

IAG Webinar Africa



February 28, 2022 ; 8:00 am - 1 pm (GMT+1)

Coordinator: **Dr Ghislain ZANGMO TFOGOM**

INTERNATIONAL GEOMORPHOLOGY WEEK 2022

Soil moisture dynamics: research progress and a catchment-scale case study analysis from southwest Nigeria

Adedayo Oreoluwa Adewole, Obafemi Awolowo University, Nigeria

08:00 – 08:15



Soil moisture is a critical determinant of runoff development, flowpath and biogeochemical cycle within a catchment. Catchment-scale studies suggest that catchments exhibit behavioural differences; consequently, results from major catchments cannot be generalized. Specific objectives are to examine the relationship between soil moisture and rainfall, assess the influence of soil characteristics on soil moisture-rainfall relationship and compare soil moisture-rainfall relationship from ground-based data sources with that derived from selected satellite imageries. Available results show spatio-temporal and landcover/use variability in soil moisture distribution, with potential implications for food production, hydrogeomorphological inferences and modelling, especially at catchment-scale.

Erosion risk assessment through prioritization of sub-watersheds in Nyabarongo river catchment, Rwanda

Luc Cimusa Kulimushi, University of Rwanda - College of Education, Rwanda

08:15 – 08:30



Few attempts have been made to combine objectively different techniques for watersheds prioritization based on their susceptibility to erosion. While the latter is a multi-dimension problem which still challenging researchers and planners worldwide. The study defined three order clusters using HCA, and these represent different sub-watersheds of Nyabarongo River Catchment. Erosion risk assessment combined the compound index (Ci) and Erosion Hazard Rate Index (EHRI) derived from AHP. The former considered the morphometric parameters dimensionally reduced using PCA, land cover, soil, and geology, while the latter considered the soil loss, sediment production rate, sediment transport index, runoff potential and slope parameters.

Spatio-temporal geomorphic landscape dynamics and geological hazards in Ghana

Ezekiel Addison Otoo, University of Education, Winneba, Ghana

08:30 – 08:45



The study investigated the extent of landscape change and possible geological hazards between 1986 and 2016. It adopted GIS and Remote Sensing to examine the extent of landscape change as well as interviewed residents and experts for the qualitative analysis. The results confirmed the landscape was undergoing degradation and depositional. About 56.11% of the landscape underwent degradation while 43.89% underwent deposition. Geomorphic change in the municipality was largely due to anthropogenic activities. Possible geological hazards identified included earth quake, flooding and mudflow. It was recommended that hazard prone areas should be zoned and residents relocated to prevent future fatalities.

Geomorphology and recent dynamics of landform units of the coastal area between Hammem El Ghzez and Kélibia

Habila Hajer, University of Tunis, Tunisia

08:45 – 09:00



The coastal area of Kélibia is part of the eastern coast of Cap Bon. Its length is about 18 km extending from Oued El Ksob to the north of Hammem El Ghzez up to Oued El Hajar south of Kélibia. It presents a variety of geomorphologic units of the coastal area. The study of the physical components would allow the understanding of the functioning of these units, the morphogenesis and the dynamics of the coastal area.

Etude des inondations du site de Pointe-Noire : analyse des facteurs, évaluation des conséquences et cartographie des zones affectees (République Du Congo)

Gracia Rochelvie Moueba, Université Marien Ngouabi, République du Congo

09:00 – 09:15



La ville de Pointe-Noire est confrontée aux inondations qui prennent de l'ampleur presque au même diapason que l'érosion hydrique, qui de loin est l'un des facteurs des dites inondations dans certains bassins versant. Ces phénomènes provoquent des catastrophes plus destructrices et occasionnent d'importants dégâts humains et matériels. Les résultats attendus au terme de ces travaux sont : les types d'inondations qui affectent la ville de Pointe-Noire sont déterminés et leur ampleur actuelle décrite ; les facteurs explicatifs des inondations sont identifiés par type et commentés ; les phénomènes d'inondations sont modélisés et cartographiés et la politique et les mesures d'une bonne gestion de ce phénomène sont décrites.

Application of Remote Sensing and GIS for Assessing Spatiotemporal Change of Coastline along Egyptian Mediterranean Coast

Kamal Srogy Darwish, Minia University, Egypt

09:15 – 09:30



Coastal areas are remarkable regions with high spatiotemporal variability. The Egyptian Mediterranean coast has rapidly changed in the last thirty years under the influence of natural and anthropogenic factors. In this study, Spatial temporal change in the Northern Saini coast was detected and analysed from 1990 to 2020 with 5-years interval to automatically extract the coastline and change analysis in coastline position due to accretion and erosion. Remote sensing imagery were collected and analysed; Landsat time-series images including Thematic Mapper (TM), Enhanced Thematic Mapper Plus (ETM+), and Operational Land Imager (OLI) within a tidal range of ±50 cm. The extracted coastlines were analysed using the coupling of Geographic Information System with Digital Shoreline Analysis System (DSAS).

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Approche cartographique de l'évolution du trait de côte dans l'estuaire de la Casamance

Mamadou Thior, URICA/Laboratoire d'Archéologie IFAN-UCAD, Sénégal

Cette étude propose une approche cartographique et statistique qui permet de calculer les taux de variation historique du trait de côte avec le plug-in DSAS dans la partie nord de l'estuaire de la Casamance au Sénégal. Pour ce faire, une méthode statistique d'extrapolation et de calcul de tendances est mise en place, basée sur le traitement des images satellitaires Landsat acquises entre 2004 et 2019. Cette méthode a permis d'obtenir une représentation cartographique et graphique des résultats statistiques sur l'évolution du trait de côte de l'estuaire nord de la Casamance.



09:45 – 10:00

Geomorphic hazards of Sannur Cave, East desert, Egypt

Noura Fayad, Damansour University, Egypt - Primorska University, Slovenia

Sannur Cave is located near the village of Sannur, Beni-Suef, Upper Egypt. It lies on the east bank of the Nile River, the cave's composition dates back to about 65 million years of the Middle Eocene Epoch. Sannur Cave is a classic karst cave created by groundwater percolating through the Eocene limestone of the Galala Plateau. This paper aims to define the geomorphological characteristics of the cave and study the geomorphological hazards facing opening the cave for the visitors, depending upon extensive field study and geomorphic mapping of the geomorphological hazards of the cave.



10:00 – 10:15

Assessment of real-time siltation of A lacustrine system in the Magoye catchment, Zambia

Manoah Muchanga, University of Zambia, Zambia

The study aimed at assessing real-time rate at which sediment was settling on the bed of a lacustrine system using Sedimeter SM3A. On average, the daily sediment settling rate was 0.03 cm/day. Sediment depth increased from 2.29 m in 2014/2015 to about 2.32 m by the end of 2016/2017 rainy season. A very strong relationship ($r^2 = 0.93$) between daily rainfall and sedimentation was observed. Sediment loading was 685.57 tonnes for 2015/2016 rainy season and 2,362.90 tonnes for 2016/2017 rainy season.



10:15 – 10:30

A brief look at the evolution of the Rwandan current landscape

Michael Biryabarema, University of Rwanda - College of Education, Rwanda

The Rwandan landscape cascades from the mountainous West through the relatively lesser mountains in the central regions associated with competent metasedimentary zones and granitic batholiths, to the relatively low lying east representing a more depressed topography. Some of the eastern parts are also hilly, largely preserved by quartzitic horizons. A number of methods will be used for a better understanding of the phenomena involved.



10:30 – 10:45

Study and geomorphological mapping of landslide on the northern flank of the perched Syncline of Jbel El Gorraa (North-West Tunisia)

Syrine Slouli, University of Tunis, Tunisia

This work focuses on the northern flank of the perched syncline of Jbel El Gorraa which is part of the northern Haut-Tell (North-West of Tunisia) and which dominates the southern shore of the middle valley of Oued Medjerda. This flank presents a set of characteristics of the natural environment which were at the origin of an active morphological dynamic. This gave rise to a series of landslides belonging to several families which were at the origin of the irregular aspect of the slope. In addition to the favorable natural context, this dynamic has been accelerated with significant anthropization. The situation on the northern flank of the perched syncline of Jbel El Gorraa seems to be worrying, especially in its north-western part, dominating the agglomeration of Djebba, which is characterized by both a dynamic of active landslide, in particular rock fall and a very remarkable human presence. This area requires urgent intervention in order to stabilize the slope and minimize the risk due to landslides.



10:45 – 11:00

Multi-model Analysis of Soil Erosion Susceptibility Zones and the Causative Factors in Anambra State, South East Nigeria

Romanus Udegbonam Ayadiuno, University of Nigeria, Nigeria

Soil erosion is a natural geomorphologic hazard which occurs when erosion agents disintegrate and remove the surface layers of the soil. Soil erosion consists of gully erosion, among others. Gully erosion tears and degrades land; causes soil loss, dissect roads and cut off communities and reduces agricultural productivity. This study used secondary data obtained from satellite imageries and other published literature. From the literature, some dynamic causative factors were identified and subjected to statistical analysis using SPSS and ArcGIS, to evaluate, generate models and predict the impact of the causative factors in soil erosion susceptibility level of the study area.

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11:00 – 11:15

Coral reef biogeomorphology of Ras Muhammad area, South Sinai, Egypt

Mohamed Abd-Elghany Mahmoud Mohamed, Suez Canal University, Egypt

A quantitative survey of reef community structure was carried out within the Ras Mohammed National Park in the southern Sinai. Three transects on Ras Mohammed fringing reef were surveyed to a depth of ± 2 m around the southern tip of the Ras Mohammed Peninsula. Some features of its biogeomorphologic processes were found, including three basic bio-geomorphologic units: Coastal reef, Barriers reef and Cutting Coral reef. The objective of this paper is to define types of coral reef, biogeomorphic mapping and its geomorphological features in the study area, depending upon remote sensing analysis and extensive field surveying, profiling and mapping.

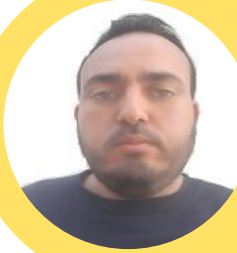


11:15 – 11:30

Vulnérabilité du réseau routier aux risques de dégradation par l'érosion hydrique dans le District d'Ewo (Département de la Cuvette-ouest, République du Congo)

Schistel Assounga, Université Marien Ngouabi, République du Congo

Depuis plusieurs années, le réseau routier du District d'Ewo dans le département de Cuvette-ouest au centre-ouest Congo, est exposé aux phénomènes d'érosion hydrique dont l'étude des principaux indicateurs ou facteurs de vulnérabilité est l'objectif principal de ce travail ainsi, que les enjeux, qui sont attachés aux réseaux routiers. Trois types d'opérations complémentaires classiques en géographie ont été menés pour atteindre cet objectif à savoir : l'analyse documentaire, la collecte des données, le traitement et de l'analyse des données sur ce phénomène.



11:30 – 11:45

Le bassin versant du cours amont d'Oued el Khil (Sud-est Tunisien): Etude géomorphologique

kharchoufi Mohamed Houcine, University of Tunis, Tunisia

Le bassin versant du cours amont d'Oued el Khil fait partie du Sud-est tunisien, du plateau de Matmata-Dahar. Ce bassin versant s'encaisse dans un relief de cuesta. Cette structure monoclinale se caractérise par une variété des roches géologiques et présente des formes structurales majeures et mineures. Les modelés et les dépôts quaternaires sont bien liés aux changements climatiques qui se sont manifestés par la dynamique de l'action hydrique et éolienne. Ces modelés se sont mis en place au cours des différentes périodes du Pléistocène inférieur jusqu'à l'Holocène.

Actuellement, l'évolution morphodynamique se manifeste par l'érosion hydrique et l'érosion éolienne.



11:45 – 12:00

Soil loss measurement models applied in Rwanda

Vaillant Byizigiro, University of Rwanda, Rwanda

Rwanda is a hilly country, in some regions with a relatively young topography with young youthful drainage characteristics. These hills are largely cultivated, and the population density is one of the highest in Africa. The hazard of soil erosion from both the natural hilly landscape and the intensive activity makes the understanding of soil loss through erosion very pertinent.

A number of soil loss models have been tested in the country. The description of one study area using RUSLE model will be presented.



12:00 – 12:15

Les Blocs et Dalles Granitiques de la Localité de Lara (Extrême-Nord Cameroun) : Un Atout pour le Développement du Géotourisme

Hyacinthe Nouhou Dama Zouyane, University of Maroua, Cameroon

Lara appartient à la Chaîne Panafricaine d'Afrique Centrale. Il est constitué des granites qui affleurent en blocs et dalles, de tailles et de formes diversifiées. Les travaux de laboratoire et de terrain ont permis de faire une sélection, une description et une cartographie de ces entités géomorphologiques qui n'ont jamais été étudiés pour une perspective géotouristique. Les blocs granitiques présentent des surfaces carapacées, des taffoni et une forte fissuration par endroit. Les dalles granitiques possèdent des marmites de géants et des cupules. Ces entités géomorphologiques constituent un géohéritage exceptionnel nécessaire pour le développement du géotourisme dans Lara.



12:15 – 12:30

Anthropogeomorphological Wetlands in South Africa

Renée Grundling, University of Pretoria, South Africa

The influence of humans on the environment is becoming more pronounced as populations, particularly the urban population, increase. Anthropogeomorphology is the study of how humans modify and create landform and landform processes. Wetlands are generally seen as natural geomorphological features, but wetlands can be formed and modified due to human activities and may therefore be attributed to anthropogeomorphology. The aim of this research is to investigate the role of anthropogenic wetland formation in the realm of anthropogeomorphology and to assess the effects of these systems on the surrounding communities and current environmental management paradigms in South Africa.