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**EDUCATION**

M.S. in Geography, University of Tennessee, Knoxville, 2012

B.A. in Geography, University of Tennessee, Knoxville, 2008

**CAREER TRAINING HIGHLIGHTS**

Online Advanced GIS Capstone Certificate Program, University of Wisconsin, Madison, In Progress

MOOC Cartography (Online Course), Esri Academy, Oct 2018

Data Visualization & Infographics with D3 (Online Course), Knight Center for Journalism in the Americas, 2015

Geographic Information Systems Professional (GISP) Certification, GIS Certification Institute, renewed 2019

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**PROFESSIONAL EXPERIENCE**

Technical Professional Staff, Feb 2014 - Present

[*Oak Ridge National Laboratory - Environmental Sciences Division*](https://www.ornl.gov/division/esd)*, Oak Ridge, TN*

* Provide data management and analysis support for project-specific needs and ad-hoc requests from management, project leads, team members, and sponsors.
* Create and implement cartographic production and publication workflows (digital and for print) to develop and manage maps effectively for research projects and sponsor activities.
* Develop and update digital maps and maps for print that effectively convey complex analytical information in an easily digestible and visually engaging manner for both expert and general audiences.
* Identify GIS data needs and challenges, research solutions, and recommend actions to program managers and project leads.
* Contribute to project scoping, proposal writing, budget planning, and ensuring that deadlines are met within time and budgetary constraints.
* Act as the point person for handling external data, map, and research inquiries for ORNL's HydroSource project.

Post-Master's Research Associate, Jun 2012 - Feb 2014

[*Oak Ridge National Laboratory - Environmental Sciences Division*](https://www.ornl.gov/division/esd)*, Oak Ridge, TN*

* Contributed GIS data management from analysis through archival and produced 200+ maps for the New Stream-Reach Development project—team received the \*\*Significant Event Award for its significant contribution to the ORNL’s National Hydropower Asset Assessment Program (national-scale data integration project).
* Designed the first prototype for The National Hydropower Map to visualize and characterize the geospatial distribution of the U.S. existing hydropower fleet; received \*Awards for Best Cartography on both the 2014 and 2016 versions at the East TN Geographic Information Council Annual Meeting.
* Coordinated with management, project leads, team members, and sponsors to support the development of website content such as web pages, applications, and data resources for energy-water-environmental research and data initiatives.

Graduate Research & Teaching Assistant, Sep 2009 - May 2012

[*University of Tennessee - Department of Geography*](https://geography.utk.edu/)*, Knoxville, TN*

* Fall 2011, Spring 2012 (RA) — U.S. EPA’s ReVA project. Processed Land Use Land Cover GIS data to support U.S. water quality modeling research.
* Fall 2010, Spring & Fall 2011 (Head GTA) — Introduction to GIS.
* Fall 2009 & Spring 2010 (TA) — Introduction to Physical Geography.

GIS Intern, Jan 2008 - Aug 2011

[*Oak Ridge National Laboratory - Geographic Information Science & Technology Group*](https://www.ornl.gov/division/csed/gist)*, Oak Ridge, TN*

* Collaborated with GIS team members to compile, analyze, and report ad-hoc estimates and 90-meter resolution visualizations of potentially affected populations for real-time national emergency response simulations.
* Used GIS analysis and remote sensing techniques to validate and verify large geospatial infrastructure and high-resolution population database models used to address critical emergency response situations.
* Stayed atop organizational and other relevant data management standards and handled all data ethically and responsibly to ensure research integrity and appropriate handling of pre-publication and protected information.
* Managed data licenses for ORNL's LandScan Global project.
* Led a case study on extending LandScan’s USA model to better account for geospatial-temporal distributions of business and leisure travel populations and presented findings at the 2009 American Association of Geographers Annual Meeting.
* Collected spatial and temporal data on holiday populations and used ArcGIS software to organize the information into a flexible and user-friendly geodatabase.

Laboratory Technician, Aug 2007 - Apr 2008

[*University of Tennessee - Laboratory of Tree-Ring Science*](http://ltrs.utk.edu/)*, Knoxville, TN*

* Prepared and analyzed core samples and data on a master whitebark pine chronology for Arkansas Game and Fish Commission vs. the United States; Funded by the United States Department of Justice, Environment and Natural Resources Division, Natural Resources Section. Hiked off-trail to collect core samples and fire history data to support various dendrochronology research initiatives within the Department of Geography.

Student Conservation Association Botany Intern, Jun 2007 - Aug 2007

[*National Park Service - Great Smoky Mountains National Park*](https://www.nps.gov/grsm/index.htm)*, TN & NC*

* Used GPS units to navigate off-trail to remote sites, set up sample plots, and collect ecological and soil data to monitor the status and trends of vegetation communities throughout the Great Smoky Mountains National Park. Prepared soil samples for analysis and input vegetation data into an Access database system.

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**SELECT TECHNICAL SKILLS**

GIS: ArcGIS Desktop and Pro, familiar with QGIS

Cartographic: Adobe Illustrator, Photoshop, Lightroom; Natural Scene Designer Pro 7.0; familiar with Blender

Languages: HTML, CSS, ArcPy, GDAL/OGR; familiar with Javascript (D3), Python, VBA, SQL

Data Analysis and Modeling: KNIME, ArcGIS (Model Builder, ArcPy, ArcToolbox); familiar with Python

Content Management Systems: Drupal, Wordpress, Wix

Microsoft Office: Word, Excel, PowerPoint, Access, Visio, OneNote

Project Management: Mindjet, Trello

**AWARDS**

  \*Best Cartography Award for the ‘2016 National Hydropower Map’ – 2016 East TNGIC Conference

    Best Technical Paper (2nd Place) – 2015 HydroVision International Conference

\*\*Significant Event Award for the National Hydropower Asset Assessment Program – 2014, issued by ORNL

  \*Best Cartography Award for the ‘2014 National Hydropower Map’ – 2014 East TNGIC Conference

**Professional Memberships & Committees**

North American Cartographic Information Society (NACIS)

Visualization Facility Committee - Renewable Energy Systems Group, ORNL

**Data Products**

[6] N.M. Samu, S.-C. Kao, P.W. O'Connor, M.M. Johnson, R. Uria-Martinez, and R.A. McManamay, National Hydropower Plant Dataset, Version 2 (FY18Q3). Existing Hydropower Assets [series] FY18Q3. National Hydropower Asset Assessment Program. Oak Ridge National Laboratory, Oak Ridge, TN.

[5] N.M. Samu, S.-C. Kao, P.W. O'Connor, M.M. Johnson, R. Uria-Martinez, and R.A. McManamay, National Hydropower Plant Dataset, Version 1, Update FY18Q2 (2018). Existing Hydropower Assets [series] FY18Q2. Curriculum Vitae | Page 4 Updated: July 2018 National Hydropower Asset Assessment Program. Oak Ridge National Laboratory, Oak Ridge, TN, Retrieved from: http://nhaap.ornl.gov.

[4] McManamay, R.A., M.S. Bevelhimer, S.C. Hetrick, S-C. Kao, E.A. Frimpong, W. Yaxing, M. Martinez Gonzalez, N. M. Samu (2013), U.S. Maps of Fish Traits Potentially Vulnerable to Hydropower Development, Oak Ridge National Laboratory National Hydropower Asset Assessment Environmental Attribution, available at:

[3] McManamay, R.A., M.S. Bevelhimer, S.C. Hetrick , S-C. Kao, W. Yaxing, M. Martinez Gonzalez, N. M. Samu (2013). U.S. Maps of Fish Species of Concern. Oak Ridge National Laboratory, Oak Ridge, TN, Retrieved from:

[2] McManamay, R.A., M.S. Bevelhimer, S.C. Hetrick, S-C. Kao, W. Yaxing, M. Martinez Gonzalez, N. M. Samu (2013), U.S. Maps of Water Use. Oak Ridge National Laboratory, Oak Ridge, TN, Retrieved from:

[1] McManamay, R.A., M.S. Bevelhimer, S-C. Kao, W. Yaxing, M. Martinez Gonzalez, N. Samu (2013), U.S. Maps of Hydrologic Classes. Oak Ridge National Laboratory, Oak Ridge, TN, Retrieved from:

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**Publications**

[8] Smith, B. T., N.S. Samu, S. Curd, S.-C. Kao, Y. Wei, Z. Wei. *In Review*. (Expected Release: 2019). “HydroSource Data Dictionary.” No. ORNL/TM-2019/1234. Oak Ridge National Laboratory, Oak Ridge, TN.

[7] Kao, S.-C., M. Ashfaq, B.S. Naz, R. Uria Martinez, R. Deeksha, R. Mei, Y. Jager, N. M. Samu, M.J. Sale (2017). “Effects of Climate Change on Federal Hydropower - The Second Report to Congress.” GPO DOE/EE-1063. Oak Ridge National Laboratory, Oak Ridge, TN.

[6] McManamay, R. A., M. J. Troia, C. R. DeRolph, and N. M. Samu (2016). “Stream Classification Tool User Manual: For Use in Applications in Hydropower-Related Environmental Mitigation.” No. ORNL/TM-2015/670. Oak Ridge National Laboratory, Oak Ridge, TN.

[5] DeNeale, S. T., P.W. O’Connor, D. R. Chalise, E. E. Centurion, A. R. Maloof, N. M. Samu (2015). “Parametric Cost Modeling for National-scale Hydropower Feasibility.” Conference paper, HydroVision International, Portland, OR (2015).

[4] McManamay, R. A., N. M. Samu, S.-C. Kao, M. S. Bevelhimer, and S. C. Hetrick (2015). "A Multi-scale Spatial Approach to Address Environmental Effects of Small Hydropower Development." Environmental Management 55, no. 1: 217-243.

[3] Kao, S.-C., R. A. McManamay, K. M. Stewart, N. M. Samu, B. Hadjerioua, S. T. DeNeale, D. Yeasmin, M. F. K. Pasha, A. A. Oubeidillah, and B. T. Smith (2014). New Stream-Reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States, GPO DOE/EE-1063, Wind and Water Power Program, Department of Energy, Washington, DC.

[2] Hadjerioua, B., S.-C. Kao, R.A. McManamay, M.F.K. Pasha, D. Yeasmin, A.A. Oubeidillah, N.M. Samu, K.M. Stewart, M.S. Bevelhimer, S.L. Hetrick, Y. Wei, B.T. Smith (2013). "An assessment of energy potential from new stream-reach development in the United States: Initial Report on Methodology." ORNL/TM-2012/298. Oak Ridge National Laboratory, Oak Ridge, TN.

[1] Jager, H. I., B. Elrod, N. M. Samu, Ryan A. McManamay, and Brennan T. Smith (2013). “ESA Protection for the American Eel: Implications for US Hydropower.” No. ORNL/TM2013/361. Oak Ridge National Laboratory, Oak Ridge, TN.