society for Photogrammetry and Remote Sensing, October 23-27, Sioux Falls Convention Center, Sioux Falls, SD, 10 pages, *CD-ROM*.

Yarbrough, L.D., G. Easson, and J.S. Kuzmaul, 2005. Using At-Sensor Radiance and Reflectance Tasseled Cap Transforms Applied to Change Detection for the ASTER Sensor, *presented at* IEEE Third International Workshop on the Analysis of Multi-temporal Remote Sensing Images, 16–18 May 2005, Beau Rivage, Biloxi, Mississippi, USA, 5 pages, *CD-ROM*.

Aten, M.L., L.D. Yarbrough and G.L. Easson, 2004. Stable Band Set Selection for the Preprocessing of AVIRIS and Hyperion Hyperspectral Data. *Sensors, Systems, and Next-Generation Satellites VIII–Proceedings of SPIE*, Gran Canaria, Spain, 13–15 September, **5570**, pp. 589–594.

DeLozier, S.A., L.D. Yarbrough and G.L. Easson, 2004. GIS in a Small Town. *GeoWorld*, **12** (3), pp. 42–45.

#### Abstracts

Yarbrough, Lance D., 2008. Recent Research Efforts Using the Next-Generation NASA Global Precipitation Measurement (GPM) Proxy Data. Joint Meeting of the Association of American Geographers (AAU) Great Plains-Rocky Mountain Division and American Society for Photogrammetry & Remote Sensing (ASPRS) Upper Midwest Chapter, University of North Dakota, 12–13 September 2008. (Session III-B Moderator-Environmental Applications Geospatial Technologies)

Rahman, S., A.C. Bagtzoglou, L.D. Yarbrough, and F. Hossain, 2007. Investigating Satellite Rainfall Based Flood Modeling in Anticipation of GPM: Understanding the Worth of Spatial Downscaling and Satellite Rainfall Uncertainty. *Eos Trans. AGU*, Fall Meeting Supplement, Abstract IN43B-1176.

Yarbrough, L.D., and G.L. Easson, 2007. Geocoding techniques and effects of error on results from risk management decision support systems. Mid-South Area Engineering and Sciences Conference (MAESC), The University of Mississippi, Oxford, MS, May 17–18, 2007. *CD-ROM*.

Easson, G., J. S. Kuzmaul, L.D. Yarbrough, D. Irwin, E. Cherrington, 2006. Rapid Prototyping of Simulated VIIRS Data in the SERVIR Fire Rapid Response System. *Eos Trans. AGU*, 87(52), Fall Meeting Supplement, Abstract IN32A-01.

Yarbrough, L.D., G.L. Easson, and J.S. Kuzmaul, 2004. DN Based Tasseled Cap Transform Coefficients for the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Sensor Level 1-B Data. American Society of Photogrammetry and Remote Sensing, Fall Meeting, Kansas City, Missouri.

Yarbrough, L.D., G.L. Easson, 2003. Comparison of Techniques for Deriving Bathymetry of Remotely Sensed Data, *Oceanology International and Alliance of Marine Remote Sensors*, New Orleans, Louisiana.

Easson, G.L. and L.D. Yarbrough, 1999. The Use of GIS in Determining Root Area Ratio. Program with Abstracts, Association of Engineering Geologist. 26–29 September 1999. Salt Lake City, Utah.

#### Contract and Industry Reports

Yarbrough, L.D., 2009. Analysis of Sedimentation and Impact of Plantation Lake, Olive Branch, Mississippi (Supplemental-Soil Lose Analysis). Submitted to the Law Office of Greer, Pipkin, Russell, Dent & Leathers, Tupelo, Mississippi.

Yarbrough, L.D., 2008. Analysis of Sedimentation and Impact of Plantation Lake, Olive Branch, Mississippi. Submitted to the Law Office of Greer, Pipkin, Russell, Dent & Leathers, Tupelo, Mississippi.

Aughenbaugh, N.B., L.D. Yarbrough, 2006. Formal Inspection Report for Pine Lake (MS02734), Panola County Mississippi.

Holt, R.M., L.D. Yarbrough, 2002. Analysis Report-Task 2 of AP-088-Estimating Base Transmissivity Fields (AP-088: Analysis Plan for Evaluation of the Effects of Head Changes on Calibration of Culebra Transmissivity Fields). Task Number 1.3.5.3.1.2.

#### Dissertation

Yarbrough, L.D., 2006. The Legacy of the Tasseled Cap Transform: A Development of a More Robust Kauth-Thomas Transform Derivation. A dissertation at The University of Mississippi, Department of Geology and Geological Engineering. G.L. Easson, Advisor. 202 pages.

#### Thesis

Yarbrough, L.D., 2000. Channel Bank Stability Analysis and Design – Considering the Effects of Riparian Vegetation and Root Reinforcement. A thesis at The University of Mississippi, Department of Geology and Geological Engineering. G.L. Easson, Advisor. 139 pages.