

Timothy Mulrooney

Education	<p>2007 - 2009 UNC at Greensboro Greensboro, NC</p> <p>Ph.D. Geography</p> <ul style="list-style-type: none"> PhD in Geographic Information Systems (GIS) within Geography Department. Transferred graduate credits from the Earth Observation Systems Program at George Mason University in Fairfax, Virginia (2005 – 2006). Dissertation Title: “Turning Data into Information: Assessing and Reporting GIS Metadata Integrity Using Integrated Computing Technologies” <p>1999 – 2002 University of Idaho Moscow, Idaho</p> <p>M.S. Geography</p> <ul style="list-style-type: none"> Degree in Geography with emphasis in GIS, Remote Sensing and GIS programming. Thesis Title: “A Survey of Interactive Mapping Applications in the Web Environment: A New Approach to Choropleth Mapping” <p>1997 - 1999 Loyola College Baltimore, Maryland</p> <p>M.E.S. Computer Science</p> <ul style="list-style-type: none"> Languages studied include HTML, Java, JavaScript, C/C++, Assembly and Visual Basic. Also included coursework in Operating Systems, Hardware Programming, Systems Engineering, Algorithm Design and Systems Analysis <p>1992 - 1995 Columbia University New York. New York</p> <p>B.A Mathematics</p> <ul style="list-style-type: none"> Also earned special program in Secondary Science Education and New York State Teaching Certificate. <p>1990 - 1992 Rowan University Glassboro, New Jersey</p> <p>Physical Science</p> <ul style="list-style-type: none"> Physical Science Major Until Transfer to Columbia University
Professional experience	<p>2017 – Present North Carolina Central U. Durham, NC</p> <p>Associate Professor</p> <p>Associate professor in the Department of Environment, Earth and Geospatial Sciences at state university.</p> <p>2010 – 2017 North Carolina Central U. Durham, NC</p> <p>Assistant Professor</p> <p>Assistant professor in the Department of Environment, Earth and Geospatial Sciences at state university.</p>

2008 – 2010 Winston-Salem State U. Winston-Salem, NC

Data Research Lead and Lab Manager

GIS research associate in charge managing GIS and IT lab, creating and assisting in mapping projects and developing data for these projects. Assist WSSU faculty and teach GIS courses and workshops. Other activities include:

- Regular software and database (spatial and aspatial) maintenance catered to local community based agencies and WSSU GIS needs at the Transforming Communities Research Laboratory (TCRL), a 12 seat GIS and IT laboratory used to support WSSU students and faculty, plus members of the community wishing to perform GIS research.
- Application and web page development to deliver information about TCRL GIS data assets and instructional materials to the larger GIS data community.
- Develop technical papers, posters and presentations for publications, workshops and conferences.
- Writing grants catered to research to be performed by the TCRL.
- Develop workshops and exercises catered to professors and students wishing to integrate geospatial sciences into their curriculum and research.

2007 – 2008 Winston-Salem State U. Winston-Salem, NC

GIS Instructor

Instructor for 3 credit Technical Analysis (JUS 4342) course using GIS offered through the Justice Studies Program at Winston-Salem State University. In charge of all facets of presentation development, exercises and course assessment. Received positive reception from students and administration.

2004 – 2008 Fort A.P. Hill Bowling Green, Virginia

Senior GIS Specialist

In addition to previous responsibilities as a GIS Analyst at Fort A.P. Hill, also accountable for the following tasks:

- Regular hardware and software maintenance of 12 Terabyte server containing U.S. Army GIS data and associated documentation
- Maintenance and upkeep of ESRI SDE application and underlying Oracle 10g database used to store data
- Implementation of HTTP, HTTPS, FTP and ArcIMS sites for the viewing and storage of online maps and related documentation
- Programming of ArcGIS and related spatial and non-spatial applications using Java Script, ArcXML, ArcObjects, VBA and ASP/ASP.NET
- Project lead on various mapping and technical projects as it relates to environmental stewardship and range management at U.S. Army Installations

2002 - 2003 Fort A.P. Hill Bowling Green, Virginia

GIS Analyst

GIS Analyst in United States Army ITAM-SRP (Integrated Training Area Management – Sustainable Range Program) Program. Create and assess geographic data that could be used in decision making processes regarding training and environmental stewardship on various military installations throughout the world. Responsibilities include:

- GIS data and metadata development using a variety of techniques, including GPS use
- GIS data upkeep to reflect changes in spatial and attribute data for Army GIS data and pertinent metadata using ESRI applications
- Map creation, data analysis and subsequent distribution to various

	<p>government agencies</p> <ul style="list-style-type: none"> ▪ Meeting with installation Army personnel regarding individual installation mapping and data development goals. Arrange with various installation range and environmental personnel to collect data and edit maps based on installation specific needs ▪ Teach workshops and present technical papers at local and national conferences regarding GIS technology as it pertains to ITAM-SRP program goals and interests <p>2001 - 2002 Potlatch Jr. – Sr. High School Potlatch, Idaho</p> <p>High School Teacher</p> <p>High school earth science and physical science teacher for rural high school.</p> <ul style="list-style-type: none"> ▪ Served as assistant wrestling and head track and field coach. Coached one wrestler to a second-place finish at Idaho 1A-2A State Wrestling Championships. Coached two athletes (1 male and 1 female) to runner-up finishes at Idaho 2A State Track and Field Championships. ▪ Helped develop map and GPS curriculum for earth science students to increase geographic awareness and as an introduction to computer based tools used to create and read maps. <p>1999 - 2001 University of Idaho Moscow, Idaho</p> <p>Teaching Assistant</p> <p>Teaching assistant for 1 credit physical geography laboratory taught in conjunction with 3-credit lecture class.</p> <ul style="list-style-type: none"> ▪ Served as Head Teaching Assistant for 2000 – 2001 school year. Coordinated schedule for more than 20 sections of this laboratory course. Mediated conflicts between students, faculty and teaching assistants. Regularly met with professors to ensure that lecture and lab materials correlated with each other. <p>2000 - 2001 Latah County Moscow, Idaho</p> <p>GIS Data Coordinator</p> <p>Worked with the Latah County Economic Development Council (EDC) to coordinate and maintain GIS database. Duties included:</p> <ul style="list-style-type: none"> ▪ Acquire and project data into proper coordinate system. ▪ Derive GIS data layers that could be used in the EDC decision making process. ▪ Aid county administrators unfamiliar with GIS about making decisions in order to attract new industries to rural parts of Latah County. <p>1995 - 1999 John Carroll School Bel Air, Maryland</p> <p>High School Teacher</p> <p>Math, science and computer programming teacher at coeducational private high school near Baltimore, Maryland.</p> <ul style="list-style-type: none"> ▪ Assistant wrestling coach for 4 years. ▪ Developed and delivered new Programming in C/C++ course for advanced students wishing to prepare for collegiate computer programming studies.
<p>Workshops Taught</p>	<p>Mulrooney, Timothy. 2003. <i>GIS Tools for Range Managers</i>. RTLP (Range and Training Lands Program) Symposium. Hampton, Virginia, May 6.</p> <p>Mulrooney, Timothy and Maple, R. 2003. <i>GPS/GIS Integration</i>. 6th Annual ITAM (Integrated Training Area Management) Conference. El Paso, Texas, August 11.</p>

	<p>Mulrooney, Timothy, Maple, R. and Walters, J. 2003. <i>Spatial Analyst – Short Course</i>. 6th Annual ITAM (Integrated Training Area Management) Conference. El Paso, Texas, August 13.</p> <p>Mulrooney, Timothy. 2005. <i>GIS Data Sources</i>. 8th Annual ITAM (Integrated Training Area Management) Conference. Indianapolis, Indiana, August 2 - 3.</p> <p>Mulrooney, Timothy and Allan, T. 2005. <i>Publishing Map Documents Using the Publisher Extension</i>. 8th Annual ITAM (Integrated Training Area Management) Conference. Indianapolis, Indiana, August 3 - 4.</p> <p>Mulrooney, Timothy and Maple, R. 2006. <i>GPS Support for SRP</i>. 9th Annual ITAM Conference. Manhattan, Kansas, August 7 – 9.</p> <p>Mulrooney, Timothy and Allan, T. 2007. <i>SRP GIS Quality Assurance Procedures</i>. 1st Annual SRP (Sustainable Range Program) Workshop. Hampton, Virginia, May 14 – 18.</p> <p>Mulrooney, Timothy. 2009. <i>Measuring the Impact of Your Work: Data Collection, Benchmarks and Mapping</i>. National CCDO (Community Capacity Development Office) Conference. Tampa, Florida, July 13.</p> <p>Mulrooney, Timothy. 2015. <i>The Use and Application of GIS in the Study of Food Deserts – A Public Administration Context</i>. Public Administration 5130 (Principles of Public Administration). North Carolina Central University, Durham, NC, November 9.</p> <p>Mulrooney, Timothy and Pederson, Craig. 2017. <i>Metadata Training for the State of North Carolina</i>. Daylong workshop in support of NCDOT Grant #2017-20. North Carolina Central University, Durham, NC, December 12.</p> <p>Mulrooney, Timothy and Foster, Richard. 2018. <i>Metadata Training for the State of North Carolina</i>. Daylong workshop in support of NCDOT Grant #2017-20. North Carolina Central University, Durham, NC, October 16.</p>
<p>Presentations</p>	<p>Mulrooney, Timothy. 2003. <i>The LCM (Land Condition Model) for Modeling Military Lands</i>. 23rd Annual ESRI Users Conference. San Diego, California, July 9.</p> <p>Mulrooney, Timothy, and Bower, A. 2003. <i>Metadata Creation and Management</i>. 6th Annual ITAM (Integrated Training Area Management) Conference. El Paso, Texas, August 12.</p> <p>Mulrooney, Timothy. 2004. <i>Data Dictionary Basics</i>. 7th Annual ITAM Conference. San Francisco, California, August 11.</p> <p>Mulrooney, Timothy. 2005. <i>GIS as an Effective Educational Tool at Germanna Community College Geography Courses</i>. Virginia Community College System New Horizons Conference. Roanoke, Virginia, April 8.</p> <p>Mulrooney, Timothy. 2005. <i>Technical Complications of Implementing Free Downloadable Data from the Internet</i>. 8th Annual ITAM Conference. Indianapolis, Indiana, August 2.</p> <p>Mulrooney, Timothy. 2006. <i>GIS Data Sources for Sustainable Range Program GIS</i>. 9th Annual ITAM Conference. Manhattan, Kansas, August 7.</p> <p>Mulrooney, Timothy. 2007. <i>A Case Design in Range Design and Reconfiguration Utilizing GIS</i>. VAMLIS (Virginia Association of Mapping and Land Information Science) Annual Conference. Richmond, Virginia, May 7.</p> <p>Mulrooney, Timothy. 2007. <i>Grappling with Geographic Diversity: A Spatial Analysis of NCAA Wrestling Programs</i>. VAMLIS (Virginia Association of Mapping and Land</p>

Information Science) Annual Conference. Richmond, Virginia, May 8.

Mulrooney, Timothy. 2009. *The Effects of the 2006 Annexation of Winston-Salem on Urban Crime Patterns*. North Carolina GIS Conference. Raleigh, North Carolina, February 19.

Mulrooney, Timothy. 2009. *MART – Metadata Assessment and Reporting Tool*. 21st Century Entrepreneurial University Conference hosted by the University of North Carolina, Greensboro. Greensboro, North Carolina, March 23.

Mulrooney, Timothy. 2009. *Using GIS to Measure the Effectiveness of a Weed and Seed Initiative in Winston-Salem, 2001 - 2007*. National CCDO (Community Capacity Development Office) Conference. Tampa, Florida, July 15.

Mulrooney, Timothy and Atkinson, A. 2010. *Using Geospatial Technology as a Catalyst for Increasing Diversity in the Geosciences*. Presentation for Faculty at Winston-Salem State University. Winston-Salem, North Carolina, January 29.

Mulrooney, Timothy and Diluca, K. 2010. *Taking Stock: Using Data to Guide our Local Strategies*. Piedmont Triad Partnership Youth Mapping Workshop. Lexington, North Carolina, February 25.

Carmichael, Mike and Mulrooney, T. 2010. *Using Research and GIS Strategically to Shape Action and Response Issues*. ESRI Southeast Regional User Group (SERUG) Conference. Charlotte, North Carolina, April 26.

Mulrooney, Timothy. 2011. *Streamlining the Metadata Process Using ArcObjects Programming*. North Carolina GIS Conference. Raleigh, North Carolina, February 17.

Mulrooney, Timothy. 2011. *Grappling with Geographic Diversity: Exploring Spatial Patterns of Collegiate Wrestling Opportunities Across the United States*. Association of American Geographers (AAG) Annual Meeting. Seattle, Washington, April 15.

Mulrooney, Timothy. 2011. *Measuring Patterns of Crime in Durham, North Carolina*. Annual ESRI Users Conference. San Diego, California, July 14.

Mulrooney, Timothy. 2012. *Using GIS to Address Food Availability in Durham, North Carolina*. Association of American Geographers (AAG) Annual Meeting. New York, New York, February 24.

Mulrooney, Timothy and Love, Garrett. 2013. *Using GIS to Address Food Availability in Durham, North Carolina*. NC GIS Conference. Raleigh, North Carolina, February 8.

Mulrooney, Timothy. 2014. *Geostatistical Methods to Measure Patterns of Black Bear Sightings in New Jersey*. Southeastern Division of the Association of American Geographers, Annual Meeting. Athens, Georgia, November 24.

Mulrooney, Timothy, Bacon, Kerry and Love, Garrett. 2014. *Optimizing Travel-Time Between North Carolina High School Football Playoff Teams Using an Origin-Destination (O-D) Matrix*. Southeastern Division of the Association of American Geographers, Annual Meeting. Athens, Georgia, November 23.

Mulrooney, Timothy. 2015. *Semi-Automated Procedures to Assess the Quality of NCDOT GIS Data*. NC GIS Conference. Raleigh, North Carolina. February 26.

Mulrooney, Timothy. 2016. *Creating Travel Time Surfaces to Measure Rural Food Availability in North Carolina*. Association of American Geographers (AAG) Annual Meeting. San Francisco, April 2.

Mulrooney, Timothy, McGinn, Chris and Branch, Benjamin. 2016. *A GIS (Geographic Information Systems) Approach to Understanding and Addressing Food Security*. North Carolina Central University, April 12.

Wayne, Lynda, Pederson, Craig, Mulrooney, Tim, Wray, Sarah and Duncan, Chelsea. 2017. *Jumpstart Metadata Creation with the NC Metadata Profile*. NC GIS Conference. Raleigh, North Carolina. February 24.

Mulrooney, Timothy, McGinn, Chris, Madumere, Richard, Beratan, Kathi and Ifediora, Byron. 2017. *A Framework to Assess and Evaluate the Accuracy of Healthy and Unhealthy Food Sources Used in the GIS (Geographic Information Systems) Analysis of Food Deserts*. 17th Annual IMGC (International Medical Geography Conference), Angers, France, July 6.

Mulrooney, Timothy. 2017. *A Comprehensive Assessment of Geospatial Data Used in the Study of Food Deserts*. Applied Agriculture and Economics Association Meeting, Chicago, Illinois, August 1.

Mulrooney, Timothy. 2017. *Best Practices of the New North Carolina State and Local Government GIS Metadata Profile*. North Carolina Geographical Society Annual Meeting, Winston-Salem, North Carolina, November 3.

Mulrooney, Timothy. 2017. *A Comparison of Raster-Based Travel-Time Surfaces Against Vector-Based Network Calculations as Applied in the Study of Rural Food Deserts*. Applied Geography Conference, Port Canaveral, Florida, November 14.

Mulrooney, Timothy, McGinn, Chris, Ifediora, Byron and Madumere, Chibuike. 2017. *The Use and Application of the Raster GIS Data Model in the Study of Food Deserts and Food Swamps in North Carolina*. Southeastern Division of the Association of American Geographers, Annual Meeting. Starkville, Mississippi, November 20.

Mulrooney, Timothy and Pederson, Craig. 2017. *Application of a New GIS Metadata Standard in the State of North Carolina*. Southeastern Division of the Association of American Geographers, Annual Meeting. Starkville, Mississippi, November 20.

Mulrooney, Timothy and Duncan, Chelsea. 2018. *Application of the North Carolina State and Local Government GIS Metadata Profile*. GIS-Transportation Conference. Little Rock, Arkansas, March 21.

Mulrooney, Timothy. 2018. *Assessing and Evaluating Standard Compliance with a State and Local Government GIS Metadata Profile in Large Geospatial Databases*. GeoProcessing 2018 Conference. Rome, Italy, March 27.

Mulrooney, Timothy. 2018. *Using Geospatial Technologies to Measure the Spatial Proliferation of Variety Stores in Rural North Carolina, United States*. Global Conference on Economic Geography. Cologne, Germany, July 25.

Mulrooney, Timothy. 2018. *Estimating Service Areas for Farmers' Markets in Southeastern North Carolina Using the Spatial Interaction Model*. NIFA Agricultural Economics and Rural Communities Project Directors Workshop. Washington DC, August 8.

	<p>Mulrooney, Timothy and Foster, Richard. 2019. <i>Networking Tools to Calculate Drive Times to Healthy Food in Support of Food Desert Mapping</i>. CNH (Coupled Natural-Human Systems) Symposium. North Carolina A&T State University, Greensboro, NC. November 12th.</p> <p>Mulrooney, Timothy and Wooten, Tysean. 2020. <i>A Public Participatory Approach Toward the Development of a Comprehensive Geospatial Database in Support of High-Scale Food Security Analysis</i>. GIS-TAM (Technology, Applications and Management) Conference. Virtual, May 8th.</p> <p>Mulrooney, Timothy and Gutierrez, Isabel. 2020. <i>Comparing Travel-Time Distance Calculations Versus Euclidean Distances as Applied in the Study of GIS</i>. NCDOT Transportation Research Summit. Virtual, October 14th.</p> <p>Mulrooney, Timothy. 2021. <i>Mapping COVID-19 Incidence Rates and Measuring their Relationship to Food Insecure Areas in North Carolina</i>. North Carolina GIS Conference. Virtual, February 11th.</p>
<p>Poster Presentations</p>	<p>Mulrooney, Timothy. 2003. <i>Wendell Ford Regional Training Center Installation Special Map</i>. Annual ESRI Users Conference. San Diego, California, July 9.</p> <p>Mulrooney, Timothy. 2008. <i>The Movement of Part I Crimes in Winston-Salem, North Carolina, 2002 - 2005</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Greensboro, North Carolina, November 22 – 25.</p> <p>Mulrooney, Timothy and Carmichael, M. 2009. <i>GIS for the Classroom and Research at Winston-Salem State University</i>. Winston-Salem State University Center for Excellence in Teaching and Learning (CETL) Showcase. Winston-Salem, North Carolina. April 2.</p> <p>Mulrooney, Timothy and Pender, R. 2010. <i>Measuring the Impact of Gangs and Gang Crime in Winston-Salem</i>. Winston-Salem State University Center for Excellence in Teaching and Learning (CETL) Showcase. Winston-Salem, North Carolina. April 15.</p> <p>Holden, Nelson and Mulrooney, Timothy. 2011. <i>Exploring Patterns of DUI Fatalities Across the United States</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Savannah, Georgia, November 20 – 22.</p> <p>Green, Erik, Bang, John, Yang, Zhiming and Mulrooney, Timothy. 2011. <i>Utilization of Aerosol Optical Depth (AOD) Data from MODIS for Real Time Regional Air Quality Assessment: A Feasibility Study</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Savannah, Georgia, November 20 – 22.</p> <p>Mulrooney, Timothy and Green, Erik. 2012. <i>Exploring Patterns and Factors Related to Deer-Vehicle Collisions in Central North Carolina</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Asheville, North Carolina, November 18 – 20.</p> <p>Mulrooney, Timothy, McGinn, Christopher, Ifediora, Byron and Madumere, Richard. 2016. <i>An Assessment of GIS Data Used in the Study of Food Deserts</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Columbia, South Carolina, November 21.</p>
<p>Invited Talks</p>	<p>Mulrooney, Timothy. 2008. <i>Programming with ArcObjects, VBA and GIS Metadata</i>. Geography 614: GIS Programming and Design Application. University of North Carolina, Greensboro, November 20.</p> <p>Mulrooney, Timothy. 2011. <i>Using Maps and GIS in the Nursing Sciences</i>. Alamance</p>

	<p>Community College. October 31.</p> <p>Mulrooney, Timothy. 2012. <i>Using Maps and GIS in Social Work</i>. North Carolina Central University – Master’s of Social Work Program. February 18.</p> <p>Mulrooney, Timothy, 2013. <i>The Many Uses of Geographic Information Systems (GIS) in the Academic and Professional Worlds</i>. Durham Technical Community College – Monthly Science Seminar. February 20.</p> <p>Mulrooney, Timothy and Love, Garrett. 2014. <i>Using Spatial Enabled Information to Analyze and Visualize Health Behaviors</i>. Duke University Informatics Research Seminar Series. Durham, North Carolina, March 5.</p> <p>Mulrooney, Timothy. 2014. <i>Using GIS (Geographic Information Systems) to Analyze and Map Food Deserts</i>. Geography Awareness Week, Alamance Community College, Graham, NC. November 20.</p> <p>Mulrooney, Timothy. 2016. <i>Using GIS (Geographic Information Systems) to Analyze and Map Food Insecurity</i>. HEDU 2000 – Introduction to Health Education. North Carolina Central University. October 6.</p> <p>Mulrooney, Timothy, Wray, Sarah and Duncan, Chelsea. 2017. <i>Jumpstarting Metadata Creation</i>. North Carolina State University Geospatial Studio Lecture Series. October 26.</p>
<p>Moderated Forums</p>	<p><i>GIS: Are You Using It in Your Classroom?</i> 2005. Virginia Community College System New Horizons Conference. Roanoke, Virginia, April 7.</p>
<p>Publications (academic and journal)</p>	<p>Mulrooney, Timothy. 2002. <i>A Survey of Interactive Mapping Applications: A New Approach to Web Mapping (Master’s Thesis)</i>. Moscow, Idaho: University of Idaho.</p> <p>Mulrooney, T. and Carmichael, M. 2009. Using GIS to Assess the Effectiveness of the Weed and Seed Initiative in Winston-Salem, North Carolina, 2002 - 2005. <i>Journal of Justice Studies</i> 1(1): 109 - 128.</p> <p>Mulrooney, Timothy. 2009. <i>Turning Data into Information: Assessing and Reporting GIS Metadata Integrity Using Integrated Computing Technologies (PhD Dissertation)</i>. Greensboro, North Carolina: University of North Carolina, Greensboro.</p> <p>Mulrooney, Timothy. 2011. An Assessment of Wind Power as an Alternative Energy Source in North Carolina: A GIS Approach. <i>The North Carolina Geographer</i> 18: 35 – 44.</p> <p>Love, Garrett, Mulrooney, Timothy and Brown, LaDonna. 2012. Using GIS to Address Food Availability in Durham, North Carolina. <i>The North Carolina Geographer</i> 19: 35 - 53.</p> <p>Mulrooney, Timothy and Mulrooney, S. 2013. Using Quadrat Analysis and Clustering Techniques to Quantify Patterns of Bear Sightings in Northwest New Jersey. <i>The Middle States Geographer</i> 46: 51 – 60.</p> <p>Mulrooney, T., Beratan, K., McGinn, C. and Branch, B. 2017. A Comparison of Raster-Based Travel Time Surfaces against Vector-Based Network Calculations as Applied in the Study of Rural Food Insecurity. <i>Applied Geography</i> 78: 12 – 21. (http://www.sciencedirect.com/science/article/pii/S0143622816306099)</p> <p>Mulrooney, T., McGinn, C. Branch, B., Madumere, C. and Ifediora, B. 2017. A New Raster-Based Metric to Measure Relative Food Availability in Rural Areas: A Case Study in Southeastern North Carolina. <i>Southeastern Geographer</i> 57(2): 151 - 178.</p>

Mulrooney, Timothy. 2018. Assessing and Evaluating Standard Compliance with a State and Local Government GIS Metadata Profile in Large Geospatial Databases. *GEOProcessing 2018: The Tenth International Conference on Advanced Geographic Information Systems, Applications, and Services*, Rome, Italy, March 27. ISBN: 978-1-61208-617-0: 36 – 39.

Mulrooney, Timothy. 2019. Facilitating a Statewide GIS Metadata Standard through Training, Outreach and Programmatic Metadata Evaluation. *International Journal on Advances in Software* 12(2): 166 - 178.

Dhamankar, S. S., Hashemi-Beni, L., Kurkalova, L. A., Liang, C. L., Mulrooney, T., Jha, M., Monty, G., and Miao, H. 2020. Study of Active Farmland Use To Support Agent-Based Modeling Of Food Deserts, *International Archives of Photogrammetry and Remote Sensing and Spatial Information Science*, XLIV-M-2-2020, 9–13, <https://doi.org/10.5194/isprs-archives-XLIV-M-2-2020-9-2020>.

Mulrooney, T., Foster, R., Jha, M., Hashemi Beni, L., Kurkalova, L., Liang, C.L., Miao, H., Monty, G. 2021. Using Geospatial Networking Tools to Optimize Source Locations as Applied to the Study of Food Availability: A Study in Guilford County, North Carolina. *Applied Geography* 128: <https://doi.org/10.1016/j.apgeog.2021.102415>.

Mulrooney, T. and Wooten, T. 2021. Digital High-Scale Food Security Analysis: Challenges, Considerations and Opportunities. *Communications in Computer and Information Systems* 1411: 140 – 166. https://doi.org/10.1007/978-3-030-76374-9_9.

Liang, C.-L., Kurkalova, L., Hashemi Beni, L., Mulrooney, T., Jha, M., Miao, H., and Monty, G. 2021. Introducing an innovative design to examine human-environment dynamics of food deserts responding to COVID-19. *Journal of Agriculture, Food Systems, and Community Development*, 10(2): 123–133. <https://doi.org/10.5304/jafscd.2021.102.037>

Lee, D., Paul, C., Pilkington, W., Mulrooney, T., Diggs, N and Kumar, D. 2021. Examining the Effects of Social Determinants of Health on COVID-19 Related Stress, Family's Stress and Discord, and Personal Diagnosis of COVID-19. *Journal of Affective Disorders Reports*, 5: <https://doi.org/10.1016/j.jadr.2021.100183>

Mulrooney, T., McGinn, C., Madumere, C. and Ifediora, B. 2021. A Comprehensive Assessment and Evaluation of the Digital Geospatial Data Sources Used in the Study of Food Deserts and Food Swamps. *The North Carolina Geographer*, 20: 13 -27.

McGinn, C., Mulrooney, T., Howard, R. and Wooten, T. 2021. Proliferating Transportation-Related Careers through the National Summer Transportation Institute (NSTI). *The North Carolina Geographer*, 20: 28 - 36.

Hashemi Beni, L., Kurkalova, L., Mulrooney T. and Azubike, C. 2021. Combining Multiple Geospatial Data for Estimating Above Ground Biomass in North Carolina. *Forest Remote Sensing*, 13(14): 2731. <https://doi.org/10.3390/rs13142731>

Boehme, H., Malhotra, R. and Mulrooney, T. 2021. More Gas, More Crime: A Geospatial Examination of the Concentration of Gas Stations and Predatory Crime. *The Southeastern Geographer* (pending).

Mulrooney, T. and McGinn, C. 2022. A Brief Statistical and Geostatistical Survey of the Relationship Between COVID-19 and By-Mail Balloting in the 2020 North Carolina General Election. *The Professional Geographer*, 74(1): 115 - 120. DOI: [10.1080/00330124.2021.1933551](https://doi.org/10.1080/00330124.2021.1933551).

	<p>Mulrooney, T., Mulrooney, E. and McGinn, C. 2022. Exploring Rural Food Insecurity in North Carolina: Debunking an Urban Myth. <i>Sociation - Journal of the North Carolina Sociological Association</i>, 20(2): 40 – 50.</p>
<p>Publications (reports)</p>	<p>Mulrooney, Timothy and Carmichael, M. 2009. <i>Putting Maps and GIS to Use in the Community and Classroom</i>. Winston-Salem, North Carolina: The Transforming Communities Research Laboratory. 49 pp.</p> <p>Quandt, Sara A., Arcury-Quandt, Alice E., Washington Chasity J., Mulrooney, Timothy and Bertoni, Alain. 2010. <i>Community Gardens and Farmers Markets: Forsyth County, North Carolina</i>. 57 pp.</p> <p>Weinstein, M., Fuller, K. Mulrooney, T. and Koch, G. 2014. <i>The Benefits of Recreational Programming on Juvenile Crime Reduction: A Review of Literature and Data</i>. Report for National Parks and Recreation Association. 345 pp.</p> <p>Mulrooney, Timothy. 2015. <i>Final Report: Applying QA/QC Procedures to Quantitatively Measure the Quality of NC DOT GIS Data. A Summary of NC DOT GIS Data</i>. Report for North Carolina Department of Transportation. 64 pp.</p> <p>Mulrooney, Timothy. 2019. <i>Final Report: Facilitating the New Statewide GIS Metadata Standard through Training and Outreach</i>. Report for North Carolina Department of Transportation. 22 pp.</p> <p>Mulrooney, Timothy. 2019. <i>Documenting and Mapping UAS Legislation by Municipality in the State of North Carolina</i>. Report for North Carolina Department of Transportation, Division of Aviation. 10 pp.</p>
<p>Non-Refereed Publications (conference)</p>	<p>Walters, J. and Mulrooney, T. 2003. <i>Case Study in Range Design / Reconfiguration Utilizing GIS</i>. Proceedings of the ESRI Users Conference, San Diego, California, August 3 - 7.</p> <p>Mulrooney, Timothy and Zech, A. 2003. <i>Monitoring Land Condition Related to Military Training</i>. Proceedings of the ESRI Users Conference, San Diego, California, August 3 - 7.</p> <p>Mulrooney, Timothy. 2006. <i>SDTS and Compatibility Issues with ESRI ArcGIS 9.x Software</i>. Proceedings of the 9th Annual ITAM Conference, Manhattan, Kansas, August 7 - 10.</p> <p>Bereitshaft, Bradley and Mulrooney, T. 2008. <i>A Comparative Assessment of Organic Farming Practices in the American Southeast</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Greensboro, North Carolina, November 22 – 25.</p> <p>Mulrooney, Timothy. 2010. <i>Thinking Big Picture About Metadata – Metadata Do's and Don't's</i>. North Carolina Arc/Info Users Working Group Newsletter. Spring, 2010.</p> <p>Mulrooney, Timothy. 2011. <i>Measuring Patterns of Crime in Durham, North Carolina</i>. . Proceedings of the ESRI Users Conference, San Diego, California, July 11 - 15.</p> <p>Mulrooney, Timothy. 2011. <i>Mapping and Modeling Intercollegiate Wrestling Opportunities in the American Southeast</i>. Proceedings of Southeastern Division of the Association of American Geographers, Annual Meeting. Savannah, Georgia, November 20 – 22.</p> <p>Mulrooney, Timothy, Love, G, McAlexander, T and Bush, T. 2013. <i>Creating Travel Time Surfaces to Model Food Imbalance in Durham, NC</i>. Proceedings of Southeastern Division of the Association of American Geographers, Annual Meeting. Roanoke, Virginia,</p>

	<p>November 24 – 26.</p> <p>Azubike, Chinazor S., Kurkalova, Lyubov A. & Mulrooney, Timothy J., 2019. <i>Modeling Land Use and Land Cover in North Carolina; a Markov Chain Approach</i>. Agricultural and Applied Economics Association Annual Meeting, Atlanta, GA, July 21-23, Atlanta.</p> <p>Mulrooney T. and Wooten, T. A Public Participatory Approach toward the Development of a Comprehensive Geospatial Database in Support of High-scale Food Security Analysis. In <i>Proceeding of the 6th International Conference in Geographical Information Systems Theory Application and Management (GISTAM 2020)</i>, pages 21 – 32. ISBN: 978-989-758-425-1.</p>
<p>Student Presentations Mentored</p>	<p>Brown, Phillip. 2011. <i>Using GIS to Find Links Between Heart Disease and Fast-Food Restaurants</i>. College of Science and Technology Research Symposium. April 16.</p> <p>Peery, Jameel and Sneed, Z. 2013. <i>North Carolina Black Male Incarceration & Violent Death Rates</i>. North Carolina Central University Research Symposium. April 20.</p> <p>Dozier, Ricoya and Mixon, R. 2013. <i>Using GIS to Interpret Female Breast Cancer Rates in North Carolina</i>. North Carolina Central University Research Symposium. April 20.</p> <p>Holden, Nelson. 2013. <i>Research Triangle Park Rate of Change</i>. North Carolina Central University Research Symposium. April 20.</p> <p>Pisaputi, Vijayshree. 2013. <i>Using GIS to Site a New Hiking Trail in the Research Triangle Area</i>. North Carolina Central University Research Symposium. April 20.</p> <p>Baker, Steidrick. 2014. <i>Using GIS to Map Climate Change in North Carolina</i>. North Carolina Central University Research Symposium. April 11 - 12.</p> <p>Holden, Nelson. 2014. <i>Exploring Patterns of Malfunctioning Septic Systems Associated with Contaminated Streams in The Upper Neuse River Basin</i>. North Carolina Central University Research Symposium. April 11 - 12.</p> <p>Koch, Glenn. 2014. <i>Terrestrial Carbon Sequestration: GIS Mapping and Analysis of Select Land Use Land Change Carbon Sinks</i>. North Carolina Central University Research Symposium. April 11 - 12.</p> <p>Holden, Nelson and Mulrooney, Timothy. 2014. <i>Effects of Malfunctioning Septic System in Durham County on Water Quality using application of GIS</i>. Southeastern Division of the Association of American Geographers, Annual Meeting. Athens, Georgia, November 23.</p> <p>Moore, Gerald and Clark, Bridget. 2015. <i>Visualizing National Suspension, Expulsion and Arrest Rates in US Schools</i>. North Carolina Central University Research Symposium. April 11.</p> <p>Branch, Benjamin. 2016. <i>Embedded Librarianship in Support of Food Insecurity</i>. North Carolina Central University Research Symposium. April 16.</p> <p>Branch, Benjamin. 2016. <i>Community Informatics in Support of Food Insecurity (CISFI)</i>. North Carolina Central University Research Symposium. April 16.</p> <p>Khademian, Mehrnaz. 2016. <i>Mapping and Assessing the Food Environment in Southeastern North Carolina</i>. North Carolina Central University Research</p>

Symposium. April 16.

Carson, Brittany. 2016. *Mapping the Importance of Arts Education in US Schools*. North Carolina Central University Research Symposium. April 16.

David, Tyrone. 2016. *Mapping and Assessing Hospitals in South Carolina*. North Carolina Central University Research Symposium. April 16.

Madumere, Richard. 2016. *The Field Verification (QA/QC) of Features used in the study of food Insecurity*. I Know What You Did Last Summer – Summer Internship Presentation, North Carolina Central University. September 16.

Madumere, Richard. 2016. *Creation of High-Quality Destination Data as Part of a Spatial Interaction Model Used in Food Insecurity Research*. Southeastern Division of the Association of American Geographers, Annual Meeting. Columbia, South Carolina, November 20.

Khademian, Mehrnaz. 2016. *Geostatistical Tools to Measure the Distribution of Food Sources in Southeastern North Carolina*. Southeastern Division of the Association of American Geographers, Annual Meeting. Columbia, South Carolina, November 20.

Ifediora, Byron. 2016. *Building a GIS Database in Support of Food Security Analysis*. Southeastern Division of the Association of American Geographers, Annual Meeting. Columbia, South Carolina, November 21.

Gates, Katherine. 2017. *Is There a Relationship Between Grocery Store Locations and Income in Orange County NC?* North Carolina Central University Research Symposium, April 1.

Pederson, Craig. 2017. *Applying Geo-Statistical Analysis to Create a Socio-Economic Contextualized Examination of School Achievement Grades*. North Carolina Central University Research Symposium, April 1.

Martin, Mykael. 2017. *Mapping Coronary Heart Disease Deaths in Southeastern North Carolina*. North Carolina Central University Research Symposium, April 1.

Munn, Natasha. 2017. *Food Desert: Access to Healthy Food for McDougald Terrace Community, Durham, NC*. North Carolina Central University Research Symposium, April 1.

Caddell, Cory. 2017. *The Spatial Distribution of Ulcerative Colitis in the State of North Carolina*. North Carolina Geographical Society Annual Meeting, Winston-Salem, North Carolina, November 3rd.

Gates, Katherine. 2017. *Socio-Economic Neighborhood Characteristics of the Food Environment in Orange County, North Carolina*. North Carolina Geographical Society Annual Meeting, Winston-Salem, North Carolina, November 3rd.

Ifediora, Byron. 2017. *Neighborhoods and Grocery Store Chains: A GIS Approach to Studying Socio-economics*. North Carolina Geographical Society Annual Meeting, Winston-Salem, North Carolina, November 3rd.

Madumere, Chibuiké. 2017. *A Quantitative Comparison of Rural Food Access to Health Indicators in Southeastern, North Carolina*. North Carolina Geographical Society Annual Meeting, Winston-Salem, North Carolina, November 3rd.

Zdanksi, Cristian. 2018. *Socio-Economic Variables Used to Define Need in the Study of Food Insecurity*. North Carolina Central University Research Symposium, April .

Lippy, Adam. 2018. *Food Deserts: A Case Study Around the NCCU Campus*. North Carolina Central University Research Symposium, April .

Wooten, Tysean. 2018. *Food Security: Low Income vs. High Income Neighborhood Nutrition Sources*. North Carolina Central University Research Symposium, April 7.

McKinney, Angie. 2018. *Mapping the Leading Causes of Death by Age Group 15-24, of North Carolina Residents*. North Carolina Central University Research Symposium, April 7.

Phillips, Stacie. 2018. *Closing the Gap Between the Aging Aviation Workforce and the New Technicians Need to Replace Them: A Spatial Approach to Solving this Problem*. North Carolina Central University Research Symposium, April 7.

Emma Bouie. 2018. *Exploring Patterns of on Campus Student-Lead Hunger Relief Programs*. North Carolina Geographical Society Annual Meeting. November 9.

Holley, Edward. 2018. *Conducting Geospatial Analysis on Tobacco Accessibility in Halifax County, North Carolina*. North Carolina Geographical Society Annual Meeting. November 9.

Caddell, Cory. 2018. *Utilizing ArcScan to perform Food Desert Data Comparisons in North Carolina*. North Carolina Geographical Society Annual Meeting. November 9.

Foster, Richie. 2018. *Exploring Drive Times to Healthy Food Options in Durham County*. North Carolina Geographical Society Annual Meeting. November 9.

Ross, Leticia and Massey, Lashawn. 2019. *Mapping School Suspension Rates by County in North Carolina*. North Carolina Central University Research Symposium. March 31.

Oliver, Georgette and Malan, Mishkah. 2019. *Using GIS to Map Incidences of Uterine Fibroids in North Carolina*. North Carolina Central University Research Symposium. March 31.

Spruill, Lettia. 2019. *Mapping Minority Communities in Areas of Wood Pellet Production Plants*. North Carolina Central University Research Symposium. March 31.

Bouie, Emma. 2019. *Mapping Rare Earth Element Deposits in Western North Carolina*. North Carolina Geographical Society Annual Meeting. Greensboro, NC, November 1.

Wooten, Tysean. 2020. *Utilizing Geographic Information Systems (GIS) to Map Food Availability*. Transportation Research Board Annual Meeting. Washington D.C., January 13th.

Gutierrez, Isabel. 2020. *A Comparison of Travel-Time Distance Calculation Versus Euclidean Distance Calculations as Applied in The Study of Food Deserts*. State of North Carolina Undergraduate Research & Creativity Symposium, November 7.

Gutierrez, Isabel. 2022. *Using Travel-Time Algorithms to Measure Seafood Accessibility in the Research Triangle Region, North Carolina*. Transportation Research Board Annual Meeting. Washington D.C., January 12th.

**Student
Awards
Mentored**

Roberts, Joseph. 2013. *Accuracy Assessment of Historical Maps from the Roanoke River Watershed, North Carolina*. North Carolina GIS Conference. February 6 – 7. Herb Stout Memorial Award – Undergraduate Division.

Martin, Philip. 2013. *Geospatial and Temporal Analysis of Seismicity in the New Madrid Seismicity Zone*. North Carolina GIS Conference. February 6 – 7. Herb Stout Memorial Award – Graduate Division.

Holland, James. 2013. *Using GIS to Make Effective Site Determinations for Additional Air Quality Monitoring Sites in North Carolina*. North Carolina Central University Research Symposium. April 20. 1st Place (Undergraduate Poster Presentation – Arts and Science Division)

Holley, Edward. 2013. *Mapping School Shootings in the United States*. North Carolina Central University Research Symposium. April 20. 2nd Place (Undergraduate Poster Presentation – Arts and Science Division).

Etukakpan, Clement. 2014. *Use of GIS to Effectively Maximize the Use of Telecommunications Resources (channels) in Durham*. North Carolina Central University Research Symposium. April 12. 3rd Place (Graduate Oral Presentation – Arts and Science Division).

Cooper, Jocelynn, 2014. *The Correlation Between Point Source Pollution and Cancer Deaths in Durham County, North Carolina*. North Carolina Central University Research Symposium. April 12. 1st Place (Undergraduate Poster Presentation).

Pederson, Craig. 2015. *Understanding School Achievement Grades Through GIS Context Analysis of Socio-Economic Behavioral Patterns*. North Carolina Central University Research Symposium. April 11. 1st Place (Undergraduate Oral Presentation – Behavioral and Social Science Division).

Meadows, Lashonda. 2016. *Mapping Attention Deficit Hyperactivity Disorder (ADHD) in the United States*. North Carolina Central University Research Symposium. April 16. 3rd Place (Undergraduate Poster Presentation – Behavioral and Social Science Division).

Madumere, Richard. 2016. *The Field Verification (QA/QC) of Features used in the study of food Insecurity*. National Society of Black Engineers. Charlotte, North Carolina, September 30. Top Technical Presentation.

Zdanski, Cristan. 2017. *Correlation of Aerosol Optical Depth and Particulate Matter*. North Carolina GIS Conference. February 23 – 24. Herb Stout Memorial Award – Undergraduate Division.

Cameron, Cortney. 2017. *An ArcGIS Network Analyst Approach for Congressional Redistricting in NC: Progress, Problems and Public Engagement*. North Carolina GIS Conference. February 23 – 24. Herb Stout Memorial Award – Graduate Division.

O'Quinn, Hyleah. 2017. *A Spatial Analysis of Swine Lagoons in North Carolina*. North Carolina Central University Research Symposium. April 1. 3rd Place (Undergraduate Poster Presentation – Arts and Science Division).

Marks, Ashley. 2017. *Use of Geospatial Technology within Primary Education to Increase Students Understanding of Geographic Concepts*. North Carolina Central University Research Symposium. April 1. 2nd Place (Graduate Oral Presentation – Arts and Science Division).

Clinton, Erica. 2017. *Student Attendance Rates and Successful End of Grade*

	<p><i>Testing Percentage in Durham Public School District's Elementary Schools</i>. North Carolina Central University Research Symposium. April 1. 2nd Place (Poster Presentation – Arts and Science Division).</p> <p>Caddell, Cory. 2018. <i>Using the NC Vital Statistics Database to Examine the Spatial Distribution of Ulcerative Colitis in North Carolina</i>. North Carolina Central University Research Symposium. April 7. 3rd Place (Poster Presentation – Undergraduate Arts and Science Division).</p> <p>Foster, Richard. 2018. <i>Exploring the Spatial Relationship Between Income and Healthy Food Availability in Durham County, NC</i>. North Carolina Central University Research Symposium. April 7. 1st Place (Poster Presentation – Undergraduate Arts and Science Division).</p> <p>Hargrove, Dezma. 2018. <i>Mapping of North Carolina SIDS Deaths Rates between 2000-2014</i>. North Carolina Central University Research Symposium. April 7. 2nd Place (Poster Presentation – Undergraduate Social and Behavioral Science Division).</p> <p>Holley, Edward. 2018. <i>Developing a Geodatabase for Health Disparities in Halifax County, North Carolina</i>. North Carolina Central University Research Symposium. April 7. 2nd Place (Poster Presentation – Graduate Arts and Science Division).</p> <p>Sink, Carter. 2018. <i>A Geostatistical Analysis of Age-Adjusted Cancer Death Rates and Hog Farm Frequency</i>. North Carolina Geographical Society Annual Meeting. November 9th. 1st Place (Graduate Division).</p> <p>Sciacca, Kaylee and Harris, KayLynn. 2018. <i>Projected Transitory Food Insecurity in Durham County Following Hurricane Florence</i>. North Carolina Geographical Society Annual Meeting. November 9th. 1st Place (Undergraduate Division).</p> <p>Foster, Richard. 2019. <i>Exploring the Spatial Relationship Between Income and Healthy Food Availability in Durham County, NC</i>. North Carolina GIS Conference. February 27 – March 1. Herb Stout Memorial Award – Undergraduate Division.</p> <p>Little, LaTausha. 2019. <i>Using GIS to Map Homelessness in North Carolina</i>. North Carolina Central University Research Symposium. March 31. 3rd Place (Poster Presentation – Undergraduate Social and Behavioral Science Division).</p>
<p>Grant Awards</p>	<p>Mulrooney, Timothy (PI) and Carmichael, M. (Co-PI). 2009 – 2010. Federal Geographic Data Committee, National Spatial Data Infrastructure CAP (Cooperative Agreement Program) Grant, Award G09AC00-5. <i>Metadata 101: Hands-On GIS Metadata Training and Support for North Carolina</i>. 1 yr. / \$24,173.</p> <p>Mulrooney, Timothy and Carmichael, M. 2009. <i>Forsyth Futures Indicators Data Development</i> [Collect, store and analyze data for publication to assess quality of life issues in Winston-Salem and Forsyth County]. .75 yr. / \$6,000.</p> <p>Mulrooney, Timothy. 2009. <i>Forsyth Futures Web Site Re-Design</i> [http://www.forsythfutures.org]. .5 yr. / \$1,975.</p> <p>Quandt, Sarah (PI), Atkinson, A. (co-PI), Mulrooney, Timothy (co-PI) and Carmichael, M. (co-PI). 2010. TSI (Transitional Science Institute) Program in Community Engagement and Implementation. <i>Assessing and Mapping Community Gardens and Farmers' Markets in Forsyth County</i>. .5 yr. / \$3,500.</p> <p>Mulrooney, Timothy (PI). 2011. North Carolina Central University Faculty-Student Scholarly/Creative Productivity Initiative. <i>Using GIS to Address Food Availability in</i></p>

Downtown Durham. 1 yr. / \$3,250.

Mulrooney, Timothy (PI). 2013. North Carolina Department of Transportation Research Program, Award 2014-02. *Applying QA/QC Procedures to Quantitatively Measure the Quality of NCDOT GIS Data.* 1 yr. / \$74,741.

Weinstein, Meredith (PI), Dennis, Arnold (co-PI), Stiefvater, Robert (co-PI), Dorwart, Catherine (co-PI) and Mulrooney, Timothy (co-PI). 2014. National Recreation and Park Association, Crime Reduction Metric Grant. *Benefits of Parks and Recreation in Reducing Juvenile Delinquency.* 1 yr. / \$35,168.

Mulrooney, Timothy (PI). 2016. North Carolina Department of Transportation Research Program Award 2017-20. *Facilitating the New Statewide GIS Metadata Standard Through Training and Outreach.* 2 yrs. / \$95,193.

Mulrooney, Timothy (PI), McGinn, Christopher (co-PI) and Beratan, Kathy (co-PI). 2016. NIFA (National Institute of Food and Agriculture) / USDA (United States Department of Agriculture) Foundational Grant Program Award 2016-67023-24904. *Geospatial Tools and Analyses to Assess, Educate and Inform Spatial Dimensions of Rural Food Insecurity.* 3 yrs. / \$417,942.

Mulrooney, Timothy (PI) and McGinn, Chris (co-PI). 2018. North Carolina Department of Transportation Research Program Award 2018-41. *Spatializing UAS Legislation by Municipality in the State of North Carolina.* 1 yr. / \$24,385.

Mulrooney, Timothy (PI), McGinn, Chris (co-PI) and Anderson, Cha'ssem (co-PI). 2018. North Carolina Department of Transportation / Federal Highway Administration. *National Summer Transportation Institute: Summer 2018 High School Day Camp.* \$24,000.

Vlahovic, Gordana (PI), McGinn, C. (co-PI), Malhotra, R. (co-PI) and Mulrooney, T. (co-PI). 2019. National Science Foundation. GEOPATHS-IMPACT: Growing Geoscience Enrollment Through Academic Partnership with NC Community Colleges. 3 yrs./\$316,944.

Jha, Manoj (PI), Liang, K. (co-PI), Beni, L. (co-PU), Kurkalova, L. (co-PI), Monty, G. (co-PI), Mulrooney, T. (co-PI). National Science Foundation – Dynamics of Coupled Natural and Human Systems (NCH). 2019. *Dynamics of Rural and Urban Food Deserts Driven by the Interactions Between Community Socio-Economic Characteristics and Land/Water Quality.* 3 yrs. / \$749,990.

Paul Chris (PI), Diggs, N. (co-PI), Lee, D. (co-PI) and Mulrooney, T. (Researcher). NC Policy Collaboratory. 2020. *The Role of Food Security in the Social Determinants of Health: Contingent Impacts of COVID-19 in North Carolina.* 1 yr. / \$65,000.

Mulrooney, Timothy (PI), McGinn, Chris (co-PI) and Gerald, Carresse (co-PI). 2021. NIFA (National Institute of Food and Agriculture) / USDA (United States Department of Agriculture) Foundational Grant Program Award 2021-67021-34152. *FACT: A Framework to Comprehensively Evaluate, Distribute and Catalog Geospatial Data Sources Used in the Study of the Food Environment.* 3 yrs. / \$364,500.

Mulrooney, Timothy (PI) and Malhotra, Rakesh (co-PI). 2021. North Carolina Department of Transportation Research Program Award 2022-21. *The Interactive Mapping of the NCDOT Research Project Program Using Story Maps.* 2 yrs. /

	<p>\$44,125.</p> <p>Lawlor, Lathleen, McCoy, Henry, Mulrooney, Timothy, Paul, Christopher, Krome-Lukens, Anna and Bahls, Patrick. University of North Carolina System Undergraduate Research Award Program. <i>Applied Public Policy Research on Race and Economic Opportunity: Connecting Senior Capstone CUREs at NC Central University, UNC Asheville, and UNC Chapel Hill to Inform Reparations Initiatives in Durham and Asheville.</i> 1 yr./\$29,500.</p>
<p>Courses Taught</p>	<p><i>High School Level:</i> Pre-Algebra, Algebra I, Algebra II, Geometry, Physical Science, Earth Science, Introduction to Programming, Programming in C/C++</p> <p><i>College Level:</i> North Carolina Central University</p> <ul style="list-style-type: none"> ▪ Introduction to Geography (GEOG 1000) ▪ World Regional Geography (GEOG 1100) ▪ Physical Geography (GEOG 2100) ▪ Introduction to GIS (GEOG 2020) ▪ Introduction to GIS – Online (GEOG 2020-OL) ▪ Geographic Information Systems (GEOG 3435) ▪ Applied Geographic Information Systems (GEOG 4010) ▪ Geostatistics (GEGO 4130) ▪ Geographic Theory and Methods (GEOG 4920) ▪ Field Mapping (GEOG 4950) ▪ Digital Geographic Information Systems (EASC 5120) ▪ Raster GIS (EASC 5125) ▪ Applied Geostatistics for the Earth Sciences (EASC 5130) <p>Other Colleges and Universities</p> <ul style="list-style-type: none"> ▪ Physical Geography Lab (GEO 100-L) ▪ Physical Geography (GEO 200) ▪ Introduction to Human Geography (GEO 210) ▪ World Regional Geography (GEO 220) ▪ GIS Primer (GEO 385) ▪ Technical Analysis (JUS 4342) <p>Online Courses Taught</p> <ul style="list-style-type: none"> ▪ Introduction to GIS ▪ Introduction to Geography ▪ World Regional Geography ▪ Physical Geography
<p>Graduate Committees</p>	<p>Master's Chair</p> <ul style="list-style-type: none"> ▪ Erik Green, <i>Exploring Patterns and Factors Related to Deer-Vehicle Collisions in Central North Carolina</i> (Graduated Fall 2013)* ▪ Marc Duchatelier, <i>Development of Geographic Information System (GIS) Database for Haiti Based on the January 12, 2010 Earthquake</i> (Graduated Fall 2013) ▪ Vijayshree Pisaputi, <i>Using the ESRI Flex API to assess and analyze air quality data in North Carolina</i> (Graduated Fall 2013)* ▪ Steidrick Baker, <i>The Assessment of Interpolation Methods Used to Estimate Diurnal Temperature Range In North Carolina</i> (Graduated Fall 2014) ▪ Nelson Holden, <i>Effects of High Density Malfunctioning Septic Systems in Durham County in Water Quality Using Applications of GIS</i> (Graduated Spring 2015) ▪ Zuri Sneed, <i>Assessing Horizontal Accuracy for Durham County Roads for the NC DOT</i> (Graduated Spring 2015)

- Antoniquan Johnson, *GIS Internship with the City of Oxford, North Carolina* (Graduated Spring 2015)
- Patrick Adams, *Location Analysis Protocols for a Micro-Computer Laboratory to Enhance the Academic Computing Infrastructure at North Carolina Central University* (Graduated Summer 2015)
- Troy Bass, *GIS Internship with the City of Oxford, North Carolina* (Graduated Summer 2015)
- Patricia Quinichett, *Using GIS to Assess Additional Sites for the Water Distribution Sample Siting Plan for the City of Durham, North Carolina* (Graduated Fall 2015)
- Mehrnaz Khademian, *Assessing the Food Environment Using Point Pattern Analysis: A Case Study in Fayetteville, North Carolina* (Graduated Spring 2017)*
- Richard Madumere, *Estimating Service Areas for Farmer's Markets in Southeastern North Carolina Using a Spatial Interaction Model* (Graduated Fall 2017)*
- Craig Pederson, *Comparative Analysis: Using Linear and Geographically Weighted Regression Models to Predict NC Public Schools Outcomes* (Graduated Spring 2018)*
- Byron Ifediora, *Neighborhoods and Grocery Store Chains: A GIS Approach to Studying Socio-Demographics* (Graduated Spring 2018)*
- Carter Sink, *A GIS Methodological Exploration of the Possible Spatial Correlation of Swine Lagoon Density and Respiratory Cancer Death Rates in Southeastern North Carolina* (Graduated Spring 2019)*
- Edward Holley, *Conducting Geospatial Analysis of Tobacco Accessibility and Lung Cancer Death Rates in Halifax County, North Carolina* (Graduated Spring 2019)*
- Richard Foster, *Using Machine Learning for Image Classification of Drone Imagery* (Fall 2020)

* Indicates students who pursued thesis track as opposed to project track

Master's Committee Member

- Frederick Ayivi, *Analysis of Land Change Detection Techniques Applied to High Resolution Satellite Imagery of Raleigh, North Carolina.* (Graduated Spring 2011)
- Yonas Birhanemeskel, *Development of a GIS Database for the New Madrid Seismic Zone.* (Graduated Summer 2011)
- Motunrayo Akinpelu, *Building a GIS Database for the Eastern Tennessee Seismic Zone.* (Graduated Summer 2011)
- Sanja Knezevic Antonijevic, *Analysis of November 3, 2010 Kraljevo Earthquake (MW=5.4) and its Aftershock Sequence* (Graduated Spring 2012)
- Jubril Davies, *Bayesian Time-Travel Inversion for Earthquake Hypocenter Location in 1D Layered Media* (Graduated Summer 2012)
- Carl Stearns, *DEM Analysis of the Eastern Tennessee Seismic Zone: Evaluating Slope/Area and SL Index Methods* (Graduated Fall 2012)
- Toulupe Agbaje, *Teleseismic P-wave Traveltime Residual Mapping in the Eastern Tennessee Seismic Zone* (Graduated Fall 2012)
- Philip Martin, *Shear Wave Splitting Measurements In the New Madrid Seismic Zone With Local Earthquake Data* (Graduated Spring 2013)
- Abdella Salem, *Detection of Land Deformation in Eastern Tennessee Seismic Zone Using Persistent Scatterers Interferometry Synthetic Aperture Radar Technique* (Graduated Summer 2014)
- Terra Wright, *Internship with Development Finance Initiative, School of Government, University of North Carolina – Chapel Hill.* (Graduated Spring 2016)

	<ul style="list-style-type: none"> ▪ Rebekah Mixon, <i>Internship with Development Finance Initiative, School of Government, University of North Carolina – Chapel Hill.</i> (Graduated Spring 2017) ▪ Cortney Cameron. <i>Seismicity-Hydrology Relationships in the Eastern Tennessee Seismic Zone.</i> (Graduated Summer 2017) ▪ Blaine Lary. <i>Geomorphological Assessment of the Eastern Tennessee Seismic Zone.</i> (Graduated Spring 2019) ▪ Emma Bouie, <i>Examining Slope Instability Zonation Using the Qualitative Map Combination Method in Buncombe County, North Carolina</i> (Graduated Spring 2020)
<p>Student Internships Supported</p>	<ul style="list-style-type: none"> ▪ Miller, John, 2013 – 2014. <i>U.S. Department of Fish and Wildlife</i> ▪ Koch, Glenn, 2014. <i>North Carolina Department of Transportation</i> ▪ Mitchell, Roderick, 2014. <i>North Carolina Department of Transportation</i> ▪ Holley, Edward, 2014. <i>North Carolina Department of Transportation</i> ▪ Koch, Corey, 2014. <i>North Carolina Department of Transportation</i> ▪ Sneed, Zuri, 2014. <i>North Carolina Department of Transportation</i> ▪ Holden, Nelson, 2015. <i>Spatial Data Integration</i> ▪ Johnson, Antoniquan, 2015. <i>City of Oxford – GIS Database Development</i> ▪ Bass, Troy, 2015. <i>City of Oxford – GIS Database Development</i> ▪ Madumere, Richard, 2016. <i>United States Department of Agriculture</i> ▪ Ifediora, Byron, 2016. <i>United States Department of Agriculture</i> ▪ Harrison, Haley, 2017. <i>The Nature Conservancy</i> ▪ Martin, Mykael, 2017. <i>United States Department of Agriculture</i> ▪ Pederson, Craig, 2017. <i>North Carolina Department of Transportation</i> ▪ Pederson, Craig, 2018. <i>North Carolina Department of Transportation</i> ▪ Foster, Richard, 2018. <i>The Nature Conservancy</i> ▪ Wooten, Tysean, 2018. <i>United States Department of Agriculture</i> ▪ Zdanksi, Cristan, 2018. <i>United States Department of Agriculture</i> ▪ Sink, Carter, 2018. <i>North Carolina Department of Transportation, Aviation Division</i> ▪ Gates, Katherine, 2018. <i>North Carolina Department of Transportation, Aviation Division</i>
<p>Ongoing Service</p>	<ul style="list-style-type: none"> ▪ Statewide Mapping Action Committee (SMAC), Metadata Working Group ▪ Graduate Director, Department of Environmental, Earth and Geospatial Sciences. <ul style="list-style-type: none"> ○ Proposed new graduate classes: <i>EASC 5125: Raster GIS, EASC 5130: Geostatistics</i> and <i>EASC 5050: Field Mapping</i> (All currently being taught) ▪ College of Health and Science, Curriculum Committee (Member) ▪ Undergraduate Research Committee, Member ▪ Maintenance of DEEGS YouTube Page that contains tutorials, events and student/faculty highlights (https://www.youtube.com/user/DEEGSNCCU)
<p>Accreditations</p>	<p>Idaho State Teaching Certification (Secondary Earth Science, 2001 - 2006), Army Corps of Engineers GIS / GPS Short Course, Level I Terrorism Awareness Training. ESRI Instructor-led courses: Introduction to ArcIMS, Building GeoDatabases, ArcObjects Programming; USMC Intermediate Range Safety Course; GEOINT Professional Exam: GIS and Analysis Tools; FAA Small UAS Certification (License #4271260).</p>
<p>Software</p>	<p>ArcGIS Suite 10.x, 9.x and extensions, ArcGIS Server, ArcINFO, ArcSDE, ArcIMS, ArcGIS Online, Oracle 10g, MySQL, ERDAS Imagine, LizardTech GeoExplorer,</p>

Experience	Microsoft Office, SPSS, Pathfinder Office for Trimble ProXRS and GeoXT GPS Receiver. Programming Experience: ArcObjects, VB/VBA, AML, HTML, C/C++, Java, JavaScript, .NET, ASP (VBScript), Perl, ArcXML, R, PHP, Python
Professional Memberships	Member, Association of American Geographers Member, Southeast Division, Association of American Geographers (SE-DAAG) Federal Geographic Data Committee (FGDC) Metadata Working Group
Security Clearance	Secret
Awards Received	Department of Environmental, Earth and Geospatial Sciences Faculty Teaching Award, 2016 – 2017 school year Department of Environmental, Earth and Geospatial Sciences Research Award, 2015 – 2016 school year Department of Environmental, Earth and Geospatial Sciences Faculty Teaching Award, 2012 – 2013 school year School of Graduate Studies and Sponsored Programs, Bronze Award (for Exceptional Accomplishments at Winston-Salem State University) Excellence in Action Award (Company Award for Outstanding Work at 2007 SRP Conference)