8th European Conference of Tropical Ecology

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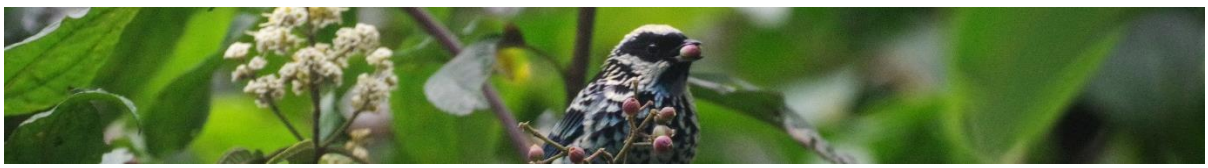

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TOPIC 1: Freshwater and marine ecosystems

Session 1

Title: **Seasonal ebbs and flows and their impacts in tropical freshwater ecosystems**
Conveners: Nadia Raytselis[1], Naima Starkloff[2], Ben Lukubye[1]
Affiliations: 1 = Emory University, USA, 2 = University of Amsterdam, Netherlands

Abstract: The tropics are typically characterized by wet and dry seasons which differ significantly in their precipitation levels. Freshwater ecosystems in the tropics are inherently dependent on water, and are, thus, greatly impacted by these drastic seasonal changes in precipitation. This includes impacts on aquatic ecosystem size and function, caused by shifts in water body size, connectivity, and quality, as well as landscape desiccation. This can also cascade into variability in key abiotic characteristics such temperature and conductivity. Such seasonal changes can lead to non-equilibrium or transient dynamics and the dynamic coexistence of aquatic species across seasonal cycles. This session will focus on how seasonality in precipitation and other factors can influence species interactions such as predation and disease in freshwater tropical ecosystems over space and time. This knowledge is even more critical in the face of climate change, which already causes more unpredictable seasonal precipitation patterns.

Keywords: freshwater, precipitation, seasonality, species interactions, tropical ecology

Session 2

Title: **Marine and freshwater tropical ecosystems**
Conveners: Sancia van der Meij
Affiliations: University of Groningen, Netherlands

Abstract: Aquatic environments, both freshwater and marine, compose a large part of Earth's tropical ecosystems. These systems hold immense biodiversity and play a large role in Earth system function. However, aquatic ecosystems are increasingly threatened by human impacts. Ecological assessments and conservation strategies are necessary for preserving and protecting these globally important ecosystems. This session will focus on aquatic ecosystems: their status (both past and present), the threats they face in upcoming decades to centuries, and how we can best manage and conserve them. We hope to develop a diverse session that showcases a wide range of research approaches, including monitoring, modelling and experimental, and explores multiple aspects of the marine and freshwater environment in the tropics.

Keywords: aquatic ecology, climate change, diversity, environmental pollution, modelling, monitoring

TOPIC 2: Human-environment interactions

Session 3

Title: **Connecting the world's dry topical forests: A platform for understanding their socio-ecology**
Conveners: Natasha Sofia Ribeiro[1,2], Ana I. Ribeiro-Barros[2], Joao Neves Silva[2], Oswaldo Maillard[3]
Affiliations: 1 = Eduardo Mondlane University, Mozambique, 2 = University of Lisbon, Portugal, 3 = Fundación para la Conservación del Bosque Chiquitano (FCBC), Bolivia

Abstract: Tropical dry forests (TDF) harbor diverse and multifunctional landscapes and are inextricably linked to the lives of millions of people across the globe. Additionally, they hold about 25% of the global terrestrial carbon, thus playing a major role in regulating global climate dynamics. Despite their significance, there is a substantial lack of knowledge on the many factors involved in their dynamics, and resilience as well as options for sustainable management. The TDF are highly fragile and vulnerable to the contexts of intensifying drought and fire scenarios, as well as the rapid transformation of land use to satisfy the needs of an ever-growing human population. One of the strategies to reduce the destruction of these forests is to strengthen decision-making and governance in general. This session aims to create the foundations to build a global TDF network that can act in a coordinate manner to address the major challenges and opportunities. The specific topics to be discussed in this session are long-term responses to climate changes, impacts of changing forest ecosystem on the resources provided to local communities and strategies to create communities of practices to support governance for more resilient and adapted TDF.

Keywords: climate change, conservation, deforestation, forest degradation, governance, resilience

Session 4

Title: **Human-wildlife coexistence**
Conveners: Michiel P. Veldhuis
Affiliations: University of Leiden, Netherlands

Abstract: Earth is experiencing a major crisis in terms of biodiversity loss. Bending the curve of biodiversity loss will require increasing biodiversity in human-dominated landscapes. But how to do this is a major challenge, as increasing biodiversity can have large negative impacts on local livelihoods, by affecting income, health, safety, etc. In this session we invite talks that provide broader lessons for human-wildlife coexistence, by showcasing what works and/or what not.

Keywords: biodiversity-inclusive society, human-wildlife coexistence, human-wildlife conflict, people and nature, sustainable landscapes

Session 5

Title: **Sustainability in the tropics**
Conveners: Joeri Zwerts
Affiliations: Utrecht University, Netherlands

Abstract: The tropics provide resources (goods and services) to global human populations and are also important for global-scale ecological and Earth system processes (e.g., hydrological cycles, carbon sequestration). Increasing sustainable resource use in tropical systems is crucial for preserving and protecting tropical systems and their function in global cycles. Policy is also key for implementing sustainable resource use in tropical systems. This session welcomes submissions that relate to sustainability, ranging in topics from agro-industries to certifiable products to environmental conservation. We particularly welcome submissions that are interdisciplinary or multidisciplinary, and/or have a policy focus.

Keywords: agriculture, agro-forestry, circular economy, environmental policy, One Health, planetary boundaries, product certification, systems science

Session 6:

Title: **The anthropic tropics**
Conveners: Kate Dudgeon, Umberto Lombardo
Affiliations: Autonomous University of Barcelona, Spain

Abstract: Tropical ecosystems are characterized by diverse and lush vegetation, containing some of the most valuable and threatened biodiversity hotspots of the world. For decades, humans have been seen as mere agents of ecological disturbance causing prevalently negative environmental impacts. While it is true that most tropical areas are now threatened by land use change, archaeological research shows that tropical ecosystems are the result of varying degrees of past human-environment interactions. Therefore, extant tropical ecosystems cannot be understood without integrating historical perspectives. In this session we aim to bring together ecologists and archaeologists to foster debates which improve our understanding of the role humans played in creating modern patterns of biodiversity and how our community can contribute to the current and future land management strategies in the tropics.

Keywords: Anthropocene, archaeology, biodiversity, deforestation, disturbance, ecological legacy, human impact

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TOPIC 3: Monitoring and modelling

Session 7

Title: **Living collections in botanic gardens: Efforts in science communication, research, education and conservation**
Conveners: Sven Focke
Affiliations: Hortus Botanicus Amsterdam, Netherlands

Abstract: Botanic gardens have multifaceted roles as dynamic institutions that bridge science, conservation, and public engagement. As public-facing institutions with their living collections, they are uniquely positioned to raise awareness about environmental issues and foster a deeper understanding of the natural world. During this session attendees will gain insights into the latest efforts and activities for leveraging living collections to enhance public understanding of science and conservation, this will provide the opportunity to delve into the plant collections housed at various leading botanic gardens in Europe, their specializations, education initiatives, current developments and areas of interest. These collections may also facilitate scientific research, offering invaluable resources and collaboration opportunities for the study of plant biology, ecology, and evolution. By the end of the session, participants will have a greater appreciation for the important role botanic gardens play in safeguarding biodiversity, facilitating research and educating the public about the challenges facing our natural world. The ultimate goal of this session is to bring together scientists working on tropical flora and keepers of living tropical plant collections to foster collaborative opportunities.

Keywords: biodiversity, botanic gardens, conservation, living collections, science communication

Session 8

Title: **Mathematical and statistical models to predict and protect tropical species and ecosystems: A new era**
Conveners: Juliano Morimoto[1,2], Ran Levi[1], Janis Lazovskis[1]
Affiliations: 1 = University of Aberdeen, UK, 2 = Federal University of Paraná, Brazil,

Abstract: Ecology relies on statistical and mathematical models to make predictions and galvanise action. We live amidst a revolution in computer sciences that enabled old tools to be applied – and new ones to be developed – to advance our understanding of tropical ecosystems. This thematic section will explore these theoretical tools and highlight the ground-breaking consequences – as well as future promises – that they can deliver to tropical ecology. We will feature work from all taxonomic groups and across biological scales, provided they articulate how the interdisciplinary relationships between ecology, mathematics, and statistics contributes to tropical ecology. This includes but is not limited to cutting-edge technologies such as machine learning and artificial intelligence in modelling and monitoring tropical biodiversity, as well as the promises and challenges of such models to the advancement of the field. We will discuss policy-related research and introduce a new tool for analyses of multidimensional ecological data – topological data analysis ('TDA') – and how it can be used alone or in combination with other cutting-edge methods (e.g. machine learning) for insights into tropical systems. This thematic session will collate the work into a

special issue and/or perspective paper forming an authoritative resource for tropical ecologists of the present and future.

Keywords: Bayesian statistics, deep learning, ecological modelling, multidimensional niche, network analysis

Session 9

Title: **Monitoring wildlife populations in tropical forests**
Conveners: Marijke van Kuijk, Yannick Wiegers, Julia Blok, Joeri Zwerts
Affiliations: Utrecht University, Netherlands

Abstract: Tropical forests, which harbor the planet's richest biodiversity, are increasingly threatened by anthropogenic activities such as hunting, habitat fragmentation, climate change, and land-use changes. Understanding the impact of these activities on species abundance is crucial for effective conservation strategies.

Various animal monitoring methods, such as camera traps, acoustic sensors, drones, and environmental DNA, are utilized to track wildlife populations in tropical forests and assess the effects of human-induced factors. The development and refinement of these methods are crucial for improving the accuracy and efficiency of wildlife monitoring. Additionally, improvements in data analysis techniques, including machine learning algorithms and advanced statistical models, allow for better interpretation of the data collected.

In this session we aim to share the latest advancements in monitoring technologies, discuss their applications in conservation efforts, and explore how these innovations can be integrated into broader conservation strategies with a primary focus on tropical forests.

Keywords: Anthropocene, conservation, non-invasive monitoring, tropical forests, wildlife

Session 10

Title: **Plant Invasions in the Tropics: Bridging the gap between science and practice**
Conveners: Emily Strange
Affiliations: Leiden University, Netherlands

Abstract: Invasive alien plants (IAPs) pose a major threat to the structure and function of many tropical ecosystems, diminishing biodiversity, ecological resilience and the well-being of people. As the field of invasion ecology grows we realize the importance of approaching IAP challenges with an interdisciplinary lens as well as working with non-scientific partners to translate key findings into practical solutions and strategies that benefit both people and nature. The goal of this session is to bring together different scientists working on plant invasions across the tropics, share recent findings and hopefully inspire new ways to bridge the gap between the latest ecological research and future management of invaded systems.

Keywords: conservation, invasive species, restoration

TOPIC 4: Patterns and processes

Session 11

Title: **Microbial ecology in the tropics**
Conveners: Laszlo Nagy
Affiliations: University of Campinas, Brazil

Abstract: The microbial world is more diverse and less known than the macro-world, and this is particularly the case in tropical regions (terrestrial and aquatic). The relative lack of information from tropical regions on microbial communities means that there is a fundamental gap in our understanding of how tropical ecosystems function and will likely respond to climatic change. This session seeks to bring together research on microbial communities from the perspective of their diversity, stability and resilience in the face of climatic and environmental change. As well as the interaction of microbial communities with other parts of ecosystems, for example, the relationship between soil microbial communities and the plants that live on those soils, or the gut microbes of a particular bat species.

Keywords: bioinformatics, evolutionary biology, game theory, metagenomics, microbial physiology, molecular systems biology

Session 12

Title: **Mutualisms in the (changing) tropics**
Conveners: Anna S. Görlich[1], Boris A. Tinoco[2], Bryan G. Rojas[2], Ricardo Sánchez-Martín[1]
Affiliations: 1 = Swiss Federal Institute for Forest, Switzerland, 2 = Universidad del Azuay, Ecuador

Abstract: The tropics are renowned for hosting the planet's richest biodiversity. Many major evolutionary transitions, which have enabled the diversification of life itself, hinge on mutualistic interactions. These interactions are essential for sustaining diversity and maintaining key ecosystem functions. However, mutualistic interactions are inherently fragile. They rely on the interplay between partners' traits, temporal and spatial distribution, and context-dependent factors. The tropics now face an unprecedented era of human-induced changes. These alterations are impacting mutualistic interaction networks all across the globe. In megadiverse systems like the tropics, the disruption or emergence of novel interactions will likely have cascading consequences including restructuring communities and accelerating species extinctions. By unraveling the drivers and vulnerabilities of these interactions, we can understand how mutualisms shape the generation and maintenance of diversity. This knowledge will help us develop strategies to predict community stability and restructuring, mitigate species loss, and conserve ecosystem function. This session aims to unite researchers who study mutualistic interactions across multiple disciplines, including community, theoretical and evolutionary ecology, conservation, and restoration.

Keywords: anthropogenic changes, mutualism, network ecology, species extinctions, species interactions

Session 13

Title: **Tropical ecosystem recovery: Reassembly of species diversity, communities, and interactions**
Conveners: Malika Gottstein[1], Eva Tamargo López[2], Edith Villa Galaviz[3], Karen Marie Pedersen[3]
Affiliations: 1 = Albert-Ludwigs-Universität Freiburg, Germany, 2 = Philipps-Universität Marburg, Germany, 3 = Technical University of Darmstadt, Germany

Abstract: Over the last few decades, habitat conversion from natural to anthropogenic ecosystems contributed to the unprecedented degradation of natural tropical ecosystems resulting in the decline and loss of many species, communities, and interactions. However, tropical secondary forests show a high potential for species recovery when the landscape and land-use conditions are appropriate and, therefore, are increasingly important for biodiversity conservation. Understanding the diversity and interactions recovery as well as the species communities' resistance and resilience in such restored ecosystems is crucial for the recovery of tropical forests. Hence, research that uncovers the processes behind community composition, species interactions, and functional traits in the context of ecosystem stability and natural recovery is essential. Species communities and interactions drive processes influencing the variability and stability of ecosystems. These processes are mediated by interspecific interactions: pollination, primary and secondary seed dispersal, seedling recruitment, herbivory, predation, and decomposition, among others. For this session, we invite contributions on the resilience and recovery of species communities, their interactions, as well as the resulting processes in response to anthropogenic disturbances and habitat conversion.

Keywords: diversity, interactions, natural recovery, resilience, species communities

Session 14

Title: **Tropical ecosystem functionality**
Conveners: Katrin Fleischer
Affiliations: VU Amsterdam, Netherlands

Abstract: Many tropical ecosystems have functionality that is important on continental to global scales, including carbon sequestration, hydrological cycling, and food production. Most tropical systems are multifunctional, and the functionality of many systems can be altered by natural disturbances (e.g., earthquakes, tsunamis) or human-induced disturbances (e.g., fire, deforestation, damming). Assessments of ecosystem functionality, the linkages between functional processes, and how functionality changes as a result of disturbances are the focus of this session. We welcome submissions that focus on system science approach and variation in functionality across various spatial and temporal scales.

Keywords: carbon cycle, ecosystem services, food, hydrological cycle, traits, water resources

Session 15

Title: **Tropical molecular ecology**

Conveners: Ute Radespiel[1], Pablo Orozco-terWengel[2]
Affiliations: 1 = University of Veterinary Medicine Hannover, Germany, 2 = Cardiff University, U.K.

Abstract: Tropical environments are under threat for a variety of reasons including human population expansion and encroachment, habitat loss and fragmentation, and climate change. At the same time, tropical biodiversity often remains poorly understood or completely undescribed, so that many species may go extinct before being discovered. Species living in tropical environments are highly challenged, since they are generally adapted to relatively stable environmental conditions with narrow ecological niches resulting in a need to modify life history strategies and/or change distribution ranges in response to environmental changes. Increasing landscape discontinuities in addition to natural barriers to gene flow (e.g., rivers, mountains) constrain movements, population dynamics and consequently the biogeographic plasticity of most species. Modern genetic and genomic techniques are excellent tools to investigate the evolutionary processes responsible for current patterns of biodiversity and the impacts of anthropogenic challenges (e.g., demographic changes, hybridization, extinction, inbreeding). This is of utmost importance for estimating the viability of populations and entire species and implementing effective conservation measures in the future.

We aim to bring together a collection of contributions that address these and related questions in tropical biota from around the world. This session will provide the opportunity to present new data, critically review existing evidence and discuss important avenues for future research in tropical molecular ecology.

Keywords: evolution, genetics, genomics, landscape dynamics

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TOPIC 5: Restoration and conservation

Session 16

Title: **Climate change impacts on tropical ecosystems**
Conveners: Crystal N.H. McMichael
Affiliations: University of Amsterdam

Abstract: Natural and human induced climatic change have played a major role in shaping tropical ecosystems over (multiple) millennia. This climate change has played a major role in determining the complex biodiversity and spatial patterns we observe in tropical regions today. Ongoing and projected future climate change present fundamental challenges for many regions as species are required to adapt to climate system shifts which result in changes such as increasing frequency of extreme event, shifting rainfall patterns and seasonality change. In addition to parameterizing the direction of climate change in the tropics it is also critical that a robust understanding of the speed of change (abrupt or gradual) and the existence of potential system 'tipping points' is critical to developing effective conservation and management strategies. In this session we want to bring together a range of studies exploring the variability of climate and its impacts on tropical ecosystems. We welcome submissions from all spatial and temporal scales in these assessments, and particularly welcome projects on monitoring and modeling climate variability in tropical ecosystems.

Keywords: climate dynamics, drought, precipitation, resilience, seasonality, temperature

Session 17

Title: **Drivers of recovery in restored tropical forests**
Conveners: Ximena Palomeque[1], Selene Báez[2], Gabriela Maldonado[1]
Affiliations: 1 = Universidad de Cuenca, Ecuador, 2 = Escuela Politécnica Nacional del Ecuador, Ecuador

Abstract: In recent years, several initiatives have proposed tropical forest restoration as a means to mitigate climate change, and biodiversity loss resulting from habitat degradation. In highly heterogeneous tropical areas, climate, management, landscape attributes, and species interactions have been shown to influence the success of forest restoration initiatives. Yet, critical knowledge gaps remain for many tropical ecosystems. Improving our understanding of the drivers of tropical forest recovery is urgent to develop management practices and policies that maximize forest recovery. This symposium seeks to bring together a diverse group of researchers exploring different aspects of tropical forest recovery. Contributions are expected fall mainly along five topics: 1) the role of seed dispersal and pollination on forest recovery, 2) recovering species interactions (above- and belowground), 3) spatial or landscape determinants of forest recovery, 4) management practices driving forest recovery, 5) key species for forest restoration. This symposium may be of interest to ecologists working on several aspects of restoration ecology in tropical regions.

Keywords: ecological restoration, forest recovery, habitat degradation, management practices, tropical forest

Session 18

Title: **Ecosystem resilience to altered fire regimes**
Conveners: Imma Oliveras Menor[1,2], Masha van der Sande[3] , S. Yoshi Maezumi[4]

Affiliations: 1 = University of Montpellier, France, 2= University of Oxford, UK, 3 = Wageningen University & Research, Netherlands, 4 = Max Planck Institute of Geoanthropology, Germany

Abstract: Before human colonisation, tropical wet forests were largely fire-free, but fires regimes have shaped the flora, fauna and ecosystem functioning of tropical dry forests and savannas. However, anthropogenic influences profoundly changed the fire regime across all tropical ecosystems, increasing fire in fire-sensitive ecosystems and decreasing fire in fire-prone systems. These changes have exacerbated in the last few decades when increasing temperatures and extreme drought events, coupled with heavy anthropogenic land use change, have profoundly changed the seasonality, frequency, intensity and extent of fire events across tropical ecosystems. It remains yet unknown how these ecosystems can resist and recover from these new fire regimes. Here, we invite presentations of research on the past, present and future fire resilience of tropical ecosystems.

Keywords: altered fire regimes, fire resilience, recovery, survival, tropical ecosystems

Session 19

Title: **Succession and restoration of tropical forests**
Conveners: Tomonari Matsuo, Lourens Poorter
Affiliations: Wageningen University & Research

Abstract: Tropical forests are global hotspots of biodiversity and provide a wealth of ecosystem functions and services to the local, regional, and global communities. However, they suffer from widespread deforestation due to global changes, highlighting the need for a large-scale restoration. In areas with minimal anthropogenic or natural disturbances, tropical forests can be restored through natural regeneration (i.e., passive restoration). In contrast, in highly degraded areas, active restoration techniques (e.g., tree planting or agroforestry) may be needed to restore tropical forests. Here, we invite presentations on secondary succession and restoration of tropical forests across diverse socio-ecological contexts.

Keywords: ecosystem functions, ecosystem services, restoration, secondary succession, socio-ecological context, tropical forests

Session 20

Title: **Tropical forest fragmentation**
Conveners: Crystal N.H. McMichael
Affiliations: University of Amsterdam

Abstract: Deforestation may be the single biggest threat to tropical forest ecosystems. The effects of deforestation include decreased biodiversity, increased numbers of invasive/exotic species, changes in microclimate, changes in carbon uptake and potential carbon storage, increased flammability and

fire occurrences, and alterations to microclimates that may have regional effects. This session will focus on ecological and environmental assessments of deforested (fragmented) landscapes on local to regional to continental scales. We are particularly keen to include fundamental scientific studies alongside studies that examine how policy and policy changes have affected deforestation rates over the last decades.

Keywords: carbon dynamics, deforestation, edge effects, environmental policy, invasive species, micro-climate, urban ecology

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TOPIC 6: Spatial and temporal scales

Session 21

Title: **Tropical island ecology: An integrative approach to bridging the past and present**
Conveners: S. Yoshi Maezumi
Affiliations: Max Planck Institute of Geoanthropology, Germany

Abstract: Tropical islands are biodiversity hotspots that play a crucial role in the global ecological landscape. They are home to unique species and ecosystems, many of which are highly sensitive to environmental changes. However, these islands face increasing threats from climate change, habitat loss, and human activities, making it essential to understand their ecological dynamics from both historical and modern perspectives.

This session aims to unite ecologists and palaeoecologists to explore the complex and dynamic ecological systems of tropical islands worldwide. By integrating contemporary ecological research with palaeoecological data, we can gain a comprehensive understanding of the past, present, and future trajectories of these vital ecosystems. Understanding the long-term ecological history of tropical islands is crucial for predicting future changes and developing effective conservation strategies. The session will encourage collaboration between disciplines, fostering innovative research that bridges the temporal divide and provides deeper insights into biodiversity patterns, species interactions, and the impacts of climate change. We will also explore the role of human activity in shaping island ecologies over time, offering a holistic insights for future conservation efforts. Cross-disciplinary contributions are welcomed to facilitate a comprehensive discussion on the integrative approaches needed for the sustainable management of tropical island ecosystems.

Keywords: biodiversity, conservation, island ecology, palaeoecology, tropical islands

Session 22

Title: **Tropical biogeography and palaeoecology**
Conveners: Renske Onstein[1], William D. Gosling[2]
Affiliations: 1 = Naturalis Biodiversity Centre, Netherlands, 2= University of Amsterdam, Netherlands

Abstract: Understanding spatial and temporal variations in ecosystems across the tropics, both terrestrial and marine, has intrigued scientists and naturalists for centuries. The first key challenge is the observation of variance across space and through time, and the second is to use these data to explain the observed patterns. For example, the identification of biogeographic barriers (such as the Isthmus of Panama or the Dahomey Gap), followed by the assessment of their longevity and impact on the surrounding flora and fauna. Furthermore, many human populations (past and present) have left ecological legacies which have shaped biogeographic patterns and driven change through time. Disentangling natural and human roles in shaping biogeographic patterns and past ecological change necessitates a multi-disciplinary approach. Therefore, in this session we aim to draw together a range of studies which quantify spatial and temporal variation in the tropics. We welcome submissions using both empirical (field and remote sensing) and modelling approaches.

Keywords: climate change, distribution, ecological barriers, evolution, macro-ecology, space, time

TOPIC 7: General ecology

Session 23

Title: **Open session**
Conveners: William D. Gosling
Affiliations: University of Amsterdam

Abstract: If you have an ecological study from a tropical region that you want to showcase at the 8th European Conference of Tropical Ecology, but you do not feel it fits clearly into one of the sessions named above. Please feel free to submit it to this open session.

Keywords: general ecology

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