07:00-07:15

Importance of rock engineering when locating ground water in mountainous areas of Mvenyane rural in Matatiele, South Africa.

Sinazo Mabhengu, Science and Agriculture Institution, University of Fort Hare, South Africa

Rock engineering plays a crucial role in identifying and sustaining ground water resources. The geological characteristics of rock formations significantly influence groundwater availability and movement. Proper understanding of rock mechanics assists in determining locations for groundwater. Advance research in geophysical surveys, hydrological modelling as well as borehole analysis is required to enhance the accuracy of groundwater extraction. This research will investigate the rock formations on ground water flow and availability using geophysical methods to locate optimal borehole sites. This study will carry out the risks involved in groundwater extraction such as landslides and rock falls, mechanical behaviour of rock formations.

07:15-07:30

Contribution to analysis of urban dynamics and gullying in Tsiémé watershed in Brazzaville (Republic of Congo) from 1994 to 2024

M'Bouka Milandou Idriss, Higher Institute of Geographic, Denis Sassou-N'guesso University, Republic of Congo

The aim of this study is to show the factors that explain land use in the Tsiémé watershed and gullying. The method used consisted in processing Landsat 1994, 2004 and Copernicus 2014 and 2024 of the watershed, on ENVI and the realization of maps on ArcGis 10.8. Gullying was analyzed by direct field observations and quantification. The results show that from 1994 to 2024, bare/occupied soil, which covered 2,162 ha (33.53%) in 1994, increased to 4,940.38 ha (76.61%) in 2024. Under these conditions, 12 gullies scarring the left slope of the basin have been quantified, for a land loss of 1,073,734 T. Soils are dominated by 50% fine sands, with K values ranging from 0.35 to 0.45 t.ha.h/ha.MJ.mm. The R index is approximately 8,152 MJ.mm/ha.h.yr. Slopes vary from 4 to 17% over almost 96% of the watershed.

07:30-07:45

Karst geomorphology of caves and their ancient uses on the Sheikh Said cliff, north Tell El Amarna Area, Minia Governorate, Upper Egypt

Noura Fayad, Damanhour University, Egypt – Nova Gorica University, Slovenia

The study area is located in the northern margins of the Tell el-Amarna, located about 60 km south of Minia City; it is the land of the ancient Egyptians' lives. In addition to a multitude of paleo karst caves, Sheikh Said's cliff boasts manually dug caves that serve as graves, safeguarding bodies from theft. The Minia formation is primarily formed from Eocene limestone. Sedimentary successions, ranging in age from the Middle Eocene to the Pleistocene and Holocene, essentially cover this area geologically. This paper aims to monitor the caves dug on the cliff, examining their formation, morphological characteristics.

07:45-08:00

Assessment of soil erosion risk using the SIG/RUSLE approach on the Kouvé plateau (South-East Togo)

Kokou Amenouvévé Amedeka, Department of Geography, University of Lomé, Togo

Soil conservation on plateaus is a major issue in sub-Saharan Africa. In Togo, the Kouvé plateau suffers from severe water erosion, which has a significant impact on the soil. This study aims to quantify and map erosion using the RUSLE model and Geographic Information Systems (GIS). The results reveal soil losses ranging from 0 to 99 t/ha/year, with an average of 3 t/ha/year, exceeding the critical threshold of 1 t/ha/year. The most vulnerable areas are the peaks and slopes of the plateau, while valley bottoms and flat vegetated surfaces are less exposed.

08:00-08:15

Soil moisture-rainfall relationship at plot scale and its potential implication for catchment hydrology

Adedayo Adewole, Department of Goegraphy, Olabisi Onabanjo University, Ago-Iwoye, Nigeria

Soil moisture-rainfall relationship requires improved understanding because it varies with landuse/cover, soil properties and season. This study examines soil moisture- rainfall relationship in a part of southwestern Nigeria. Results indicated a complex but significant ($p < 0.05$) relationship, viz; a direct and positive relationship (b=0.43, R.sq = 0.18) between soil moisture (SM) and rainfall, a mixed relationship with antecedent soil moisture (ASM), (b= 3.03, -2.63 of S.M and ASM, respectively; R.sq = 0.38) and (b=0.03, R.sq=0.383), with soil temperature. SM also exhibited a nonlinear relationship with porosity and bulk density. The study associated varying landuse/cover with heterogeneity in soil moisture-rainfall-relationship.

08:15-08:30

Recent dynamics of the Onive river (Central Highlands of Madagascar) : contemporary adjustment and river behaviour

Tsiarofy Andrianirinolosoa, Department of Geography, University of Antananarivo, Madagascar

The Onive river, in Madagascar's Central Highlands, illustrates the dynamics of watercourses through its historical bed changes, whose former courses, now converted to farmland, are subject to recurrent flooding during the rainy seasons. This study aims to analyse the river's recent evolution through a semi-automated diachronic approach, supported using a geographic information system (GIS). The results show that, over the last two decades, the main channel has remained remarkably stable, despite local micro-adjustments. Conversely, morphological adjustments are more pronounced in the tributaries where the processes of reorganization of hydrographic network appear to be more active.
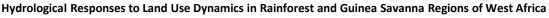
INTERNATIONAL GEOMORPHOLOGY WEEK 2025

08:30–08:45

Geomorphology and landscape dynamics in the Zammour Valley (Southeastern Tunisia)

Feiza HAMMAMI, Faculty of humanities and Social Sciences, University of Tunis, Tunisia

Wadi Zammour watershed is located in southeastern Tunisia and is part of the Matmata-Dahar plateau. It desiccates a backslope of a cuesta relief characterized by geomorphological diversity offering a variety of structural forms. The watershed underwent significant evolution during the Quaternary period. From the Lower Pleistocene to the Holocene, a variety of Quaternary forms and deposits were formed. This was driven by fluvial and aeolian activities. All geomorphological features are shown on a 1:10,000 geomorphological map. A diachronic mapping approach shows that today's landscape is the result of a morphodynamic evolution as well as a significant changes in Man's land use.

Hydrological Responses to Land Use Dynamics in Rainforest and Guinea Savanna Regions of West Africa

Rotimi Obateru, Department of Geography, University of Ibadan, Nigeria

08:45–09:00

Urbanization and climate change challenge global water management. This study employs machine learning geospatial techniques and models to evaluate land use impacts on stormwater runoff and retention in Nigerian cities from Rainforest (Akure, Owerri) and Guinea Savanna (Makurdi, Minna) ecoregions for 2002, 2022, and 2042. Landsat imagery, processed with a random forest classifier using NDVI, and MOLUSCE-simulated future land use were integrated into the InVEST platform. Findings reveal urban and agricultural expansion significantly reduce stormwater retention by 1.55%–14.83% within 5–10 km of urban cores, underscoring the need for afforestation and agricultural practices to mitigate climate impacts.

09:00–09:15

Local perceptions of water erosion in the Gamboma Plateau Subdivision (North Congo Division, Republic of Congo)

Yam Moye HOKILI, Department of Geography, Marien NGOUABI University, Republic of Congo

The Gamboma subdivision, North Congo, is affected by water erosion, with local populations partly responsible. This study evaluates their knowledge to define a participation strategy. It is based on a survey carried out among 114 households. The results show that 90% of respondents are aware of erosion, 82% identify climatic aggression as the cause, and 59% point to the lack of channelling. However, 60% are not concerned about erosion and 57% are not afraid of it. In addition, almost 60% have no opinion on anti-erosion solutions. Awareness is therefore crucial.

Assessing Fluvial Sedimentation Impact on Agriculture and Proposing Mitigation Strategies for the Lusitu River Catchment, Southern Zambia

Manoah Muchanga and Nordoft Singubi, Geography, Climate Change & Section, University of Zambia, Zambia

09:15–09:30

Fluvial sedimentation is a global issue, particularly affecting the Lusitu River Catchment in Southern Zambia. Lusitu River supplies water to about 20,000 Gwembe Tonga people relocated in 1958 for the Kariba Dam. Sedimentation disrupts water-dependent activities, causing environmental and socio-economic problems. The study used interviews, sediment coring, and GIS analysis. About 68.34% of channel storage is lost to sedimentation, affecting small-scale farmers. People adapt through subsurface flow of the riverbed. The study concludes that sedimentation, caused by soil erosion and farming practices, worsens rural poverty by reducing crop yields and livestock productivity. River Restoration is recommended for broader implementation.

09:30–09:45

Use of longshore geomorphological figures as an indicator of the intensity of littoral sediment dynamics : the case of Assouindé and Port-Bouët (Ivory Coast)

Saimon Aby Atsé Mathurin, Oceanological Research Center Abidjan, Ivory Coast

Knowledge of shoreline morphologies as an indicator of sediment dynamics has been studied on the Port-Bouët and Assouindé stretches of coastline. Long shore monitoring was carried out between November 2023 and May 2024. Three sections of each shoreline segment were surveyed on the high foreshore, with a construction level of more than 250 m. Analysis of the morphologies shows a shoreline sediment dynamic per unit length of between 0.44 and 0.56 m2 greater at Port-Bouët than at Assouindé, where these values range from 0.15 to 0.17 m². The longshore morphology is characterised by a succession of beach crescents with lengths varying between 37.75 and 71.35 m at Port-Bouët and between 100 and 180.88 m at Assouindé.

Assessing and analysis of ecological/geological factors of the shoreline dynamics in southwestern Madagascar, using DSAS tools

Sitrakiniaina Ramarokoto, Geology Department, University of Antananarivo Madagascar

09:45–10:00

Madagascar, which encompass extensive mangrove areas. In order to observe the processes of coastal retreat (erosion) and advance (accretion), satellite images from different dates (1990/2000/2010/2020) were analysed using remote sensing and GIS tools. These processes were also associated with a set variables that have the potential to act as drivers of shoreline dynamics. These included coastal land use (presence/absence of mangroves), distance to the nearest river mouth, Bouguer anomaly, which serves as a proxy for tectonic subsidence risk, and foreshore slope. Tectonic subsidence, linked to high Bouguer anomalies, can also cause sea levels to rise, leading to shoreline erosion.

INTERNATIONAL GEOMORPHOLOGY WEEK 2025

10:00–10:15

The sedimentary environment of the Quaternary stratigraphic sands of the Bakorobabugu profile, Bamako, Mali

Amadou MINTA, University of Social Sciences and Management of Bamako, Mali

Sands are very abundant Quaternary sediments in the city of Bamako along the river. This study focuses on the sediments identified at Bakorobugu on the right bank of the Niger River, east of the city of Bamako. The aim of this study is to understand the origin and processes that led to the deposition of the sands in the Bakorobagubu stratigraphic profile. The stratigraphic profile was sampled systematically, with one sample taken every 10cm. Granulometric analyses by sieving the samples were used to calculate parameters such as graphical mean, graphical median, dispersion parameters Trask indices or Sorting-Index So and skewness index using the R statistics software package G2SD (Grain-Size Statistic and Description of Sediment).

10:15–10:30

Pointe Denis between coastal erosion and marine submersion: analysis of vulnerability and prospective vision

Vivino Max Thiery MOUYALOU, CNDIO/CENAREST, Libreville, Gabon

Situated between the Rogolié River and Wingombé Point, the Pointe Denis coastline is a hot spot for coastal erosion and marine submersion. The Vulnerability Assessment reveals a peak erosion rate of 24m/year between 2011 and 2024 and numerous submersion events that have led to the disappearance and threatening of numerous ecotourism, environmental and socio-economic issues. Based on Past-Present-Future, the projection to 2035 and 2100 illustrates the spectacular upheavals that have led to a multi-axis research program (1) Coastal dynamics and physical processes, (2) Risk Governance and Coastal planning, (3) Tourism activities and waste management (4) Dynamics of coastal ecosystems.

10:30–10:45

Geomorphology and artificial intelligence: using machine learning to map gully susceptibility in central Senegal

Seydou Alassane SOW, UCAD, Department of Geography, Senegal

The results of this study show that gullying is systematically distributed throughout the study area. In terms of accuracy, the ROC curves show AUC values of 78.96% for the FR model, 78.47% for the SVM-CNN model and 89% for the LR-CNN model. This shows that the models constructed in this study provided accurate and reliable results for predicting susceptibility to water erosion by gullying, which has both environmental and socio-economic consequences in this central part of Senegal.