reconstructions of past long-term fire occurrence along with palynologically-derived estimations of plant biodiversity, represent a crucial step towards deeper ecological hypothesis testing, especially with regard to ecosystem resilience. In our approach, we use surface samples from sediment traps across large environmental gradients and compare their pollen and charcoal influx (particles cm-2 year-1) to remote-sensing products of land cover and fire occurrence (i.e. GlobCover 2009 and MODIS). By using these relationships and applying them to Palaeoecological records, we aim to identify fire-related, ecosystem-specific, disturbance thresholds. Additionally, we plan to investigate how different factors (i.e. biodiversity, climate or human-impact) affect the resilience of ecosystems and how these relationship change over long time scales.
Ultimately, by combining such results with modeling approaches and by including them into tools such as the Local Ecological Footprinting Tool (LEFT), we hope to facilitate the broad-scale incorporation of palaeoecological results into resource and land management planning.

500 years of change in Kenyan mountain forests and savannahs

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The East African landscape has experienced significant socio-ecological changes over the last 500 years. Increased climate variability, marked by either the increase in occurrence and length of droughts or increased strength of the El Niño, combined with accelerated expansion of human activity has developed complex socio-ecological landscapes. The increasing demand on natural resources and threats facing these ecosystems underpins our efforts to understand the sociological and ecological factors shaping the landscape and the consequences of human activity as well as the impacts of current and future climatic changes. Thus, long-term human-environmental histories make an important contribution to sustainability dialogues.

The data from several sedimentary records from the Eastern Mau forest and Amboseli landscape reveals the ranges of variability of vegetation compositions, fire activity and physical environment processes, that are driven by interactions between climatic and human activities. The decrease of Afromontane taxa coupled with an increase of disturbance species Amaranthaceae/Chenopodiaceae and Poaceae are associated with a drier climate around the Mau range. The appearance and increase of pollen indicate cropping as well as increased charcoal peaks indicate increase fire frequency pointing towards increasing human-ecosystem impacts. Rapid changes in the elemental profiles as well as the particle size of the inorganic matter further indicate increased activity on the landscapes. Multiple records from Amboseli show that the timing of the onset of changes was different across the wetlands that are intermittently distributed on the landscape. The ecological information when coupled with available historical and archaeological records can be applied in the design of locally adaptive sustainable management practises as well as providing a long-term perspective to local communities about environmental change that can inform decision-making.

Integrating palaeoecology and dendroecology to reconstruct ecosystem changes in the African tropics

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Climate, disturbance regimes and ecological succession are key factors to understand the diversification and distribution of present African ecosystems. Identifying such processes in the palaeorecord, and the relevant time scale at which they may operate (i.e. low- vs. high-frequency changes), require multi-disciplinary and multi-scale palaeoecological approaches that complement short-term ecological observations. Over the last decade, high-resolution and chronologically well-constrained lake-sediment records have provided new insights into the response of East African ecosystems to climatic stressors, with biomass burning largely mediating the control of rainfall variability on the savanna/forest boundary. In areas where lake records are scarce, insights about vegetation-fire-climate linkages can be gained by charcoal preserved in soils, providing more taxon-specific rate of recovery of forest tree species following drought or disturbance regime events. Finally, recent advancements in stable-isotope research on tree rings can provide spatially detailed disturbance histories and stand-scale dynamics of keystone species, and contribute new century-long reconstructions of annual rainfall variability. Methodological approaches combining such different temporal perspectives are relevant for tropical palaeoecology because they can improve existing regional-scale syntheses of ecosystem history (palaeovegetation, palaeofire). Additionally, integrative records of past ecosystem responses can better inform landscape management and conservation of keystone species, such as the African teak, *Pericopsis elata*, in the Congo Basin.

POSTER PRESENTATIONS

Quaternary perspectives on Climate change Impacts on the Oil Palm Leaf miner in Nigeria

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This paper evaluates climate change and variability from 1961-2010 and projections up to 2050 and its impacts on the oil palm leaf miner - Coelaenomenodera elaeidis (Coleoptera: Chrysomelidae), in the study area. The study involved direct field insect pest surveys and assessments at the Nigerian Institute for Oil Palm Research (NIFOR) main station. A complete randomized design (CRD) was utilized. The leaf miner was sampled during 2009-2010 in oil palm fields and records from previous surveys from 1976-1980 were utilized. Climate variability projections up to 2050 were evaluated and impacts on the leaf miner evaluated. Time series analysis was conducted using Minitab 14.0. Least square method was used to estimate the trend in the series and the trend equations. Computed models for temperature, rainfall and relative humidity were Yt = 30.6174 + 3.51E -02*t; Yt = 163.829 - 0.112521*t and Yt = 68.8473 – 230E -02*t respectively where t is time. On this basis, a forecast up to 2050 was generated indicating an upward trend in temperature and a downward trend in rainfall and relative humidity. Specific forecast indices for 2050 were: Temperature: 33.8oC; Rainfall: 153.70mm; and Relative humidity: 66.8%. The study has established an upward increase in temperature, attributed to climate change, with concomitant increase in leaf miner abundance between 1980 and 2010 The integration of weather forecasting with farmer action has great potential for control of insect pests in oil palm growing areas.

Perceptions of and responses to climate change by maize-dependent smallholders in Ethiopia

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