Zhenzhen Zhang | Cell Phone: (+1) 734-276-8879, **Email**: zzhang59@ncsu.edu

EDUCATION

North Carolina State University, NC
Ph.D. in *Forestry* minor in *Interdisciplinary Sustainable Science, 4.0/4.0* *Expected: 2021.8*

University of Michigan, Ann Arbor, MI
Master of Science in *Environmental Informatics;* Master in *Landscape Architecture;3.9/4.0* *May 2017*

Beijing Forestry University
B. Agriculture in *Ornamental Horticulture 3.85/4.0* *July 2014*

RESEARCH INTEREST

- Children and nature connection
- Greening schoolyards and equal access to nature benefits
- Participatory engagement for green infrastructure application in schoolyards
- Nature-based environmental education

RESEARCH EXPERIENCE

Research assistant *North Carolina State University, NC*

- **WRRI and NC Sea Grant funded project "Green Infrastructure in Schools: Creating a Network for Student Engagement and Well-being"** **July.2018 – Present**

  This research collaborated with Wake County Public School System (WCPSS) to understand nature-rich spaces in schoolyards and promote access to nature and its benefits for all children. The first part of research studied the environmental awareness and nature-based activities in schoolyards with the effect of physical environment of schoolyards, teachers' professional development and teacher-lead outdoor activities among K-5 students. The second part of research studied how to increase students' experience in school via nature-based activities and greening schoolyards. This research surveyed 205 students and their teachers in WCPSS North Carolina.

- **WRRI and NC Sea Grant funded project "Mitigating Greenness Equity via Green Schoolyards"**

  This study addressed the environmental justice issue by comparing greenness in schools and neighborhood across four largest school districts in North Carolina. In this study, the land cover within school property and neighborhoods was classified based on high-resolution satellite imagery and Lidar data using a machine learning method. The greenness equity within schools and neighborhood was assessed using spatial modeling. Greenness was found to be evenly distributed in schools but not in neighborhoods. Greening schoolyards is a promising strategy to address the environmental injustice issue.

- **The influence of COVID-19 on park use across North Carolina** *Sep.2020 - Present*

  This research used mixed-research approach that combined secondary data (point-of-interest) data and survey instrument to understand how COVI-19 affect the park use across North Carolina. This research focused on vulnerable communities specifically, and analyzed the park use change before and during COVID-19 across on the function of socioeconomic status and race/ethnicity.

- **Green infrastructure (GI) planning for future climate: promote GI for mitigating urban stormwater challenge under future climate scenarios** **July.2020 - Present**

Climate change would increase the amount rainfall, especially in the northeast of US. Cities which are still using combined sewerage systems face the extremely pressure of stormwater risk under future climate scenario. This study aims at promoting GI in residential level. This research will simulate the decision-making process at the residential level using future climate data. Different planning scenarios will be evaluated to find out the best strategy that can mostly mitigate the stormwater risk.

- **Hurricane Matthew Impact Urban Flood Risk Mapping**

  This research used a deep learning method (conventional neural network/CNN) and combined the graphical information (e.g. DEM, slope, floodplain, social vulnerability etc.) to map the potential flooding risk extreme precipitation in Robeson County, North Carolina.

Research assistant *University of Michigan, Ann Arbor, MI*

- **Green Infrastructure Planning based on Landscape Ecology Theory.**

  This study developed a planning model to increase landscape connectivity for the City of Detroit. This worked originated from the urban ecology perspective, targeting on developing green infrastructure network to landscape connectivity for urban residents and wildlife. Multi-criteria decision making that considered land cover and land use constrains was used in modeling process. Connectivity was assessed and evaluated by different landscape ecology indicators by FRAGSTATS, Conefor and ArcGIS.

- **USDA Forest Service "SEAS Forest Properties: Forest Research, Data Sharing and Outreach". PI Kathleen Bergen. 2016-2017**

  This study mapped and analyzed the land cover and land use change for three university owned forests and surrounding areas over 40 years.

AWARDS AND GRANDS

2019 North Carolina Water Resources Research Institute (WRRI) and NC Sea Grant (NCSG) Joint Graduate Student Research Funding Opportunity
2017 Rackham Conference Grants, University of Michigan
2015 The William and Mabel Jackson Award, University of Michigan
2013 Third Scholarship of Outstanding Student, Beijing Forestry Univ.
2012 National Scholarship, Ministry of Education of the People's Republic of China
2011 Second Scholarship of Outstanding Student, Beijing Forestry Univ.

PUBLICATION

Zhang, Z., Meerow, S., Newell, J., Lindquist, M., (2019). Enhancing Landscape Connectivity through Multi-functional Green Infrastructure Corridor Modeling and Design. *Urban Forestry and Urban Green*

Bergen, K., Zhang, Z., Tyrrell, G., K. Kennedy and J. Rumschlag (2018). Mapping Forest and Surrounding Landscape Changes 1949-2015 at The University of Michigan's Historic Forestry Education Properties. *Michigan Academician (Journal of the Michigan Academy of Arts, Sciences and Letters).*

PAPERS IN PROGRESS

Zhang, Z., Martin, K., Stevenson, K.T., & Yao, Y., (2021) Schoolyards as sources of green equity: understanding spatial and demographic distribution of urban green infrastructure. *Landscape and Urban Planning.* (Under 2nd Review)

Zhang, Z., Stevenson, K.T., Martin, K., (2021) How schoolyards are being used for children-nature connection: understanding the influence of school ground truth and teachers' PD on children's nature-based activities. *Urban Forestry and Urban* (Under Review)

Zhang, Z., Oh, J., Beam, W., Larson, L., Ogletree, S., Bocarro, J., Lee, K., Casper, J., Stevenson, K., Hipp, J., & Michelle, Well., (2021) Urban park use during the pandemic: Do shifting recreation patterns disproportionately burden socially vulnerable communities? Frontier in Sustainable Cities (COVID-19 special issue, Abstract Accepted)

Zhang, Z., Stevenson, K.T., Martin, K., (2021) Use of nature-based school grounds can enhance students' perceptions of schoolyard benefits. (In preparation)

Lan. K., Zhang, Z., (2021) Green infrastructure adoption for climate change in urban residential areas coupled with agent-based modeling and GIS (In preparation)

CONFERENCE PRESENTATION

Zhang, Z., Stevenson, K.T., & Martin, K., Yao, Y., (2021, March). *Diversifying green spaces in schoolyards improve children's perception of school and affective response to being there*. Oral presentation at NC Water Resources Research Institute Annual Virtual Meeting

Zhang, Z., Martin, K., Stevenson, K.T., & Yao, Y., (2020, May). *Schoolyards as a source for green equity: Understanding the spatial and demographic distribution of urban green infrastructure*. Oral presentation at International Association for Landscape Ecology Annual Virtual Meeting.

Zhang, Z., Martin, K., Grey, J., Stevenson, K.T., & Yao, Y., (2018, December). *Evaluating machine learning approaches for mapping flood risk.* Poster presented at the American Geophysical Union Annual Meeting, Washington, DC.

Zhang, Z., Meerow,S., Newell, J., (2017, April). *Enhancing landscape connectivity through multifunctional green corridors in Detroit*. Oral presented at American Association of Geographers Annual Meeting, Boston, MA