

Brian Miles

CONTACT selimnairb@gmail.com
 <https://github.com/selimnairb/>

EDUCATION **Ph.D. Geography (2014)**
 University of North Carolina at Chapel Hill
 Advisor: Lawrence E. Band
 Dissertation: *Small-scale Residential Stormwater Management in Urbanized Watersheds: A Geoinformatics-driven Ecohydrology Modeling Approach*

M.S. Natural Resources, Environmental Thought & Culture (2008)
 Rubenstein School of Environment & Natural Resources, University of Vermont
 Thesis: *Putting Aesthetics in Its Place in the Vermont Wind Power Debate*

B.S. Information and Decision Systems (2001)
 Carnegie Mellon University

CERTIFICATIONS - AWS Certified Cloud Practitioner: June 2018-2020.

SKILLS - Programming languages (current): Java, Python
 - Programming languages (past): C/C++, JavaScript, Perl, Visual Basic, C#;
 - Cloud: Azure, AWS;
 - IoT: OGC SensorThings API;
 - GIS programming: GRASS GIS, GDAL/OGR, OGC WCS and WFS;
 - GIS: GRASS GIS, QGIS, ArcGIS, Whitebox GAT;
 - Environmental: Air quality monitoring; rainfall-runoff modeling;
 - Software engineering: TDD/BDD, Git, CI/CD;
 - DevOps: Configuration and use of Docker containers;
 - Web (current): Spring Boot, REST, microservices architecture, Angular.io;
 - Web (past): Django, OAuth, Java Servlet, JSP, ASP, Perl CGI, PHP, Rails;
 - Mobile: iOS development with Swift;
 - Databases: PostgreSQL/PostGIS, Cassandra, SQLite/Spatialite, Oracle;
 - Data analysis tools: matplotlib, pandas, NumPy, R, MATLAB; and
 - Distributed computing: JMS, Azure Service Bus, iRODS, LSF, PBS/TORQUE, SLURM, ØMQ, Google Protocol Buffers.

Brian Miles

- EMPLOYMENT**
- Director, Consulting** **CGI Federal Inc.**
May 2018 – Present **Lafayette, LA**
- Technical lead for team of 15 software developers and testers using Scaled Agile Framework (SAFe) methodology to develop Java microservices for a leading commercial satellite remote sensing company;
 - Collaborate on funding proposals with water science researchers at Institute for Coastal & Water Research at the University Louisiana at Lafayette;
 - Technical lead for Lafayette Engagement and Research Network (LEaRN) air quality sensor deployment project in collaboration with Lafayette Consolidated Government, University of Louisiana at Lafayette, and Lafayette Public Schools; and
- Senior Consultant** **CGI Federal Inc.**
May 2017 – May 2018 **Lafayette, LA**
- Contribute code to Fraunhofer IOSB FROST SensorThings API server;
 - Develop Kinota Big Data an open source, NoSQL partial implementation of OGC SensorThings standard;
 - Develop iOS application for U.S. EPA Office of Water Integrated Watershed Network (IWN) initiative; and
 - Mentor junior software developers.
- Consultant** **CGI Federal Inc.**
April 2016 – May 2017 **Lafayette, LA**
- Develop J2EE applications for U.S. EPA Central Data Exchange (CDX);
 - Lead transition from SVN to Git;
 - Pilot CI/CD pipeline implementation using Bamboo; and
 - Mentor junior software developers.
- Research Scientist** **Institute for the Environment**
November 2014 – April 2016 **University of North Carolina at**
Chapel Hill
- System design and software development for NSF-funded HydroShare project;
 - Co-PI for NSF-funded project “Interoperating CyberGIS and HydroShare for Integrated Food, Energy and Water Research”;
 - Ecohydrology modeling and GIS software design for NSF-funded CyberSEES project “A New Framework for Crowd-Sourced Green Infrastructure Design”;
 - Develop EcohydroLib, a platform for reproducible geospatial data acquisition workflows for ecohydrology modeling applications;
 - Develop RHESSysWorkflows, an extension of EcohydroLib for building geospatial data parameterizations for Regional Hydro-Ecological Simulation System (RHESSys) ecohydrology models;

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EMPLOYMENT
(CONT'D)

Graduate Research Assistant
August 2010 – November 2014

Department of Geography
University of North Carolina at
Chapel Hill

- Work under the direction of Dr. Lawrence E. Band on applications of the Regional Hydro-Ecologic Simulation System (RHESSys) to urban catchments in Baltimore, MD and Durham, NC;
- Develop ecohydrology data acquisition and preparation workflow tools using iRODS data grid as part of NSF-funded EarthCube project;
- Acquire geospatial data from municipal sources for integration with numerical ecohydrology models;
- Software development on NSF-funded HydroShare project.

Wind Energy Extension Specialist
September 2008 – July 2010

North Carolina Solar Center
NC State University

Coordinated Solar Center's Coastal Wind Initiative:

- Provided technical assistance to NC Environmental Management Commission regarding state-wide wind permitting legislation;
- Organized, with NC Dept. of Commerce, NC exhibition and business breakfast at AWEA Windpower conference, raising over \$15,000 from NC-based and international business sponsors;
- Managed field collection of wind data at four sites in coastal NC.

Graduate Research Assistant
August 2005 – September 2008

Rubenstein School of
Environment and Natural
Resources
The University of Vermont

Worked under the direction of Dr. Austin Troy on an agent-based land use model of Chittenden County, Vermont:

- Debugged and customized UrbanSim, an agent-based land use model;
- Assisted with QA/QC of geospatial demographic and infrastructure data used as input to land use model;
- Integrated land use model with TransCAD transportation model;
- Developed custom software tools for managing model output data.

Research Systems Programmer
June 2001 – July 2005

Computing Services
Carnegie Mellon University
Pittsburgh, Pennsylvania

- Designed and implemented web applications;
- Managed a project to extend web services to a new campus in Qatar;
- Participated in the evaluation, selection, and implementation of a campus-wide web portal;
- Lead programmer for campus-wide event calendar system.

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TEACHING EXPERIENCE

Instructor
June 2015 – December 2016

Software Carpentry

Graduate Teaching Assistant
January 2006 – May 2006

**Introduction to Geographic
Information Systems (GIS)**
The University of Vermont

Assisted Dr. Austin Troy in the teaching of an undergraduate course in GIS:

- Assisted in the administration of weekly labs to 30+ students;
- Graded lab assignments, assisted with grading of exams and final projects;
- Lectured during Dr. Troy's absence.

PROFESSIONAL AFFILIATIONS

American Geophysical Union
American Water Resources Association

PUBLICATIONS (PEER-REVIEWED)

Leonard L., **Miles B.**, Heidari B., Lin L., Castronova A.M., Minsker B., Lee J., Scaife C., Band L.E. (2018) *Development of a participatory Green Infrastructure design, visualization and evaluation system in a cloud supported jupyter notebook computing environment*. Environmental Modelling & Software Vol. 111, pp. 121-133.

BenDor T.K., Shandas V., **Miles B.**, Belt K., Olander L. (2018) *Ecosystem services and US stormwater planning: An approach for improving urban stormwater decisions*. Environmental Science & Policy 88, 92-103.

Hwang T., Martin K.L., Vose J.M., Wear D., **Miles B.**, Kim, Y., Band L.E. (2018) *Non-Stationary Hydrologic Behavior in Forested Watersheds is Mediated by Climate-Induced Changes in Growing Season Length and Subsequent Vegetation Growth*. Water Resources Research.

BenDor T.K., Jordanova T.V., **Miles B.** (2017). *A geospatial analysis of land use and stormwater management on fecal coliform contamination in North Carolina streams*. Science of the Total Environment. Volumes 603-604, 15 December 2017, pages 709-727. DOI: 10.1016/j.scitotenv.2017.02.093.

Martin K.L., Hwang T., Vose J.M., Coulston J.W., Wear D.N. **Miles B.**, Band L.E. (2017). *Watershed impacts of climate and land use changes depend on magnitude and land use context*. Ecohydrology. 17 July 2017. DOI: 10.1002/eco.1870.

Miles B., Band L.E. (2015). *Green Infrastructure Storm Water Management at the Watershed Scale: Urban variable source area and watershed capacitance*. Hydrological Processes. Volume 29, Issue 9, pages 2268-2274. DOI: 10.1002/hyp.10448.

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PUBLICATIONS (PEER-REVIEWED; CONT'D)

Miles B., Band L.E. (2015). *Ecohydrology Modeling Without Borders?*. In eds. Ralf Denzer, Robert M. Argent, Gerald Schimak, Jiří Hřebíček. Environmental Software Systems — Infrastructures, Services and Applications. 11th IFIP WG 5.11 International Symposium, ISESS 2015. Melbourne, Australia, March 2015. IFIP Advances in Information Technology (AICT) 448, Springer.

Hwang T., Band L.E., Hales T.C., Miniati C.F., Bolstad P.V., **Miles B.**, Price K. (2015). *Simulating vegetation controls on hurricane-induced shallow landslides in southern Appalachians with a distributed ecohydrological model*. Journal of Geophysical Research: Biogeosciences. Volume 120, Issue 2, pages 361-378. DOI: 10.1002/2014JG002824.

Band L.E., McDonnell J., Barros A., Bejan A., Burt T., Dietrich W., Emanuel R., Duncan J., Hwang T., Katul G., Kim Y., McGlynn B., **Miles B.**, Porporato A., Scaife C., Troch P. (2014). *Ecohydrological flow networks in the subsurface*. Ecohydrology. Volume 7, Issue 4, pages 1073-1078. DOI: 10.1002/eco.1525

Voigt B., Troy A., **Miles B.**, Haselton A.R. (2009). *Testing an integrated land use and transportation modeling framework for a small metropolitan area*. Transportation Research Record: Journal of the Transportation Research Board. Volume 2133 / 2009, pp. 83-91.

Farley J. and **Miles B.** (2008). *Science and Problem Solving in a Political World: Lessons from Katrina*. International Journal of Ecological Economics & Statistics. 11:S08, pp. 3-20.

Miles B., Morse S. (2007). *The Role of News Media in Natural Disaster Risk and Recovery*. Ecological Economics. 63:2-3, pp. 365-373.

Gaddis E., **Miles B.**, Morse S., Lewis D. (2007). *Full cost accounting of coastal disasters in the United States: Implications for planning and preparedness*. Ecological Economics. 63:2-3, pp. 307-318.

OTHER PUBLICATIONS

Band L., Galluppi K., Moore R., Rajaseker A., **Miles B.**, de Torcy A. (2011). *Knowledge management in the Earth Systems Sciences: Case study of the co-evolution of watershed and ecosystem patterns*. NSF EarthCube white paper.

Brian Miles. (2009). *Tilting at Windmills*. Harper's. Vol. 318, No. 1904, Jan. 2009, p. 4.

INVITED PRESENTATIONS

Miles B. (2015) *Urban Hydrology*. Lecture for University of North Carolina at Chapel Hill, Department of Geography course 441: Introduction to Watershed Systems. Instructor Dr. Diego Riveros-Iregui. 17 Apr.

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INVITED PRESENTATIONS (CONT'D)

Miles B. (2018) *Lafayette Engagement and Research Network*. Air Sensors International Conference, Oakland CA, 14 Sept.

Miles B., Chepudira, K. (2017) *LEaRN: Lafayette Engagement and Research Network & the EPA Smart City Air Challenge*. Making Sense of Sensors. South Coast Air Quality Management District (AQMD), Diamond Bar, CA, 27-28 Sept.

Miles B. (2015) *Urban Ecosystem Processes at the Watershed Scale: The urban variable source area concept, infiltration-based stormwater management, and watershed capacitance*. USGS Eastern Geographic Science Center, 18 Feb.

Miles B. (2014) *Reducing stormwater pollution in suburban ecosystems: the role of household-scale management*. Department of Geography Colloquium, University of North Carolina at Chapel Hill, 21 Mar.

Miles B., Band L. (2013) *Software Development in the Water Sciences: a view from the divide*. Abstract IN22A-03 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.

CONFERENCE PRESENTATIONS

Miles B., Chepudira K., LaBar W. (2017) *Kinota Big Data: An Open-Source NoSQL implementation of OGC SensorThings for large-scale high-resolution real-time environmental monitoring*. Poster presentation. IN51B-0016, American Geophysical Union Fall Meeting, New Orleans, CA, 15 Dec.

Miles B., Idaszak R. (2015) *Unleashing spatially distributed ecohydrology modeling using Big Data tools*. Poster presentation. IN51B-1808, American Geophysical Union Fall Meeting, San Francisco, CA, 18 Dec.

Tarboton D., Idaszak R., Horsburgh R., Ames D., Goodall J., Band L., Merwade V., Couch A., Hooper R., Maidment D., Dash P., Stealey M., Yi H., Gian T., Castronova A., **Miles B.**, Zhiyu L., Morsy M. (2015) *Advancing Collaboration through Hydrologic Data and Model Sharing*. Oral presentation. H43A-04, American Geophysical Union Fall Meeting, San Francisco, CA, 17 Dec.

Vimal S., Tarboton D., Band L., Duncan J., Lovette J., Corzo G., **Miles B.** (2015) *Developing an Approach to Prioritize River Restoration using Data Extracted from Flood Risk Information System Databases*. Poster presentation. H43A-1465, American Geophysical Union Fall Meeting, San Francisco, CA, 17 Dec.

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CONFERENCE
PRESENTATIONS
(CONT'D)

Ames D., Zhiyu L., Xiaohui Q., Tarboton D., Idaszak R., Horsburgh R., Merwade V., **Miles B.**, Swain N., Lineberger R., Rice E. (2015) *Web-Based Data Visualization and Analysis using HydroShare and the Open Source Tethys Platform*. Poster presentation. H43A-1473, American Geophysical Union Fall Meeting, San Francisco, CA, 17 Dec.

Goodall J., Morsy M., Castronova A., **Miles B.**, Merwade V., Tarboton D. (2015) *Model Sharing and Collaboration using HydroShare*. Poster presentation. H43A-1474, American Geophysical Union Fall Meeting, San Francisco, CA, 17 Dec.

Miles B., Band L. (2015) *Understanding the Role of Residential Stormwater Management in Reducing Runoff: An Urban Variable Source Area Approach*. Oral presentation. Topical Session T111, Geological Society of America Annual Meeting, Baltimore, MD, 4 Nov.

Miles B., Band L. (2015) *Green Infrastructure Designer: A New Framework for Crowd-Sourced Green Infrastructure Design*. Oral presentation. Baltimore Ecosystem Study (BES) Long-Term Ecological Research Program Annual Meeting, Baltimore, MD, 20 Oct.

Miles B., Band L. (2015) *Ecohydrology Models without Borders? Using Geospatial Web Services in EcohydroLib Workflows in the United States and Australia*. Oral presentation. Paper no. 72, International Symposium on Environmental Software Systems, Melbourne, Australia, 25-27 Mar.

Miles B., Band L. (2014) *Infiltration-based stormwater retrofits on residential parcels: a watershed-scale ecohydrology modeling approach*. Oral presentation. Session no. 2680, Association of American Geographers Annual Meeting, Tampa, Florida, 8-12 Apr.

Miles B., Band L. (2013) *Stormwater pollution in suburban ecosystems: the role of residential rooftop connectivity*. Oral presentation. Abstract H13P-06 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Miles B., Hwang T., Band L. (2013) *Stormwater pollution in suburban Baltimore ecosystems: the role of household-scale management*. Poster presentation. Baltimore Ecosystem Study Annual Meeting, Baltimore, MD, 22-23 Oct.

Miles B., Band L. (2013) *Toward a common framework for ecohydrology model data preparation workflows: EcohydroWorkflowLib*. Oral presentation. 2013 CUAHSI Conference on Hydroinformatics and Modeling, July 17-19. Logan, UT.

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CONFERENCE PRESENTATIONS (CONT'D)

Miles B., Band L. (2012) *Residential-scale stormwater management: a geoinformatics-driven ecohydrology approach*, Abstract H51J-1481 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Koch B., **Miles B.**, Rai A., Band L., Minsker B., Palmer M., Williams M., Idaszak R., Whitton M., Ahalt S. (2012) *Advancing Water Science through Improved Cyberinfrastructure*, Abstract GC51C-1205 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Miles B., Band L. (2012) *Toward a geoinformatics framework for understanding the social and biophysical influences on urban nutrient pollution due to residential impervious surface connectivity*. Poster presentation. CUAHSI 3rd Biennial, July 16-18. Boulder, CO.

Miles B., Band L. (2011) *Land use pattern, storm water quality, and ecosystem services in urban watersheds*. Poster presentation. Presented at 2011 Fall Meeting, AGU, San Francisco, Calif.

Miles B. (2008) *Identity and Scale in the Vermont Wind Power Debate*. Oral presentation. Presented at Annual Meeting, Association of American Geographers, Boston, April 2008.

Ivakhiv A., **Miles B.** (2007) *What's Clean, Green, Pure, White Beautiful, and Threatened? Brand "Vermont"*. Oral presentation. Presented at Annual Meeting, Association of American Geographers, San Francisco, April 2007.

Miles B. (2006) *The Rhetoric of Aesthetics in the Vermont Wind Power Debate*. Oral presentation. Presented at Interactions, Annual Conference of the Graduate School of Arts and Humanities, University of Glasgow, Scotland, October 2006.

GRANTS

U.S. National Science Foundation. S. Wang, Co-PI. D. Tarboton, Co-PI. **B. Miles**, Co-PI. 2015-2016. \$61,266 (sub-award amount). *Interoperating CyberGIS and HydroShare for Integrated Food, Energy and Water Research*.

North Carolina Green Business Fund. D. Eggleston, Co-PI. **B. Miles**, Co-PI. 2011-2013. \$230,919. *Evaluation of Hybrid Wind-Photovoltaic Energy to Support the NC Marine Aquaculture Industry*.

U.S. National Science Foundation. W. DeLuca, Co-PI. L. Annetta, Co-PI. P. Carpenter, Co-PI. A. Clark, Co-PI. J. DeCarolis, Co-PI. **B. Miles**, Senior Researcher. 2009-2011. \$499,564. *GRID-C II: Green Research for Incorporating Data in the Classroom Phase 2*.

U.S. Department of Energy. **B. Miles**, Principal Investigator. 2009-2011. \$99,347. *Wind Powering America: The next steps in North Carolina*.

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- GRANTS (CONT'D) **U.S. Department of Energy. B. Miles**, Principal Investigator of NC State sub-award (Project PI: Heather Rhodes-Weaver, eFormative Options, LLC). 2009-2011. \$30,000 (sub-award amount). *Power Through Policy: 'Best Practices' for Cost-Effective Distributed Wind*.
- REVIEWING **Ecological Informatics;**
Environment;
Journal of Computing in Civil Engineering, American Society of Civil Engineers;
University of Wisconsin Sea Grant Institute.
- SERVICE **Bloomberg Philanthropies, 2018 Mayors Challenge Champion City** core team member. October 2017 – October 2018.
- Chair, **Durham, NC City-County Environmental Affairs Board**. 2012 – 2013.
- UNC Graduate Association of Geography Students**. Co-President, 2012 – 2013.
- Secretary, **Durham, NC City-County Environmental Affairs Board**. 2011 – 2012.
- UNC Graduate Association of Geography Students**. Faculty committee representative, 2011 – 2012.
- Vice-chair, **Durham, NC City-County Environmental Affairs Board**. 2010 – 2011.
- Durham, NC City-County Environmental Affairs Board**. Appointed 2009.