Exponent®
Engineering & Scientific Consulting

Qiuyan Yu, Ph.D.

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Professional Profile

Dr. Qiuyan Yu is a Senior Scientist at Exponent who helps clients assess and manage environmental and infrastructure risks using advanced modeling, geospatial analytics, and AI-enhanced workflows. She works closely with utilities, infrastructure developers, and legal teams to evaluate risks, regulatory filings, and build defensible strategies supported by publicly available and specifically sourced data.

Her consulting experience spans multiple hazard domains, including:

Utility Risk & Infrastructure Resilience

Dr. Yu helps utility clients assess exposure to multiple natural hazards — including earthquakes, wildfires, hurricanes, and landslides — using a combination of remote sensing, geospatial modeling, and risk analytics. Her work supports asset risk prioritization, regulatory compliance (e.g., SB-884), and long-term infrastructure resilience planning.

She has developed custom tools that simulate seismic impacts on pipeline infrastructure, integrating PGV, VS30, fault proximity, and site condition metrics. For landslide risk, she leverages soil moisture, slope, and vegetation indices to identify terrain instability in vulnerable service areas.

Dr. Yu also conducts wildfire ignition and spread risk assessments, combining remote sensing, utility asset conditions, vegetation stress, and wind exposure to identify potential ignition corridors and support fire mitigation strategies. In hurricane-prone regions, she assists in evaluating wind and flood-related exposure across infrastructure networks.

Her integrated, data-driven approach enables utility clients to:

- Quantify hazard exposure at the asset level
- Prioritize hardening or operational response plans
- Communicate risk profiles effectively to regulators, insurers, and the public

Environmental Exposure & Regulatory Modeling

Dr. Yu conducts airborne dispersion modeling to assess public and environmental exposure to herbicides and pesticides, particularly for regulatory and litigation support. She uses CALPUFF and AERMOD to simulate how chemicals behave under varying meteorological and topographic conditions. To support decision-making and defensibility, she builds custom post-processing tools that allow stakeholders to:

- Visualize exposure concentrations across sensitive zones

- Compare alternative applications or weather scenarios
- Integrate with land-use, topography, and sources and receptor

Her modeling helps clients meet regulatory requirements, manage liability, and communicate scientific findings in clear, actionable formats.

Academic Credentials & Professional Honors

Ph.D., Geography & Enviro Sci & Poli, University of South Florida, 2018

M.S., Cartography & Geographic Information System, Beijing Normal University, 2013

B.S., Geographic Information System, Lanzhou University, 2010

Panel Reviewer for NASA and NSF, 2021-2022

First place in Student Paper Competition, American Association of Geographers, 2017

Outstanding Graduate of Lanzhou University (the highest honor), 2010

Prior Experience

Research Assistant Professor, New Mexico State University, 2021 – 2023

Postdoc Associate, New Mexico State University, 2019 – 2021

Professional Affiliations

Society of Ecological Restoration

American Geophysical Union

American Associations of Geographers

Ecological Society of America

Sino-Ecologists Association Overseas

Publications

Book

Pu R, Yu Q. 2025. Thermal infrared remote sensing: principles and applications.

Peer Review Journal Articles

Nazir A, Hanan NP, Yu Q, Gilani H. Enhancing GEDI above ground biomass density estimates in contrasting forests of Pakistan. Forest Ecology and Management 2025; 587:122747.

Yu Q, Ryan MG, Ji W, Prihodko L, Anchang JY, Kahiu N, Nazir A, Dai J, Hanan NP. Assessing canopy height measurements from ICESat-2 and GEDI orbiting LiDAR across six different biomes with G-LiHT LiDAR. Environmental Research: Ecology 2024; 3(2):025001.

Enomah LD, Acheampong M, Yu Q, Wilson I, Tanyi S, Muambo KE. Urban expansion and the loss of

agricultural lands and forest cover in Limbe, Cameroon. 2024.

Kahiu N, Anchang J, Prihodko L, Yu Q, Hanan N. Satellite-based woody canopy cover for Africa: Uncovering bias and recovering best estimates across years. Science of Remote Sensing 2024; 9:100124.

Li H, Wang C, Yu Q, Smith E. Spatiotemporal assessment of potential drivers of salt marsh dieback in the North Inlet-Winyah Bay estuary, South Carolina (1990–2019). Journal of Environmental Management 2022; 313:114907. https://doi.org/10.1016/j.jenvman.2022.114907

Stovall M, Ganguli A, Faist A, Schallner J, Yu Q, Pietrasiak N. Can biological soil crusts still be prominent landscape components in rangelands? A case study from New Mexico, USA. Geoderma 2022. https://doi.org/10.1016/j.geoderma.2021.115658.

Hanan NP, Milne E, Aynekulu E, Yu Q, Anchang J. A role for drylands in a carbon neutral world? Frontiers in Environmental Science; 539. https://doi.org/10.3389/fenvs.2021.786087.

Zhao A, Yu Q, Cheng D, Zhang A. Spatial heterogeneity of changes in cropland ecosystem water use efficiency and responses to drought in China. Environmental Science and Pollution Research 2021. https://doi.org/10.1007/s11356-021-16829-4.

Zhao A, Yu Q, Wang D, Zhang A. Spatiotemporal dynamics of ecosystem water use efficiency over the Chinese Loess Plateau base on long-time satellite data. Environmental Science and Pollution Research 2021; 1-13. https://doi.org/10.1007/s11356-021-15801-6.

Yu Q, Ji W, Prihodko L, Ross CW, Anchang JY, Hanan NP. Study becomes insight: ecological learning from machine learning. Methods in Ecology and Evolution 2021; 12(11):2117-2128. https://doi.org/10.1111/2041-210X.13686.

Ross CW, Hanan NP, Prihodko L, Anchang J, Ji W, Yu Q. Woody-biomass projections and drivers of change in sub-Saharan Africa. Nature Climate Change 2021; 1-7. https://doi.org/10.1038/s41558-021-01034-5.

Sun Z, Luo J, Yang J, Yu Q, Zhang L, Xue K, Lu L. Nation-scale mapping of coastal aquaculture ponds with Sentinel-1 SAR data using Google Earth Engine. Remote Sensing 2020; 12(18):3086. https://doi.org/10.3390/rs12183086.

Yu Q, Ji W, Pu R, Landry SM, Acheampong M, O' Neil-Dunne J, Ren Z, Tanim SH. A preliminary exploration of the cooling effect of tree shade in urban landscapes. International Journal of Applied Earth Observation and Geoinformation 2020; 92:10. https://doi.org/10.1016/j.jag.2020.102161.

Zhao A, Yu Q, Feng L, Zhang A, Pei T. Evaluating the cumulative and time-lag effects of drought on grassland vegetation: a case study in the Chinese Loess Plateau. Journal of Environmental Management 2020; 261:110214. https://doi.org/10.1016/j.jenvman.2020.110214.

Dong Y, Ren Z, Wang Z, Yu Q, Zhu L, Yu H. 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 2020; 8(1):73623-73633. DOI: 10.1109/ACCESS.2020.2988122.

Anchang JY, Prihodko L, Ji W, Kumar SS, Ross CW, Yu Q, Lind B, Sarr MA, Diouf AA, Hanan NP. Toward operational mapping of woody canopy cover in tropical savannas using Google Earth engine. Frontiers in Environmental Science 2020; 8:4. https://doi.org/10.3389/fenvs.2020.00004.

Fu Y, Ren Z, Yu Q, He X, Xiao L, Wang Q, Liu C. Long-term dynamics of urban thermal comfort in China's four major capital cities across different climate zones. Peer J 2019; 7:e8026.

https://doi.org/10.7717/peerj.8026.

Acheampong M, Yu Q, Cansu Ertem F, Deba Enomah Ebude L, Tanim S, Eduful M, Vaziri M, Ananga E. Is Ghana ready to attain sustainable development goal (SDG) number 7? — A comprehensive assessment of its renewable energy potential and pitfalls. Energies 2019; 12(3):408. https://doi.org/10.3390/en12030408.

Acheampong M, Ejiofor C, Salinas-Miranda A, Wall B, Yu Q. 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 2019; 4(1):3. https://doi.org/10.1186/s41256-019-0108-0.

Yu Q, Acheampong M, Pu R, Landry SM, Ji W, Dahigamuwa T. 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 2018; 73:712-720. https://doi.org/10.1016/j.jag.2018.08.016.

Pu R, Landry S.M, Yu Q. Assessing the potential of multi-seasonal high resolution Pleiades satellite imagery for mapping urban tree species. International Journal of Applied Earth Observation and Geoinformation 2018; 71:144-158. https://doi.org/10.1016/j.jag.2018.05.005.

Acheampong M, Yu Q, Enomah LD, Anchang J, Eduful M. 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 2018; 73:373-384. https://doi.org/10.1016/j.landusepol.2018.02.019.

Acheampong M, Ejiofor C, Salinas-Miranda A, Jaward FM, Eduful M, Yu Q. Bridging the under-five mortality gap for Africa in the era of sustainable development goals: an ordinary least squares (OLS) analysis. Global Health 2018; 84(1):110-120. DOI: 10.29024/aogh.9.

Acheampong M, Ejiofor C, Salinas-Miranda A, Jaward FM, Eduful M, Yu Q. Bridging the under-five mortality gap for Africa in the era of sustainable development goals: an ordinary least squares (OLS) analysis. Global Health 2018; 84(1):110-120. DOI: 10.29024/aogh.9.

Cao S, Yu Q, Sanchez-Azofeifa A, Feng J, Rivard B, Gu Z. Mapping tropical dry forest succession using multiple criteria spectral mixture analysis. ISPRS Journal of Photogrammetry and Remote Sensing 2015; 109,17-29. https://doi.org/10.1016/j.isprsjprs.2015.08.009.

Cao S, Zhu X, Pan Y, Yu Q. 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 2014; 7(8):3502-3512. DOI: 10.1109/JSTARS.2013.2264312.

Presentations

Yu Q, Ji W, Hanan NP, Ryan MG, St. Hilaire R, Prihodko L, Anchang J. The determinants of ecosystem structure – a case study in Oregon. U.S. American Geophysical Union, December 2021.

Yu Q, Ji W, Hanan NP, Ryan MG, St. Hilaire R., Prihodko L, Anchang J. Global climatological determinants of canopy height. Online presentation, Ecological Society of America, August 2021.

Yu Q, Ji W, Hanan NP, Prihodko L, Anchang J. Framework for comparing plant height measurements from spaceborne LiDAR systems. Online presentation, American Geophysical Union, December 2020.

Anchang J, Kahiu NJ, Ouko E, Ndungu LW, Ji W, Yu Q, Hanan NP, Prihodko L. Year-round monitoring of vegetation conditions in an East African rangeland: implications for livestock forage production in response to climate variability and local system shocks. Online presentation, American Geophysical Union, December 2020.

Yu Q, Ji W, Hanan NP, Prihodko L, Ross W, Anchang J. Bifurcation and feedback mechanisms in tropical savannas. Online presentation, Ecological Society of America, August 2019.

Yu Q, Ji W, Hanan NP, Prihodko L, Ross CW, Anchang J. Rage against the machine: ecological learning from machine learning. American Geophysical Union, San Francisco, CA, December 2019.

Hanan N, Yu Q, Ross W, Anchang J. Machine learning: friend and foe of geospatial and ecological science. SCINet Workshop, Las Cruces, NM, September 11, 2019.

Yu Q, Ji W, Hanan NP, Prihodko L, Ross CW, Anchang J. 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, September 2019.

Ross CW, Hanan NP, Prihodko L, Yu Q, Ji W, Anchang J. 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, September 2019.

Prihodko L, Hanan NP, Ross CW, Yu Q, Bucini C, Tredennick A. Shrub and tree canopy cover and above-ground woody biomass patterns in Sub-Saharan Africa. Ecological Society of America, Louisville, Kentucky, August 2019.

Ji W, Hanan NP, Prihodko L, Yu Q, Ross CW, Anchang J. Do we need to rethink how we think about woody plant encroachment? International Savanna Science Network Meeting, Skukuza, South Africa, March 2019.

Ross CW, Hanan NP, Prihodko L, Anchang J, Ji W, Yu Q, Lind B. Drivers of woody vegetation across sub-Saharan Africa. International Savanna Science Network Meeting, Skukuza, South Africa, March 2019.

Yu Q, Pu R, Landry SM. Quantifying 3-D shade provision in urban landscape: multi-city comparison and relationship to land surface temperature. Association of American Geographers 2018 Annual Meeting, New Orleans, LA, April 2018.

Landry SM, Yu Q, Pu R, Acheampong M, O'Neil-Dunne J. Mitigating effects for vertical and horizontal vegetation structure on urban heat islands in five USA cities. Association of American Geographers 2018 Annual Meeting, New Orleans, LA, April 2018.

Yu Q, Pu R, Landry SM, Acheampong M. 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, 2017.

Landry SM, Yu Q. 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, Boston, MA, April 2017.

Landry SM, Yu Q. 30 years of tree canopy cover change in unincorporated and incorporated areas of Orange County, 1986-2016. Report to Orange County, Orlando, FL, June 2017.

Yu Q, Landry SM. 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, Apopka, FL, November 2017.

Yu Q, Landry SM. 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, Apopka, FL, November 2017.

Cao S, Yu Q, Zhang, J. 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, 2012.

Cao S, Yu Q, Zhang J. 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, 2012.

Project Experience

Hydrological Modeling for Pesticide Transport

Developed watershed-scale hydrological models to simulate surface runoff and pesticide movement through agricultural landscapes. The models supported regulatory review of chemical fate, exposure, and compliance, helping clients build defensible environmental risk assessments.

Air Dispersion Modeling for Herbicides, Pesticides, and Gas Emissions

Led multiple air quality modeling projects using CALPUFF and AERMOD to simulate chemical dispersion from agricultural applications and gas-emitting facilities. Assessed potential human and ecological exposure under varying meteorological and terrain conditions to support litigation, permitting, and regulatory compliance.

Custom Tools for Client Decision Support

Built Python-based tools for clients to improve environmental data workflows and risk communication, including:

- PDF parsing utilities to extract and organize regulatory or technical content
- Interactive analysis dashboards to explore hazard layers and prioritize infrastructure resilience actions
- Automated reporting scripts for scenario comparison and data visualization

Flood Risk & Infrastructure Impact Modeling

Performed rainfall-runoff and inundation modeling to assess building and infrastructure exposure under extreme flood scenarios. Evaluated structural vulnerability, land use dynamics, and stormwater flow paths to support hazard mitigation planning and resilience design.

Water Quality Analysis for Aquatic Ecosystems

Modeled nutrient and contaminant levels across watersheds to evaluate potential impacts on fish habitats and aquatic biodiversity. Supported clients in water resource management, environmental compliance, and ecological risk evaluations.

Historical Land Use Change and Pollution Assessment

Analyzed multi-decadal land use and land cover changes using remote sensing and historical data integration. Linked anthropogenic shifts to patterns of soil and water pollution, helping clients understand legacy impacts and support remediation strategy development.

Research Grants

NASA ROSES GLOBAL Ecosystem Dynamics Investigation (GEDI), 2020 – 2023

NASA ROSES NASA Research Announcement Studies with ICESat-2, 2020 – 2023

Peer Reviews

Conservation Biology

Frontiers in Ecology and the Management

Methods in Ecology and Evolution

Scientific Reports

Ecosphere

International Society for Photogrammetry and Remote Sensing (ISPRS)

International Journal of Applied Earth Observation and Geoinformation

Journal of Applied Remote Sensing

Remote Sensing

Frontiers of Earth Science

Frontiers in Environmental Science

Atmosphere

Sustainable Cities and Society