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Summary

PhD in Geoscience, MS in Botany, and Postdoctoral experience in Forestry. Expertise in ecological modeling, big-GIS data processing, and deep learning applications for understanding cause and effect of diverse systems. Industry experience includes HIPAA-certified safety analytics, automated GIS workflows, LiDAR processing, multispectral image classification, and weather forecasting models. Recent projects focus on burned-area mapping and invasive species detection using high-resolution multispectral imagery. Known for delivering clear, executive-ready insights and scalable geospatial ML solutions.

SKILLS AND EXPERTISE

Health/Human Data: HIPAA-certified safety analytics, Granger-Causality test, time series, cause and effect testing

Geospatial Data Science (using spatial data collected by drone, satellite, Lidar, etc.,): Mapping, Spatial Analysis, Big Data Management, Geocoding, Visualization, Scripting and Automation.

Statistical Machine Learning(ML): spatial and aspatial regression (multiple, logistic, poisson, lasso, ridge).

Deep Learning(DL) & AI: neural network, computer vision (CNN, U-Net), RetinaNet, Supervised and Unsupervised classification in detecting objects and processes.

Classical Statistics: multivariate statistics, mixed models, experimental design, hypothesis testing

Ecological Special Models: species distribution modeling, mathematical statistics, spatial monte carlo simulation.

Cloud and ML Platforms: AWS (SageMaker, Lambda), Google Earth Engine (GEE), Planetary Computer

Softwares: Esri ArcGIS Pro, SPSS, STATA, PCORD, MAXENT, FRAGSTAT, Microsoft Excel, Word, Powerpoint, Google Colab, Github, R, Python, VSCode, PowerBI, Minitab.

EDUCATION

- Ph.D., Geosciences, Specialization in Biogeography, Fire Ecology, and Spatial Data Analysis, Florida Atlantic University, May 2022.
- M.S., Botany, Specialization in Plant Systematic and Biodiversity, Tribhuvan University, Kathmandu, Nepal, June 2014.

WORK EXPERIENCE

Data Scientist, Ignite Data Analytics Program, Innovation Data Enterprise Architecture, IT, NextEra Energy, June 2023-July 2024.

Postdoctoral Fellow, Department of Forest and Rangeland Stewardship,
>Colorado State University, Fort Collins, CO, June 2022-June 2023
>>Project: *Understanding Aspen habitat and wildfire relationship.*

Instructor, Florida Atlantic University, Boca Raton, FL
>Weather and Climate and Climate Change (MET 2010-002), Summer 2022
>*Lectured in-person, mentored students, and graded assignments.*

Graduate Teaching Assistant, Florida Atlantic University, Boca Raton, FL   For three
>different courses: Quantitative Method (GEO 4022) and The Blue Planet (ESC 2000), and The Introduction to Physical Geography (2200C), Fall 2019- Spring 2022.

FIRST AUTHORED PUBLICATIONS   [Google Scholar]

Paudel, A., Chen, Y. H., Brodylo, D., and Markwith, S. H. (2024). Spatial Monte Carlo Simulation and Analysis of Climate Change Enhanced Fire and Projected Landscape-Scale Variation in Vegetation Heterogeneity. *Journal of Geovisualization and Spatial Analysis*, *8*(2), 22.

Paudel, A., and Markwith, S. H. (2023). From the severity patch to the landscape: Wildfire and spatial heterogeneity in northern Sierra Nevada conifer forests. *Journal of Vegetation Science*, *34*(5), e13207. https://doi.org/10.1111/jvs.13207

Paudel, A., Coppoletta, M., Merriam, K., and Markwith, S. H. (2022). Persistent composition legacy and rapid structural change following successive fires in Sierra Nevada mixed conifer forests. *Forest Ecology and Management,* 509, 120079. https://doi.org/10.1016/j.foreco.2022.120079

Paudel, A., Markwith, S. H., Konchar, K., Shrestha, M., and Ghimire, S. K., 2020. Anthropogenic fire, vegetation structure, and ethnobotanical uses in an alpine shrubland of Nepal's Himalaya. *International Journal of Wildland Fire*, 29(3), 201-214. https://doi.org/10.1071/WF19098

AWARDS & HONORS

	2024
Forest Carbon Code Fest research scholarship award by ESIL, University of Colorado	2022
Best Paper Presentation Award-Florida Society of Geographers	2021
Travel Award: Association of Pacific Coast Geographers	
Student Publication Award -Florida Atlantic University	
International Student of the Year- Florida Atlantic University	2020
Sponsorship for Participation-Florida International Leadership Conference, FAU	2019
Research Fund-GLORIA Team, Missouri Botanical Garden	2019
	2009

GRANTS

	Not Funded

Markwith, S. H. (PI), and Paudel, A. (Co-PI). Joint Fire Science Program, Graduate Research Innovation program, "Nucleation forest restoration in post-fire high-severity shrub patches." $20,379.

Paudel, A., and Markwith, S. H. The Biogeography Specialty Group of American Association of Geographers Student Research Grant Proposal competition, "Predicting vegetation successional trajectories due to synergistic effect of climate change and fire in mixed conifer forest of Sierra Nevada, California." $1000.   Not Funded

SYNERGISTIC ACTIVITIES

- Training workshop on Forest Carbon CodeFest, ESILL and Earth Lab, University of Colorado, Boulder, Colorado, Mar 12-14, 2024.
- Training workshop on NSF Winning Grant proposal, Colorado State University, Fort Collins, CO, Nov 9, 2023.
- Training workshop on forest resiliency and data synthesis working group, Earth Lab, University of Colorado, Boulder, Colorado, Feb 13-16, 2023.
- Training workshop on Graduate Professional Development "Interviewing Tips, Colorado State University, Fort Collins, CO, Mar 1, 2023.
- Mentor, undergrad student, Salina Rai, Department of Sociology, Florida Atlantic University, Fall 2020-current.
- Judge, Poster session, Florida Society of Geographer Annual Meeting, Feb 2021.
- President, Nepalese Student Association, Florida Atlantic University Spring 2020-Summer, 2021.
- Certified Student Leader, Florida Atlantic University, 2020.
- Secretary, International Friends Program, Florida Atlantic University, Spring 2020-Summer 2020.
- Volunteered as an Event Supervisor of Fossil B & C, Science Olympiad, 2019 & 2020, Florida Atlantic University, Boca Raton. 60 hours, November of 2019 & 2020.
- Volunteered for vegetation sampling with Habitat Specialists, Inc at Oakland Park/Broward County, FL, 10 hours, November 2019.
- Participated in Elevator Pitch Competition, Florida International Leadership Conference, Feb 2019.
- Training workshop on process-based modeling in ecology, LANDIS II, in Madison, Wisconsin, June 27-29, 2018.
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PROFESSIONAL MEMBERSHIPS

Association of Pacific Coast Geographers (APCG)
American Association of Geographers (AAG)
Florida Society of Geographers (FSG)
The Resource Nepal (TRN)
Gamma Theta Upsilon, International Geographical Honor Society

Voluntary Work: Reviewer in Peer Reviewed Journals *Landscape Ecology, Environmental Monitoring and Assessment, Frontiers in Plant Science, Southeastern Naturalist, Ecosphere, PeerJ*