Asare Stephen

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Education

Kwame Nkrumah University of Science and Technology, Kumasi, Ghana 2018-2022
Bachelor of Science with Honors Graduation: March 2023
Specialization: Meteorology and Climate Science
Class: Second Class (Upper Division) **CWA**: 67.98 *Equivalent GPA*: 3.513 certificate

Honors and Awards

ForWeb Ambassador September 2023
Honoured for my dedication to producing regular weather forecasts and engaging in community outreach to advance co-produced research uptake, certificate.

The Frontiers Award (Best Poster Presentation). December 2022.
As the only undergraduate among PhD candidates, was recognized for outstanding research and presentation skills during the Mathematical Biology and Medicine workshop. certificate.

Publications

Edmund I. Yamba, Kingsley Badu, Thomas A. Kyeimiah, Nathaniel O. Abrokwah, **Stephen Asare**, Franklin Asiedu-Bekoe and Leonard K. Amekudzi. *Modeling malaria for vector surveillance and control decision making in Ghana.* In preparation.

Daniel Aderotoyel, Benjamin Zaitchik, **Stephen Asare**, Samuel Akandel. *Heat waves trends and patterns in West Africa: Definitions and Drivers. Abstract submitted to The 104th AMS American Meteorological Society Annual Meeting. Accepted for oral presentation.* **Stephen Asare**, *Calvin A. Atuahene, Tony Essiedu, Edmund I. Yamba. A climate based distribution of the current and future malaria transmission in Ghana. Submitted to Frontiers Journal of Applied Mathematics and Statistics, 2023.*

Edmund I. Yamba, Michael K. Benneh, Jeffrey N. A Aryee, **Stephen Asare**, *Josephine Tetteh and Leonard K. Amekudzi A Re-Evaluation Of Seasonal Rainfall Onset and Cessation Dates, Length And Variability Over The Agro-Climatic Zones of Ghana, In preparation.*

Josephine Tetteh; **Asare Stephen**; *Samuel B. Kunji; Joseph Alhassan; Daniel Buor; Dacosta Aboagye; Andrews Ofosu. The climate and environmental drivers of domestic water supply change at the Nasia catchment in Northern Ghana.* **doi**: *10.31223/X50D42 (Pre-Print)*

Presentations

Revisiting the Agro-Climatic zones of Ghana: A reclassification in conformity with climate change and variability, AR, Ghana, Knust Research week (TEKCONFAB). *2023*

Climate suitability for the survival and malaria transmission capacity of Anopheles Stephansi in Ghana, AR, Ghana. [Co - presented] Health and Well being Group, Knust Research Week 2023 (TEKCONFAB '23).

Talk on Thunder and Lightning all you need to know, Teknokrat, (*here*) **Focus Fm station***2023.*

Impacts of climate on health and Well-being, Teknokrat, **Focus Fm station** (*here*, *here*) *2023.*

A climate based distribution of the current and future malaria transmission in Ghana, Mathematical Biology and Medicine Workshop, Ghana Numerical Analysis. certificate *Nov 2022.*

Research Experience

Knust Research Assistantship Position *with Dr. Edmund I. Yamba* *2022-Present*
Worked on Climate-based distribution of seasonal malaria transmission over Ghana.

- *Investigated the current and future distribution of malaria in Ghana under extreme case climate change scenarios namely: RCP 2.6 and RCP 8.5.*
- *Used modelled data from ICTP RegCM4 and HadGEM2 RCM and GCM outputs and CHIRPS, ERA-5 and CRU products. Implemented the VECTRI model by the International Center for Theoretical Physics (ICTP).*

Worked on Impacts of global warming: Rethinking Sustainable Development Goals.

- *Examining the rate of warming in the northern regions of Ghana and their effects on their health and livelihood.*

Worked on Mapping seasonal malaria transmission risk, a function of climate and environment using entomological indices of Temperature on the Vectorial Capacity of Malaria.

- *Reviewed current literature and discovered setbacks in available research works.*
- *Implemented Python-based techniques to compute the vectorial capacity and the survival probabilities.*

KNUST JNAA Research Lab *with Dr. Jefferey Aryee* *September 2020-2022*
Worked on Using multiple drought metrics to assess climatic drought and floods

- *Extracted, explored, and processed 100GB gridded data computed the RAI, SAI, and SPI.*
- *Examined the efficacy of gridded precipitation datasets namely; CRU, CHIRPS and GPCC in predicting drought and flood occurrences using several drought metrics.*
- *Computed the RAI, SAI, and SPI-3 on the gridded and observed datasets.*

Teaching Experience

KNUST Teaching Assistant Position

KNUST MET 254 Python for Scientific Computing Teaching Assistant	*Spring 2023*
Knust PHY 494 Biometeorology Teaching Assistant	*Spring 2023*
Knust MET 253 Fortran for Scientific Computiung Teaching Assistant	*Fall 2022*
KNUST PHY 394 **Environmental Physics I&II** *Teaching Assistant*	*Fall 2022*

Workshops and Conferences

School on Air Quality and Pollution Prevention., *Clean Air Fund* *21 Oct-4 Nov 2023.*
Workshop on Next Generation Emission Measurement, *US EPA* *17 October 2023*
certificate

- *Helping to Improve Air Quality and Source Understanding*

ICFO-KNUST International School On Photonics *8-14 October 2023*

- *Learnt about Quantum Metrology, Ultrafast Spectroscopy, Terahertz spectroscopy, Quantum Sensing, Medical Photonics and Clean Energy.*

ECMWF–ESA Workshop on Machine Learning for Earth Observation and Prediction.
Reading, UK *14-17 Nov 2022*

- *Learnt the application of machine learning techniques in weather prediction*
- *Joined the working group 1 on the application of AI on earth observation and prediction.*

Mathematical Biology and Medicine Workshop, *Ghana. certificate* *9-10 Nov 2022.*

- *Gave a poster presentation on my undergraduate dissertation.*
- *Learnt the interdisciplinary nature of research in climate, health and mathematical sciences.*

UCLA Advanced Research Computing Statistical Methods and Data Analytics Workshop *1 Nov 2022*
Introductory to R Seminar.

- *Introduced to RStudio, ggplot and R markdown.*
- *Developed my first statistical program with R*

2nd GCOS Climate Observation Conference, *WMO, Darmstadt, Germany.* *17-19 Oct 2022*

- *Learnt about current state of the climate and approaches on and earth observation.*

UK Center for Ecology and Hydrology Wallingford, Oxfordshire, UK. *Jul 2022*
Virtual Workshop on Land Surface Temperature demonstration.

- *Implemented the Land-Surface Temperature model to estimate the intensities of precipitation in West Africa.*
- *Implemented the model in preparation of weather forecast in Kumasi.*

Grad Course Projects

MET 253/254 Fortran I & II *with Dr. Edmund I. Yamba* *Fall 2020*

- *Utilized the WRF-SC model, processed the outputs and visualized the data.*

MET454 Biometeorology *with Dr. Edmund Yamba* *Spring 2022*

- *Developed a biological model to simulate the transmission dynamics of malaria in a stagnant population.*
- *Defined an interdisciplinary research problem from scratch by looking into real-world issues and narrowing down project scope by mapping the major challenges and stakeholder needs and soliciting experts' view.*

Volunteering and Internships

GhanaFlux *10 March 2023*
Volunteer:
- *Asssisted in installation of a carbon flux monitoring tower in the Mim forest reserved Ghana under the FluxNet initiative. (here,here)*

Internship Facilitator *Oct – Nov 2022*
Kwame Nkrumah University of Science and Technology
Volunteer:
- *Effectively taught interns Python for Data Science and LaTex for Scientific writing and actively assisted them with their undergraduate thesis.*

Climate Action Advocacy Center *Jul 2022*
Volunteer:
- *Successfully planted 100 trees to contribute to climate action at the event organized by the climate change advocacy center at the Kwame Nkrumah University of Science and Technology business school.*

Kwame Nkrumah University of Science and Technology. *Sep 2021 – Dec 2021*
Intern:
- *Visualized and analyzed precipitation data using Python-based packages and prepared daily weather forecasts using numerical weather prediction models.*

Ghana Meteorological Agency *Sep 2021 – Dec 2021*
Intern:
- *Provided daily weather information to the flight crew members, dispatchers and pilots.*
- *Determined and forecasted weather daily conditions for the community.*

Networks and Memberships

Knust College of Science Robotics Club, Member *Jan 2023 – Present*
Black In AI, Member *Dec 2022 - Present*
Knust Department of Meteorology Soccer team *Nov 2018 - 2022*
KNUST Weather Forecasters (Forweb), Member *Sep 2021 – Present*

- *Facilitate and supervise the issuing of the daily weather forecast for Kumasi.*
- *Oversee the validation of the produced weather forecasts.*
- *Assist ForWEB members with the use of NWPs and the Martin software in predicting weather events.*

Digital Skills

Python FORTRAN R ArcGIS Linux Command Line Shell NCAR Command Language (NCL) Climate Data Operator (CDO) Latex Arduino

References

Dr. Edmund Ilimoan Yamba
Lecturer and Research Scientist in Climate Sciences at Knust, **Email:** *eiyamba@knust.edu.gh Phone: (+233)200876117*

Dr. Jeffery Nii Armah Aryee
Lecturer and Research Scientist at Knust, **Email:** *jnaaryee@knust.edu.gh Phone: (+233)248524226*

Prof. Emmanuel Quansah
Senior Lecturer and Research Scientist at Knust, **Email:** *equansah.cos@knust.edu.gh Phone: (+233)248571016*