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PROGRAM



MOSAIC



UNIVERSITÉ DE
MONTPELLIER

Université de Montpellier, Ecole Doctorale : GAIA

Advertisement: PhD Position

Remote Sensing and Spatial Modeling of Large Herbivore Populations and Health in Response to Environmental Changes in the Amboseli Ecosystem, Kenya

Start date: 1 October 2024, Application deadline: 10 July 2024

Research area: We are seeking a strong early career researcher for an open PhD position. The successful candidate will utilize Earth Observation data to model landscape usage by large herbivore populations, including buffalo, elephant, cattle, zebra, and wildebeest. This research aims to better characterize the impacts of environmental changes—such as climate change, extreme climatic events, and land cover changes—on animal population dynamics and health. The study area is the Amboseli ecosystem in Southern Kenya, where long-term monitoring surveys have been conducted for decades as part of ecological research (Mose, Western, and Tyrrell 2018; Mose et al. 2012; 2013).

Topic of position: The thesis will develop innovative spatial modeling methods to simulate animal mobility using remote sensing data, addressing key challenges such as creating a multi-species model for species interactions and modeling environmental changes under various scenarios. The research will involve characterizing and monitoring drivers of large herbivore mobility—including water resource dynamics, vegetation quality and quantity, land use, and barriers—using high-resolution multi-spectral images (Sentinel 2). It will also model the annual dynamics of animal mobility with agent-based models (Rumiano 2021; Rumiano et al. 2020; Caron et al. 2023). that simulate the movements of ungulate species in relation to environmental factors like surface water seasonality and land cover, using the Ocelet domain-specific language (<http://www.ocelet.fr>). Finally, the study will explore the impacts of different environmental change scenarios, such as climate change, extreme climatic events, land cover changes, demographics, and herd management, on animal population dynamics and health.

Qualification and Requirements: Candidates must hold a Master's degree in a Quantitative Ecology/Health subject (Biostatistics, Mathematics, Data Science, Geographical Information System, Remote Sensing, epidemiology or related field), and will preferably have prior experience with modelling (Ocelet), data analysis (R, Python), Geographic Information Systems (ArcGIS, QGIS), image processing (OrfeoToolBox).

Partnership: This fully funded PhD is part of the MOSAIC project (Multi-site application of Open Science in the Creation of healthy environments Involving local Communities) funded by European Union (2024-2027) and coordinated by the French Institute of Research and Development (IRD). During the thesis, the candidate will interact with the different partners of the project, with regular visits between research units in Montpellier (France), and field missions to Amboseli region in Kenya.

Please apply by **July 10, 2024**, for full consideration. Applicants are requested to submit a curriculum vitae including a research statement, relevant academic certificates and transcripts, and names and contact information for three references. Submit applications electronically in **ONE PDF** format to annelise.tran@cirad.fr, victor.mose@acc.or.ke and renaud.marti@inrae.fr



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Supervisor: **TRAN** Annelise, PhD Email: annelise.tran@cirad.fr

Co-Supervisor: **MOSE** Victor Nyaliki, PhD: victor.mose@acc.or.ke

Co-Supervisor: **MARTI** Renaud, PhD: renaud.marti@inrae.fr