

# Mukti Subedi

PHD CANDIDATE; GEOSPATIAL TECHNOLOGIES LAB AT TEXAS TECH UNIVERSITY

2619 19th Street, Lubbock, 79410, Texas

+1 361-228-2801 | [mukti.subedi@ttu.edu](mailto:mukti.subedi@ttu.edu) | [suvedimukti](https://www.linkedin.com/company/suvedimukti) | [subedimukti](https://www.linkedin.com/company/subedimukti) | [suvedimukti](https://www.linkedin.com/company/suvedimukti)

*I am a forester, geospatial and Remote Sensing data analyst.*

## Research Topics

- Land Use and Land Cover Mapping
- Time Series Image Analysis
- Image Acquisition, Processing, Analysis and Visualization
- Carbon Stock Assessment
- Forests and Trees Modeling
- Human Dimensions in Forestry

## Primary Research Methods

- Geographic Object-Based Image Analysis (GEOBIA) and Mapping
- High-resolution Imagery/UAV/ LiDAR in Decision Making
- (Non)Linear Mixed effect modelling
- Supervised and Unsupervised Machine Learning

## Skills

<b>GIS Data Collection and Post Processing</b>	Tremble Juno, Trimble GeoHX (6000), Spectra Precision ProMark 220, ArcPad (10.2x), TerraSync, GPS pathfinder office (> v5.2), Vertex Laser Geo
<b>GIS Mapping and Modeling</b>	ArcGIS pro (2x), ArcGIS 10x (Model builder, Python for ArcGIS), Google Earth Pro, Google Earth Engine (GEE), QGIS 3x, FME 2019
<b>Remote Sensing and Image Analysis</b>	R, Jupyter Notebook, GEE, ERDAS Imagine, eCognition, ENVI
<b>Data Analysis and Econometrics</b>	R (3 yrs), STATA (10 yrs), Python Scripting (2 yrs)
<b>Quantitative Research</b>	t-test, ANOVAs, Regressions, Factor Analysis, Principal Component Analysis, Redundancy Analysis, Supervised/Unsupervised Machine Learning
<b>Languages</b>	English, Nepali and Hindi

## Education

### Texas Tech University

PH.D. IN NATURAL RESOURCE MANAGEMENT

Lubbock, TX

Jan. 2019 - Present

- Expected graduation: May 2022
- Dissertation Title: "Understanding Grassland Structural and Compositional Patterns in Texas Using High Resolution Remote Sensing."
- Committee members: Drs. Carlos Portillo Quintero (adviser; Dissertation chair), Samantha Kahl, Robert Cox, Nancy McIntyre, and Xiaopeng Song

### Texas A&M University

M.Sc. IN BIOLOGY

Kingsville, TX

Jan. 2014 - Aug. 2016

- Committee members: Drs. Weimin Xi (adviser; Thesis chair), Christopher Edgar, and Sandra Rideout-Hanzak

### Institute of Forestry, Tribhuvan University

B.Sc. IN FORESTRY (GIS ELECTIVE)

Kritipur, Kathmandu

Mar. 2005 - Jan. 2010

## Certificates

### TAMUK

CERTIFICATE IN GIS

Jun. 2016 - Present

## FME Software

FME DESKTOP 2016 BASIC

Jan. 2017 - Present

## UC DAVIS

GEOGRAPHIC INFORMATION SYSTEMS (GIS) SPECIALIZATION

Dec. 2016 - Present

# Working Experience

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## Geospatial Research Technologies Lab

Lubbock, TX

GRADUATE RESEARCH ASSISTANT

Jan. 2019 - Present

- Design, and implement high-resolution large-extent Land Use Land Cover (LULC) mapping
- Supervise Undergraduate Research Assistants
- Assist lab members in geospatial data analysis
- Process Light Detection and Ranging (LiDAR) data and derive surface products from LiDAR

## West Virginia University

Morgantown, WV

RESEARCH ASSISTANT

Aug. 2017 - Dec. 2018

- Assist supervisor in data analysis and reporting
- Design, and implement forest inventory
- Automating data logging using MayFly data loggers

## Geospatial Research Laboratory (GSRL)

Kingsville, TX

GIS ANALYST-INTERN

Aug. 2016 - May. 2017

- Provided technical support for ArcGIS suite, lab upgrading, and troubleshooting
- Trained and supervised new lab manager
- Assisted in GPS data collection and differential correction
- Updated laboratory assignment as per upgraded version of ArcGIS suite
- Assisted students using lab to complete their homework assignment and project

## Geospatial Research Laboratory (GSRL)

Kingsville, TX

LAB MANAGER

Jan. 2014 - Jul. 2016

- Analyzed Forest Inventory and Analysis (FIA) data databases and created biomass and volume distribution by County, forest ownership class, spatiotemporal variations of biomass and volume distribution in East Texas
- Created student's labs, produced lab grading rubrics, designed and conducted training and workshops (Intro to ArcGIS, spatial and attribute query, Model builder, and ArcGIS Online)
- Managed, manipulated, and integrated GIS, LiDAR (ArcGIS platform), KMZ, GPS, and CAD data to produce maps
- Provided mapping support and data analysis to civil engineers, environmental engineers, wildlife biologists, and geologists
- Provided technical support for ArcGIS suite, troubleshoot and guided around 80 undergraduate students in their projects during 2 years
- Designed Geodatabases, created, analyzed, tested and prepared data ready for editing and field use
- Applied differential correction to the field gathered gps points
- Worked mostly in ArcGIS 10.x (including desktop extensions) environment
- Involved in the production of data and analysis, planning and delivering services in an academic setting

## Community-Based Forest and Tree Management in the Himalayas (ComForM)

Pokhara, Nepal

Co-PI

Sep. 2013 - Jan. 2014

- Prepared data collection templates, organize a meeting with stakeholders, conducted interview and data entry and analysis
- Maintained positive and professional relationship with the public, answer questions, phone calls, effectively relay information
- Engaged local people to prepare participatory timber marketing route maps
- Designed Geodatabase, database management, research, read and understand component drawings, geo-referencing, troubleshooting, create schematic procedures and specifications, and problem-solving
- Train local people on data collection using GPS (eTrex 20) devices, software programs (DNR Garmin, GPS utility, and ArcView, Google Earth)

## Federation of Community Forests Users' Nepal (FECOFUN)

Kathmandu, Nepal

DOCUMENTATION OFFICER

Feb. 2012 - Sep. 2013

- Acquired local conflict location data and prepared maps
- Designed research, developed data collection tools and reporting tools and templates
- Trained 18 staffs and 20 practitioners (Modular training participants): Data collection, Data entry in MS Access and excel spreadsheet, open-ended questions, GPS handling, using reporting template staffs and
- Managed relational database (MS Access) of activities, conducted by central and district chapters of the program

## Association for the Development of Environment and People in Transition (adaptnepal)

Kathmandu, Nepal

GIS DATA ANALYST-LAND USE CHANGE AND FORESTRY

Jun. 2011 - Feb. 2012

- Developed and improved training contents, delivered and facilitated workshops and training
- Gathered, and analyzed meteorological and performed interpolations
- Prepared rainfall, and temperature distribution maps
- Extracted elevation data and classify vegetation types based on criteria defined by IPCC
- Analyzed the Land use change and forestry data in preparing second national communication report to United Nations Framework Convention on Climate Change (UNFCCC)
- Biomass loss/accumulation maps by vegetation over two decades (1990-2010) with different biomass growth factors

## ComForM

Pokhara, Nepal

GIS DATA ANALYST-LAND USE CHANGE AND FORESTRY

Dec. 2009 - May 2011

- Discussed, and submitted progress reports as necessary to immediate supervisor and working team
- Assisted in research design and data collection templates design
- Conducted GPS boundary survey of 10 community forests, assisted image analysis (GeoEye) and collected ground control points
- Collected forest inventory data from permanent sample plots
- Collected Ground control points for georeferencing, Georeferenced and classified (Visual image interpretation) GeoEye image)
- Managed database and analyzed the data for PI's manuscripts

## Teaching Experience

### Aerial Photo Interpretation (5404)

Texas Tech University

INSTRUCTOR

July. 2020 - Aug. 2020

- Co-taught with Dr. Carlos Portillo as a part of teaching practicum

### GEOL 5312; GEOL 5313

TAMU-Kingsville

TEACHING ASSISTANT

Aug. 2014 - Jul. 2016

- During spring, summer and fall semester

### Math and Science in GIS

TAMU-Kingsville

UPWARD BOUND MATH AND SCIENCE STUDENTS

Jun. 2016 - Jul. 2016

## Publications

### REFEREED JOURNAL PAPERS

**Subedi, M.R.**, Xi, W., Edgar, C., Rideout-Hanzak, S., & Yan, M. (2021). Tree mortality and biomass loss in drought - affected forests of East Texas, USA. *Journal of Forestry Research*, 32, 67–80. <https://doi.org/10.1007/s11676-020-01106-7>

Jackson, M., Portillo-Quintero, C., Cox, R., Ritchie, G., Johnson, M., Humagain, K., & **Subedi, M.R.** (2020). Season, Classifier, and Spatial Resolution Impact Honey Mesquite and Yellow Bluestem Detection using an Unmanned Aerial System. *Rangeland Ecology & Management*, 73(5), 658–672. <https://doi.org/10.1016/j.rama.2020.06.010>

KC, K., Bhumpakhpan, N., Trisurat, Y., Mainmit, N., Ghimire, K., & **Subedi, M.R.** (2020). Analysis of Potential Distribution of Tiger Habitat using MaxEnt in Chitwan National Park, Nepal. *Journal of Remote Sensing and GIS Association of Thailand*, 21(3), 1–15.

**Subedi, M.R.**, Oli, B. N., Shrestha, S., & Chhin, S. (2018). Height-Diameter Modeling of Cinnamomum tamala Grown in Natural Forest in Mid-Hill of Nepal. *International Journal of Forestry Research*, 2018. <https://doi.org/10.1155/2018/6583948>

**Subedi, M.R.**, & Timilsina, Y. P. (2016). Evidence of User Participation in Community Forest Management in the Mid-hills of Nepal: A Case of Rule Making and Implementation. *Small-Scale Forestry*, 15(2), 257–270. <https://doi.org/10.1007/s11842-015-9321-y>

Oli, B. N., & **Subedi, M.R.** (2015). Effects of management activities on vegetation diversity, dispersion pattern and stand structure of community-managed forest (*Shorea robusta*) in Nepal. *International Journal of Biodiversity Science, Ecosystem Services and Management*, 11(2), 96–105. <https://doi.org/10.1080/21513732.2014.984334>

**Subedi, M.R.**, & Sharma, R. P. (2012). Allometric biomass models for bark of Cinnamomum tamala in mid-hill of Nepal. *Biomass and Bioenergy*, 47, 44–49. <https://doi.org/10.1016/j.biombioe.2012.10.006>

**Subedi, M.R.** (2009). Climate change and its potential impact in tree line position: an introduction and analysis. *The Greenary*, 7(September), 17–21.

## GREY PUBLICATION

Gyawali, A., & **Subedi, M.R.** (2011). Assessing the forest governance: transparency and participation perspective. *The Prahbat*, 1, 189–197.

**Subedi, M.R.** (2008). Volume equation for *Alnus nepalensis* in Lwang ghalel Village Development Committee of Kaski District. *The Prahbat*, 13(1), 58–61.

## Presentations

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### PEER-REVIEWED CONFERENCE PRESENTATIONS

**Subedi, M.R.** (December 2021). *Do LiDAR data provide practical significance to improve classification accuracy over NAIP Data? evidence from target-oriented validation strategies* North Central Texas Council of Governments [Virtual]

**Subedi, M.R.** (November 2021). *Large-area land use/land cover classification of very high-resolution imagery: accounting for spatial bias in sample data*. South Central Arc User Group (Grapevine, Texas).

Xi, W., **Subedi, M.R.** Liu, Z & Yan M. (August 2021). *Widespread increase of tree mortality triggered by an exceptional drought in east Texas, USA*. Ecological Society of America (ESA, Virtual Annual Meeting 2021).

Hedquest, Brent & **Subedi, M.R.** (April 2018). *Using Geospatial Tools for Documentation and Preservation of Historical Structures and in Undergraduate Experiential Learning at Rancho La Union, Zapata County, Texas*. American Association of Geographers.

**Subedi, M.R.** (April 2016). *Creating a Geographical Information System (GIS) Database for Documenting Historical Structures at Rancho La Union Ranch, Zapata County, Texas*. Poster presented at South Central Arc User Group Annual Meeting.

**Subedi, M.R.**, (November 2015). *Comparing interpolation techniques for Annual Standard Precipitation Evaporation Index (SPEI) mapping using multiple evaluation criteria: a case study of east Texas, USA*. Poster presented at Del Mar College on GIS Day.

**Subedi, M.R.** & Xi, Weimin (October, 2015). *Evaluating drought-induced tree mortality and biomass loss in east Texas forests*. Poster presented at Pathway symposium, at Texas A&M University-Corpus Christi.

**Subedi, M.R.** & Xi, Weimin (August, 2015). *Evaluating extreme drought-induced tree mortality and biomass loss in east Texas using Forest Inventory and Analysis (FIA) data*. Poster presented at 100th ESA meeting.

**Subedi, M.R.** & Xi, Weimin (April, 2014). *Spatiotemporal pattern and variability of drought in East Texas, USA*. Presented at Javelina research symposium, at Texas A&M University-Kingsville.

### INVITED GUEST LECTURES

#### Department of Biology

Texas A&M University-Kingsville

##### TREE MORTALITY MODELLING

April, 2020

- Invited guest talk on Tree mortality modelling in East Texas Forests using Forest Inventory and Analysis Data

#### Department of Biology

Texas A&M University-Kingsville

##### DROUGHT INDUCED TREE MORTALITY

April, 2016

- Invited guest talk on Evaluating extreme drought-induced tree mortality and biomass loss in east Texas using Forest Inventory and Analysis (FIA) data

#### World Wood Day

Kathmandu, Nepal

##### SPATIO-TEMPORAL DROUGHT AND TREE MORTALITY

March, 2016

- Invited guest talk on Geospatial distribution of drought and drought-induced tree mortality in the east Texas, USA: an implication for sustainable forest management

#### Forest Fire workshop

ICIMOD, Nepal

##### FOREST FIRE IN NEPAL

April, 2012

- Presented on Needs and gaps, regional networking and collaboration for ways to adopt innovative geospatial technologies for forest fire monitoring and management

## Grants

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## The Urbanovsky endowment

ELO AND URBANOVSKY FELLOWSHIP

- begin in Fall 2021 through 2024
- Funding Amount: \$15000/year

Texas Tech University, Lubbock

2021-2014

## Hallie I. and Ernest B. Fish Endowed Scholarship

FISH ENDOWED SCHOLARSHIP

- Begin Fall 2021 through Spring 2022
- Funding Amount: \$3000

Texas Tech University, Lubbock

2021-2022

## James A. “Buddy” Davidson Charitable Foundation

DAVIDSON ENDOWED SCHOLARSHIP

- Funding Amount: \$2000

Texas Tech University, Lubbock

2019

## Office of campus sustainability Texas A&M University-Kingsville

STUDENT SUSTAINABILITY COMPETITION AWARD

- Awarded to Green Hands Team : Mukti R. Subedi, Rohan Jayasuriya, and Nippun Bhadsavle
- Funding amount: \$3000 USD.

Texas A&M University, Kingsville

2015

## Nepal Federation of Indigenous Nationalities (NEFIN)

FOREST CARBON STOCK ASSESSMENT OF REDD+ PILOTING AREA (KHASUR VDC)

- Co-PI a project funded by NEFIN to estimate carbon stock assessment of indigenous people managed forests.
- Funding amount: \$10,000 USD.

Kathmandu, Nepal

2012

## Community Based Forests and Trees Management in the Himalaya (ComForM)

POLITICAL ECONOMY OF RE-CENTRALIZING CF IN NEPAL

- Funding amount: \$5,500 USD.

Pokhara, Nepal

2012

## Annapurna Conservation Area Project (ACAP)

UNDERGRADUATE RESEARCH GRANT

- Competitive undergraduate Research Grant awarded to conduct research on Biomass production and distribution pattern of Cinnamomum tamala in Mijuredanda VDC
- Funding amount: \$400 USD.

Pokhara, Nepal

2009

## ComForm

RESEARCH GRANT

- Co-PI a project to assess formulation and implementation status of community forest operation plan: a case study from Tanahun and Parbat districts
- Funding amount: \$3,000 USD.

Pokhara, Nepal

2009

## District Forest Office

EXPLORATORY RESEARCH GRANT

- Co-PI a project funded to estimate diversity and distribution of Lichens and Orchids in Dhankuta district
- Funding amount: \$800 USD.

Dhankuta, Nepal

2009

## ACAP, Lwang Unit

RESOURCE ASSESSMENT GRANT

- Co-PI a project funded to execute forest resource assessment of Lwang Unit Conservation of ACAP
- Funding amount: \$3,000 USD.

Pokhara, Nepal

2008

## Satanchuli Community Forest User Group

WORKING PLAN

- A project awarded to prepare working plan of Satanchuli Community Forest User Group.
- Funding amount: \$850 USD.

Chitwan, Nepal

2008

# Awards and Honors

## Department of Natural Resources Management

GRADUATE RESEARCH ASSISTANTSHIP

Lubbock, TX

Jan. 2019 - Present

## College of Graduate Studies

GRADUATE SCHOLARSHIP

- Amount: \$1000 USD.

Kingsville, TX

Jan. 2014

## Texas A&M University

HOUSING SCHOLARSHIP

Kingsville, TX

Jan. 2014 - Aug. 2014

## Service

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### Novel Approaches in Tropical Forests Mapping and Monitoring – Time for Operationalization

*Remote Sensing, MDPI*

GUEST EDITOR

2020- present

- Ongoing

### Journal of Forestry Research (JFR)

*Springer*

REVIEWER

2016- Present

- Reviewed seven manuscripts

### Forestry Chronicles

*Canadian Institute of Forestry*

REVIEWER

2020-2021

- Reviewed two manuscript

### Ecosystem Services

*Elsevier*

REVIEWER

2016

- Reviewed one manuscript

### Basic Research Journal of Agricultural Science and Review (BRJSR)

*Basic Research Journals*

REVIEWER

2015

- Reviewed one manuscript

### The Greenery - a Journal of Environment and biodiversity

*Nepal*

REVIEWER

2009

- Reviewed seven manuscripts

## Current Memberships

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- Mendeley-International Advisor, since 2012
- Association of Natural Resource Scientist
- South Central Arc User Group (SCAUG)
- Coastal Bend Arc User Group (CBGIS)
- Ecological Society of America (ESA)