Qianru Liao

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EDUCATION

Ph.D. in Marine-Estuarine-Environmental Sciences 2021– present
University of Maryland in College Park, College Park, Maryland
Advisor: William Fagan

Master of Science in Geography 2018 – 2020
The State University of New York at Buffalo, Buffalo, NY
Advisor: Adam Wilson
Cumulative GPA: 3.98/4.0
Thesis: *The Spatial Distribution of Plant Biodiversity in the Greater Cape Floristic Region of South Africa: Comparing Distribution Models with Expert Range maps*

Bachelor of Science in Natural Geography and Resource Environment 2013 – 2017
Yunnan University, Kunming, Yunnan, Mainland China
Advisor: Xiaoxia Huang
Cumulative GPA: 3.5/4.0; Major GPA: 3.7/4.0; Rank: 2/25
Thesis: *The Spatial Pattern of Beta Ecosystem Diversity in Yunnan Province*

Exchange in Geography 2016 – 2017
Hong Kong Baptist University, Hong Kong

RESEARCH PROJECTS

University at Buffalo, SUNY 2018 – 2020

The Spatial Distribution of Plant Biodiversity in the Greater Cape Floristic Region (GCFR) of South Africa: Comparing Distribution Models with Expert Range Maps

- Mapped spatial patterns of plant species' richness and beta biodiversity from expert range maps.
- Built species distribution model (SDM) to predict species distributions and mapped spatial pattern of biodiversity derived from SDM.
- Used another independent species' presence-absence data to evaluate the performances of expert range maps and SDM predictions in 10^{th}, 50^{th}, and 75^{th} percentile threshold in confusion matrix indices.
- Compared the spatial pattern of species biodiversity derived from expert range maps and SDM.
- Examined the responses of plant biodiversity to several environmental variables in order to assess the factors that have a strong relationship with the species richness in spatial aspects.

Plant Species Reserve Selection in Greater Cape Floristic Region (GCFR) in South Africa

- Calculated planning unit selection in Minimum Set Cover Model, Maximum Set Cover Model, and Maximum Target Coverage Model, and compared their differences.

Burn Severity Mapping of the California Camp Fire in 2018

- Calculated differenced normalized burn ratio (DNBR) of Camp Fire in 5 burn severity levels.
- Analyzed the spatial pattern of burn severity and discussed the possible reasons and impacts.

Web Design: Creating Interactive Maps

- Created a spatial distribution of rodent incidents in Buffalo in proportional symbol and choropleth map. (http://www.acsu.buffalo.edu/~qliao/project1.html)
- Created a dot map and cluster map of vacant places in the Buffalo area. (http://www.acsu.buffalo.edu/~qliao/project2.html)
- Created an interactive map of U.S. counties and bubbles map of the population density of U.S. counties. (http://www.acsu.buffalo.edu/~qliao/project3.html)

Analysis of the Spatial Pattern of Biodiversity of Plant Species From the View of Environmental Factors

- Analyzed environmental variables that correlated with plant species biodiversity.
- Analyzed the relationship between biodiversity and geodiversity.

Conservation Plan Design for Tifft Nature Reserve in Buffalo

- Constructed a conceptual ecological model for Tifft Nature Preserve and created a case study for Tifft based on alternate trajectories of successionary processes.
- Created a 5-year management plan for controlling *Phragmites australis* and mapped the highest-priority areas.
- Created a management plan that would reduce or remove invasive red ants from the area.

- Considered biomagnification and unintended effects of pollutant cleanup by bivalves.
- Created a simple management plan for *Branta canadensis*.

Plant Species Beta Diversity in the Greater Cape Floristic Region
- Mapped spatial patterns of plant species richness and beta biodiversity from expert range maps

Working for Water Program in South Africa
- Reviewed the background of study areas and multiple managements in controlling invasive species.
- Analyzed the impacts of this program on hydrology, ecology, employment, education, and policy.

Review of Wildlife Corridors' Usage by Elephants, Giant Pandas, Koalas and Zebras
- Figured out the actual usage and appropriate design of wildlife corridors under the conflict between humans and wildlife by using the cases of 4 species—Giant pandas, African elephants, zebras, and koalas—as examples.

Yunnan University 2013 – 2017

The Spatial Pattern of Beta Ecosystem Diversity in Yunnan Province
- Obtained the spatial distribution pattern of beta diversity in the Yunnan ecosystem from remote sensing data.
- Identified the key areas using Sørensen Similar Index and compared them with existing nature reserves.
- Provided research support for the government about protected area selection and conservation network optimization.

The Interdisciplinary Contest in Modeling Competition: The Regional Water Scarcity Measure and Forecasting Model
- Modeled the water scarcity and proposed the water stress index based on Life Cycle Impact Assessment (LCIA).
- Forecasted the total water supply and demand using artificial neural networks (ANNs) and regression method.
- Proposed an appropriate intervention plan to ease the water stress and assessed the impact.

The Impact of Climate Change to 2000–2011 on Central Yunnan Crop Production
- Analyzed the response of the output and the sown area of main crops (rice, corn, and wheat) to climate change.

The Certificate Authority Cup International Mathematical Contest in Modeling: The Classification of the Land Temperature in Antarctica with Semiparametric Regression
- Calculated time series of average surface temperature in Antarctica and analyzed the reasons for distribution patterns.

China Undergraduate Mathematical Contest in Modeling: The Allocation of Taxi Resources in the Era of Internet Plus
- Analyzed big data from ride-hailing apps to obtain the taxi resources allocation status in different cities.

CONFERENCE PRESENTATIONS & POSTERS

- Liao, Qianru, and Adam Wilson. "The Spatial Distribution of Plant Biodiversity in the Greater Cape Floristic Region of South Africa: Comparing Distribution Models with Expert Range maps." AGU Fall Meeting 2020. AGU, 2020.
- Liao, Qianru, and Adam Wilson. "Spatial Pattern of Beta Diversity of Plant Species in the Greater Cape Floristic Region of South Africa." AGUFM 2019 (2019): B23F-2608.
- Liao, Qianru, and Adam Wilson. (2019) "Spatial Pattern of Beta Diversity of Plant Species in the Greater Cape Floristic Region of South Africa." Presented at the 2019 AAG Annual Meeting, Washington, DC, April 4. https://aag.secure-abstracts.com/AAG%20Annual%20Meeting%202019/abstracts-gallery/19735

SKILLS

- **Data Analysis:** R, Google Earth Engine, Python, JavaScript, SQL, ENVI, SPSS
- **Web Maps and GIS:** Mapbox, D3.js, HTML, CSS, ArcGIS, QGIS
- **Other Software:** Jupyter, AutoCAD
- **Language:** English (Proficient), Chinese (Native)

FIELD STUDIES

- Assessing vegetation impacts from deers in Buffalo 2019
- Facies mapping of tidal flat and grain size analyses in Tong Fuk Tidal Delta in Hong Kong 2016
- The distribution of intertidal zone macrobenthos from salt marsh in Shanghai 2016

ACTIVITIES

Poster Presenter, 2020 Annual meeting of American Geophysical Union 2020

- Presented the poster "The Spatial Distribution of Plant Biodiversity in the Greater Cape Floristic Region of South Africa: Comparing Distribution Models with Expert Range Maps."

Poster Presenter, 2019 Annual meeting of American Geophysical Union 2019

- Compared the spatial pattern of biodiversity of plant species in South Africa from 2 different data sources.

Paper Presenter, Annual meeting of America Association of Geographers 2019

- Presented the paper "Spatial Pattern of Biodiversity of Plant Species in South Africa."

Team Leader, Chinese University Geography Exhibition Competition 2016

- Led project on the impact of climate change to the main crops production in Central Yunnan.

Survey on Satisfaction of Curriculum in School of Resource Environment and Earth Science 2016

- Designed and distributed the questionnaires to all the students in the school.
- Completed professional investigation reports from multiple perspectives, including students and faculty.

WORK EXPERIENCE

Research Assistant, University of Maryland, College Park 2021 – present

- Help advisor research on the animal movements and how the encounters between individuals would change individual's home ranges

Editor, GISphere 2020 – present

- Edited the posts about Chinese undergraduates who major in geography-related majors in GISphere official account and help them to access the most up-to-date information on master/Ph.D.opportunities, funding availabilities, webinars, and competitions globally.

Research Assistant, We Education 2020 – 2021

- Liaised with researchers from fields of biology, medicine, and agriculture who have done international research to develop Nagoya Protocol use cases.
- Wrote blog-style stories about international collaboration in science.
- Networked with the USA Nagoya Protocol Education Action Group.

International Science Intern, Nagoya Protocol Learning Portal 2020 – 2021

- Liaised with researchers from fields of biology, medicine, and agriculture who have done international research to develop Nagoya Protocol use cases.
- Wrote blog-style stories about international collaboration in science.
- Networked with the USA Nagoya Protocol Education Action Group.

Assistant, Geography Graduate Student Association Union 2019 – 2020

- Designed and organized holiday party and academic discussion.

Graduate Ambassador, University at Buffalo, SUNY 2018 – 2019

- Provided tips and suggestions for new incoming students and organized the campus tour.

Research Assistant, Yunnan University 2016 – 2017

- Helped edit textbook *Restoration Ecology*, and assisted in funding application.

AWARDS AND SCHOLARSHIPS

Dean Fellowship, University of Maryland 2021 – 2022

Excellent Graduation Thesis, Yunnan University 2017

Excellent Student Cadre, Yunnan University 2017

Excellent Student, Yunnan University 2014 – 2016

Second Prize (Honor Mention), Interdisciplinary Contest in Modeling 2016

Third Prize, Certificate Authority Cup International Mathematical Contest in Modeling 2015

Third Prize, China Undergraduate Mathematical Contest in Modeling 2015

Second Prize, Authentication Cup of China Tiao Zhan Mathematical Contest in Modeling 2015

ORGANIZATIONS

AAG, Association of American Geographers 2018 – Present

AGU, American Geophysical Union 2019 – Present

ESA, Ecological Society of America 2018 – Present