Libert Niyonkuru Katabogama

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Summary

Climate and environmental scientist and data specialist with experience in climate analytics, risk analysis, and sustainability strategies. Skilled in working with large-scale environmental datasets,and geospatial analysis to support climate adaptation, resilience, and sustainable infrastructure development across transportation, industrial, agricultural, and energy sectors. Experienced working with government agencies and cross-sector teams on emissions analysis, environmental modeling, and quantitative climate assessments using Python, GIS, and scientific computing tools.

Technical Skills

Languages: Python, R, SQL, C/C++, Linux, Git/GitHub

Python Ecosystem & Data Science: Pandas, NumPy, SciPy, xarray, geopandas, rasterio, matplotlib, scikit-learn, TensorFlow, netCDF4, Jupyter

Environmental & Air Quality Modeling: MOVES4/5, SMOKE, AERMOD, Greenhouse Gas Inventories

GIS & Geospatial Analysis: ArcGIS Pro, QGIS, Google Earth Engine, GDAL, Remote Sensing Analysis

Climate & Environmental Datasets: ERA5, CMIP6, GOES, MODIS, Landsat, Sentinel, CHIRPS, NLDAS, SMAP, MERRA-2

Statistical & Analytical Methods: Regression Analysis, Machine Learning, Time Series Analysis, Climate Diagnostics, Uncertainty Analysis, Environmental Statistics

Education

MS **Texas A&M University**, Atmospheric Sciences — College Station, TX — Aug 2021 – Aug 2024

- Thesis: Investigating Statistical Approaches for Diagnosing Soil Moisture Behavior Using the Simplified Soil Moisture Model
- Advisor: Dr. John Nielsen-Gammon
- Coursework: Atmospheric Dynamics, Atmospheric Physics & Chemistry, Climate Modeling, Statistical Methods in Climate Science, Climate Change Analysis

BS **University of Nebraska-Lincoln**, Integrated Sciences — Lincoln, NE — Aug 2017 – May 2021

- Minor degrees: Applied Climate Sciences, Conservation Ag, Leadership, Entrepreneurship
- Advisor: Dr. Mike Hayes
- Coursework: Climate in Crisis, Applied Climate Sciences, Energy and the Environment, Earth's Climate (Past, Present, Future)

Professional Experience

Louisville Metro Government APCD, Environmental Coordinator — Louisville, KY
June 2025 – Oct 2025

- Contributed to greenhouse gas inventories across transportation, industrial, agricultural, and energy sectors using emissions modeling and environmental reporting frameworks.
- Conducted motor vehicle emissions simulations using MOVES4 and MOVES5 to support regional air quality conformity analyses under National Ambient Air Quality Standards (NAAQS).
- Performed emissions quality assurance and validation workflows for large environmental datasets spanning local, regional, and national scales.
- Applied SMOKE and AERMOD modeling systems for emissions processing and air dispersion simulations supporting environmental planning initiatives.
- Integrated emissions and climate datasets into environmental planning and sustainability workflows.
- Supported environmental compliance and climate planning efforts through cross-team coordination, technical analysis, and reporting.
- Assisted in analysis of transportation emissions, industrial emissions, and atmospheric pollutants including PM2.5, PM10, NO_2, and VOCs.
- Supported environmental monitoring efforts involving installation, calibration, and deployment of air quality monitoring systems and sensors.

Lumora Consulting, Climate Analytics Consultant — Boston, MA
Dec 2024 – Dec 2025

- Developed climate and carbon strategies for clients using quantitative climate risk analysis and environmental modeling approaches.
- Conducted sustainability and climate impact analyses across transportation, industrial, agricultural, and energy systems.
- Translated complex climate datasets and analytical findings into actionable recommendations supporting emissions reduction and resilience planning.
- Supported client reporting alignment with sustainability and regulatory disclosure frameworks, contributing to improved compliance readiness.
- Applied Python-based analytical workflows to process and evaluate large environmental datasets.
- Collaborated with cross-functional teams to support climate strategy development and environmental reporting initiatives.
- Assisted clients in identifying environmental risks, emissions trends, and climate adaptation opportunities.

Texas A&M Systems, Research Technician II — College Station, TX
Dec 2024 – May 2025

- Analyzed climate model outputs and environmental datasets to assess greenhouse gas-driven impacts on long-term climate variability and environmental systems.
- Processed large-scale climate datasets spanning multi-decadal temporal scales and multiple environmental variables.
- Supported applied climate research connecting emissions, climate variability, and economic systems.
- Conducted statistical and quantitative analyses to support climate diagnostics and environmental assessments.
- Assisted in communicating scientific findings through technical reports, presentations, and data summaries.

Texas Climatologist Office, Graduate Research Assistant — College Station, TX — Aug 2021 – Aug 2024

- Developed a numerical soil moisture model to investigate hydroclimatic responses to changes in precipitation and temperature in a one-dimensional soil column.
- Applied regression analysis and machine learning techniques to evaluate modeled soil moisture dynamics against observational datasets.
- Processed multi-terabyte climate and remote sensing datasets spanning multi-decadal temporal scales using Python scientific computing tools.
- Applied geospatial and remote sensing techniques using GOES satellite datasets to quantify urban heat island dynamics.
- Conducted statistical analyses on drought, climate variability, and environmental datasets to identify long-term trends and relationships.
- Built reproducible analytical workflows using Python, GIS, and geospatial data processing libraries.
- Supported development of research proposals and technical documentation through scientific analysis and technical writing.
- Compiled scientific summaries, visualizations, and presentations to communicate research findings to technical and non-technical audiences.

National Drought Mitigation Center, Intern — Lincoln, NE — Jan 2019 – Jan 2020

- Conducted drought impact assessments for the Greater Horn of Africa and the United States using GIS and climate datasets.
- Applied GIS and Google Earth Engine workflows to analyze rainfall deficits and drought severity patterns.
- Processed irrigation and soil management datasets to evaluate drought mitigation strategies and agricultural resilience.
- Utilized climate and hydrologic datasets to support environmental and agricultural impact assessments.
- Developed and maintained analytical databases in Excel and R for drought monitoring and environmental analysis applications.
- Generated geospatial visualizations and environmental data products supporting drought assessment efforts.

University of Nebraska-Lincoln, Intern — Lincoln, NE — June 2018 – Jan 2019

- Operated and analyzed hydrologic model outputs through the High Plains Regional Climate Center.
- Investigated ENSO impacts on precipitation variability and drought conditions across agricultural regions.
- Conducted climate and hydrologic analyses supporting agricultural planning and environmental research.
- Presented findings on teleconnections and drought variability at regional scientific conferences.

Selected Projects and Publications

Air Quality & Emissions Modeling for Transportation Conformity — June 2025 – Oct 2025

Modeling emission impacts of new transportation projects in Indiana and Kentucky.

- Conducted emissions and air dispersion simulations using MOVES4/5, SMOKE, and AERMOD for environmental analysis and planning applications.
- Supported greenhouse gas inventory development and transportation emissions assessments.

Simplified Soil Moisture Model June 2022 – Aug 2024

Second Phase in progress

- Developed a one-dimensional numerical soil moisture model to simulate hydroclimatic responses to precipitation and temperature variability.
- Applied regression analysis and machine learning techniques to evaluate modeled soil moisture behavior against observational datasets.
- Investigated drought sensitivity and environmental responses under changing climate conditions.

Urban Heat Island Analysis (UHI) Oct 2021 – Apr 2022

Investigating impacts of land use and land cover change on UHI

- Applied remote sensing methods using GOES-16 and GOES-17 satellite datasets to quantify urban heat island intensity and diurnal temperature variability.
- Conducted geospatial and statistical analyses across varying urban landscapes and land surface characteristics.

Energy and the Environment: Economics and Policies Jan 2020 – May 2020

- The U.S. Should Rejoin the Paris Agreement: Moral, Economic, and Political Reasons Why Rejoining the Paris Agreement Is Right

Drought Impact on Human Health Jan 2019 – Jan 2020

- Applied GIS, drought datasets, and climate diagnostics to assess drought severity and environmental impacts across the United States and Greater Horn of Africa.