



8th World Climate Congress

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Scientific Tracks & Abstracts

Day 1

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Natural and artificial microhabitats of an endemic lizard (*Liolaemus lutzae*) threatened by climate change: Debris as useful microhabitats to mitigate hours of restriction in lizard thermal nicheCarlos Frederico Duarte Rocha¹, Catia M Militao¹, Patricia Almeida-Santos¹ and Paulo Nogueira-Costa²¹Rio de Janeiro State University, Brazil²Federal University of Southern and Southeastern Para, Brazil

The world's largest scientific research involving populations of lizards has recently found a worrying pattern of extinctions of lizard species resulting from global temperature increase of planet, showing massive lizard extinctions simultaneously in all continents, by alteration of their thermal niche due severe restriction of number of hours of activity, compromising most physiological characteristics. It is predicted that remaining current climate change trends, about 20% of all species of lizards would be extinguished by 2080. Additional appropriated microhabitats are crucial to mitigate the effects by allowing lizards to keep preferred body temperatures along a larger number of hours of activity. One of the lizard species predicted to go extinct was the endangered sand lizard *Liolaemus lutzae*, endemic of Rio de Janeiro State in Brazil living only along a narrow strip of beach habitat 50-100 m wide along 200 km of coast. We studied use of natural and anthropogenic microhabitats by *L. lutzae* in its habitat (Praia Grande, Rio de Janeiro, Brazil), evaluating how this use was influenced by thermal characteristics of microhabitats. We recorded frequency of different microhabitats used, operative microhabitat temperature (T_e), individuals-body temperature (T_b °C). For operative microhabitat temperature we used HOBO® data loggers. Individuals used seven microhabitat types, being vegetation-covering ground the most frequently natural-microhabitat used. Plastics and wood debris were the most frequently used anthropogenic used as artificial-microhabitats. Models installed among vegetation registered highest averages of T_e (59.9 °C). T_b of individuals between vegetation (33.5±2.2, 28.4-38.2, N=70) remained more constant throughout the day than those of plastic (32.3±2.5, 39-27.8, N=47) or under wood (31.3±3.7, 24-40.2, N=65). Data indicated that *L. lutzae* uses vegetation and debris of anthropic origin deposited in its habitat to maximize its thermoregulation and that the debris constitute useful thermoregulation sites, which can mitigate negative effects of hours of restrictions imposed by climate changes to its thermal niche.

Biography

Carlos Frederico Duarte Rocha has completed his PhD in Science (Ecology) obtained at Universidade Estadual de Campinas, Campinas, Brazil in 1992. He is a Full Professor at Universidade do Estado do Rio de Janeiro in Rio de Janeiro, Brazil. His main interests are in ecology and conservation of amphibians and reptiles. He has published a total of 412 scientific articles in 59 different international scientific journals and in 35 different Brazilian journals and published or organized ten books, mainly on biodiversity and conservation. He was in the coordination of the Graduate Program in Ecology and Evolution of UERJ from 2008 to 2016 and he is Level I-A Researcher (Higher level of Brazilian Scientists attributed by the Brazilian Council of Science and Technology - CNPq) of the Brazilian Environmental Ministry.

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Shoreline change detection and their morphological analysis of the coastal regions of Bangladesh using remote sensing techniquesMd Jashim Uddin¹, Tanzider Iquebal¹, Abu Saleh M Mohiuddin¹ and Mozammel Haque Sarker²¹University of Dhaka, Bangladesh²Space Research and Remote Sensing Organization, Bangladesh

Statement of the Problem: The coastal regions of Bangladesh covers 710 kilometer along with three distinct geographical parts: western, central and eastern. This lies between 21°30' to 22°30' north latitudes and 88°01' to 92°00' east longitudes. It comprises the most active portion of the complex delta of the Ganges-Brahmaputra-Meghna River system in Bangladesh. Many reported that about 2.5 billion tons/year sediments loaded in the Bay of Bengal through the river systems. The impact of climate change may also aggravate the situation in a serious turn. As a result, erosion and accretion games are common phenomenon in the coastal regions. For this reason, a study was initiated to understand the shoreline and morphological change of the coastal regions of Bangladesh.

Method: Landsat imagery was collected for three different time series level viz. 1973, 1989 and 2010. The study involves remote sensing data collection, their pre-processing, data/layer generation, data analysis, finally extraction of coastal morphological datasets and shoreline change detection, etc. ERDAS Imagine 9.1 was used for image processing and analysis.

Findings: The study revealed that during 1973 to 2010, more erosion and accretion took place in the central part while deposition took place in the western part. The western part is less stable whereas the eastern part is more stable due to nearby hilly morphology. Land area is decreasing and water covered area is increasing due to erosion and water logging in the central part than the other areas. Shoreline change rate at central region is more visible than the other regions.

Conclusion: The above study reveals the hydrodynamic nature of the major rivers of Bangladesh and also the future prediction story of shoreline movement. Thus, it is urgent to make a green policy to combat erosion and accretion processes in the coastal regions of Bangladesh.

Biography

Md Jashim Uddin is a Professor of Department of Soil, Water and Environment in the University of Dhaka, Bangladesh. He has completed his PhD from the Kingston University, London, United Kingdom. He has served at Soil Resource Development Institute and Bangladesh Rice Research Institute. He is specialized in soil carbon and land use dynamics and climate change related issues. He bears vast experiences of using GIS and Remote Sensing technology. He published more than 45 research articles in national and international journals.

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Influences of climate changes on hydrologic system in the Lam Takhong River Basin of Thailand

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The effects of Climate Changes (CC) on the hydrologic system in the Lam Takhong Basin located in northeastern Thailand were determined using Soil and Water Assessment Tool (SWAT). The hydrologic SWAT model was set up with land use and soil data of 2002 and observed flow and weather data during 1999-2000. The model was calibrated and validated against observed flow data during 2001-2009 and its CC scenario with input weather data during 2010-2065 was simulated. The results showed that changing climate over the 56-year period appeared to affect both water yields and flows. Water scarcity will tend to take place across the Lam Takhong River Basin in the near future. Longer periods of severe droughts and floods might occasionally occur, particularly downstream. Therefore, it is critical to prepare specific management measures to mitigate climate change-related impacts in the river basin.

Biography

Nuanchan Singkran has completed her PhD from Cornell University, USA in Aquatic Science and minor field in Environmental Systems Engineering. She has worked for Water Quality Management Bureau, Pollution Control Department, Ministry of Natural Resources and Environment, Thailand. She was responsible for aquatic systems modeling works spanning from rivers through coastal zones to the sea during her work at the PCD (2008-September 2012). She is working as a Permanent Lecturer at Faculty of Environment and Resource Studies, Mahidol University, Thailand. Her research interests are in water resources management, material flow analysis in diverse systems in relation to urban development and climate change-related effects.

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Recent sea surface temperature trends and future scenarios for the Red Sea

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The current paper analyzes the recent trends of Red Sea Surface Temperature (SST) using 0.25° daily gridded Optimum Interpolation Sea Surface Temperature (OISST) data from 1982-2016. The results of three different GFDL (Geophysical Fluid Dynamics Laboratory) model simulations are used to project the sea surface temperature (here after called Tos) under the four representative concentration pathway scenarios through 2100. The current research indicates that the average Red Sea surface temperature is 27.88 ± 2.14 °C, with a significant warming trend of 0.029 °C yr⁻¹. The annual SST variability during the spring/autumn seasons is two times higher than during the winter/summer seasons. The Red Sea surface temperature is correlated with 13 different studied parameters, the most dominant of which are mean sea level pressure, air temperature at 2 m above sea level, cross-coast wind stress, sensible heat flux and Indian Summer Monsoon Index. For the Red Sea, the GFDL-CM3 simulation was found to produce the most accurate current SST among the studied simulations and was then used to project future scenarios. Analysis of GFDL-CM3 results showed that Tos in the Red Sea will experience significant warming trends with an uncertainty ranging from 0.6 °C century⁻¹ to 3.2 °C century⁻¹ according to the scenario used and the seasonal variation.

Biography

Mohamed Elsayed Hassan Shaltout has many research activities in the field of sea level projection together with ocean modeling and different environmental issues. He has in depth knowledge of specific oceanic conditions along the Egyptian Mediterranean coast. He has completed his PhD from Alexandria University and he is a Guest Researcher in Earth Science Department, Gothenburg University, Sweden and Earth Science Department, Abdus Salam International Centre for Theoretical Physics (ICTP), Italy. He has studied climate change impacts on Egyptian coastal waters and the Mediterranean Sea and has lectured extensively on this subject. He is experienced in the use and application of remote sensing tools.

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Cultivation of oyster mushroom (*Pleurotus ostreatus* (Jacq.) P. Kumm) using coffee waste and pulp to mitigate caffeine and pulp related pollutionJuan Carlos Calderon Lopez^{1,2} and Kampanad Bhaktikul¹¹Mahidol University, Thailand²Jose Matias Delgado University, El Salvador

This paper aims to assess the technical, economic, and financial viability of cultivation of mushroom from coffee waste and pulp. The raw material characteristics and technical aspects were analyzed. In techno economic analysis, the investment is defined, and the financing of the project were explained. It is believed that production of mushroom from coffee waste and pulp is feasible as well as profitable in San Salvador. Use of coffee waste in the production of mushroom will prevent its dumping in landfills and thus be friendly to environment as well.

Biography

Juan Carlos Calderon Lopez has his expertise working in Agroindustrial, Tourism, Environmental and Food Safety Production projects since 2007 for Jose Matias Delgado University in El Salvador, Central America. He has managed projects of the International Cooperation of the Metropolitan Area of Barcelona since 2014 in the agricultural area of controlled environments, agroindustrial and food technology. Since February 2017 he is working as a Researcher and Foreign Expert for the Faculty of Environment and Resource Studies, Mahidol University, Thailand.

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Ammonium nitrate pretreatment increased salt tolerance of Thai jasmine rice**Bualuang Faiyue¹, Thanchanok Kraipitukkul², Doungsree Saetae² and Poonyaporn Apithanawit²**¹Environmental Research Institute-Chulalongkorn University, Thailand²Mahidol Wittayanusorn School, Thailand

Soil salinity is one of abiotic problems affecting rice (*Oryza sativa* L.) growth and productivity. The objective of this research was to investigate the effect of ammonium nitrate (NH_4NO_3) pretreatment on growth and ion accumulations in Thai jasmine or Khao Dawk Mali 105 (KDML105) rice seedlings under a salt-stress condition. Rice seedlings were pretreated with 0 or 3 mM NH_4NO_3 for 1 week when they were 21 days old. Then, seedlings were salinised with 0 or 50 mM NaCl for 2 weeks. The results showed that rice seedlings pretreated with 3 mM NH_4NO_3 before being exposed to salt stress significantly increased root dry weight and shoot dry weight compared with non- NH_4NO_3 pretreated seedlings. Rice seedlings pretreated with 3 mM NH_4NO_3 also significantly decreased Na^+ and K^+ concentrations in shoots and roots, but Na^+/K^+ ratio was not affected. It can be concluded that NH_4NO_3 pretreatment potentially increased salt tolerance in rice via the reduction of root- and shoot Na^+ concentrations.

Biography

Bualuang Faiyue has completed his PhD from University of Sussex, Brighton, UK. He focuses on screening and improving salt-tolerant abilities in rice. His research is based on the study of an apoplastic pathway or bypass flow of sodium ion as this pathway is important of sodium uptake into the rice plants under salt stress. After graduation, he has worked as a Biology Teacher at Mahidol Wittayanusorn School, Nakhon Pathom, Thailand. Presently he is a Researcher at Environmental Research Institute, Chulalongkorn University, Bangkok, Thailand.

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Short-term PM10 and emergency department admissions for selective cardiovascular and respiratory diseases in Beijing, China**Wei Feng**

Capital Medical University, China

This study aimed to examine the overall effects of PM10 on EDAs for cardiovascular and respiratory diseases, including specifically, Cerebrovascular Events (CVE), Ischemic Heart Disease (IHD), arrhythmia, Heart Failure (HF), Upper Respiratory Tract Infection (URTI), Lower Respiratory Tract Infection (LRTI), Chronic Obstructive Pulmonary Disease (COPD) and asthma. We collected daily data for EDAs from the 10 largest hospitals in Beijing, between January 2013 and December 2013 as well as daily measurements of PM10 from 17 stations in Beijing. The generalized-additive model was utilized to evaluate the associations between daily PM10 and cardio-pulmonary disease admissions. In all, there were approximately 56,212 cardiovascular and 92,464 respiratory emergency admissions presented in this study. The largest estimate effects in EDAs of total cardiovascular disease, CVE, IHD, total respiratory diseases, URTI, LRTI and COPD were found for PM10 at day 4 (accumulative) moving average, were 0.29% (95% CI: 0.12%, 0.46%), 0.36% (95% CI: 0.11%, 0.61%), 0.68% (95% CI: 0.25%, 1.10%), 0.34% (95% CI: 0.22%, 0.47%), 0.35% (95% CI: 0.18%, 0.51%), 0.34% (95% CI: 0.14%, 0.55%), 2.75% (95% CI: 1.38%, 4.12%) respectively. In two-pollutant models and full-pollutant model modified confounding factors, the positive correlation remained unchanged. The elderly (age ≥ 65 years) and male subjects were more susceptible to specific respiratory diseases. PM10's impact on EDAs for HF was found higher during the hot season however, EDAs for COPD peaked during the cold season. The study markedly informed that PM10 pollution was strongly associated with EDAs for cardio-pulmonary diseases.

Biography

Wei Feng is currently pursuing his MS studies in Epidemiology and Health Statistics at School of Public Health, Capital Medical University, China. His main research direction is the effect of air pollution on cardiovascular and cerebrovascular diseases and the longitudinal study analysis of early risk factors of Alzheimer's disease.

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Short-term effect of ambient sulfur dioxide on cause-specific cardiovascular hospital admission in Beijing, China: A time series study**Endawoke Amsalu and Xiuhua Guo**

Capital Medical University, China

Evidence of the short-term effect of SO₂ on hospital admissions for cause-specific Cardiovascular Diseases (CVD) is still limited. This study aimed to examine the short-term associations between SO₂ and cause-specific CVD hospital admission in Beijing. A total of 460,938 hospitalizations for total CVD were obtained from electronic hospitalization summary reports from 2013 to 2017. A time series analysis was conducted to investigate the association between SO₂ exposure and hospitalizations for total and cause-specific CVD, including Coronary Heart Disease (CHD), Atrial Fibrillation (AF) and Heart Failure (HF). Stratified analysis was also conducted by age group (18-64 years and ≥65 years), sex and season. A generalized additive Quasi-Poisson model was used to examine the associations between SO₂ and cause-specific CVD after controlling for seasonality, day of the week, public holidays and weather conditions. We found an almost linear relationship between the exposure to SO₂ and cause-specific CVD admissions. A 10 µg/m³ increase in the two-day average concentration (lag0-1) of SO₂ was associated with an increase of 1.38% (95% CI: 0.99%; 1.77%) in hospital admission for total CVD, 1.58% (95% CI: 1.16%; 2%) for CHD and 1.69% (95% CI: 0.41%; 2.99%) for AF. Nevertheless, a statistically significant association was not observed for admissions for HF. The observed associations in the single-pollutant models were robust to the inclusion of pollutants in the two-pollutant model, but the estimate was attenuated when adjusting for fine particulate matter (PM_{2.5}). No difference in the association was observed for the effect modifiers of sex, season and age. A statistically significant association between hospitalizations and SO₂ was observed. The observed association between SO₂ and hospitalization might not be independent of fine particulate matter (PM_{2.5}) and further studies should be conducted to demonstrate the independent effect of SO₂.

Biography

Endawoke Amsalu has his expertise in environmental epidemiology focused on air pollution. He is currently pursuing his PhD in the Department of Epidemiology and Health Statistics. He focuses on non-communicable disease and also infectious disease.

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