NICOLE SAMU, M.S., GISP

Technical Professional Staff Associate | Cartography & GIS Analysis

Water Resources Science & Engineering Group
Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box 2008, MS 6038, Oak Ridge, TN 37831-6038

(E) samunm@ornl.gov | (C) 865.576.3894
Map Samples: https://www.nicole-samu.com
Staff Profile: https://www.ornl.gov/staff-profile/nicole-m-samu

EDUCATION

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

- Thesis: "Spatial Discrepancies between NHDPlus & LIDAR-Derived Stream Networks"

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

- Study abroad program – Geography & Culture of China, 2007 (summer)

PROFESSIONAL EXPERIENCE

Technical Professional Staff Associate, Feb 2014 - Present
Oak Ridge National Laboratory - Environmental Sciences Division, Oak Ridge, TN

- Design maps for various types of media (e.g. posters for print, presentations, interactive visualizations, publication figures, web pages, etc.) that communicate information to target audiences in a clear, intentional, and visually engaging manner.
- Conduct scenario-specific GIS analyses, modeling, and data visualization to support core analysis capabilities for assessing bioenergy in the United States.
- Identify GIS analysis and visualization needs, research solutions, propose potential options, and develop and implement plans within time and budgetary constraints.
- Prepare and disseminate technical documentation and metadata for GIS data and maps that are clear, complete, and accessible to end-users.
- Optimize the performance of GIS data and map interfaces to accommodate intended end-usage for desktop and web-based applications.
- Collaborate with co-workers to develop map and data production methods, publication workflows, branding and design specifications, and Water Power Program-specific practices for handling data and maps throughout their life cycles.
- Teach and provide guidance to co-workers on GIS software and techniques for map creation and GIS analysis.

Post-Master's Research Associate, Jun 2012 - Feb 2014
Oak Ridge National Laboratory - Environmental Sciences Division, 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, 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, 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 geospatial 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, 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, 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.

SELECT TECHNICAL SKILLS

- GIS Platforms: ArcGIS Desktop (v3 -10), ArcGIS Pro 2.5, ArcGIS Server, ArcGIS Portal, ArcGIS Online, ArcGIS Enterprise, QGIS 3
- GIS Analysis Tools: ArcGIS Toolbox, ArcGIS Model Builder, QGIS Processing Toolbox and Graphical Modeler, PostGIS, SQL, Python, GDAL/OGR, ArcPy
- Cartography: ArcGIS Pro, ArcGIS Desktop, ArcGIS Maps for Adobe CC, QGIS, Adobe Illustrator, Adobe Photoshop, Mapbox Studio, Natural Scene Designer Pro, Tableau
- Big Data Analytics: KNIME, PostgreSQL, Tableau
- GIS Databases: ESRI Geodatabase (personal, file, SDE), PostGIS, PostgreSQL, pgAdmin, psql
- GIS Metadata Creation: FGDC CSDGM, ISO, and ESRI standards
- Website Management: Drupal, HTML, CSS, Google Analytics
- Team Collaboration: Microsoft TEAMS, Slack, Trello, MindManager, ArcGIS Pro Tasks

AWARDS

- *Best Cartography Award: "The 2016 National Hydropower Map," 2016 East TNGIC Conference; "The 2014 National Hydropower Map," 2014 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

CAREER TRAINING HIGHLIGHTS

- Online Advanced GIS Capstone Certificate Program, University of Wisconsin, Madison, 2019
- Geographic Information Systems Professional (GISP): Credential ID: 67702, Issued by: The GIS Certification Institute, Renewed Jun 2019

PROFESSIONAL MEMBERSHIPS

- American Association of Geographers
- North American Cartographic Information Society

DATA & MAP PRODUCTS

[11] N.M. Samu, D. Singh, B.M. Pracheil, B.T. Smith. 2020. U.S. Hydropower and Environmental Mitigation Map Series, V1: USA. 2020. HydroSource. Oak Ridge National Laboratory, Oak Ridge, TN. DOI: 0.21951/ThemMapSeries_FY20/1668703.

[10] N.M. Samu, D. Singh, B.M. Pracheil, M.M. Johnson, B.T. Smith. 2020. U.S. Hydropower and Fish Species Map Series, V1: USA. 2020. HydroSource. Oak Ridge National Laboratory, Oak Ridge, TN. DOI: 0.21951/ThemMapSeries_FY20/1668717.

[9] Samu, N.M., D. Singh, M. Johnson, Kao, S.-C., Gangrade, S., Curd, S., and B.T. Smith. 2020. The 2020 National Hydropower Map: USA. 2020. HydroSource. Oak Ridge National Laboratory, Oak Ridge, TN. DOI: 10.21951/NationalHydropowerMap_FY20/1634829.

[8] N.M. Samu, D. Singh, M.M. Johnson, and B.T. Smith. U.S. Hydropower Relicensing Map Series, V1: USA. 2020. HydroSource. Oak Ridge National Laboratory, Oak Ridge, TN. DOI: 0.21951/ThemMapSeries_FY20/1618290.

[7] B. Smith, N.M. Samu, S. Curd, S.-C. Kao, Y. Wei, Z. Wei, (2019). HydroSource Data Dictionary. Oak Ridge National Laboratory, Oak Ridge, TN. ORNL/TM-2019/1234.

[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. 10.21951/1454737.

[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 FY18Q2. National Hydropower Asset Assessment Program. Oak Ridge National Laboratory, Oak Ridge, TN. 10.21951/1326801.

[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, Oak Ridge, TN.

[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.

[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.

[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.

PUBLICATIONS

[9] Askander, J., S. Jones, C. Freeman, M. Langholtz, and N.M. Samu (2020). Biopower: The Impact of Deploying Biofuels to Replace Petroleum Liquids in Stationary Power Applications. Pacific Northwest National Laboratory, Richland, Washington. PNNL-3190.

[8] Smith, B. T., N.S. Samu, S. Curd, S.-C. Kao, Y. Wei, Z. Wei. (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.