

# **PhD Candidate in Hydrogeochemical Data Science**

## **Department of Earth and Climate Sciences, University of Nairobi**

The University of Nairobi, in partnership with the Geological Survey of Denmark and Greenland as the project lead, and other collaborators – Turkana University College, Water Resources Authority, Regional Centre on Groundwater Resources, University of Copenhagen and Aarhus University, is implementing a project entitled: *Groundwater fluoride and salinity vs. equity in arid regions: Obtaining inclusive and sustainable resource management (GEM)*.

GEM is an interdisciplinary project that aims to enhance groundwater resource management for climate change resilience and adaptation in arid regions. The main project objectives are: 1) to understand drivers of groundwater fluoride concentrations and salinity under climate change and increasing groundwater demand, and 2) to explore equity in groundwater resource availability and quality and its impact on the local communities in Turkana County. The research is funded by the Ministry of Foreign Affairs of Denmark and managed by the Danida Fellowship Centre.

We are looking for a highly motivated PhD candidate that will generate novel knowledge on environmental variables governing regional spatial patterns of groundwater fluoride concentrations and salinity in arid regions based on interdisciplinary field work and state-of-the-art machine learning methods. The research will be conducted in Turkana County. During the three-and-a-half-year study you will:

- Collect, digitize (if needed) and quality check relevant archive geospatial data, e.g. geology, water quality in Turkana County, in collaboration with Water Resources Authority.
- Conduct field surveys, including transient electromagnetic (TEM) mapping and water quality assessment at around 150 wells across Turkana County.
- Process TEM profiles and develop understanding of relationship between electrical resistivity, groundwater fluoride concentrations and salinity.
- Predict spatial distribution of groundwater resources, groundwater fluoride concentrations and salinity across Turkana County based on state-of-the-art machine learning methods.
- Understand environmental variables governing distribution of groundwater resources, groundwater fluoride concentrations and salinity in arid regions.
- Undertake an external PhD stay in Denmark.
- Publish at least three papers in international peer-reviewed journals.

You are also expected to collaborate actively with the project research team to achieve the project goals, and to disseminate research outputs to stakeholders and the broader research community through conferences and stakeholder meetings.

The ideal candidate is an early-career researcher with a background in inorganic hydrogeochemistry or hydrogeology, and a strong interest in application of data science and machine learning to address environmental problems. The candidate should also have excellent analytical, communication, and writing skills, as well as a willingness to work in a diverse, multicultural team, and conduct fieldwork.

### **Requirements**

- MSc degree in Hydrogeology, Hydrology, Geology, Geosciences or closely related degree in Earth or Environmental Sciences with strong geology components.
- Strong skills in hydrogeological, geophysical and chemical data interpretation.

- Expertise in Geographical Information Systems for processing and analysis of geographical data.
- Willingness to travel for work for extended periods to Turkana County and Denmark.
- Ability to work independently, as well as within a multidisciplinary research team.
- Excellent written and spoken English skills.

### **Additional Skills**

- Experience with large datasets and geodatabases is an advantage.
- Experience in machine learning, programming languages, such as Python or Matlab, or in geostatistical analysis is preferred, though not required.

### **Terms of Employment**

This is a **full-time PhD position** with a duration of three-and-a-half-years, starting on 1<sup>st</sup> September 2025 and ending in March 2029 (42 months). The candidate is expected to submit and successfully defend the PhD thesis within this period.

The PhD student will be enrolled at the Department of Earth and Climate Sciences, Faculty of Science and Technology, University of Nairobi, under the supervision of Professor Daniel Olago. The co-supervisor will be Dr. Julian Koch, Senior Researcher at the Geological Survey of Denmark and Greenland.

A monthly stipend will be paid to the student following successful provisional admission to the PhD programme. Full admission to the PhD programme will be granted upon the student presenting an approved research proposal - this process should be completed within the first six months of the programme. All research and travel expenses will be covered by the project.

### **Application Information**

Interested applicants are invited to apply with an application containing 1) a one-page motivation letter, 2) a CV summarizing academic and professional experience, and publications, if any (maximum four pages), and 3) contact information of two referees. **The application deadline is midnight 6<sup>th</sup> August 2025.**

Applications should be sent to the following email: [icca@uonbi.ac.ke](mailto:icca@uonbi.ac.ke) with the subject heading: “**PhD Candidate in Hydrogeochemical Data Science – Applicants Name**” and should be copied to [juko@geus.dk](mailto:juko@geus.dk). **Important Note!** The motivation letter, CV and contact information of two referees should be compiled in one pdf.

Women are strongly encouraged to apply.

For further information, please contact Professor Daniel Olago ([dolago@uonbi.ac.ke](mailto:dolago@uonbi.ac.ke)) or Dr. Julian Koch ([juko@geus.dk](mailto:juko@geus.dk)).