Qiuyan Yu, Ph.D.

Plant and Environmental Science, New Mexico State University
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Research interests:

My scientific interest centers on monitoring ecosystems and investigate how ecosystem structure and functions interacts with anthropogenic and natural disturbances. I have a background in geospatial sciences, extensive experience in LiDAR and optical remote sensing of tree canopies in urban/natural landscapes, and application of machine learning and high performance computing in earth system science.

Education:

2018.12 University of South Florida
Doctor of Philosophy, Geography & Environmental Science and Policies
Dissertation: Assessing the cooling effects of urban vegetation on urban heat mitigation in selected U.S. cities.

2013.06 Beijing Normal University
Master of Science, Cartography and Geographic Information System
Thesis: Mapping trees and crops using a multi-criteria spectral mixture analysis considering endmember variability.

2010.06 Lanzhou University, 1st class honor
Bachelor of Science, Geographic Information System
Thesis: Land use and land cover change in Yuzhong Basin, Lanzhou, China.

Professional experience:

2018.11– Postdoc research associate at New Mexico State University

2016-2018 Research assistant at University of South Florida

2018 Instructor at University of South Florida

2014-2017 Teaching assistant at University of South Florida

2010-2013 Research assistant at Beijing Normal University

2009 Research assistant at Lanzhou University

Grant Awards:

2020-2024 Program: NASA ROSES GLOBAL Ecosystem Dynamics Investigation (GEDI)

Title: Patterns and Drivers of Tree Height and Biomass in Water Limited (tropical and temperate) Ecosystems. ($499K)

Personnel: **Qiuyan Yu** (**PI**), Niall P. Hanan, Lara Prihodko, Wenjie Ji, Rolston St. Hilaire, Julius Anchang, and Mike Ryan

2020-2023 Program: NASA ROSES NASA Research Announcement Studies with ICESat-2

Title: Improving estimates of vegetation structure and biomass in global savannas and

drylands with ICESat-2. ($617K)

Personnel: Niall P. Hanan (PI), Lara Prihodko, **Qiuyan Yu** (**Co-PI**), Wenjie Ji, Wade Ross, and Julius Anchang

Professional activities

2020-	Panel Reviewer for NASA Programs
2020-	Judge for NASA Space Apps Annual Challenges and special COVID-19 Challenges
2020-	Reviewer for Ecological Society of America 2020 annual meeting
2018–2021	Student Co-Director for Remote Sensing Specialty Group of American Association of Geographers

Publications:

Peer-reviewed

1. Ji, W., Hanan, N. P., **Yu, Q.**, Fensham. R. J., Rohde, R. F., Anchang, J., Ross, W., Wojcikiewicz, R. K., Prihodko, L. (*under review*). Rethinking how we think about global woody plant encroachment. *Ecology Letters*.
2. Sun, Z., Luo, J., Yang, J., **Yu, Q**., Zhang, L., Xue, K., & Lu, L. (2020). Nation-Scale Mapping of Coastal Aquaculture Ponds with Sentinel-1 SAR Data Using Google Earth Engine. Remote Sensing, 12(18), 3086.
3. Stovall, M., Ganguli, A., Faist, A., Schallner, J., **Yu, Q**., & Pietrasiak, N. (*under review*). Can biological soil crusts still be prominent landscape components in rangelands? A case study from New Mexico, USA. *Ecosphere*.
4. **Yu, Q.**, Ji, W., Pu, R., Landry, S. M., Acheampong, M., O' Neil-Dunne, J., Ren, Z., & Tanim, S. H. (2020) A preliminary exploration of the cooling effect of tree shade in urban landscapes. *International Journal of Applied Earth Observation and Geoinformation.* 92, 10.1016/j.jag.2020.102161
5. Dong, Y., Ren, Z., Wang, Z., **Yu, Q.**, Zhu, L., & Yu, H. (2020) Spatiotemporal patterns of forest changes in Korean Peninsula using Landsat images during 1990-2015: implications for sustainable development with a comparative study of two neighboring countries. *IEEE Access*, 8(1), 73623-73633. 10.1109/ACCESS.2020.2988122
6. Zhao, A., **Yu, Q.**, Feng, L., Zhang, A., & Pei, T. (2020). Evaluating the cumulative and time-lag effects of drought on grassland vegetation: A case study in the Chinese Loess Plateau. *Journal of Environmental Management*, 261, 110214.
7. Anchang, J. Y., Prihodko, L., Ji, W., Kumar, S. S., Ross, C. W., **Yu, Q.**, ... & Hanan, N. P. (2020). Towards Operational Mapping of Woody Canopy Cover in Tropical Savannas using Google Earth Engine. *Frontiers in Environmental Science*, 8, 4.
8. Fu, Y., Ren, Z., **Yu, Q**., He, X., Xiao, L., Wang, Q., & Liu, C. (2019). Long-term dynamics of urban thermal comfort in China's four major capital cities across different climate zones. *Peer J*, 7: e8026.
9. Acheampong, M., **Yu, Q.**, Cansu Ertem, F., Deba Enomah Ebude, L., Tanim, S., Eduful, M., ... & Ananga, E. (2019). Is Ghana Ready to Attain Sustainable Development Goal (SDG) Number 7? —A Comprehensive Assessment of Its Renewable Energy Potential and Pitfalls. *Energies*, 12(3), 408.
10. Acheampong, M., Ejiofor, C., Salinas-Miranda, A., Wall, B., & **Yu, Q**. (2019). Priority setting towards achieving under-five mortality target in Africa in context of sustainable development goals: an ordinary least squares (OLS) analysis. *Global Health Research and*

Policy, 4(1), 3.

11. **Yu, Q.**, Acheampong, M., Pu, R., Landry, S. M., Ji, W., & Dahigamuwa, T. (2018). Assessing effects of urban vegetation height on land surface temperature in the City of Tampa, Florida, USA. *International Journal of Applied Earth Observation and Geoinformation*, 73, 712-720.
12. Pu, R., Landry, S. M., & **Yu, Q**. (2018). Assessing the potential of multi-seasonal high resolution Pleiades satellite imagery for mapping urban tree species. *International Journal of Applied Earth Observation and Geoinformation*, 71, 144-158.
13. Acheampong, M., **Yu, Q.**, Enomah, L. D., Anchang, J., & Eduful, M. (2018). Land use/cover change in Ghana's oil city: Assessing the impact of neoliberal economic policies and implications for sustainable development goal number one–A remote sensing and GIS approach. *Land Use Policy*, 73, 373-384.
14. Acheampong, M., Ejiofor, C., Salinas-Miranda, A., Jaward, F. M., Eduful, M., & **Yu, Q**. (2018). Bridging the Under-Five Mortality Gap for Africa in the Era of Sustainable Development Goals: An Ordinary Least Squares (OLS) *Analysis. Global Health*, 84(1), 110-120.
15. Dahigamuwa, T., **Yu, Q.**, & Gunaratne, M. (2016). Feasibility study of land cover classification based on normalized difference vegetation index for landslide risk assessment. *Geosciences*, 6(4), 45.
16. Cao, S., **Yu, Q.**, Sanchez-Azofeifa, A., Feng, J., Rivard, B., & Gu, Z. (2015). Mapping tropical dry forest succession using multiple criteria spectral mixture analysis. *ISPRS Journal of Photogrammetry and Remote Sensing*, *109*, 17-29.
17. Cao, S., Zhu, X., Pan, Y., & **Yu, Q**. (2014). A stable land cover patches method for automatic registration of multitemporal remote sensing images. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, *7*(8), 3502-3512.

Manuscripts in preparation

1. **Yu, Q.**, Ji, W., Prihodko, L., & Hanan, N. P. "Study becomes insight: ecological learning from machine learning".
2. **Yu, Q.**, Ji, W., Prihodko, L., & Hanan, N. P. "Alternative states and feedback mechanisms in tropical savannas diagnosed via length-scales of canopy aggregation".
3. **Yu, Q**., "Framework for comparing plant height measurements from spaceborne LiDAR systems".

Research Experience:

2019–2020 **Research Associate. NASA Carbon Cycle Science**

Examine the bifurcation of woody cover and its underlying mechanisms at different scale with high-resolution remote sensing data. *NASA*

2018 **Research Assistant. Resilient and resistant urban forests to hurricane**

Utilized field data, pre-and post-storm remotely sensed images, post-storm field-based damage assessments, and sociodemographic census data to assess urban forest resilience and resistance to hurricane. *National Science Foundation*

2017 **Research Assistant. *i-Tree Ecosystem Services Monitoring***

Quantitatively evaluate land use land cover and recommended land use scheme for i-Tree ecosystem services assessment in Atlanta GA and Tampa FL. *US Department of Agriculture, Forest Service*

2017 **Research Assistant. *Orange County Tree Project***

Used remote sensing techniques and statistical analysis to assess tree canopy cover

change in Orange County, FL, US in the past three decades. *Orange County, Florida*

2016 **Research Assistant. *Gainesville Tree Project***

Applied remote sensing to monitor tree canopy change in *Gainesville, FL, US*

2016–2017 **Research Assistant. *Tampa Urban Forest Project***

Predicted carbon storage and carbon sequestration for Tampa urban forest using remote sensing. *US Department of Agriculture, Forest Service*

2011–2013 **Research Assistant and Field Team Leader. *China's Major Project of High Resolution Earth Observation System***

Prepared proposal to apply for the project; conducted field work in Beijing and Heilongjiang; and created tools through ENVI+IDL to process high-resolution data. *Beijing Normal University and the China National Bureau of Statistics*

2010–2011 **Research Assistant and Field Team Leader. *China's Project Crop Area and Yield Estimation Project***

Developed remote sensing approach to classify major crops in China's main crop product area and led field work in Heilongjiang Province, China to estimate crop yield. *Beijing Normal University and the China National Bureau of Statistics*

2010 **Research Assistant. *Interpretation of Haloxylon Ammodendron***

Classified *Haloxylon Ammodendron* using high-resolution remote sensing data and acquired its spectral reflectance and leaf area index in the field in Ulan Buh Desert, China. *Lanzhou University and Society Entrepreneur Ecology (an NGO in China)*

2009 **Research Assistant**. ***Detection of Poisonous Weeds***

Detected and analyzed the distribution of poisonous weeds with remote sensing and GIS in the Heihe River Basin, China. *Cold and Arid Regions Environmental and Engineering Research Institute Chinese Academy of Sciences*

2009 **Research Assistant. *Digitize campus***

Digitized buildings on Lanzhou University campus using SketchUp. *Lanzhou University*

2009 **Research Assistant. *China's project on Environmental Economic Effects of Rural Household Energy Consumption***

Conducted survey in rural areas of China's Loess Plateau. *Lanzhou University*

Teaching Experience:

2018 **Instructor. EVR4169: Forest Ecology and Management**

A general course that provides instruction on the theories and techniques of forest ecology and management. Topics include: forest ecology, silviculture, forest health, dendrology, and forest measurements.

2015 **GIS Lab Instructor. GIS4043: Geographic Information System**

General course that provides introduction to the concepts underlying Geographical Information Systems, with an emphasis on analytical capabilities of such systems in both raster and vector domains.

GIS Lab Instructor. GIS5049: GIS for non-major

A graduate-level class provides overview of the science, technology and applications of geographic information principles and concepts. Examines the GIScience that provides the foundations for ArcGIS as well as real-world applications to gain meaningful analysis of spatial data.

2014–2017 **Teaching Assistant**

GIS3006: Computer Cartography; EVR4027: Wetland Environment; EVR2001: Intro to Environmental Science; EVR2861: Intro to Environmental Policy; GEO2200: Intro to Physical Geography; and GEO2400: Human Geography

Presentations at Conferences and Workshops:

1. **Yu, Q.**, Ji, W., Hanan, N. P., Prihodko, L., Ross, C. W., & Anchang, J. (2019). Rage against the machine: ecological learning from machine learning. enlightening talk, *American Geophysical Union*, San Francisco, CA, 12/9/2019-12/13/2019.
2. **Yu, Q.**, AGU 2020
3. **Yu, Q.**, ESA
4. Hanan, N., **Yu, Q.**, Ross, W., Anchang, J. (2019). Machine learning: friend and foe of geospatial and ecological science. *SCINet Workshop*, Las Cruces, NM, 9/11/2019.
5. **Yu, Q.**, Ji, W., Hanan, N. P., Prihodko, L., Ross, C. W., & Anchang, J. (2019). Alternative states and feedback mechanisms in tropical savannas diagnosed via length-scales of canopy aggregation. Poster, *NASA Terrestrial Ecology Science Team Meeting*, College Park, MD, 9/23/2019-9/25/2019.
6. Ross, C.W., Hanan, N.P., Prihodko, L., **Yu, Q.**, Ji, W., & Anchang, J. (2019). The distribution of woody biomass in sub-Saharan Africa: An analysis of climate change and anthropogenic drivers. *NASA Terrestrial Ecology Science Team Meeting*, College Park, MD, 9/2019.
7. Prihodko, L., Hanan, N. P., Ross, C. W., **Yu, Q**., Bucini, C., & Tredennick, A. (2019). Shrub and tree canopy cover and above-ground woody biomass patterns in Sub-Saharan Africa. *Ecological Society of America*, Louisville, Kentucky, 8/2019.
8. Ji, W., Hanan, N. P., Prihodko, L., **Yu, Q.**, Ross, C. W., & Anchang, J. (2019). Do we need to rethink how we think about woody plant encroachment? *International Savanna Science Network Meeting*, Skukuza, South Africa, March 03-08, 2019.
9. Ross, C. W., Hanan, N. P., Prihodko, L., Anchang, J., Ji, W., **Yu, Q.**, & Lind, B. (2019). Drivers of woody vegetation across sub-Saharan Africa, *International Savanna Science Network Meeting*, Skukuza, South Africa, March 3-8, 2019.
10. **Yu, Q.**; Pu, R.; Landry, & S. M. (2018), "Quantifying 3-D shade provision in urban landscape: multi-city comparison and relationship to land surface temperature." *Association of American Geographers 2018 Annual Meeting*. April 10-14, 2018 in New Orleans, LA.
11. Landry, S. M., **Yu, Q.**, Pu, R., Acheampong, M., & O'Neil-Dunne, J. (2018). "Mitigating effects for vertical and horizontal vegetation structure on urban heat islands in five USA cities." *Association of American Geographers 2018 Annual Meeting*. April 10-14, 2018 in New Orleans, LA.
12. **Yu, Q.**, Pu, R., Landry, S. M., & Acheampong, M. (2017). "Understanding the relationship between land surface temperature and vegetation structure for urban heat island studies using multisource remote sensing data", *Association of American Geographers 2017 Annual Meeting, Boston* (**1st place** of Remote Sensing Specialty Group Student Illustrated Paper Competition).
13. Landry, S. M., & **Yu, Q**. (2017). "Land Use Matters When Estimating Urban Forest Structure and Benefits: Sensitivity to the Number and Configuration of Land Use Categories." *Association of American Geographers 2017 Annual Meeting*. April 5-9, 2017 in Boston, MA.
14. Landry, S. M., & **Yu, Q**. (2017). 30 Years of Tree Canopy Cover Change in Unincorporated and Incorporated Areas of Orange County, 1986-2016. Report to Orange

County, June 2017. Orlando, FL.

15. **Yu, Q.**, & Landry, S. M. (2017). "Assessing effects of horizontal and vertical urban vegetation structures on land surface temperature using multisensor remote sensing data." *American Society for Photogrammetry and Remote Sensing (ASPRS), FL-ASPRS/UF Fall 2017 LiDAR Workshop*, November 9, 2017 in Apopka, Florida

16. **Yu, Q.**, & Landry, S. M. (2016). "Integrating LiDAR with Ground measurements to estimate urban aboveground biomass", *American Society for Photogrammetry and Remote Sensing (ASPRS), FL-ASPRS/UF Fall 2016 LiDAR Workshop*, November 3, 2017 in Apopka, Florida.

17. Cao, S., **Yu, Q**., & Zhang, J. (2012, August). An automatic registration method for multitemporal remote sensing images using land cover patches in rural regions. *In Agro-Geoinformatics (Agro-Geoinformatics), 2012 First International Conference on* (pp. 1-4). *IEEE*.

18. Cao, S., **Yu, Q**., & Zhang, J. (2012, August). Automatic division for pure/mixed pixels based on probabilities entropy and spatial heterogeneity. *In Agro-Geoinformatics (Agro-Geoinformatics), 2012 First International Conference on* (pp. 1-4). *IEEE*.

Social Activity/Internship:

2016 **TRUE Leadership Camp**
Participated in international leadership camp in North Carolina, U.S. with international students from 26 countries.

2013 **Translation of Arcgis10.1 Official Guide**
Translated the third chapter of Arcgis10.1 Official Guide: 'Analyzing Spatial Data' from English to Chinese for ESRI, China.

2009–2010 **Teaching support for village schools**
Established a library for a rural primary school in Gansu, China.

Honors and Awards:

2018 Tharp Award, *University of South Florida*

2017 Tharp Award, *University of South Florida*

2017 First place of AAG 2017 RSSG Student Illustrated Paper Competition, *AAG 2017, Boston*

2011 Research Award, *Beijing Normal University* (top 5%)
Excellent Leader of Student Association, *Beijing Normal University*

2010 Research Award, *Beijing Normal University*
Outstanding Graduate of *Lanzhou University*, 2010 (top 1%)
1st Place of Volleyball Game, *Lanzhou University*

2009 Outstanding Student Association, *Lanzhou University* (top 1%)

2008 Excellent Student Award, *Lanzhou University* (top 1%)

2007 Excellent Student Award *Lanzhou University*, (top 10%)

Peer Reviewer for proposals: NASA New (Early-Career) Investigator Program

Peer Reviewer for Academic Journals: Frontiers of Earth Science, Frontiers in Environmental Science, Journal of Applied Remote Sensing, Atmosphere, Sustainable Cities and Society

Programming language: familiar with R, IDL, MATLAB, Google Earth Engine, Colab, and Python; used Visual Basic, FORTRAN, and SQL.
Professional Software: familiar with ArcGIS, ENVI; used EARDAS IMAGINE, GRASS, GEODA.