



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Scientific Tracks & Abstracts (Day 1)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate Change events induced risk assessment and mapping and a potential insurance policy

**Ionut Purica**

AOSR and Universitatea Hyperion Bucharest, Romania

The EU is developing and implementing a coherent climate change risk management policy stressing the need to set up insurance policies related to hazard risks. Based on recorded data series for temperature and precipitations for the last 50 years and damage data from the UNSDR and EU Solidarity Fund the risks of combined events (i.e. floods, drought, snow and freeze) are assessed for each of Romania's counties. The risks are mapped using a tool developed in Excel and the exposure of the population is calculated (risk per capita) for each county. The conclusions are detailing the possibility to use these results to set up a hazard risk insurance policy and a supporting mitigation and adaptation fund.

### Biography

Ionut Purica, presently an Executive Director of the Advisory Center for Energy and Environment, worked as a project officer for energy and climate change in the World Bank, in Romania, as an international researcher for ENEA Rome and as an associate researcher at ICTP Trieste. He has authored books at Imperial College Press, Academic Press, etc. and published articles in journals like Risk Analysis, IEEE Power Engineering Review etc. He took his second PhD in economics, (the first in Energy Engineering) and, is also a Professor teaching a course in Risk management to masters of science in Hyperion University.

puricai@yahoo.com

Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Water or Wine? Irrigation in Viticulture and a return to Dryland Farming

**Linda Johnson-Bell**

The Wine and Climate Change Institute, England

When *vitis vinifera* is grown outside its indigenous regions, irrigation is often used – but is it necessary? 99% of the water used in wine-making in arid regions, is for irrigation. In fact, irrigation is viticulture's number one Adaptation ally, whilst it is Mitigation's number one foe. Climatologists love wine. The grape is the crop most susceptible to changes in climate, and its migration patterns serve as models for future climate scenarios. The Water Footprint Network reports that it takes 29 gallons (131 litres) of water for a glass of wine (comprising blue, green and grey waters). This calculation would have taken into account the type and frequency of irrigation, planting density, type of rootstock, trellising style, soil properties, varietal and a vineyard's temperatures, wind and sun exposure. It is interesting then, that this thirsty \$300 billion international industry and its water crisis has not come into more focus. An agricultural crop like any other, wine grapes rarely feature in discussions of water competition when in fact, there are regions where local water licenses are allocated to wineries rather than to agricultural crops and livestock. With more erratic harvest conditions existing within increasing temperatures (weather vs climate), the majority of the world's viticulturists are under threat from drought. Is a return to dry farming the answer? This presentation examines viticulture's global water footprint; compares the European model of dry farming, and argues that a return to the historic use of dryland and desert farming is a viable option for sustainable viticulture. South Africa's Swartland is examined as a case study.

### Biography

Linda Johnson-Bell has been an expert wine critic, judge and author for 25 years. She has a BA in Political Sciences from Scripps College, California, and diplomas from le SciencesPo, l'Université de Paris IV la Sorbonne, l'Université de Nice and Post-graduate diplomas in Law from Oxford Brookes and the University of Oxford's OXILP. She is CEO and Founder of the newly-formed Wine and Climate Change Institute, an Associate/Viticulture Resilience Expert with the Global Climate Adaptation Partnership, and she is co-producing the TV documentary based on her most recent book, *Wine and Climate Change: Winemaking in a New World*.

author@thewinelady.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Risk adaptation space of water resources to climate change in China's city agglomeration under construction

Minghao Bai<sup>1,2</sup>, Min Zhao<sup>1,2</sup> and Shenbei Zhou<sup>1,3</sup><sup>1</sup>Hohai University, China<sup>2</sup>Jiangsu Province' Water Resources and the Sustainable Development Research Center, China<sup>3</sup>George Mason University, USA

With the advance of urbanization, city agglomerations have emerged on a large scale in China. However, the extension of the scale and the concentration of population and industry result into large input of resources and discharge of pollutants, inserting great pressure to the resource environment of the city agglomeration regions. And the frequent extreme climate brings great uncertainty to the tense environmental carrying capacity. Based on the background, this paper aims to figure out the space of city agglomerations to adapt to water-use risk and the factors influencing its adaptability. Considering that VAR model based on hierarchical Bayesian can not only figure out the homogeneity risk response of large-scale city urbanization, but also judge the impact of heterogeneity factors on risk adaptability, this paper adopts it to analyze, from the temporal space, the fluctuant range of years' rainfall in city agglomeration which can survive the extreme climate and maintain the normal production and living. And the results find that: the space size of water-use risk adaptation in China city agglomeration has high correlation to spatial location. Western city agglomerations can maintain the normal production and living under greater rainfall fluctuation range, followed by middle city urbanizations, and then by eastern ones while the situation in southern city agglomerations is better than that in northern ones. Three factors can explain the results: water resource endowment, river basin location and city agglomeration scale. In the end, this paper has given some suggestions to city agglomerations in China about how to adapt to climate change.

### Biography

Minghao Bai has completed his Bachelor of Science from Hohai University School of Science and Doctoral studies from Business School of Hohai University. During this time, he has participated in many projects, such as Jiangsu province' soft science research project, fundamental research funds for the central universities and the national social science project.

baiminghao0000@163.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The problem of the desert areas: Agro-forestry recovery of the same and influence of this on climate

Gualtiero A N Valeri<sup>1,2</sup><sup>1</sup>Montevenda Engineering International Association, Switzerland<sup>2</sup>University St. Rita of Rome, Italy

Among the causes related to climate change - in part for natural, and partly by human action - an important factor, as already mentioned by the author in the past, is connected to the change of state of soils and to land use in a great part of the planet. As noted above, an important contribution to climate modulation, canceling, at least partly, the natural or anthropogenic factors that determine it would be in the recovery of a green cover - agricultural and forestry - in the soils today have become infertile, at the same time recovering and protecting the original biodiversity. We can estimate to 30% of the dry land the surface now occupied by deserts. A first, successful, experiment, which extends now over large areas in Africa and China, has been done, over the last years, by Prof. Venanzio Vallerani (1924-2012). For desert areas where even the Vallerani system is inapplicable, we want here to propose a modification of it, related to a series of measures to support plants growth, prevent the silting up of the same, and to develop a land use planning that encourage its natural, climatic and socio-economic recovery. We will, therefore, with this intervention hypothesis, pass from a passive phase of observation of climatic changes in place, to an active phase of testing of possible solutions - implemented in large scale - of the phenomenon, especially in relation to the needs of life (social, in terms of health, and economic) of the world population.

### Biography

Gualtiero A N Valeri studied industrial chemistry and chemical engineering in Padua. He is a consultant in the applied sciences, R&D and Professor of Industrial Chemistry at St. Rita University of Rome. He is the Member of Tiberina Pontifical Academy, Vice-president of scientific committee of Mediterranean Parliament and President of Montevenda Engineering International Association. He has received the "J. Benveniste" award for the Biophysic in the year 2011 and Special award for the diffusion of scientific culture from Center "Culturambiente" of Rome and from "Centre for Peace" of Vatican City in the year 2013. He also received "Hippocrates" award for the Medicine in the year 2015.

valeri@montevenda.net

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## A data mining approach to elucidate the relationships between air pollution and respiratory diseases in big cities

**Fabio Teodoro de Souza**

Pontifical Catholic University of Parana, Brazil

The sustainability of large cities is controlled by consumption, disposal, and environmental capacity. The weather patterns have been affected by the quick growing of the cities. These imbalances imply climate changes and negative consequences to the public health. In addition, due to the explosive growth in carbon dioxide emissions from fossil-fuel usage, researchers emphasize the importance in improving the quantitative control of the global carbon cycle as a central element to understand the patterns and projections of climate change. It is also discussed the importance in attributing observed CO<sub>2</sub> variations to human or natural cause. This research focuses on better understanding the relationships between air pollution and respiratory diseases. The methodology consists in applying data mining techniques on hospitalization due to respiratory diseases organized with atmospheric and urban variables. The knowledge acquired from this study - which is still in the early phase of data collection - could be useful for urban management and public health policies. Some qualitative associations between air pollutants in Curitiba and respiratory morbidity of childhood population have been discussed. Curitiba has a metropolitan area with population around 3 million. Some scientists highlighted the necessity of spreading methodological experiences from medium-size cities with relatively stable emissions to the more complex and representative environments of megacities (metropolitan areas with populations greater than 10 million). Moreover, this research should verify if the use of data mining techniques may potentially contribute to explain air pollution associated to the augment of the anthropogenic CO<sub>2</sub> signal in urban environments of megacities.

### Biography

Fabio Teodoro de Souza has completed his PhD from Federal University of Rio de Janeiro (COPPE/UFRJ). He concluded his Post-doctoral studies in 2010 at the Tsinghua University in Beijing (China). He is Professor of the Pontifical Catholic University of Paraná (PUCPR) at the Post-graduate Program in Urban Management since 2011 and member of the International Network Routes towards Sustainability since 2014. He is Coordinator of a research project concerning air pollution and respiratory diseases financed by the National Council for Scientific and Technological Development. He published 4 articles with Impact Factor >1.4 (JCR).

fabio.teodoro@pucpr.br

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Integrating the technical and human dimensions of climate change: Communication, culture, conflict and collaboration

**Gregg B Walker**

Oregon State University, USA

Climate policies, such as those featured in the Paris Agreement, are grounded in the arenas of scientific and technical information. The reports of the Intergovernmental Panel on Climate Change (IPCC) emphasize, understandably, scientific and technical aspects of climate change. The United Nations Framework Convention on Climate Change (UNFCCC) includes a negotiating group, the subsidiary Body for Scientific and Technical Advice (SBSTA) that, as its name states, addresses science and technology. Climate science serves as the primary driver for climate policy; but climate policy becomes meaningful through climate practice. Consequently, climate science and climate practice together provide the essential foundation for efficacious climate policy. And the practices of climate change – the enactment of policies related to all aspects of climate change (e.g., mitigation, adaptation, finance, technology, capacity building) rely on human dimensions. The IPCC and UNFCCC have focused on scientific and technical aspects of climate change, but as climate policy turns to implementation, human dimensions become increasingly important. This paper focuses on four human dimensions “Cs” of climate change factors that are critical to enacting sound climate policy in practice. The four factors communication, culture, conflict and collaboration should be addressed substantially for climate practice to achieve climate policy goals. The paper discussed these four “Cs” and illustrates their importance through an analysis of one mitigation-related area – REDD+ and one adaptation-related area – loss and damage. The essay contends that for climate policies to be effective in practice, the scientific/technical and human dimensions need attention and integration.

### Biography

Gregg B Walker is a faculty member in the communication, environmental sciences, forestry, geosciences and public policy programs at Oregon State University. He teaches courses in conflict management, negotiation, mediation and environmental conflict resolution and science communication. He conducts conflict management training programs, designs and facilitates public participation processes about environmental policy issues and researches community-level collaboration efforts. He works with the National Collaboration Cadre of the US Forest Service and the US Institute for Environmental Conflict Resolution. He leads climate change project teams for Mediators beyond Borders and the International Environmental Communication Association and has attended the last seven COPs.

gwalker@oregonstate.edu

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Physical, (sociological) and societal health and public perceptions in a likely climate change scenario: Wastewater and coastal agriculture

Graciela I Ramirez toro<sup>1</sup> and Harvey Minnigh<sup>2</sup>

<sup>1</sup>Universidad Interamericana de Puerto Rico, Puerto Rico

<sup>2</sup>Gabriella and Paul Rosenbaum Foundation, USA

Oceanic islands are among the first and likeliest venues to feel the effects of climate change and in those venues the effects are most likely to be severe. In a coastal setting we present historical anthropogenic changes to stream flow, water quality, agriculture and vegetative cover and their effects, both actual and as perceived by residents, on human habitation and politico-social stressors. Among the actual effects are increased risks of waterborne and waterwashed diseases. While the specific changes are not reliably due to climate change, the effects are exactly what are likely to occur due to increased rainfall, higher temperatures and sea level rise. These include reduced velocities in streams due to occlusion, changes in watersheds, reduced species diversity and loss of arable land area. We illustrate each of these and suggest how earlier implementation of some of US EPA's planning materials (particularly, Priorities For Managing Freshwater Resources in a Changing Climate) could have reduced stresses in the area and would help prepare areas such as this for the effects of climate change. For example, establishing a planning process focused on local conditions, improved sharing of local water information and strengthened vulnerability assessments would have mitigated physical effects and reduced psycho-social stress. In addition, we show some of the particular sensitivities of islands to environmental dangers from solid waste disposal and landfills.

### Biography

Graciela I Ramirez toro completed her PhD at Drexel University in 1991. She is the Director of CECIA, the Environmental Institute of Inter American University of Puerto Rico. She has authored some 100 environmental studies and served on National, Commonwealth and local administrative and scientific committees including the National Drinking Water Advisory Council, National Environmental Justice Advisory Council and the National Advisory Council for Environmental Policy and Technology.

gramirez@inter.edu

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Economic valuation of the biodiversity-related changes in ecosystem services of the arctic caused by climate change

**Hyo-Sun Kim and Ho Il Yoon**

Korea Polar Research Institute, Korea

According to the recent observation by NOAA (US National Oceanic and Atmospheric Administration), 2015 is the warmest year based on global average temperature since 1880. The air temperatures in the Arctic have been rising at almost twice the global average and the extent and thickness of sea ice in the Arctic have declined. And the warming process in the Arctic is accelerating rapidly. These impacts of drastic change in sea ice caused by climate change in the Arctic threaten the eco-system service and biodiversity in the Arctic. This study intends to estimate the economic value on changes in eco-system services and biodiversity of the Arctic caused by climate change. The result of the valuation indicates that the total benefit from improvement of ecosystem in the Arctic ranges from 318.6 billion won to 715.9 billion won per annum. Replication scenarios can be explored into two broad categories in future studies: scenarios in consideration of conflicts of different stakeholders and scenarios based on wider or narrower definition of biodiversity in the Arctic.

### Biography

Hyo-Sun Kim is a Senior Economist of the Korea Polar Research Institute (KOPRI) for the Arctic Energy Financing and Climate Change Policy. Her career includes working for Korea Gas Corporation from 1996 to 2015 and serving at the UN Development Program from 1998 to 1999. She is also a Director of the Korea Environmental Economics Association and a Coordinator of Korea-China Green Forum. She has been serving in advisory policy positions, such as a chair for Carbon Trading Committee for Ministry of Industry and a member of Sustainable Development Committee under International Gas Union.

hyosun@kopri.re.kr

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Pricing of carbon and funding of low carbon transition under a 20C regime

**Bose K Varghese**  
Infosys Limited, India

When the Paris Agreement comes into force, the world would have committed to limiting global warming to below 20C. The 20C regime calls for a drastic and ambitious reduction, up to 70% of the 2010 emissions by 2050, in global GHG emissions. That can be achieved only through a transformation of the fuel intensive sectors and the economy in general. While the 20C regime inherently puts a price on carbon, how to arrive at a fair price and will pay that price, and how to extract that price are questions yet to be answered. Setting a fair price for carbon will become the responsibility of countries when the global emission reduction target is distributed among them under the Paris Agreement. Carbon pricing will be mainly guided by the investment needs to drive a low carbon transition of the economy. The answer to 'who will pay and how?' will largely depend on the implementation mechanism adopted. Carbon tax, allowance auction, cap-and-trade and international offsets are already established mechanisms. Cap-and-trade and international offsets rely on demand-supply gap in the market. Under a 20C regime, the targets will be steep and all significant emitters would have a share of the target. In such a scenario, it is unlikely that there will be any significant supply of emission reduction under a cap-and-trade scheme or a significant supply of offsets internationally. Carbon tax and allowance auction may offer viable mechanisms to implement a carbon price and generate capital for investing in low carbon transition.

### Biography

Bose K Varghese is the Head of Green Initiatives at Infosys Limited, India. Prior to joining Infosys, he served as a Director of Vie2Sustain Consulting LLP, Bangalore, India, and Head of Climate Change & Sustainability practice at Ernst & Young, Bangalore, India. He holds an MS degree in Environmental Engineering from University of Houston, Texas and a Bachelor of Technology degree in Chemical Engineering from the University of Calicut, Kerala.

bose.varghese@infosys.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Urbanization and its effects on water scarcity in the Islamic Republic of Iran: A retrospective cohort study

**Mehrdad Farrokhi**

University of Social Welfare and Rehabilitation Sciences, Iran

Any reduction in the availability of freshwater resources caused by climate change will be particularly problematic for those who live in areas already suffering water scarcity. The world urban population is expected to increase by 72% by 2050, from 3.6 billion in 2011 to 6.3 billion in 2050. The main objective of this study was evaluating the urbanization rate and its effect on water and wastewater sector in Iran. In the beginning of the 1980s urban population exceeded rural population for the first time. According to the 2006 statistics, the urbanization rate in Iran further increased to 68.46% in the year 2006. The Islamic Republic of Iran today counts more than double the number of inhabitants than 30 years ago. It continues to grow, although not at the same rate as in the past: Since 1995, population growth has been limited to urban areas, whereas rural areas have been characterized by shrinking population numbers since that time. Today, the ratio of urban-rural population is opposite to what it was 50 years ago (2/3 of total population lives in urban area). The number of cities more than doubled since 1986 (from 496 in 1986 to 1016 in 2006) while the number of villages in the same time span first grew and then diminished by about 7% from 68,215 in 1996 to 63,898 in 2006. The strong population growth in the past poses in urban area is a big challenge for the water and wastewater sector now. More inhabitants use more water and generate more wastewater and in addition, infrastructure for collection and transport of wastewater needs to be extended as a consequence of rising household numbers. Water supply for urban population increased from 3544.287 million m<sup>3</sup> in 1998 to 5177 million m<sup>3</sup> in 2006. Compared to population growth of about 12% in the same period, to increase water supply was almost 4 times higher. Beside overall population growth, factors like continuous urbanization, the rising number of cities as well as a shrinking average household size, followed by skyrocketing household numbers, pose an important challenge for water supply and wastewater collection and treatment. In the cities wastewater quantities are bigger not only in total numbers but also per capita than in rural areas. It is so important point that should be considered that many cities and their water catchments in Iran will get less precipitation in future that is dependent to climate change. It is concluded that special attention should be accorded to urbanization. Their high and continuously rising population, together with increased per-capita consumption poses a main threat to water resources. However, the immediate investments into the wastewater sector as a fresh water resource in cities is a necessity.

### Biography

Mehrdad Farrokhi has completed his PhD from Tarbiat Modares University School of Medicine. He was the Dean of Health School of Guilan University and currently an Associate Professor of Health in Disaster Department of University of Social Welfare and Rehabilitation Sciences in Tehran Iran. He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member of repute.

mfarokhikhb@yahoo.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Impacts of climate change on meningitis epidemics in the Western African Sahel: Enhanced threats or part of the solution?

Abdelkrim Ben Mohamed, Aminath Kelani and Eric Adehossi Omar  
Universite Abdou Moumouni, Niger

According to WHO, potentially 400 million people are exposed to bacteria *Neisseria meningitidis* within the meningitis "belt" of West Africa, resulting in 25000 to 250000 victims every year. The meningitis epidemics in this area occur almost exclusively during the local dry season thus suggesting a strong link between climate, environment and meningitis. A number of authors clearly established that under ongoing climate variability, the starting of meningitis epidemics coincide with the occurrence of large dust events within the area, and cease with the arrival of monsoon rains, synonym of the local humid season. However, it is still not clear what could be the underlying physical mechanisms in both cases, and if climatic factors can be used to predict these epidemics. On the other hand, and according to IPCC AR4, the Sahel is one of the four regions in the World where precipitation decreased during the last century, so detection and attribution of climate change in this area might be another way to look for explanation of links between meningitis epidemics and climate and environment in the Sahel, as far as the starting mechanism is concerned. Furthermore, geo-engineering being among the solutions to some aspects of climate change, it might also be part of the solution to modulate future meningitis epidemics in the Sahel. The aim of this paper is to address these issues as well as some feasibility aspects.

### Biography

Abdelkrim Ben Mohamed has completed Doctorat de 3eme Cycle degree in Nuclear Physics and Doctor of Science degree in Atmospheric Science, respectively in 1975 from University Louis Pasteur (Strasbourg, France), and 1988 from University of Niamey (Niger). He was Director of the Institute of Radio-isotopes (Université Abdou Moumouni, Niamey, Niger), Chairman of the Scientific Advisory Committee of the African Center of Meteorological Applications for Development (ACMAD), visiting Scientist at the International Research Institute for Climate and Society (Columbia University N.Y.), and is currently Senior Advisor at the Office of the President of Niger for Water and Environment issues. He published in peer review journals such as *Physical Review C*, *Journal of Applied Meteorology*, *Journal of Climate and Applied Meteorology*, *Climate Change*, *Regional Environmental Change*, among others.

benmoam@yahoo.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Organic matter sequestration and the particulate fraction at three different types of land use in Bukik Pinang-Pinang, under wet tropical area West Sumatra, Indonesia

Yulnafatmawita and A Saidi Hermansah  
Andalas University, Indonesia

Organic matter sequestration in soil profiles of tropical rain forest area was very important to reduce C concentration in the atmosphere and also to improve soil and environmental quality as OM can form and stabilize soil aggregates, increase infiltration reduce runoff, and finally control erosion. Study on SOM sequestration was conducted under three types of land use in Bukik Pinang-Pinang, the upper foot slope of Mt. Gadut in West Sumatra. The area is located on 390-640 m asl and geographically is between 100°29'40" and 100°30'20" E" as well as between 0°54'55" and 0°55'45" S. The objective of this research was to measure soil organic matter sequestration within soil profile at three land use types: forest, bush, and mixed garden under extremely high (up to 6500 mm) annual rainfall. Forest ecosystem was on the top (>640 m asl) and on the middle slope (480-495 m asl), bush was on the middle slope, and mixed garden on the foot slope (390-480 m asl). Based on Wakatsuki et al. (1986) the soil order belonged to Inceptisols with three sub group Typic Dystropept, Lithic Dystropept, dan Lithic Eutropept. Soil was sampled from top to 40 cm depth with 20 cm increment. Organic C content in the soil was determined with wet oxidation method, and the particulate fraction was mechanically separated as suggested by Cambardella and Elliott (1992). The results showed that, within the profile (0-40 cm depth), soil organic matter content decreased by depth. Land use change from forest into mixed garden could recover SOM content on the top 40 cm soil profile after approximately 50 years, and after 20 years under bush land as long as the soil surface was covered by vegetation and not cultivated. About 62-85% of the OM sequestered was in form of particulate organic matter (POM) at the 0-20 cm, and 6 - 57% at the 20-40 cm soil depth. Based on sequential topography, amount of SOM stock within soil profile (0-40 cm depth) tended to increase by decreasing altitude. Total SOM increased by 62%, 63%, and 74% as the location of the land moves downward from top into middle forest, bush land, and into mixed garden (foot slope).

### Biography

Yulnafatmawita has completed her PhD from the University of Queensland Australia in 2005. During her PhD program, she joined CRC in Greenhouse Gas Accounting of Australia (1999-2005). She measured CO<sub>2</sub> emission from soil after cultivation as her Doctoral research project. Upon graduation, she went back to Indonesia and continues her job as a lecturer at University of Andalas in West Sumatra, Indonesia up to now.

yulna\_fatmawita@yahoo.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Soil carbon stock in sub-optimal land due to climate change on development of *Cymbopogon nardus* L at Simawang village, West Sumatera, Indonesia

**Juniarti Yuni**

Andalas University, Indonesia

Simawang area is one of the critical areas (sub-optimal) that experienced drought from climate changes. Potential dry land belonging to sub-optimal in Simawang, West Sumatera, Indonesia not been fully utilized for agricultural cultivation. Simawang village, West Sumatera, Indonesia is formerly known as the rice barn, due to the climate change area is experiencing a drought, so the rice fields that were once productive now a grazing paddock because of lack of water. This study aims to calculate the soil carbon stock in Simawang village, West Sumatera Indonesia. The study was conducted in Simawang village, Tanah Datar regency, West Sumatera from October 2014 until December 2017. The study was conducted on sub-optimal land to be planted with *Cymbopogon nardus* L. (Sereh wangi in Indonesian language). Composite soil sampling conducted at a depth of 0-20 cm, 20-40 cm. Based on the depth of soil carbon stocks gained higher ground 6473 T/Ha at a depth of 0-20 cm at a depth of 20-40 cm. Efforts to increase soil carbon is expected to be cultivated through *Cymbopogon nardus* L. planting has been done.

### Biography

Juniarti Yuni has completed her PhD from Prefectural University of Hiroshima, Japan. She is the lecturer of Soil Science Dept., Faculty of Agriculture, Andalas University, Indonesia, a Soil Science, Survey and Land Evaluation, as one of Climate Change Indonesian Association. She has published more than 4 papers in reputed journals.

yuni\_soil@yahoo.co.id

### Notes:



**conference**series.com



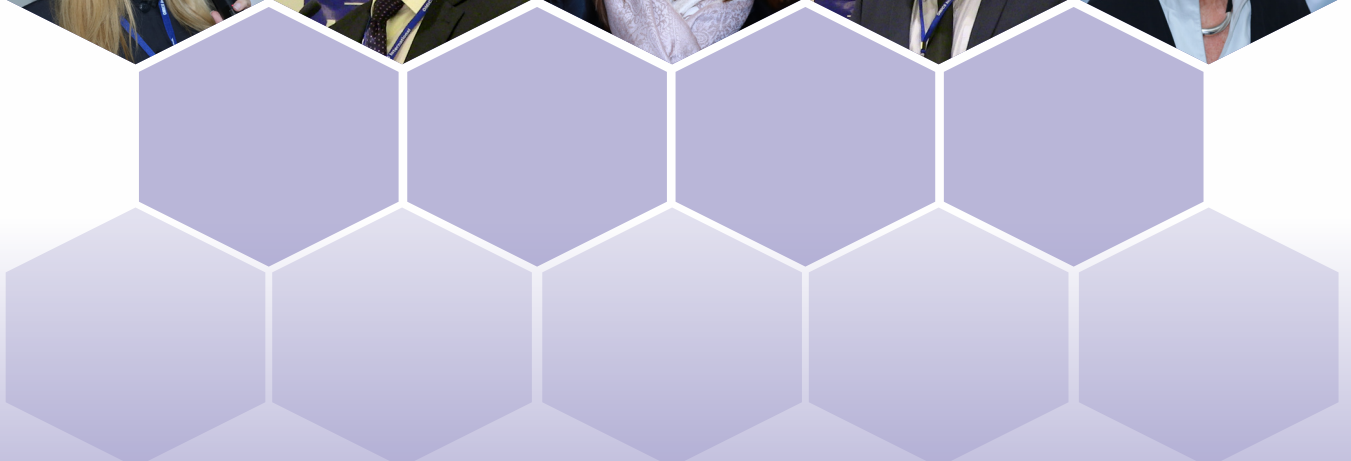
**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Young Researchers Forum (Day 1)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate change impact assessment on artificial wetlands

**Carla Idely Palencia-Aguilar**  
Lund University, Sweden

Remote sensing has been widely used for determining climate changes characteristics, also in wetland studies. Aster images from 2002 and 2008 demonstrated that the water surface in a wetland located at Guasca Municipality in Colombia increased from 3934m<sup>2</sup> to 126403m<sup>2</sup> respectively at 15m resolution. Modis images 13A3 allowed calculation of Normalized Difference Vegetation Index (NDVI) on a monthly basis from June to November 2008 with a resolution of 1 km. The results showed how variables such as Net Radiation, Temperature and Rain explained 83 percent of the NDVI monthly changes (data obtained from the meteorological stations HOBO and Campbell placed close to the wetland). In addition, Potential Evapotranspiration was calculated with formulas and compared with the ILWIS software with similar results with averages of 7.7 mm/day. Groundwater level fluctuations on a daily basis were studied as well as data from a Piezometer placed next to the wetland during the same time period. Data was fitted with Rain changes with multiple regression analysis and time series, with R<sup>2</sup> of 0.98. Groundwater temperature and conductivity changes were also analyzed; no significant changes over the studied time were noticed. However, conductivity changes were influenced by NDVI, Rain and Evapotranspiration with polynomial fittings greater than 90%. November was characterized by increasing NDVI, meaning that more agriculture took place. Agricultural runoff could increase conductivity due to additional phosphate and nitrate ions. Surface water quality analysis was performed to determine the possible contaminants. The results show that Coliforms were the most significant contaminants.

### Biography

Carla Idely Palencia-Aguilar is a Manufacturing Engineer. She has completed 4 Masters, 4 Specializations and multiple short courses in various engineering and management fields worldwide. She is a PhD candidate at Lund University in Sweden under the supervision of Dr Magnus Persson. She has participated as speaker in various conferences around the world for many years. She has published various papers in topics such as agriculture, remote sensing, modeling and land use optimization, among others. She has been a consultant for various companies in Colombia and at international level. She has been also widely involved in social work and sustainable development.

carlapalencia@hotmail.com

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate change as a challenge to the indigenous food security

**Pooja Pant**

City University of Hong Kong, Hong Kong

The challenges of the climate change are multifaceted and play an important role in exacerbating the existing problems. One of such problems is food security. Achieving food security for ever increasing population growth is one of the top most priorities of the states and researchers all over the world. Crop failure, drying of water bodies, reduced availability of wild food, and loss of livestock due to diseases and other climate related hazards are likely to be more severe with rising anomaly in the world climate. Thus with changing climate, the challenges for achieving world food security is also becoming bigger. It is more precarious to the people who are already poor and are struggling with existing food security problem. Hence, in order to tackle the problem of food security and cope with the adversities, in depth understanding of impacts of climate change on food security is indispensable. This is a significant way to identify best adaptation strategies for communities to achieve food security in the present climate change scenario. This paper analyses how food security of the households in a rural community in Far West Nepal is affected by climate change. It particularly focuses on the food security challenges posed by climate change in food habit of different indigenous communities in a rural society. This paper will explore how indigenous communities try to cope with the adversities posed by climate change. The data were collected using Participatory Rural Appraisal method and household surveys.

### Biography

Pooja Pant has completed her PhD in July 2015 from City University of Hong Kong. Her PhD thesis is focused on understanding the interrelation and inter-linkage of households' livelihood system, food security system and climate change in rural area in Far Western Nepal. She is currently involved in local NGOs in Nepal and other research works.

ppant2-c@my.cityu.edu.hk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## AR5-based climate change impact analysis on water resources in Asia monsoon region

Jeong-Bae Kim, Moon-Hwan Lee and Deg-Hyo Bae  
Sejong University, Korea

Asia has a large variation in water resources and causes frequent occurrence of natural disasters such as flood and drought. Of course, there are various reasons for these disasters, but the current climate change increases the variability of temporal and spatial patterns for the disasters and causes the difficulties in water resources management over the region. The aim of this study is to analyze climate change impact on water resources in the Asia monsoon region based on AR5 scenario. The future changes in temperature, precipitation and runoff according to climate change are evaluated and the corresponding variability characteristics are analyzed in the study region. GCMs are used for simulating future climate change scenarios and bilinear method is applied to interpolate the scenarios at 0.5 degree horizontal grid scale. Delta method is used for bias correction. To assess the performance of GCMs output that reflect well the Asian monsoon region, Taylor diagram approach is adopted in this study. The observed precipitation and temperature data were obtained from APHRODITE, which is used for input of hydrologic VIC model. As results, annual average temperature was increased in general, while the precipitation and runoff were different patterns in specific sites. In the past periods, annual average temperature, precipitation and runoff were about 10.5 °C, 672mm and 355mm, respectively. Future projections based on climate change scenario represent gradual rise in temperature in all regions, but demonstrate higher increase in temperature change with increasing latitudes. The spatial and temporal changes in precipitation and runoff are provided in this study. The flood and drought prone areas in Asia monsoon region due to climate change are analyzed and compared with the results from AR4.

### Biography

Jeong-Bae Kim has completed his M.S degree at the age of 25 years from Sejong University, Seoul, Korea. She is doctoral course student in Department of Civil and Environmental Engineering, Sejong University. She has published 1 paper in academic journal in South Korea and delivered several oral presentations in academic symposium.

morningdewjb@naver.com

### Notes:



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Scientific Tracks & Abstracts (Break Out Day 1)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Regional features and the late 1990s change in the Northern Hemisphere sea ice trends

**Renguang Wu**

Chinese Academy of Sciences, China

Present study investigated changes in the late 1990s in the Northern Hemisphere sea ice trend and impacts of several factors. While the sea ice extent for the whole Northern Hemisphere in March displays a steady downward trend during 1979-2014, pronounced regional differences are identified in the sea ice trend and its change in the late 1990s, including an enhanced downward trend in the Barents Sea, an increase in the upward trend in the Bering Sea, and a weakening of the upward trend in the Gulf of St. Lawrence. The trends and their changes in sea ice in both March and September are consistent with those in concurrent and/or preceding surface air temperature. Atmospheric wind trends and their changes in March and September contribute to surface air temperature trends and their changes in many regions. In March, the northerly trend over the Bering Sea accounts for the surface air cooling trend and the southerly trend over the Okhotsk Sea and the Kara Sea explains the surface air warming trend. In September, the anticyclonic trend over the eastern Arctic region and the southerly trend over the Barents-Kara Seas after the late 1990s enhance the surface air warming trend in these regions, which is consistent with the accelerated decline of the Arctic sea ice in September after the late 1990s. A reduction in multi-year sea ice induced by warming in previous seasons and a positive ice-albedo feedback in summer contribute to the accelerated Arctic sea ice decrease in September after the late 1990s.

### Biography

Renguang Wu obtained his PhD in 1999 from University of Hawaii at Manoa, USA. He worked as a Research Scientist at Center for Ocean-Land-Atmosphere Studies, USA. He was a Professor in the Chinese University of Hong Kong, Hong Kong. He has published more than 130 papers in referred journals and had served as an Editor of Journal of Climate.

renguang@mail.iap.ac.cn, renguang@cola.iges.org, renguang@cuhk.edu.hk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The role of climate model data and long-term data archives in climate change research

**M Stockhause and M Lautenschlager**

German Climate Computing Center, Germany

Climate change research is driven by data. Remote sensing and observation data provide evidence of the current situation, whereas model data provide information on the climate's sensitivity against different climate factors as well as on possible future developments (future projections). Data underlying the IPCC reports provide one of the largest and most comprehensive available data collections. These data disseminated by the IPCC Data Distribution Centres (IPCC-DDC) is used within scientific research for many years. Therefore, it is essential that the data is of high quality and well-documented. But equally important is the long-term availability and curation of the data by a reliable data center such as the IPCC-DDC. The IPCC-DDC for the climate model output data is hosted at the World Data Center for Climate (WDCC) at the German Climate Computing Center (DKRZ). The data workflow from the decentral CMIP (Coupled Model Intercomparison Project) data nodes into the central IPCC-DDC long-term archive at WDCC is presented, which includes a thorough quality assurance procedure and the registration of a DataCite DOI enabling data citation. Current and future challenges of the archiving workflow as well as of the data dissemination services for a broad and broadening user community are discussed.

### Biography

M Stockhause studied Meteorology at the University of Hamburg and completed her PhD in 2000. After working as an air quality expert for an engineering consulting firm, she became a Data Manager of scientific data at the Max Planck Institute for Meteorology and the German Climate Computing Center (Deutsches Klimarechenzentrum, DKRZ). She is Co-ordinator of the IPCC-DDC (Data Distribution Centre) at DKRZ and a member of IPCC TGICA (Task Group on Data and Scenario Support for Impacts and Climate Analysis).

stockhause@dkrz.de

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Let the Earth help us to save the Earth

**R D Schuiling**

Utrecht University, The Netherlands

There is much discussion about a possible climate change that is supposedly caused by the fact that we burn huge amounts of fossil fuels, producing large CO<sub>2</sub> emissions. The Earth has always emitted much CO<sub>2</sub>, mainly by volcanoes. It is estimated that volcanoes produce on average 300 million tons of CO<sub>2</sub> annually. That raises the question, is all that CO<sub>2</sub> now in the atmosphere, the oceans and the biosphere? If one multiplies 300 million tons of CO<sub>2</sub> by the age of the Earth (4.5 billion years) the result is an absurdly large number. If all that CO<sub>2</sub> had remained in the atmosphere, the CO<sub>2</sub> pressure would now be something like 100 Bar and the resulting greenhouse effect would cause a surface temperature of the Earth around 500o Centigrade. Any life would be impossible. As there is life on Earth, there must be a way in which nature has captured almost all that CO<sub>2</sub> and stored it somewhere safely. In mathematics this way of reasoning is called an indirect proof. If there are two possible solutions for a problem (case 1: there is no process that has removed the CO<sub>2</sub>, and case 2: there is such a process), but one of the two leads to a wrong answer, then the other solution must be the right one. It sounds strange to say that everybody knows that process, without realizing it. It is the weathering of rocks which captures the excess CO<sub>2</sub>. Weathering is the reaction of minerals with water and CO<sub>2</sub>. First the greenhouse gas CO<sub>2</sub> is converted to bicarbonate in solution (then it is no longer a greenhouse gas). In the next step, these bicarbonate solutions are carried by rivers to the oceans, where corals, shellfish and plankton turn them into carbonate rocks. These are the safe and sustainable storage houses of CO<sub>2</sub>. Lime stones and dolomites contain a million times more CO<sub>2</sub> than the oceans, the atmosphere and the biosphere together. It is a logical choice to use this effective process to help us to counter the ongoing climate change. That can be done by enhancing the weathering, by mining olivine, mill it and spread it over land and shallow seas. There are thousands of times more olivine than we will ever need to stabilize the climate. Olivine is the commonest mineral in the Earth, and on every continent in many countries there are vast deposits of it close to the surface, where they can be mined by opencast mining. As the weathering of olivine has been a process that has worked well over the whole history of the Earth, it is highly unlikely that it would suddenly cause environmental problems when we use it to avert climate change.

### Biography

R D Schuiling has first worked 4 years as exploration geologist with the Geological Survey of Turkey, after obtaining his Master degree in 1957. He has completed his PhD from Utrecht University and a Post-doctoral year at Princeton University. He was appointed as a Professor of Geochemistry at the Utrecht University in 1972 until his retirement in 1997. He has published more than 300 papers in reputed journals.

R.D.Schuiling@uu.nl

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The interdecadal change of wintertime climate over East Asia

**Xiaojing Jia**

ZheJiang University, China

The interdecadal change of the relationship between the winter mean surface air temperature (SAT) over East Asia (EA) and El Niño-Southern Oscillation (ENSO) is investigated using both observational data and a simple general circulation model. A positive phase of the first empirical orthogonal function (EOF) mode of the SAT (SAT-EOF1) over EA is characterized by significant warming over the mid- to high-latitude EA and is linked to the Arctic Oscillation (AO). The second EOF mode (SAT-EOF2) is represented by a significant cooling extending from 55° N to the tropics and an abnormal warming over the high-latitude EA. Focus is given to SAT-EOF2 which has a close relationship to a La Niña type sea surface temperature (SST) anomalies. A clear climate shift of SAT-EOF2 is observed in the mid-1980s. The relationship between SAT-EOF2 and ENSO in two subperiods, i.e., 1957 to 1982 (P1) and 1986 to 2010 (P2), are discussed and compared. Results showed that the relationship between SAT-EOF2 and ENSO is significantly increased after mid-1980s. This is due to stronger SST and precipitation anomalies in the tropical western Pacific associated with ENSO in P2 than in P1. In the mid-latitudes, the Pacific-North American (PNA) teleconnection pattern is more closely related to ENSO in P2, while in P1 the ENSO-related atmospheric circulation anomalies are more similar to a zonally orientated teleconnection pattern. Numerical experiments suggest that the difference in the ENSO-related circulation anomaly in the mid-latitudes is likely related to the difference in climatological mean flow of these two periods.

### Biography

XiaoJing Jia has completed her PhD from McGill University and Post-doctoral studies from McGill University Department of Atmospheric and Oceanic Sciences. She is currently working as Professor at ZheJing University. She has published more than 15 papers in highly reputed journals.

jiaxiaojing@zju.edu.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Satellite technologies for climate change mitigation in forest ecological monitoring

Marika Tatishvili, Maia Meladze and Irina Mkurnalidze  
Georgian Technical University, Georgia

The one of Earth Observing System (EOS) program component is the investigation of influence of Earth vegetation on large-scale global processes. The most applicable product from satellite observation is Normalized Difference Vegetation Index that is used in observation on vegetation. The Normalized Difference Vegetation Index (NDVI) is an index of plant "greenness" or photosynthetic activity, and is one of the most commonly used vegetation indices. Vegetation indices are based on the observation that different surfaces reflect different types of light differently. Photosynthetically active vegetation, in particular, absorbs most of the red light that hits it while reflecting much of the near infrared light. Vegetation that is dead or stressed reflects more red-light and less near infrared light. Vegetation index is important ecosystem variable widely used in variety of bio-geophysical applications. The use of NDVI, GVF and VTI in forest ecological monitoring in Georgia is reviewed in presented article.

### Biography

Marika Tatishvili is Head of Weather Forecasting, Natural and Technogenic Modeling Division of Institute of Hydrometeorology of Georgian Technical University. She is author of more than 76 scientific articles and three monographs. She is member of University scientific board.

marika.tatishvili@yahoo.com

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Quasi-biweekly oscillation of East Asian winter monsoon and its relationship with East Asian winter climate

Yunting Qiao, Mingxiang Zhang and Maoqiu Jian  
Sun Yat-sen University, China

The quasi-biweekly oscillation (QBWO) of East Asian winter monsoon (EAWM) is analyzed and the relationship with East Asian winter climate is discussed in the present study. The meridional wind at 850 hPa shows significant QBWO over East Asian winter monsoon region. Both the first two empirical orthogonal functions (EOF) patterns exhibit two centers in (90°-180°E, 10°-60°N), one in the west and the other in the east. The first two principal components (PCs) have significant lag correlation with each other. The first two EOF modes work together to reveal the evolution of QBWO of EAWM. Based on the EOF analysis, we define an EAWM\_QBWO index and divide each cycle of QBWO into eight phases. The evolution of winds and geopotential height at 850hPa has an obvious eastward propagation. During Phase 1, there are two pairs of cyclonic and anticyclonic circulations over Europe-Pacific region at mid-latitudes. Corresponding with the winds, there are also two pairs of negative and positive centers in the map of geopotential height, showing a Eurasian teleconnection pattern. During Phase 3, East Asia is mainly subjected to southerly wind. While during Phase-7, the distribution is almost opposite with that during Phase-3; indicating the active phase of EAWM. The QBWO of 300-hPa winds, geopotential height, and sea level pressure also have eastward propagation. The QBWO of EAWM has great impact on East Asian winter climate, including temperature and precipitation. During Phase 3 and Phase 4, there are warm anomaly over East Asia and cold anomaly over Siberia. The precipitation over East Asia shows positive anomaly with the center over central China. While during Phase 7 and Phase 8, most part of East Asia is featured by negative temperature and precipitation anomaly.

### Biography

Yunting Qiao has completed her PhD from Sun Yat-sen University, China. She is an Associate Professor of School of Atmospheric Sciences, Sun Yat-sen University; China. She has published more than 30 papers in various journals.

qiaoyt@mail.sysu.edu.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Inter-decadal changes in the East Asian summer monsoon and associations with sea surface temperature anomaly in the South Indian Ocean

**Zhiping Wen**

Sun Yat-sen University, China

Previous studies have revealed inter-decadal changes in the East Asian summer monsoon (EASM) that occurred around the late 1970s and early 1990s, respectively. The present study compares characteristics of these two changes and analyzes plausible influences of the South Indian Ocean (SIO) sea surface temperature (SST) change. The two changes share pronounced common features, characterized by an equivalent barotropic circulation anomaly over northern East Asia and a meridional vertical overturning circulation over the tropical region. Meanwhile, they display some distinct characteristics, especially over the tropics. The circumfluent anomalies are more robust for the first change than for the second one. Related amplitude asymmetry is partly attributed to a weakening trend in the EASM. Moreover, SST change in the SIO, featuring a decadal warming since the 1980s and a cooling after 1993, may contribute to both of these inter-decadal changes. Cold SST anomaly induces anomalous mid-tropospheric descent over the western SIO and ascent extending from the eastern SIO to Western Australia and over the equatorial Indian Ocean. The accompanying upper-tropospheric divergent flows from Western Australia and equatorial Indian Ocean to the Philippines lead to anomalous descent and an anomalous lower-tropospheric anticyclone over the South China Sea (SCS)-Philippines. Warm SST anomaly induces opposite changes in above regions. The possible influence of SST anomaly in the SIO is further confirmed by numerical experiments.

### Biography

Zhiping Wen has completed his PhD from University of Chinese Academy of Sciences, Beijing, China. He is the Director of Center for Monsoon and Environment Research, Sun Yat-sen University, Guangzhou, China. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of repute.

eeswzp@mail.sysu.edu.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## On the relationship between Intertropical Convergence Zone ITCZ variability over Indian Ocean and hurricane Chapala

**Yehia Hafez**

King Abdulaziz University, Saudi Arabia

**Aim:** The present paper investigates the relationship between the Intertropical Convergence Zone ITCZ variability over the Indian Ocean and hurricane Chapala.

**Methods:** The daily data of meteorological parameters and satellite images for hurricane Chapala through the period 28 October-3 November 2015 has been used and analyzed. The daily NCEP/NCAR reanalysis data composites for the meteorological elements over the Indian Ocean is used. The variability of the ITCZ over the Indian Ocean through the period of hurricane Chapala has analyzed.

**Results:** The results revealed that through the period of study (28 October-3 November 2015) the ITCZ is splitting over India. Moreover, there is abnormal northward shift of the ITCZ over the Indian Ocean, mainly on the southwestern part of India.

**Conclusion:** The splitting of the ITCZ over India and the northward shift of ITCZ cloud clusters over the southwest of India causing the development of hurricane Chapala.

### Biography

Yehia Hafez has completed his PhD from Cairo University. He is the Staff Member in Meteorology Department at Cairo University and King Abdulaziz University. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

d\_hafez@hotmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Biological ice-nucleating macromolecules in the atmosphere

**Bernhard G Pummer**

Max Planck Institute for Chemistry, Germany

The freezing of liquid water at temperatures below 273.15 K is thermodynamically favorable, but kinetically impeded. Freezing at temperatures higher than around 235 K only occurs when catalytic impurities that support the proper arrangement of water molecules are present. These so-called ice nucleators can be of various origins, ranging from silicate crystals to soot particles to biological macromolecules. In the atmosphere, these particles massively contribute to cloud glaciation, and therefore influence albedo and precipitation. Some organisms among bacteria, fungi, animals, and plants are capable of producing biological ice-nucleating macromolecules (bioINMs), which are proteins or saccharides. Individual bioINMs are much smaller than other ice nucleators (down to a few nanometers), and can catalyze freezing at far higher temperatures (up to the thermodynamic freezing point). As most bioINMs are easily extracted from their host cell when in contact with water, they can distribute in soil, water, and air independently, respectively attached on other particles. Since it was believed for a long time that only insoluble micro-sized particles have the potential to nucleate ice, these bioINMs have been widely ignored, and have not been adequately taken into account in atmospheric model calculations. This becomes more urgent, since the anthropogenic influence on landscapes, water bodies, and the atmosphere also influence the formation and distribution of bioINMs.

### Biography

Bernhard G Pummer has completed his PhD at Vienna University of Technology in 2013 and is currently a Post-doctoral researcher at the Max Planck Institute for Chemistry. He is the lead author of 3 peer-reviewed journal articles.

b.pummer@mpic.de

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Development of uncertainty reduction method for climate change impact assessment on high dam inflow

Moon-Hwan Lee and Deg-Hyo Bae  
Sejong University, South Korea

Water availability in a region is one of the most important factors to determine the quality of human life and the availability can be changed spatially and temporally due to the impact of climate change. Therefore, the quantitative assessment of change in water availability and appropriate water resources management measures are needed for corresponding adaptation strategies. However, there are high uncertainties in climate change impact assessment on water resources. In this reason, the development of technology to evaluate and reduce the uncertainties quantitatively is required. The objectives of this study are to develop the uncertainty reduction method for climate change impact assessment and to access the uncertainties of future projection for dam inflow in Chungju dam basin in South Korea. The 5 RCMs (HadGEM3-RA, RegCM4, MM5, WRF, and RSM), 5 statistical post-processing methods (SPP) and 2 hydrological models (HYM) were used in this study. As results, the RCMs with relatively lower simulation ability in past historical observation events had the higher uncertainty in future projection results. Therefore, RCMs with lower historical simulation ability and higher uncertainty should be excluded for the evaluation of future projections. Also, the statistical post-processing methods that cause higher uncertainty should be excluded because these methods distort the original climate change information. Through this research, the guidelines for constituting the modules for GCM downscaling and hydrologic model are supplied for the reliable climate change impact assessment and the study results in the application area are provided in this study.

### Biography

Moon-Hwan Lee has completed his Ph.D at the age of 33 years from Sejong University, Seoul, Korea. He is Post-doctoral researcher in Sejong University. He has published 2 SCI papers and various Korean journal papers related to climate change and water resources area.

ycleemh@daum.net

### Notes:



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Young Researchers Forum (Break out Day 1)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Spatial-temporal analysis of climate change and influence of Mediterranean Sea on a viticulture site Valencia D O

**Igor Sirnik**

Université Rennes 2, France

Universidad Politécnica de Valencia, Spain

The spatial-temporal variability of the climatic variables is critically observed on viticulture sites in the interest of quality of wine and climate change on local scale in the future. Various studies were elaborated regarding change of climatic variables on regional scales, although, there are just several researches made on local scale. The study is a part of doctoral project in the frame of LIFE-ADVCLIM, the international project of climate on worldwide climate change on viticulture sites. We conducted the research of last five decades on eight weather stations, located inside and in the surroundings of Valencia DO study site. In the analysis the following daily climate variables were used: mean, minimum and maximum daily temperature, daily precipitation and Winkler and Huglin bioclimatic indexes. By means of Spatial Analysis tools, we analyzed spatial variability, progress of climate change and the effect of the Mediterranean Sea on the research site. Observation on weather stations and analysis of derived data provided significant increase of the air temperature along with the bioclimatic indexes on all weather stations, particularly the stations in hinterland. Meanwhile the precipitation trend decreased, particularly in the winter season. The aim of this research is to combine spatial variability of climate change versus temporal variability of climate change. The progress of climate variables during the last five decades gave us the idea of the climate change and the influence of the Mediterranean Sea during the study period. The outcome of this research urges to adapt the vine according to climate changes.

### Biography

Igor Sirnik completed his university engineer degree studies at University of Ljubljana, Slovenia and his Master studies at the University of applied sciences, Karlsruhe in Germany. Afterwards he was working at the Ministry of Environment in Slovenia collaborating with the University of Ljubljana. He is a Doctoral student, pursuing a joint-degree PhD program at the Universidad Politécnica de Valencia, Spain and Université Rennes 2, France.

igor.sirnik@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Evapotranspiration over Mediterranean coastal grassland- bridging the gap between satellite and experimental data

Trepkli Aikaterini and S Rapsomanikis  
Democritus University of Thrace, Greece

Decreasing precipitation, major increases in temperature extremes and wind intensity across Mediterranean region may lead to periods of abnormally dry weather, long enough to cause hydrological imbalances. Besides precipitation deficit, droughts can be stimulated by increased evapotranspiration (ET). In this study an energy balance algorithm (SEBS; Su, 2002) is assessed to predict ET and atmospheric turbulent fluxes using annual remote sensing data and standard meteorological information over a typical Mediterranean coastal grassland, susceptible to desertification. The model based estimates are compared with the independently tower-based flux observations using the eddy covariance method, cross checked with the variance method. The temporal-scale structure of ET is analyzed and the corresponding drivers are quantified using in situ measurements. Examination of the relationships among temporal patterns of meteorological variations and ET, and identification of significant events affecting the stationarity of the signal due to sea vicinity, are accomplished through wavelet analysis method. ET signals exhibit the strongest power in the band of 16-34 days at spring thaw and during the months where available energy, vapor pressure deficit, air temperature, are all maximized, reflecting the high water requirement for potential evapotranspiration. Temperature fluctuations are frequently highly positive correlated and in coherence with water vapor content but when ET reaches annual maxima values, they develop significant local variations and anti-phase relationship, plausibly attributed to advection. Regarding the non linear drought impacts to the physical environment, precise description of land-atmosphere interactions related to ET will advance our understanding about the water budgets over vulnerable type ecosystems.

### Biography

Trepkli Aikaterini is a PhD Student with scientific topic: "Energy and GHG Fluxes in Urban and Rural Environments". She has two Masters' of Science degrees in Hydraulic and Structural Engineering, and a five-year undergraduate degree in Civil Engineering, with a thesis related to drought indicators at regional scale based on water balance. Projects describing the current work: "Vertical Energy and Momentum Fluxes in the Centre of Athens, Greece During a Heatwave Period", "Energy flux parametrization as an opportunity to get Urban Heat Island insights: The case of Athens, Greece", "Seasonal CO<sub>2</sub>, CH<sub>4</sub> and Evapotranspiration of a Mediterranean Coastal Grassland".

atrepkl@civil.duth.gr

### Notes:





**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Workshop (Day 1)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain



## Christopher R Bryant

*Universities of Montreal, Canada*

### Adaptation and resilience building for human activities to cope with climate change and variability

One of the most important effects of climate change and variability for human society is its impacts upon global food security, through its impacts upon agriculture and agricultural yields. In certain countries and regions, these impacts can be multiplied many times because food production resources, notably farmland, are already vulnerable because of drought conditions. In any investigation of the effects of climate change on human activities such as agriculture and food production, it is also crucial to appreciate the multiple stressors that these activities must contend with. In particular, even when far, land resources, including climate, are good to very good, even after the effects of climate change and variability (CCV) are taken into account, these activities near cities also often have to face continued urbanization pressures. In several developed countries, such as Canada and much of Western Europe, for instance, major cities are surrounded by good to excellent farmland resources in relatively temperate climates. Food security is also an increasingly important concern for some population segments in these cities and there has been a growing emphasis on local and regional sources of food for these cities and these population segments. Maintaining food production potential in these regions (and also to contribute to food security globally) face some major challenges for agriculture which must be transformed, must adapt to CCV and at the same time the farmland resource must be conserved. We therefore tackle, in the context of CCV, Agricultural Transformation, Adaptation and Conservation (ATAC).

### Biography

Christopher R Bryant completed his PhD at the London School of Economics and Political Science. He was Professor in Geography, University of Waterloo, from 1970-1990 and then in Géographie, Université de Montréal, from 1990-2014. He is currently Adjunct Professor at the Universities of Montréal and Guelph. He has published almost 100 articles in peer-reviewed journals, over 30 books and over 150 chapters in books and has made several hundred presentations at conferences.

[Christopher.robin.bryant@gmail.com](mailto:Christopher.robin.bryant@gmail.com)



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Scientific Tracks & Abstracts (Day 2)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate change and global food security in the face of other stressors: The challenges for agricultural transformation, adaptation and conservation

Christopher R Bryant<sup>1,2</sup>, Antonia D Bousbaine<sup>3</sup>, Chérine Akkari<sup>4</sup>, Omarou Daouda<sup>5</sup>, Kénel Delusca<sup>6</sup>, Terence Épule Épule<sup>7</sup>, Mamadou A Sarr<sup>8</sup> and Charles Drouin-Lavigne<sup>9</sup>

<sup>1</sup>University of Montreal, Quebec, Canada

<sup>2</sup>University of Guelph, Ontario, Canada

<sup>3</sup>University of Liege, Belgium

<sup>4</sup>University of Waterloo, Canada

<sup>5</sup>United Nation Development Programme, Canada

<sup>6</sup>European Union Climate Change Project in Haïti, Haïti

<sup>7</sup>Université de Montréal, Canada

<sup>8</sup>Centre de Suivi Écologique, Sénégal

<sup>9</sup>Consultant (Sustainable Development, Environment, Impact Studies), Canada

One of the most important effects of climate change and variability for human society is its impacts upon global food security, through its impacts upon agriculture and agricultural yields. In certain countries and regions, these impacts can be multiplied many times because food production resources, notably farmland, are already vulnerable because of drought conditions. In any investigation of the effects of climate change on human activities such as agriculture and food production, it is also crucial to appreciate the multiple stressors that these activities must contend with. In particular, even when far, land resources, including climate, are good to very good, even after the effects of climate change and variability (CCV) are taken into account, these activities near cities also often have to face continued urbanization pressures. In several developed countries, such as Canada and much of Western Europe, for instance, major cities are surrounded by good to excellent farmland resources in relatively temperate climates. Food security is also an increasingly important concern for some population segments in these cities and there has been a growing emphasis on local and regional sources of food for these cities and these population segments. Maintaining food production potential in these regions (and also to contribute to food security globally) face some major challenges for agriculture which must be transformed, must adapt to CCV and at the same time the farmland resource must be conserved. We therefore tackle, in the context of CCV, Agricultural Transformation, Adaptation and Conservation (ATAC).

### Biography

Christopher R Bryant completed his PhD at the London School of Economics and Political Science. He was Professor in Geography, University of Waterloo, from 1970-1990 and then in Géographie, Université de Montréal, from 1990-2014. He is currently Adjunct Professor at the Universities of Montréal and Guelph. He has published almost 100 articles in peer-reviewed journals, over 30 books and over 150 chapters in books and has made several hundred presentations at conferences.

Christopher.robin.bryant@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Changes in geographical distribution of plant species as a response to climatic change on the West Cornwall Peninsula (South West England)

Aleksandra (Sasha) Kosanic  
University of Konstanz, Germany

Recent climate change has had a major impact on biodiversity and has altered the changes in geographical distribution of vascular plant species. This trend is visible globally; however, more local and regional scale research is needed in order to improve understanding of the patterns of climate change and between taxa in order to develop appropriate conservation strategies that can minimize cultural, health and economic losses at these scales. In order to track species response to the climate or environmental change historical records (e.g. archive weather records, herbarium collections) present exceptional scientific and conservation value because they offer the means of tracking changes in climate and species' geographical distribution over time. Nevertheless, most of such datasets are still locked in museum archives and not available in digitized or geo-referenced form. Therefore, here we present a method to manually geo-reference botanical records from a historical herbarium dataset in order to track changes in the geographical distribution of plant species in West Cornwall (South West England) using both historical (pre-1900) and contemporary (post-1900) distribution records. It will be also assessed whether Ellenberg and environmental indicator values (calibrated for United Kingdom) can be used as markers of responses to climate and environmental change. Using these techniques we detect a loss in 19 plant species, with 6 species losing more than 50% of their previous range. Statistical analysis showed that Ellenberg (L-light, M-moisture and N-nitrogen) and environmental indicator values (Tjan-mean January temperature, Tjul-mean July temperature and RR-mean precipitation) could be used as environmental change indicators. Significant correlations were detected between percentage of area lost and species with lower January temperatures, July temperatures, light, and nitrogen value, as well as higher annual precipitation and moisture values. This study highlights the importance of historical records in examining the changes in plant species' geographical distributions and also presents a method for manual geo-referencing of such records. Furthermore, it also shows how Ellenberg and environmental indicator values can be used as environmental and climate change indicators and as tools towards appropriate conservation strategies.

### Biography

Aleksandra (Sasha) Kosanic finished her PhD at the University of Exeter (United Kingdom). Her PhD research focused on the use of climatic and vegetation historical records in order to investigate climate change at the local/regional scales (West Cornwall) and to analyze its impact on vegetation. She is a physical geographer interested in interdisciplinary studies and in how anthropogenic drivers (i.e. climate and land use change) affect the changes in geographical distribution of vegetation. Her current research is focused on the effects of climate and land-use change on a distribution of non-native invasive plants in Germany. She is also interested in non-native invasive plants impact on the provisioning of ecosystem services and regional identity.

ak352@exeter.ac.uk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Impacts of climate change on the animal farming in Mediterranean region

Nazan Koluman Darcan<sup>1</sup>, Irfan Daskiran<sup>2</sup> and Serap Goncu<sup>1</sup><sup>1</sup>Cukurova University, Turkey<sup>2</sup>Ministry of Food, Agriculture and Livestock, Turkey

Extreme climate change (CC) and atmospheric events have become nowadays a global issue. Livestock production contributes to global warming. It is estimated that livestock responsible to 9% of human-welded CO<sub>2</sub> emission, 35-40% of CH<sub>4</sub> emission, 65% of N<sub>2</sub>O emission and 64% of NH<sub>3</sub> emission. In addition, CC (increase in high temperature and drought) has been found to adversely affect livestock production. Consequently, a lot of effort is made to adjust livestock production systems to forecast on future changes in weather according to climate modeling. From this point of view, it is very important that the correct estimation will be made with regard to questions, such as which feed, or which goat breed will be found as most appropriate for different regions. The economic importance of farm animals' production has been rise-up during last decades in Mediterranean countries. The effect of climatic change (CC) on dairy production are both direct through effects on the animals themselves, and indirect through effects on production of crops and increased exposure to pests and pathogens. These negative impacts occur in face of increasing demands for food, which is related to increase in population on earth. The demand for animal products relate to rapid increase in income in some countries (Haq and Ishaq, 2011) and the perception of dairy products as high quality and gourmet food. On the other hand, there is an increased awareness to the contribution of livestock to the greenhouse effect, and hence to global warming. The animal production systems and concept of climate change which are in mutual interaction with each other has recently become a popular subject on the agenda. In this review, the direct and indirect of climate change on farm animals in Mediterranean region will be determined.

### Biography

Nazan Koluman is currently working as an assistant professor at Cukurova University, Turkey. Her research interests are Climate Change & Climatology, Climate Change effects on the animal farming etc.

nazankoluman@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Green walls used as a low-input technology to cool buildings in the Mediterranean area

**Salvatore La Bella**

University of Palermo, Italy

The building sector – public and private, residential and industrial, plays an important role when seeking to address greenhouse gas emissions. Thermal insulation is a technique which reduces energy consumption due to thermal regulation in buildings, thereby reducing the emission of substances which are damaging to human health and/or to the climate, such as carbon dioxide CO<sub>2</sub>. Amongst those technologies which can lead to improvements in energy efficiency in buildings, green walls are of considerable interest: a technology as yet little widespread, particularly in the south. Green walls could represent an extremely useful technology in the control of thermal dispersion in buildings. However, research in this area is still very much on-going and mostly regards examples of green walls constructed in central and northern Europe, where the main problem faced by energy efficiency schemes in buildings is that of heating. In the Mediterranean area, however, the main problem is cooling buildings and there is very little scientific data and information on the issue to date. In this paper we consider studies carried out in the Mediterranean area on the identification and characterization of species which are particularly adapted for use in the construction of large-surface green walls.

### Biography

Salvatore La Bella has completed his PhD in Agronomy Science from Sassari University and Post-doctoral studies from Palermo University. Since 2008, he teaches phyto-remediation at the Polytechnic school of the University of Palermo. He works at the University of Palermo as researcher. The main topics are: roof garden, phyto-remediation, aromatic and medicinal plants. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

salvatore.labela@unipa.it

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Biochar, compost and biochar-compost: Influences on yield performance, soil quality and greenhouse gas emissions in agricultural soils

Getachew Agegnehu, Paul N Nelson and Michael I Bird  
James Cook University, Australia

Soil nutrient depletion, declining agricultural productivity and climate change due to increased greenhouse gases emissions threaten the ecology and sustainability of agricultural production in the tropics and subtropics. This study investigated the effects of biochar and compost, applied individually or together, on soil fertility, crop yield and greenhouse gas (GHG) fluxes in tropical agricultural Ferral-sols of north Queensland, Australia. The treatments comprised 1) control; 2) 10 t ha<sup>-1</sup> biochar; 3) 25 t compost ha<sup>-1</sup>; 4) 2.5 t biochar ha<sup>-1</sup> + 25 t compost ha<sup>-1</sup> mixed on site; and 5) 25 t ha<sup>-1</sup> biochar and compost composted together (COMBI). Application of biochar, compost and their mixture increased peanut yield by 17-24% and maize yield by 10-29% compared to fertilizer alone. Significant organic amendment-induced improvements to plant growth and soil available nutrients were observed. Biochar, compost and their mixture significantly improved the availability of plant nutrients, which appeared critical in improving crop performance. Soil organic carbon (SOC), soil water content, nitrate and ammonium contents were significantly higher in biochar treated plots than fertilizer alone, implying that potential exposure of nitrate and ammonium to the soil microbial community was significantly lower in biochar and COMBI plots compared to the fertilizer only and compost treatments. Emissions of CO<sub>2</sub> were highest in the fertilizer treatment and lowest in the COMBI treatment, whereas N<sub>2</sub>O flux was highest in the fertilizer treatment and all amended plots reduced N<sub>2</sub>O flux compared to the control. In summary, applications of biochar and compost either singly or in combination have strong potential to improve SOC, soil nutrient status, soil moisture content crop yield and reduce GHG fluxes on tropical agricultural soils. However, the amount of conventional fertilizer that could be reduced and the resultant economic benefit because of addition of these amendments need further study for longer-term economic and environmental sustainability.

### Biography

Getachew Agegnehu is currently working at James Cook University, Australia. Getachew Agegnehu research interests are Ecosystems and climate change, Air Quality, Atmospheric Science and Climate Science etc.

getachew.jenberu@my.jcu.edu.au

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Potential changes in plant species place distribution induced by climatic pattern changes

**Marian Mierla and Mihai Doroffei**

Danube Delta-National Institute for Research and Development, Romania

The work is presenting results of a GIS analyses to derivate habitat requirements of specific species that were taken into account and to predict changes in their distribution as a function of temperature and precipitation dynamics. The studied area is the Eastern side of Romania that includes Dobrogea and Moldova regions in order to have an extended area on the North-South direction. On this extended area the values of the chosen climatic variables may be different from North to South. The data used in this paper consists in gridded data for mean temperature (MeanT), maximum temperature (MaxT) and minimum temperature (MinT) and also annual precipitation amount. The grid is constructed at 0.1 degree regular latitude-longitude for the period 1961-2013 used in the analyses. The results show distribution graphs of specific plant species depending by their characteristics for each cell of the grid in the maps of characteristics temperatures and precipitation for each cell in studied area and average temperatures preferred by selected plant species. Combining data on "evolution" of the average (mean, maximum and minimum) temperatures and also with data regarding the average temperature preference of each species taken into account from the same studied area it may suggest that ascending trend of temperatures amplitude may exceed species tolerance. Thus the positive (increasing) trend will be in that way that can result in a threat on some species in the future. In a normal and gradually change (in natural conditions) of the climatic parameters the adapted species will disappear from a place and appear to another. This will be seen as a movement of their habitats. This could be a way of changes in a climatic changing world.

### Biography

Marian Mierla has completed his PhD from "Alexandru Ioan Cuza" University. He works as scientific researcher within the Informational System and Geomatics Department. He has published more than 28 papers in reputed journals. His research work is related with the geographical information system analysis of environmental issues and elements in order to obtain more unrevealed information. He has 14 years of experience working with geospatial data. He has been actively involved in a number of large European research projects sponsored by the European Commission Directorate-General for Research and Innovation.

marian.mierla@ddni.ro

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Possible changes of the brown trout habitat suitability in the upper Po basin due to global change

**Annalina Lombardi**

University of L'Aquila, Italy

Climatic simulation models predict an increase in temperature and extreme events occurrence. These changes are expected to lead a sensible modification of the hydrological cycle with significant impacts on the ecological integrity of aquatic ecosystems. Changes in temperature regime and in-stream habitat/microhabitat characteristics will also affect the natural distribution of many aquatic species. Within this context it appears strategic to predict the effects of global change on freshwater biodiversity and species distribution in order to propose adequate measures aimed at mitigating the impacts of climate modification on natural systems. To this aim we carried out a simulation based on a chain of deterministic models to predict the distribution of the brown trout in the upper Po River basin (North Italy). A 140-years long simulation, carried out with a Regional climate model, is used to force a hydrological model simulating the hydrological cycle. The results of hydrological simulation, in particular variations in temperature and discharge regimes, are then used to evidence the areas where the target species is expected to occur. The results show how the complex proposed approach is able to reproduce, with a good confidence, the current distribution of the brown trout. The projection for future years indicates a shift of the distribution toward locations of the upper part of the basin, with a sensible decrease of the areas where the brown trout can survive, reproduce and grow. This work also focuses on the potential application of the proposed approach to evaluate the effects of climate changes on more complex ecological systems.

### Biography

Annalina Lombardi has accomplished her PhD in April 2016. She gained scientific and research experience at CETEMPS, University of L'Aquila, Italy, where she obtained several scholarships, aimed at specializing in numerical modeling, especially hydrological modeling. She has taken part in various European projects regarding hydro-meteorological risk prevention and management. During her career at the CETEMPS, she obtained a Post-doc, and has learnt the usage of atmospheric mesoscale models, weather and climate prediction, and the manipulation of a large number of data. At present days, she has collaborated in the publication of two papers on two main journals.

annalina.lombardi@aquila.infn.it

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Causes for variable greening responses to warming detected in alpine grasslands on the Tibetan Plateau

**Tianxiang Luo**

Chinese Academy of Sciences, China

The alpine meadow and steppe on the Tibetan Plateau are the highest pasture in the world, and their formation and distribution are strongly controlled by Indian summer monsoon effects. However, little is known about whether monsoon-related cues may trigger spring phenology of the vast alpine vegetation, and how the cues can influence the greening response to warming. Based on the 7-year phenological observation data at 7 altitudes (4400-5200m) in the central plateau during 2007-2013, we found that leaf unfolding dates of dominant sedge and grass species in alpine meadows synchronized with monsoon rainfall onset, advancing with increasing precipitation regardless of air temperature. Similar results were also found in a 22-year observation data set from two stations in the northeast plateau. In the monsoon-related cues for leaf unfolding, the arrival of monsoon rainfall is crucial, while seasonal air temperatures are already continuously above 0°C. In contrast, the cushion plants in the same community generally leafed out earlier (30-40 days earlier than sedge and grass species) in warmer years regardless of precipitation. We further used meteorological data from 73 weather stations over the plateau and MODIS remote sensing data to calculate both monsoon rainfall onset and vegetation green-up dates during 2001-2013. We found that the onset dates of monsoon rainfall generally controlled the spatiotemporal variations in the satellite-derived green-up dates in alpine grasslands over the plateau consistent with the site observations. Our data provide evidence that leaf unfolding of dominant species in the alpine meadows and steppes senses the arrival of monsoon-season rainfall. Such a phenological pattern suggests a strategy to prevent damage of pre-monsoon drought and frost in alpine plants. These findings also provide a basis for interpreting the fan-shaped distribution pattern of the *Kobresia* meadow and *Stipa* steppe as well as the spatially variable greening responses to warming detected in the world's highest pasture.

### Biography

Tianxiang Luo completed his PhD from Chinese Academy of Sciences. He has been interested in alpine ecosystems and their response to climate change. He has published more than 100 papers in peer review journals and has been serving as Editorial Board Members of *Journal of Arid Environments*, *Chinese Journal of Plant Ecology*, *Acta Ecologica Sinica* etc.

luotx@itpcas.ac.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate Change Adaptation (CCA) measures in industrial areas of Telangana state from India-A pilot study

**Rajani Ganta and Dieter Brulez**

Integration Environment &amp; Energy GmbH, India

The state of Telangana has over 131 Industrial Parks (IPs) areas ranges from 15 to 2500 acres established throughout the state covering various sectors like bulk drugs, pharmaceuticals, agro-processing, cement & mineral-based industries, high precision engineering, textiles, leather, iron & steel, gems & jewelers, biotechnology, defense, etc. As effects of climate change (CC) are already being felt on plants, animals and sectors worldwide, there is an urgent need to build up preparedness for addressing CCA measures in IPs of state which are having different kind of climate variability and are facing a wide range of challenges based on its exposure to climate hazard, vulnerability and adaptive capacity. To implement the CCA measures in one selected IP as a pilot work, consolidated information on climate exposure of all the existing IPs are essential including secondary data like temperature, rainfall, heat wave, drought etc., Initially screening was done and excluded IPs with minor relevance and shortlisted remaining IPs by following step by step screening criteria and certain minimum capacity and capability to adapt to climate change are considered as relevant and suitable. The screening results found that the severity of climate impact experienced by various IPs are different and some of the general problems faced by IPs are water scarcity and excessive temperature along with some localized water logging issues. The knowledge on climate change and its potential impacts are limited and varying with different people. This indicates a need for extensive capacity building on climate change so that adaption measures can effectively be implemented by IPs.

### Biography

Rajani Ganta has completed her PhD from Jawaharlal Nehru Technological University Hyderabad (JNTUH), Telangana. She worked as senior Environmental Engineer at Andhra Pradesh industry department for execution of petro corridor project and also worked with World Bank at disaster management project for implementation of cyclone risk mitigation measures at costal Andhra. Currently she is working as Technical Advisor for the CCA project for Industrial Areas Telangana is assisted by the German Government and is being carried out by INTEGRATION Environment and Energy GmbH. She has published more than 10 papers in reputed journals.

ganta\_rajani@yahoo.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The inevitability of a role for geo-engineering in the post-Paris climate change landscape

**Clare James**

University College London, UK

After Paris, it is clear that despite the political progress, there remains a gulf between policy and policy goals as current mitigation pledges are calculated to fail to restrain warming to 2°C above pre-industrial temperatures. The next 70-100 years will be a transition period during which the world aims to decarbonize (the ‘Transition’) and without radical policy changes, there is an increasing sense of inevitability to the deployment of large scale geo-engineering. Solar Radiation Management (SRM) is the cheapest and most likely geo-engineering technique to be deployed during the Transition. However, SRM engenders many risks and uncertainties including the possibility of *sui generis* climatic effects, psychological and technical lock-in and spatially and temporally heterogeneous distribution of benefits (such as uneven regional climate impacts) and harms (economic costs of the deployment, unintended side-effects and so on). Shue warned that climate change may involve “compound injustice” in reference to past inequalities in international relations when some vulnerable nations had a weakened ability to achieve fair treatment in climate negotiations “in an international system characterized by historical injustices.” SRM could exacerbate such injustices, deepen the existing differential moral burden and thus prompt a renewed and necessary interest in the significance of intra-generational and intergenerational equity in the climate change regime. In any event, SRM presents an interesting challenge for international law-making.

### Biography

Clare James is a current Doctoral student at UCL and her research is centered on the relationship between the international regime for climate change, geo-engineering and intergenerational equity. She has an LLM in International Environmental Law. She is a qualified solicitor and has worked in finance in Paris and London with an international law firm and in-house in a dual role as General Counsel and Main Board Director.

uctlcej@ucl.ac.uk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Individual and societal-level consequences of global warming media use and energy saving and carbon reduction coverage

**Huiping Huang**

National Chiao Tung University, Taiwan

The impact of global warming is worldwide. However, the consequences it has caused may differ across countries. In Taiwan, the total and per-capita carbon dioxide emissions are among the 20 worst nations. Mitigation effort is desperately needed. My recent research starts from a national survey aiming to identify factors affecting people's environmental behavior. As people receive information about global warming, energy saving and emission reductions mainly from the media, I first propose a synthetic model to examine the impact of media use on environmental actions. Results show that exposure and attention to global warming media coverage (on TV, newspapers and the Internet) positively affect individuals' willingness to adopt environmental actions, including accommodating, promotional and proactive actions. Environmental beliefs and self-efficacy also function better in predicting people's environmental behavior after considering the effects mediated by media use. The findings reveal the central role of global warming media use in the model. Organizations should actively market their mitigation policies or efforts through various media channels to encourage individuals' environmental actions. After confirming the media's important roles, I analyze 1,156 news articles on energy savings and emission reductions from Taiwan's major newspapers and find that the mainstream media cover the subject mainly from local viewpoints and lack international perspectives. The primary target audience of the news reports is the public. The media have overlooked the responsibilities the government and the industry should take, even though the latter contributes the most to carbon emissions. This may hinder the society from making effective mitigation efforts.

### Biography

Huiping Huang has completed her PhD from University of Wisconsin-Madison. She is Associate Professor of Institute of Communication Studies at National Chiao Tung University. She has published research articles and comments in reputed journals and newspapers and has served as an Associate Editor and Editorial Board Member of reputed journal in Taiwan.

hphuang@nctu.edu.tw

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Developing optimal diffuse pollution management strategies in agricultural water shed under future climate change

Dong Jin Jeon<sup>1</sup>, Seo Jin Ki<sup>1</sup>, Kyung Hwa Cho<sup>2</sup> and Joon Ha Kim<sup>1</sup><sup>1</sup>Gwangju Institute of Science and Technology, Republic of Korea<sup>2</sup>Ulsan National Institute of Science and Technology, Republic of Korea

While best management practices (BMP) are recommended to attain non-point source loads in receiving water bodies, it is still unclear whether their efficiency will be maintained under future climate change. In a present study, Soil and Water Assessment Tool (SWAT), a semi-distributed watershed model, was used to determine the best BMP options achieving the necessary pollution reductions as well as to assess changes in the pollution loads in agricultural water shed between the current and future weather conditions. Three weather scenarios for the decade of 2040 (2040–2049), which were developed from the Representative Concentration Pathways 2.6, 4.5 and 8.5 in the Intergovernmental Panel on Climate Change Report, were projected into the Yeongsan River watershed, Korea. The scenario covering both calibration and validation periods (2000–2009) was used as a reference condition. Specifically, genetic algorithm was applied for obtaining the global solutions for nonlinear problems (i.e., cost vs. efficiency). Results showed that sediment and phosphorus loads were significantly different among various weather scenarios. This implied that the current BMP options which were determined based on the reference scenario needed to be rearranged for the future conditions. While parallel terraces which decreased phosphorus removal efficiency were identified as the worst option under the future weather scenarios, no tillage approach showed the best performance, as compared to that of the current condition, for instance. We expect that the proposed methodology will provide optimal management strategies to achieve the water quality targets in complex watersheds, specifically those with mixed land uses.

### Biography

Dong Jin Jeon has completed his MS degree from Gwangju Institute of Science and Technology (GIST). He is a Doctoral student in School of Earth Sciences and Environmental Engineering at Gwangju Institute of Science and Technology (GIST).

dijeon@gist.ac.kr

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Farmer climate change adaptation in the West African Sudan Savannah: Reality check and feasible approaches

**Daniel Callo-Concha**  
University of Bonn, Germany

Farming is the economic engine of West Africa. Regularly hampered by harsh ecological and institutional conditions, the situation has been worsened by climate change. The West African Science Service on Climate Change and Adapted Land Use (WASCAL) enhances scientific knowledge, available data and local capabilities to confront climate change. To these ends, local farmer adaptation appears key by their supposed livelihoods compatibility. This presentation details the perspective of the West African Sudan Savannah farmer, i.e., drivers of their climate change perception, coping measures they carry out, and the suitability of these measures. Furthermore, building upon this knowledge-baseline, the presentation details the outcomes of specific (disciplinary and interdisciplinary) research, gauging the contribution of these studies to the general resilience and adaptability of households. Finally, the operational means and supporting policy decisions to encourage them are explored. Findings highlight the complex character of adaptation, their lack of correlation to climate hazards and extreme events, and that their selection should underline several key factors. These include their short-term economic benefit, appropriateness regarding the local socio-ecological conditions and ongoing traditional practices; and operationally, the engagement with local agricultural extension institutions.

### Biography

Daniel Callo-Concha is a senior scientist at the Center for Development Research (ZEF), University of Bonn, Germany. He is an agronomist with 15 years of experience in the interface of agriculture/natural resource management in Latin America and Africa. His latest research focuses on farmers' climate change adaptation in West Africa, contribution of traditional agro forestry systems to food and nutrition security, agricultural socioecological system resilience and adaptability and complex systems analysis.

d.callo-concha@uni-bonn.de

### Notes:





**conference**series.com



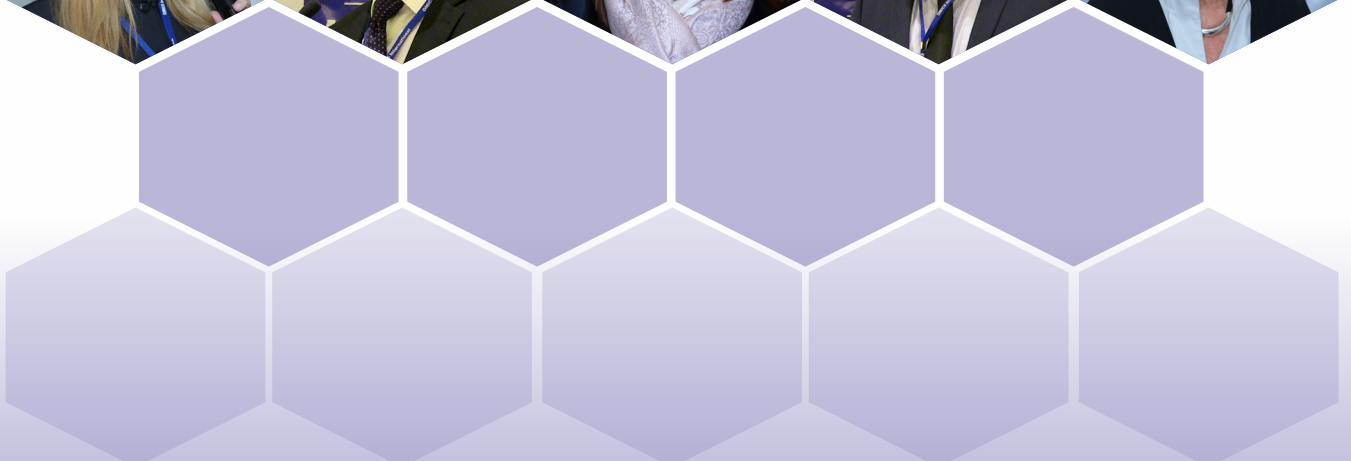
**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Young Researchers Forum (Day 2)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Projection of drought characteristics according to future climate and hydrological changes in the Korean Peninsula

Jae-Min So, Kyung-Hwan Sohn and Deg-Hyo Bae  
Sejong University, Korea

Drought is one of the serious natural disasters along with the flood in the world. The characteristics of drought are widespread and gradually developed when compared to flood event. In South Korea, drought has been known the 2-3 or 5-7 year cycle for the occurrence. However, South Korea has suffered the drought damage almost every year since 2008 due to the impacts of climate change and some others. It is therefore very urgent to find out the reasons for this phenomenon. On the other hand, Korean peninsula has a unique situation that the South and North Korea are divided with Demilitarized Zone (DMZ) and the precipitation trends on these two regions are opposite when analyzed from globally available observation data. The precipitation in South Korea had increasing trend, while decreasing trend in North Korea. It will be useful to figure out the projection of future precipitation change, especially focusing on drought change for better establishment of climate change adaptation. The objectives of this study are to project and analyze the meteorological, agricultural and hydrological drought conditions in the Korean peninsula including South and North Korea. The 3 Regional Climate Models (RCMs) for the future projection of climate change and a global hydrological model for the projections of soil moisture and runoff are used in this study. The changes in Standardized Precipitation Index (SPI), Standardized Soil moisture Index (SSI) and Standardized Runoff Index (SRI), classified as meteorological, agricultural and hydrological droughts, were estimated from simulation results of precipitation, soil moisture and runoff for both South and North Korea. Mann-Kendal test was used to analyze the change of drought trends for future period. Seasonal drought characteristics for future period were also evaluated in this study.

### Biography

Jae-Min So has completed his M.S degree at the age of 27 years from Sejong University, Seoul, Korea. He is a doctoral candidate student in Department of Civil and Environmental Engineering, Sejong University. He has published 2 papers in academic journal in South Korea.

enjoy0517@nate.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## A case study on determining real-time landslide early warning level by sequentially applying ERI and infiltration-slope stability coupled model

**Deuk-hwan Lee, Seung-Rae Lee and Joon-Young Park**

Korea Advanced Institute of Science and Technology, Republic of Korea

With the increasing magnitude and number of extreme precipitation events resulting from global climate change, the scale of rainfall-induced landslides and consequent damages has been remarkably enlarged in Korea since the beginning of 21<sup>st</sup> century. There have been few studies to constitute the landslide early warning framework by sequentially applying an empirical rainfall threshold and a physically-based slope stability model. This research introduces a concept of real-time landslide early warning scheme capable of upgrading up to two higher warning levels by applying two predictive models of different approaches in consecutive order. A specific area of 'normal' state is upgraded to a higher warning level if the predicted or actual rainfall exceeds Extreme Rainfall Index threshold, which has been previously developed to conduct a landslide temporal probabilistic assessment. This empirical semi-rainfall threshold considers soil properties (permeability and storage capacity) as well as the rainfall factors in order to incorporate the effect of spatial variation of the infiltration capacity on the landslide probability. Subsequently, the area can be updated to the highest warning level of the suggested scheme as the factor of safety decreases below 1.3, which is calculated by a coupled model connecting different but sequential processes of slope failure; infiltration and slope stability. The study tested the validity of the landslide early warning scheme for a broad-scale by applying it for several past rainfall events and corresponding landslide historical data which had occurred in Busan, the second largest metropolitan city in Korea.

### Biography

Deuk-hwan Lee is currently working at Korea Advanced Institute of Science and Technology, Republic of Korea. Deuk-hwan Lee research interests are global climate change, Air Quality, Atmospheric Science and Rainfall Index threshold etc.

deukhwan@kaist.ac.kr

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Beyond reinventing adobe as a building material: A new paradigm in anthropocene

**Olukoya Obafemi A P**

Brandenburg Technical University, Germany

The intractable challenge presented by climate change today has now attained a cusp, such that it ravages on the anthroposphere can no longer be ignored or over emphasized. This has stimulated a lot of debate and attracted researchers to the various economic sectors which are primal contributors of greenhouse gases. In that vein, the building industry which is identified to be producing an alarming figure of 23-40percent of the greenhouse gas emission has been a centre for enormous researches in recent times. This is consequently followed by an avalanche of recommendations which in the real sense, are actually running ahead of even its empirical applications today. Moreover, there is no gain saying in the fact that the sector holds one of the most plausible potentials in the struggle against the terror of climate change, if the non-environmental friendly building envelopes are addressed. The plethora of perspectives and recommendations therefore comes with little or no surprise. However, despite this plenitude of professional perspectives, the recommendations stereotypically revolve around the reinvention of traditional building materials as a contributing solution to the mitigation of greenhouse gases in Anthropocene. Sadly, in this era of Anthropocene, this mere position is no longer potent or sufficient enough to address the multi-dimensional vestiges of climate change. In light of this argument, this paper takes a step further beyond the existing blanket assertions by posing and adopting a proposition which addresses the following questions; what is the resisting ability of adobe under acidic rain in Anthropocene? What is the behavior of adobe under extreme soil chlorination as evident today? What is the resisting ability of adobe under seismic conditions rampant today? How does adobe resist the epileptic change in temperature? How much can adobe resist a storm driven rain which is a norm in Anthropocene? Therefore, to organize this paper and answer this question related to the reinvention of adobe in Anthropocene, this paper adopts an analytics approach. Existing argumentations are reviewed, interpreted and a new position is posited. Conclusively, the paper posits that before we continue to peddle cheap perspective of reinventing earthen material in era of climate change, the materials must be adapted to resist and withstand the apparent climate change vestiges which it is reinvented to address.

### Biography

Olukoya Obafemi A P had his Bachelor's (BSc) and Master's (MArch) degree in Architecture from Nigeria and Cyprus respectively. He practiced professional architecture for several years holding various positions in different franchise before establishing its own consulting firm in 2011. He had a short stint as a Teaching Assistant at Cyprus International University and a Research Assistant in TUBITAK (Scientific and Technological Research Council of Turkey) under the auspice of a restoration project of Louroujina village (Northern Cyprus) tagged TUBITAK project 112M147. He has written a few scientific publications as concerns the anomie of climate change and also a book. Currently, he is a Doctoral Researcher at Brandenburg Technical University, Institute of Graduate Research: Heritage Studies.

olukoyaobafemi@yahoo.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Land use exposure analysis in the occurrence of a storm surge event

**Alyosha Ezra C Mallari**

University of the Philippines, Philippines

Considering the effects of climate change on preparing the land use plan of an area can be useful in increasing its adaptation. For instance, determining the classification of land uses in areas susceptible to the harmful impacts of climate change can provide useful planning information to the local government units for long-term purposes. This study aims to analyze the existing land uses of areas exposed to a storm surge hazard in Tacloban City. Tacloban City, which has been devastated by the onslaught of Storm Surge in Typhoon Haiyan, is considered to be susceptible to detrimental impacts of climate change. Datasets of the Storm Surge hazard map in Tacloban City are categorized into low, medium and high. On the other hand, the existing land use map of Tacloban City is processed into GIS software to provide information on the city's land use categories. Using overlay analysis, the extent of land uses exposed in the different hazard levels is classified. The results may provide as inputs for planners and stakeholders in generating programs or projects to alleviate the vulnerable conditions of the area such as risk zoning and other necessary planning interventions.

### Biography

Alyosha Ezra C Mallari is a PhD Student at the School of Urban and Regional Planning, University of the Philippines. He has published as a sole author in an international journal and has been involved in several projects regarding climate disaster risk assessment, geographic information systems and land use planning.

aemallari@yahoo.com

**Notes:**

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Susceptibility assessment of climate change-induced geo-disasters in South Korea

Moonhyun Hong, Sangseom Jeong, Junghwan Kim and Kwangwoo Lee  
Yonsei University, Korea

Climate change adaptation in infrastructure sector has been great attention in recent years, though there is a difficulty in identifying the most suitable and efficient adaptation options. This paper proposes a framework for assessing the costs and benefits of infrastructure adaptation for the geo-disasters such as landslide and debris flow. In the Asia-Pacific region, there is an evidence of prominent increases in the intensity and/or frequency of extreme events under intense rainfall and severe storms, which trigger more geo-disasters on infrastructure. In this paper, a case study was carried out in Umyeonsan (Mt.), South Korea. Three Representative Concentration Pathways climate scenarios are utilized to estimate the cost of future damage and the conditions of the assessed infrastructure. Susceptibility assessment of geo-disasters were conducted by using physically-based models, YS-slope and ABAQUS/CEL. The climate change scenario was scaled down for Korean circumstances, and then, applied to analyze geo-disasters. It is shown that landslide hazard and debris flow damage are highly influenced by climate change scenario. Based on this result, possible cost benefit is estimated, and a conceptual methodology for susceptibility assessment of rainfall-induced geo-disasters is suggested. It is expected to guide decision making in prioritizing the most cost-effective adaptation strategies for infrastructure.

### Biography

Moonhyun Hong is a doctoral course student in Department of Civil and Environmental Engineering, Yonsei University. He has published 2 paper in academic journal in South Korea and delivered several oral presentations in academic symposium.

homh12@naver.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Past and future changes in trees spring phenology in Lithuania under changing climate conditions

Irma Sveikauskaite, Romualdas Juknys, Arvydas Kanapickas, Gintar, Sujetovien  
Vytautas Magnus University, Lithuania

The analysis of long-term data of spring phenology for different deciduous trees species showed that leaf unfolding for all investigated species is the most sensitive to temperatures in March and April illustrating that forcing temperature is the main driver of spring phenology. The most notable -12.7 days over the investigated 58 year period, advancement in leaf unfolding was detected for early season species birch. The least advancement in leaf unfolding - 9.4 days over was detected for maple, 10.3 and 10.4 days advancement for lime and oak respectively. The projection of climatic parameters for Central Lithuania on the basis of three different Global Circulation Models has shown that under the pessimistic climate change scenario - RCP 2.6, the mean temperature tends to increase by 1.28oC and under the pessimistic scenario - RCP 8.5, by 5.03oC until the end of the 21st century. Recently, different statistical models are used to analyze and to project the changes in spring phenology. Our study has shown that when the data of long-term phenological observations are available, multiple regression models are suitable for the projection of the advancement of leaf unfolding under the changing climate. According to the RCP 8.5 scenario, the projected advancement in leaf unfolding for early-season species birch consists of almost 15 days as an average of all three used GSMs. Markedly less response to the projected far future (2071-2100) climate change is foreseen for other investigated climax species; 9 days for lime, 10 days for oak and 11 days for maple.

### Biography

Irma Sveikauskaite is a PhD student of Environmental Sciences since 2013. Her field of interest is "Past and Future Changes in Phenology under Changing Climate Conditions". Currently, she is pursuing her internship at Acadia National Park (Maine, USA) working on some experimental project with Dr. Abraham Miller-Rushing. She investigates chilling importance for the different trees species spring phenology and try to incorporate physiological data to the models.

irma.sveikauskaite@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Hurricanes occurrence in the Gulf of Mexico and Caribbean Sea and its relationship with sunspots

Berenice Rojo-Garibaldi<sup>1</sup>, David Alberto Salas-de-León<sup>1</sup>, Norma Leticia Sánchez-Santillan<sup>2</sup> and María Adela Monreal-Gómez<sup>2</sup>

<sup>1</sup>Universidad Nacional Autónoma de México, Mexico

<sup>2</sup>Universidad Autónoma Metropolitana, Mexico

We present the results of the time series analysis of occurrence of hurricanes and sunspots from 1749 to 2012. Exploratory analysis shows that hurricane numbers is declining in total number by year. This decline in the number of hurricanes is related to an increase in the sunspots activity. Spectral analysis shows a relationship between the hurricanes oscillation periods and the sunspot cycles. Several sunspot cycles were identified from the hurricanes time series spectral analysis the most conspicuous being the 4, 11, 22, 60 and 80 year's cycles; and a 30-year that is related to cosmic rays cycle. The relationship between hurricanes and sunspot is both direct and inverse; the combination of the observed cycles produces seasons in which the number of hurricanes are in phase with sunspots and others which are out of phase.

### Biography

Berenice Rojo-Garibaldi finished her Master's degree in 2015 at the Institute of Marine Sciences and Limnology from National Autonomous University of Mexico, under the minor on Physical Oceanography. Actually she belongs to the PhD program in the same institution working on the paleo-climatic topics, in particular in the non linear analysis on time series. She is also experienced in sport and caves diving with the certificate of 3 star FMAS which is the Mexican federation on underwater. Her professional interests include the ocean-atmosphere interaction and its effects in the climate variability in long and short terms in different time and special scales.

bendscuevas@gmail.com

### Notes:





**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Scientific Tracks & Abstracts (Break Out Day 2)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Relationship of polycyclic aromatic hydrocarbons with algae-derived organic matter in sediment cores from a subtropical region

Yong Ran<sup>1</sup>, Dandan Duan<sup>1,2</sup>, Youda Huang<sup>1,2</sup> and Dainan Zhang<sup>1,2</sup><sup>1</sup>Chinese Academy of Sciences, China<sup>2</sup>University of Chinese Academy of Sciences, China

The influence of algae-derived organic matter (AOM) and climate warming on the historical record of polycyclic aromatic hydrocarbons (PAHs) in the subtropical reservoir sediments was investigated. The profiles of PAH concentrations and AOM contents at the eutrophic and meso-eutrophic reservoirs are significantly elevated, and show good correlations with increasing mean air temperature during the past 60 years, suggesting that increasing temperature plays a significant role in increase of algal productivity and PAH deposition. Temperature-mediated AOM is suggested to enhance the deposition and accumulation of pyrogenic PAHs in the sediment cores, also implying an inaccurate estimation on the historical record for atmospheric deposition of PAHs in eutrophic and meso-eutrophic reservoirs. For an oligotrophic reservoir, PAHs decrease as the sediment depth decreases, and are less significantly related to AOM. As the oligotrophic reservoir is phosphorus-limited and its AOM is significantly oxidized, the effect of increasing temperature on AOM and PAHs is insignificant.

### Biography

Yong Ran is a Principal Investigator or co-investigator for 18 research grants totaling 9 million Yuan (RMB) from the National Natural Science Foundation of China, Chinese Academy of Sciences and State Science and Technology Ministry of China. His recent research (1998-2015) has involved in distribution, source, sorption, bioaccumulation and bioavailability of organic contaminants in terrestrial and aquatic systems. His research was awarded with one national prize and one provincial prize. He has been the author of over 70 referred international and national publications.

yran@gig.ac.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Faster increase in apparent temperature under climate warming

**Yongqin David Chen**

The Chinese University of Hong Kong, China

Apparent temperature, an indicator of temperature human perceives, is mainly determined by air temperature, humidity and wind speed. Global warming indicated by increasing air temperature alters climatic and hydrologic circulations, and hence changes humidity and wind speed, which jointly influence apparent temperature. Here we study the global changes in apparent temperature and compare these changes with air temperature to investigate how human feels about continuous global warming. Results show that under climate warming, apparent temperature increases faster than air temperature. This phenomenon is especially remarkable in the tropics and subtropics and under high emission scenario. During 1981-2000, apparent temperature in the tropics is 0-4°C higher than air temperature, and then increases to 3-6°C higher during 2081-2100 under Representative Concentration Pathway 8.5. The apparent temperature in the tropics is projected to reach >35°C, implying severe health impacts. Continental average of apparent temperature is 1.5°C lower than air temperature in 2000, and turns to 0.25°C higher by the end of 21<sup>st</sup> century. The faster increment in apparent temperature is a combined effect of stronger heat stress and weaker cooling effect caused by increasing air temperature with negligible changes in relative humidity and wind speed.

### Biography

Yongqin David Chen is a Professor for the Department of Geography and Resource Management at The Chinese University of Hong Kong. His research and teaching areas include hydrology and water resources management, meteorology and climatology, environmental assessment and modeling, and regional development. In recent years his research activities have been focused on hydrologic impacts of global climate change and regional land-use alteration, low-flow hydrology in the Pearl River basin, hydrologic changes in the Pearl River Delta, and urban water management in Hong Kong and strategic environmental assessment in China.

ydavidchen@cuhk.edu.hk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Towards climate-resilient cities in Israel: Local planning and building measures

**Tamar Trop**

University of Haifa, Israel

Cities are major contributors to climate change. At the same time, cities, especially at the coastal zone, are heavily vulnerable to this change. In Israel, most of the population is concentrated in coastal areas. In 2001, an Israeli Climate Change Information Center (ICCIC) was setup by the Ministry of Environmental Protection, in the wake of a 2009 government decision on the preparation of a national climate change adaptation program. Since then, a multidisciplinary group of researchers identified the risks and implications of climate change, and highlighted the knowledge gaps. Recently, they have submitted their recommendations on how to address climate change in the urban environment, with regards to various action areas, including local planning and building. The recommended policy in this area includes the following measures: Assessing the specific local risks of climate change and setting priorities for mitigation and adaptation actions; reducing anthropogenic heat sources and air pollutant emissions; advancing public transportation, bike riding and walk ability; developing mixed land uses; incorporating microclimate and human comfort considerations into urban planning to reduce heat island effects; increasing open space ratio and vegetation cover, including green roofs; using building materials which absorb less heat; promoting shaded streets; promoting water-sensitive planning; utilizing the underground space; establishing fire protection zones; adjusting already existing infrastructure and building future infrastructure according to sustainability standards; and promoting green building through institutional, legislative, economic and educational tools. ICCIC team has also identified the knowledge gaps regarding each of these measures, and ranked their research priority.

### Biography

Tamar Trop has obtained PhD in Urban and Regional Planning since 2001. She is the founder and the Head of the MSc program in Management of Sustainable Built Environment at the Department of Natural Resources and Environmental Management at the University of Haifa. Since 2012, she is one to the research team leaders in the Israeli Climate Change Information Center (ICCIC). Currently, she is a member of the scientific advisory committee on Smart and Resilient Cities Indicators to the Israeli Standards Institute.

tammy20@015.net.il

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Historical and RCM future trends in Northern Tuscany (Italy)

Maria Giovanna Tanda, Marco D' Oria, Massimo Ferraresi and Paolo Molini  
University of Parma, Italy

The paper presents some results of a study conducted in northern Tuscany (Italy). The study area is the competence zone of the water company GAIA S P A. It has a surface of about 2900 km<sup>2</sup> with a great variety of landscapes with altitude ranging from 0 to 2000m A. S. L. For this study 18 rain and 14 temperature gauges, with the longest series of historical daily observations and excellent continuity (79-97anni for rainfall data and 62-89 years for medium temperatures) were selected for a detailed investigation. With rare exceptions, a downward trend of annual precipitation is noticed; the downward trend seems to be more evident in the first six months of the year and less clear in the remaining period. The tendency is rather opposite as regards the temperature where, with few singularities, an increase of the values can be noticed in recent years and for many stations the trend is significant. The historical trends were compared with the prediction produced by 13 RCM models, developed within the project EURO-Cordex project. For each pair available the simulation results, as daily rain and temperature data, for two future scenarios (RCP 4.5 and 8.5) of forcing agent's emissions were acquired. As a global result it can be assumed that for all the analyzed rain stations there is a more than acceptable agreement between the trends identified from historical data and predictions of climate models. About the temperature trends the historical outcomes frequently underestimate the RCM model predictions.

### Biography

Maria Giovanna Tanda is a Full Professor of Hydraulic Structures in the Department of Civil Engineering (DICAteA), University of Parma (Italy) from 2004 to present. Previously she had teaching experience as Associate Professor of Hydraulics and Fluid Mechanics in the Politecnico di Milano from 1990 to 2001. Her main research topics are mathematical modeling of groundwater: flow and transport problems, forensic consulting about water and flooding problems, analysis of water distribution system, sewer systems, hydrologic models of rural and urban watersheds, impact of climate change on water resources, flood routing in rivers, mathematical modeling of flood routing in lakes and storage systems.

mariagiovanna.tanda@unipr.it

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The confluence of scholarly prediction and popular experience related to global climate change in the wine producing region of Burgundy, France

Denyse Lemaire<sup>1</sup> and Charles McGlynn<sup>2</sup><sup>1</sup>Salish Kootenai College, USA<sup>2</sup>Rowan University, USA

Burgundy is one of the major wine producing regions of France with more than 31,000 hectares covered in vines. For the past two decades, reports about climate change and the effects it has or may have on viticulture have been published. Because the grape's cycle of budding, veraison, and maturation is precisely regulated by temperature, Burgundy's wine growers have clear evidence of the reality of the warming trend climate change scientists have reported; harvest dates are now significantly earlier than in previous years (13 days in Beaune and 12 days in La Rochepot in the Hautes Cotes). This discussion will examine how the confluence of scholarly prediction and popular experience has had an interesting but unfortunate impact on the risk management strategies of many small-scale growers, whose equation of climate and weather has led to an unwarranted assumption of the predictable regularity of destructive environmental events.

### Biography

Denyse Lemaire completed her PhD in 1992 from the University of Brussels, Belgium. Having retired as a Full Professor in the Environment and Geography Department at Rowan University in New Jersey, she currently teaches online classes for Thomas Edison University. She served two terms as the President of the Wine Specialty Group of the Association of American Geographers. She is a member of the American Geophysical Union, of the Association of American Geographers, and of the American Wine Society.

Lemaire@rowan.edu

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Spatiotemporal variability of climate change in the free state province of South Africa

Geoffrey Mukwada, Desmond Manatsa and Mavis Mbiriri  
University of the Free State, South Africa

This paper uses gridded precipitation and temperature data to determine if climate change has occurred in the Free State Province of South Africa, in order to generate reliable information for development planning in the province. Gridded precipitation and temperature data, as well as data on drought indices for the 1960-2013 period were extracted from Climate Explorer and analyzed using ArcGIS (Version 10.3) and Statistical Package for the Social Sciences (Version 23), as well as shift detection software, first to ascertain if climate change has occurred in the province, and secondly to determine the spatiotemporal characteristics of the changes (if any). Regime Shift Detection Software was used to determine epochs from data extracted from equidistantly spaced grid points within and around the Free State Province, while Hot Spot Analysis was undertaken in an ArcGIS environment to identify climate related spatial patterns. A comparative analysis of the resultant epochs and spatial groupings revealed an average temperature shift of 0.6°C since 2003, while GiZ-Scores from Hot Spots Analysis indicated the existence of five categories of regions within the province, each with its own spatiotemporal characteristics. When Principal Component Analysis was performed on precipitation data for each epoch, the results showed a strong correlation between the climatic conditions in the regions with ENSO. The study therefore concludes that the climate change that has occurred in the province has been induced by exogenous forces. This reality needs to be considered when developing mitigation measures to combat climate change related challenges in the province.

### Biography

Geoffrey Mukwada completed his PhD from University of the Witwatersrand in South Africa in 2006 and completed his Post-doctoral studies at the University of the Western Cape between 2007 and 2009, before taking up a lectureship position at the University of the Free State. He is currently the coordinator of the Afromontane Research Unit's research theme: Living and Doing Business in Afromontane Regions. He has published more than 30 papers in reputed journals and has been serving as a reviewer of several journals.

gmukwada@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Effect of climate warming on neutral carbohydrates in sediment cores of subtropical reservoirs, South China

Yong Ran<sup>1</sup>, Dandan Duan<sup>1,2</sup>, Youda Huang<sup>1,2</sup> and Dainan Zhang<sup>1,2</sup><sup>1</sup>Chinese Academy of Sciences, China<sup>2</sup>University of Chinese Academy of Sciences, China

The relationships of neutral carbohydrates with algal organic matter (AOM) and climate change were investigated in three sediment cores of various trophic reservoirs. Neutral monosaccharides and AOM were determined respectively by high-performance anion-exchange chromatography with pulsed amperometric detection (HPAC-PAD) and by Rock-Eval analysis. Neutral sugar concentrations are strongly correlated with AOM in the mesotrophic reservoir cores, where glucose, mannose and galactose are the most abundant monosaccharides. Monosaccharide compositions and diagnostic parameters indicate a predominant contribution of phytoplankton in the mesotrophic reservoirs. The deposited neutral carbohydrates in sediment cores are largely structural polysaccharides derived from algal detritus, and are resistant to degradation. The increasing mean air temperature during the past 40 years has significant influences on the neutral carbohydrates and algal productivity at both meso-eutrophic reservoirs and oligotrophic reservoirs. The hydrogen index (HI) is observed to be a good indicator for monitoring historical changes of primary productivity in aquatic environments. The above evidence shows that even at low latitude regions, the primary productivity in subtropical reservoirs has been significantly elevated by climate warming.

### Biography

Yong Ran is a Principal Investigator or co-investigator for 18 research grants totaling 9 million Yuan (RMB) from the National Natural Science Foundation of China, Chinese Academy of Sciences and State Science and Technology Ministry of China. His recent research (1998-2015) has involved in distribution, source, sorption, bioaccumulation and bioavailability of organic contaminants in terrestrial and aquatic systems. His research was awarded with one national prize and one provincial prize. He has been the author of over 70 referred international and national publications.

yran@gig.ac.cn

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Uncertainty on the global-warming trend under long-range correlation

Yee Leung and Yu Zhou

The Chinese University of Hong Kong, Hong Kong

Though it is commonly believed that we are on a global-warming trend, uncertainty about the trend still needs to be examined, particularly from the perspective of long-range correlation. In this study, we analyze the effect of long-range correlation in the detection of a significant trend of global warming. We employed the land-surface air temperature anomalies data to obtain the global-mean monthly means, 1880-2015. The estimated trend  $\alpha$  is  $0.71^{\circ}\text{C}/100$  years. If no auto-correlation is considered in the trend analysis, its 95% confidence interval is  $[0.68\ 0.73]$ . Then we examine if there is any auto-correlation in the global-mean monthly temperature anomalies. Detrended fluctuation analysis (DFA) is employed to detect the possible long-range correlation because the external influence like the linear trend can be removed by DFA. The Hurst exponent estimated by DFA is 0.88, other than 0.50, indicative of long-range correlation. Thus, the effect of long-range correlation has to be considered. Our Null hypothesis is that there is no linear trend, i.e.,  $\alpha=0$ . Then we calculate the probability density function of estimated trend  $\alpha$ ,  $p(\alpha)$ , to see if the obtained value of 0.71 falls in the 95% confidence interval or not. If yes, then no significant trend can be detected. Our analysis result shows that though the variance of  $p(\alpha)$  is inflated by 8.5 times by the effect of long-range correlation, the trend of temperature increase is still significant under long-range correlation.

### Biography

Yee Leung is currently Research Professor in the Department of Geography and Resource Management and Director of the Institute of Future Cities (IOFC) at The Chinese University of Hong Kong (CUHK). He has published over 180 papers in reputed journals and serves in several journal editorial boards. Yu Zhou is Research Assistant Professor at IOFC and Stanley Ho Big Data Decision Analytics Research Centre at CUHK. He has published over 20 papers in reputed journals.

yeeleung@cuhk.edu.hk

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Prognosis of climate change effects in Bangladesh

**Golam Newaz**

Wayne State University, USA

Bangladesh is projected to be one of the countries at the frontline of devastating effects due to climate change although its carbon emission level is only 0.3 percent. It will bear the brunt of the excesses that industrialized nations have emitted into the atmosphere. Bangladesh is one of the most densely populated countries in the world with 160 million people. The country is in the Ganges delta with numerous rivers flowing into the Bay of Bengal. Millions of people live in the coastal regions with cyclones, flood and now sea salinity intruding into the river system slowly but surely affecting livelihood directly as crop production and fish population are directly impacted. Rise in sea level is inevitable and the entire country may be at risk. Climate scientists project that by 2050, 18 million people from the coastal region will move inland. In a worst case scenario, an upward estimate of 50 million people can potentially face unprecedented migration to north. It is already estimated that out of the 5 million poor people in slums in the capital city of Dhaka, 1.5 million are recent displaced migrants from the coastal regions of Bangladesh. Migration of people will put tremendous pressure on cities like Dhaka and others. This paper addresses some of the difficult consequences that Bangladesh will face and discusses strategies to counter the ominous conditions that are likely to affect it for a long time.

### Biography

Golam Newaz received his PhD in Engineering from University of Illinois at Urbana-Champaign in 1981. He is a full Professor in the College of Engineering at Wayne State University, Detroit, Michigan and focuses on sustainable materials. He has over 150 engineering publications in journals and similar number in conference publications. He is a fellow of the American Society of Mechanical Engineering (ASME).

gnewaz@eng.wayne.edu

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The impact of climate change in meeting water demands in the Chira-Piura basins, Peru

Chavez-Jimenez Adriadna<sup>1</sup>, Gonzalez-Zeas Dunia<sup>2</sup>, Buguña Nilton<sup>3</sup> and Martínez Angela<sup>4</sup><sup>1</sup>University of Piura, Peru<sup>2</sup>Independent Consultant, Quito, Ecuador<sup>3</sup>Secretaría Técnica del Consejo de Recursos Hídricos de las Cuencas Chira, Peru<sup>4</sup>Canal Isabel II, Spain

The attention of water demands in the Chira-Piura's basins has been affected as a consequence of water scarcity problems and variability of water resources that characterize to this region. The Poechos reservoir located in the central area of the Chira's basin has increased the water supply in order to meet both basins demands. In the long term, these problems may be intensified under climate change scenarios. In this context, the present study evaluates the impact of climate change in meeting water demands for consumptive uses in the system Chira-Piura. The results show a slight increase of water availability in the Piura's basin and a reduction of water availability in the Chira's basin. Taking into consideration the connection between these basins through the reservoir, the current water scarcity problems in both basins can be intensified under climate change scenarios, in spite of the water resources increase in Piura's basin.

### Biography

Chavez-Jimenez Adriadna has obtained her PhD at the Technical University of Madrid, Spain. Currently, she is Professor and Researcher at the University of Piura. Her research interests are focused on water resources management, climate change, water scarcity problems, management demands and adaptation. She has published more than six papers in reputed international journals.

adriadna.chavez@udep.pe

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Storm risk based on stranded coral boulders and sea level changes around Thailand since the mid-Holocene

Grahame Oliver<sup>1</sup> and James Terry<sup>2</sup><sup>1</sup>Nanyang Technological University, Singapore<sup>2</sup>Zayed University, UAE

The west coast tourist beaches of peninsular Thailand are vulnerable to tsunamis originating from the Sumatra-Andaman subduction zone. The east coast beaches of peninsular Thailand are thought to be safe from tsunamis. However, our investigations of stranded coral boulders on Koh Samui suggest that east coast tourist beaches are vulnerable to typhoon storm induced inundations. We have estimated the physical processes required to move reef-derived coral boulders on the eastern coast of Koh Samui. Flow velocities of 2.3-8.6 m/s were required to transport the boulders, with individuals deposited up to 4.7 m above mean sea level. U-Th and <sup>14</sup>C age-dating of coral boulders, suggest that events capable of the highest flow velocities occurred around AD 1600 and AD 1750. No events of similar magnitude have been experienced in the last 250 years. The non-occurrence of similar events in living memory has implications for hazard perceptions at this important tourist destination. We also present evidence for Holocene sea-level changes across peninsular Thailand, as observed in raised seamounts in coastal limestone cliffs at KohPhaluai and near Krabi and in emergent fringing reefs at KohSamui. <sup>14</sup>C dating of oyster shells and stalactites that grew inside the notches suggest that relative mean sea level was ~2 m higher during the mid-Holocene compared to the present day. Thus, studies using coral boulders as a proxy for past storm-wave conditions must consider the broader sea-level history and are probably best limited to the period post-2000 BP in the Gulf of Thailand.

### Biography

Grahame Oliver has lectured and researched at the Universities of Otago, Cambridge, St Andrews, Curtin, Western Ontario, University College Dublin, National University of Singapore and at present, at the Asian School of the Environment, Nanyang Technological University, Singapore. He has published over a hundred papers in geochronology and geodynamics.

gjh Oliver@ntu.edu.sg

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## The long-term adaptation scenarios flagship research program (LTAS) for South Africa

Faith Nkohla, Nkohla N F and Munzhedzi S M  
Department of Environmental Affairs, South Africa

The LTAS aims to respond to the South African National Climate Change Response White Paper by developing national and sub-national adaptation scenarios for South Africa under plausible future climate conditions and development pathways. Outcomes and recommendations are used to inform key decisions in future development and adaptation planning. The program developed a consensus view of climate change trends and projections for South Africa. It summarizes key climate change impacts and potential response options identified for primary sectors, namely water, agriculture and forestry, human health, marine fisheries, biodiversity, disaster risk reduction, human settlement, economics of adaptation, food security and early warning systems. The LTAS climate scenario technical work analyzed recent trends in climate, and synthesized a range of potential future climate conditions that plausibly could occur in South Africa over three time frames (2015–2030, 2040–2060 and 2080–2100). Observed climate trends for South Africa from 1960 to 2010 were analyzed and related to modeled trends for the same period to begin identifying possible strengths and weaknesses in current modeling approaches. South Africa's climate future from 2025 and beyond was modeled using four broad climate scenarios at national scale, with different degrees of change and likelihood that capture the results of global mitigation action and the passing of time. First scenario as based on a warmer (<math><3^{\circ}\text{C}</math> above 1961–2000) and wetter, with greater frequency of extreme rainfall events. Second scenario on warmer (<math><3^{\circ}\text{C}</math> above 1961–2000) and drier is with an increase in the frequency of drought events and somewhat greater frequency of extreme rainfall events. Third scenario is hotter (>math>>3^{\circ}\text{C}</math> above 1961–2000) and wetter, with substantially greater frequency of extreme rainfall events and fourth scenario on hotter (>math>>3^{\circ}\text{C}</math> above 1961–2000) and drier with a substantial increase in the frequency of drought events and greater frequency of extreme rainfall events. Studies conducted on climate change, both internationally and nationally, indicate that the increase in the frequency and intensity of extreme events such as storms, droughts, and floods associated with climate variability and change have a significant impacted on natural and human systems. Additional stressors noted are non-climatic factors such as social inequalities that shape differential risks due to the complex interactions between climate change impacts, exposure and sensitivities. These risks are likely to result in loss of property and damage to infrastructure, disruption of essential services, and reduced agricultural production and a breakdown of food systems. Furthermore, are impacts on terrestrial, freshwater, and marine ecosystems, evidenced by species shifting their geographic ranges, seasonal activities and migration patterns. Efforts to employ effective responses for climate change resilience to various external shocks associated with climate change will potentially strengthen the attainment of the Sustainable Development Goals (SDGs)

### Biography

Faith Nkohla completed his Master of Science degree in Plant Ecology from University of Cape Town in 2008. He is currently working as Director of Climate Change Adaptation, at the Department of Environmental Affairs. His responsibilities includes managing and provision of climate change support services to sub-national and national sectors, to improve SA's adaptive capacity to climate change and key sectors such as water, agriculture, biodiversity, and disaster risk reduction. He serves in various project teams to provide guidance in climate change studies, including socio-economic livelihoods, and developing climate change adaptation sectors strategies, and guide their implementation.

vkhavhagali@environment.gov.za

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Coupled soil and water conservation and rain fed agriculture system to cope with climate change in semiarid Africa and China

You-Cai Xiong<sup>1</sup>, Levis Kavagi<sup>2</sup>, Jiang Zhang<sup>1</sup>, David Mburu<sup>3</sup>, Tao Tian<sup>1</sup> and Lu Cao<sup>1</sup><sup>1</sup>Lanzhou University, China<sup>2</sup>United Nations Environment Program, Kenya<sup>3</sup>Jomo Kenyatta University of Agriculture & Technology, Kenya

Improving rainwater resource use efficiency and controlling soil and water loss are the two major challenges under climate change in semiarid Africa and China. The two regions confront an increasing ecological crisis of water and soil loss and vegetation degradation, lowering CO<sub>2</sub> sequestration of plant community and field productivity of main crops due to extreme climatic events. It is a critical practical demand to improve food production and soil & water conservation capacity in this region. Our previous work showed that rain fed farming system of northwest China led to significant increase in rainwater use efficiency and crop yield in semiarid Kenya and Ethiopia since 2011 and also made the social-economic investigations on farmers' livelihood and ecosystem conservation as well. Local community is mainly featured by small household farmers, and the reclamation activities at sloping lands resulted in serious soil and water erosion. We designed and implemented a few successful case studies by introducing micro-field rain-harvesting farming system to improve food production level at flat lowlands, and conducting terrace construction programs to retain rainwater and restore vegetation at sloping highlands in the two regions. By this, social-economic-ecological outputs had been improved simultaneously. We therefore attempted developing a theoretical framework to guide the scientists, farmers and decision-makers to work together to adopt and extend the coupled rain fed agriculture and soil & water controlling system. The coupled system can act as a promising solution to increase vegetation cover, decrease soil & water loss, improve carbon sequestration and food production, and ultimately achieve ecosystem sustainability under climate change in semiarid Africa and China.

### Biography

You-Cai Xiong has completed his PhD from Lanzhou University, China and Post-doctoral studies from McGill University and ECORC, Agriculture & Agri-Food Canada. He is currently the Deputy Director of MOE (Ministry of Education) Engineering Research Center for Dryland Agriculture and Ecological Conservation, China. He has 20-year research experience in ecosystem sustainability and food security under climate change and has published more than 150 papers in reputed journals. He has been serving as an Editorial Board Member of over 10 international journals.

xiongyc@lzu.edu.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Mapping potential sources of water using geophysical methods

Edgar Monroy, Andrés Mauricio Munoz Garcia, Martin Eduardo Espitia and Henry Yesid Bustos  
Agrarian University Foundation of Colombia, Colombia

In the data processing after a seismic exploration, it is necessary to obtain a plausible image. One of the tools used for this is known as seismic migration target. Seismic migration is based on a wave equation process that eliminates distortions of records reflection, moving events to their correct spatial location, which by the collapse of the energy diffractions, back to their points of dispersion. In Colombia, on the occasion of the effects of climate change, especially the scarcity of water resources in areas with limited economic resources, it is essential to seek new sources of water for which the use of methods of geophysical prospecting, are an interesting alternative in order to map new underground sources that can certainly be an important solution especially for those vulnerable communities not only to effects of this environmental phenomenon but Tamien to the stubble of violence that for years have plagued our territory.

### Biography

Edgar Monroy is currently working at Agrarian University Foundation of Colombia, Colombia Edgar Monroy research interests are Climate Change, geophysical science and Climate Hazards etc.

edgar.monroy@uniminuto.edu

Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Efficacy of managed aquifer recharge to reduce the impact of climate change on coastal aquifers

Michele Vurro, Costantino Masciopinto and Isabella Serena Liso

Consiglio Nazionale delle Ricerche, Italy

The best fit of tide-gauge measurements of two monitoring stations, located along Puglia coast (Southern Italy), provided local sea level rise (LSLR) rate of 8.8 mm/y during 2000-2014 years. This local rate matches 21<sup>st</sup> and 22<sup>nd</sup> century projections of the rate of mean global sea level rise, which includes ocean thermal expansion, glaciers, polar caps, Greenland and Antarctica's ice sheets melting and by including changes in soil water storage. Under the assumption that this sea rise rate will remain constant, an increasing of seawater intrusion will be produced into the Puglia and others Mediterranean coastal aquifers. Model simulations have been applied to the Ostuni (Puglia) groundwater in order to quantify seawater encroachment in fractured coastal aquifers due to LSLR. The model implemented the Ghyben-Herzberg's equation of freshwater/saltwater sharp interface in order to determine the amount of the decrease in groundwater discharge due to the maximum LSLR during 22<sup>nd</sup> century. Since model results have foreseen an impressive depletion (over 16%) of groundwater discharge, MAR actions have been tested to prevent the seawater intrusion. The study has confirmed the suitability of MAR for enhancing the integrated water resources availability by reducing future groundwater depletions. MAR recovered 80L/s of groundwater as a new source of water supply during summer at the Ostuni area. Therefore, MAR can be a useful measure to mitigate the impact of climate change on coastal aquifers as a direct measure, due to reducing salt water intrusion, and as an indirect one, due to increasing water resource.

### Biography

Michele Vurro is the Head of research and is Scientific Coordinator of Integrated Water Resources Management at IRSA-CNR. He has been involved in research on mathematical models of flow, transport and diffusion in groundwater and in unsaturated zone, groundwater artificial recharge. He is carrying out research on impact of climate change to water resources and adaptation strategies to combat climate change condition. He has published more than 30 papers in international peer-review journals.

Michele.vurro@ba.irsa.cnr.it

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Mitigation technologies of non-CO<sub>2</sub> greenhouse gas emission in Korea

**Byung Chul Shin**

GreenConTech Co., Korea

This paper introduces the emission status and the mitigation technologies of non-CO<sub>2</sub> greenhouse gas (GHG) in Korea. The total emission of GHG is 695 million ton CO<sub>2</sub>-eq at 2013. About 10 % of them are non-CO<sub>2</sub>GHGincluding HFCs, SF<sub>6</sub>, N<sub>2</sub>O and CH<sub>4</sub> which mostly come from energy conversion plant, semiconductor and chemical industry, organic waste treatment facilities. Korean government has finalized its 2030 target of reducing GHG emissions by 37 percent from business-as-usual (BAU) levels of 851 million tons. Above 315 million ton CO<sub>2</sub>-eq has to be reduced to meet the target. The government has come up with a number of complementary measures in order to successfully implement its plan including an emission trading system. Several non-CO<sub>2</sub> GHG mitigation projects from industrial facilities have been already executed by international project base such as CDM utilizing the direct incineration or decomposing technologies at high temperature. Although these incineration technologies are simple for installation and maintenance, the additional CO<sub>2</sub> emission to atmosphere cannot be avoided due to CO<sub>2</sub>productionduring incineration and high energy consumption. The thermal energy consumption to raise the flue gas temperature is large because the non-CO<sub>2</sub> GHG concentration from industrial facilities is very low. The various leading technologies are under development to lower the energy consumption for decomposing the non-CO<sub>2</sub> GHG or conversion these to the useful by-products.

### Biography

Byung Chul Shin has completed his PhD from Korean Advanced Institute Science and Technology. He is the Director of GreenConTech after 20 years for Samsung Engineering as process researcher and strategic planner. He has developed the waste to energy technologies and air pollution control process at R&D Center and completed a lot of national strategic planning projects on environmental and energy policy. Currently, he has been carrying out the performance evaluation of non-CO<sub>2</sub> GHG mitigation R&D project.

shinbucu@naver.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Climate scenarios in China, with improved accuracy

**Tian Xiang Yue and Na Zhao**

Institute of Geographical Sciences and Natural Resources Research, China

Climate scenarios in China, with improved accuracy: Comparing CMIP5 scenarios of RCP2.6, RCP4.5 and RCP8.5 during the period 2006-2010 with observations from 735 meteorological stations indicates that mean absolute errors (MAEs) of mean annual temperature were very similar under the three scenarios. All of the MAEs were 2.2°C for the whole of China on average. The actual temperature was underestimated at more than 87% of the meteorological stations. After the downscaling process using a HASM-based method, all of the MAEs for the downscaled mean annual temperature under the three scenarios were reduced to 0.61°C for the whole land mass of China. MAEs of annual mean precipitation under scenarios of RCP2.6, RCP4.5 and RCP8.5 were respectively 345.88, 338.18 and 340.93 mm for the whole land mass of China on average. At about 80% of the meteorological stations, the actual precipitation was overestimated by all the three scenarios. The downscaling process made the MAEs of the three scenarios decreased to about 71mm for the whole of China on average. In terms of the downscaled results, almost all China would become warmer and wetter on average under all the three scenarios over the next 30 years.

### Biography

TianXiang Yue has been working as a leading Professor of Institute of Geographical Sciences and Natural Resources Research (IGSNRR) since 2000 and Geoinformatics Chair of University of Chinese Academy of Sciences (UCAS) since 2015. He is Head of Department for Ecological and Environmental Information Sciences of IGSNRR. He has published more than 200 papers in reputed journals.

yue@lreis.ac.cn

### Notes:



**conference**series.com



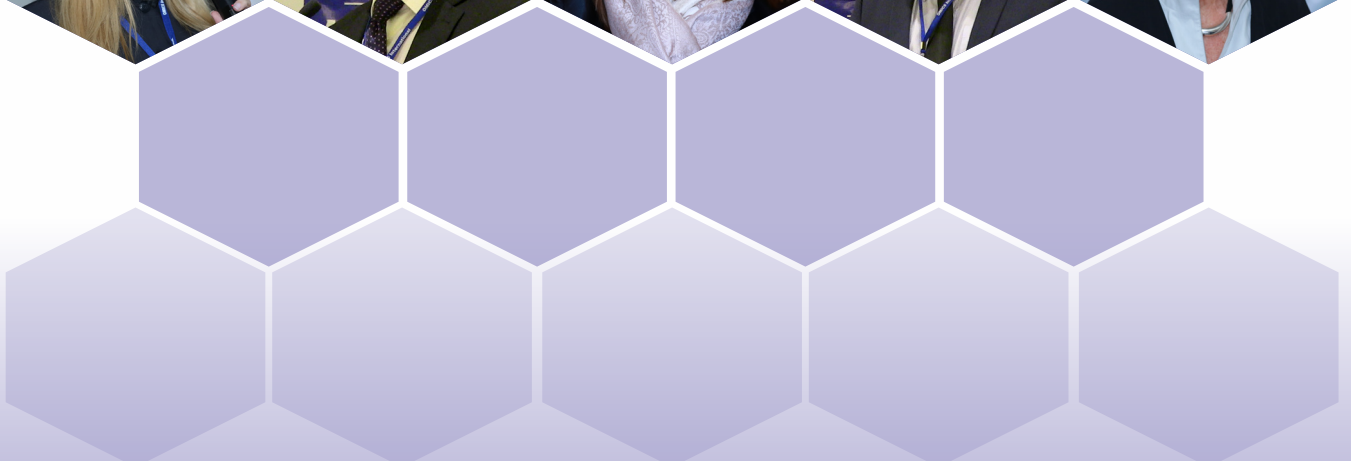
**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Young Researchers Forum (Break Out Day 2)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Governance of land security and climate-induced relocation in the Pacific region

**Dalila Gharbaoui**

University of Liege, Belgium

Retreating from affected coastal areas through migration as an adaptive strategy to changes in environmental patterns has always been part of the Pacific Islands' community's culture and practices. Community-based protection strategies and methods to cope with the adverse effects of natural disasters in the region are integrated in their traditions for millenarities. Local relocation in the Pacific can be either within or beyond the land tenure boundaries of the affected communities, planning for relocation within the customary land minimizes post-relocation vulnerability associated with land-based conflicts and allows a preservation of social cohesion crucial for the Pacific Island community's survival. Literature on limits to adaptation has shown that loss of culture is unavoidable results of relocation if customary land tenure is not considered at very early stage at relocation process. Good governance and best practice addressing limits to adaptation should include this dimension. Post-relocation vulnerability associated to land-based conflicts and the loss of customary land systems needs to be considered when planning for relocation as sustainable adaptation strategy to climate change in the Pacific region. The research will be based on ethnographic field study of communities affected by land erosions result of sea level rise and land degradation following extreme environmental events (cyclones, flooding, etc) that will be forced to adapt to climate change by relocating within the country in Fiji, New Caledonia and Solomon Islands. Ethnographic study will be conducted before relocation is taking place with the aim to evaluate the role of land ownership and tenure security in the relocation process. Field research will also be carried at the post-relocation phase in order to assess post-relocation vulnerability associated to land-based conflicts and the loss of customary land systems. One major focus will be on the consequences and implications of relocation in terms of conflict, resources distribution and power relations. Customary authorities and institutions are legitimate governance actors holding their own governance mechanisms in the Pacific region. Strategies addressing land governance and climate change adaptation in the Pacific should include both state-based governance mechanisms combined with customary non-state institutions. In order to combine those two forms of governance, it is necessary to include traditional authorities to the decision-making process on relocation. This cannot be done without a deep respect for their view of the world, a profound understanding of how they represent climate change and migration within their belief systems and how traditional knowledge directly addresses those questions.

### Biography

Dalila Gharbaoui is a PhD Student in Political and Social Sciences, University of Liege (Belgium), in joint-agreement with the Macmillan Brown Center for Pacific Studies, University of Canterbury (New-Zealand) under the Marsden Fund from New Zealand government and the Royal Society of New Zealand. She has completed her Master degree in Human Rights from The University of Sydney, Australia. Her research interests are in Anthropology, Documentary Making, Flamenco and backpacking travel.

dgharbaoui@doct.ulg.ac.be

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Will extremes become the norm under future climate change?

Renalda El-Samra<sup>1</sup>, Elie Bou-Zeid<sup>2</sup>, Hamza Kunhu Bangalath<sup>3</sup>, Georgiy Stenchikov<sup>3</sup> and Mutasem El-Fadel<sup>1</sup><sup>1</sup>American University of Beirut, Lebanon<sup>2</sup>Princeton University, USA<sup>3</sup>King Abdullah University of Science and Technology, Kingdom of Saudi Arabia

High resolution dynamical precipitation and temperature downscaling is conducted for the past (2008) and the near future (2011-2050) climates under two Representative Concentration Pathways (RCPs) (RCP4.5 and RCP8.5) over a complex topographical terrain along the eastern Mediterranean basin using the Weather Research and Forecast (WRF) model. WRF is run at two nested resolutions of 9 and 3km, forced by the High-Resolution Atmospheric Model (HiRAM) at a resolution of 25km. The future simulations covered eight years (one year per decade per scenario) that were judiciously selected based on an anomaly score that depends on the mean annual temperature and accumulated precipitation in order to identify the worst year per decade from a water resources perspective. Climate indices derived from daily simulated precipitation and temperature data show significant decrease in annual precipitation (rain and snow), reaching up to 30% relative to current conditions, in addition to changes in daily maximum summer and minimum winter temperature extremes. Seasonal variability is predicted to increase significantly, with colder winters and warmer summer projected for the study area and with notable increases in the annual occurrence of warm nights and heat wave events. The projected increase in extreme temperatures and reduction in precipitation will have an adverse effect on agriculture, ecosystems, as well as human health and comfort.

### Biography

Renalda El-Samra is PhD Candidate in Environmental & Water Resources Engineering at AUB. She has over two decades of professional experience in the environmental sector.

mfadel@aub.edu.lb

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Environmental change-migration nexus in the Philippines: Overcoming limitations and filling in the gaps

Elena Giacomelli

University of Trento, Italy

Environmental migration has always been part of human history. The need for prompt actions to overcome the limitation is not due to its novelty, rather to scientific and empirical evidences on the current (and possibly future) effects that environmental change will have on people. In recent years, environmental change and natural hazards increased their intensity and frequency. In countries such as the Philippines and the Pacific Islands, where the environmental problems are categorized as existential and security threats, such challenges need to be tackled and solved in order not to become unmanageable issues. Current researches and work done on environmental migration demonstrate how this issue is still weakly conceptualize and contextualize. The main limitations are: firstly the lack of a common definition and reliable data; secondly the lack of a linkage between environmental change and internal migration in policies measures and practices; thirdly adaptation measures considered as the main (an only) strategy; and lastly the lack of adequate financial resources and operational capacities, especially in developing country such as the Philippines. There is a need to deepen and broaden the range of conceptual tools for researchers interested in the relationship between environmental change and mobility. In particular, in the international debate, there is still missing a clarification of terminology. It is important to underline how to overcome these limitations the measures proposed needs a holistic and simultaneous intervention both from the international community and national states, especially those considered as highly prone to environmental change and natural disasters. The role of this research is to be instrumental within the environmental migration discussion in order to find a way to include this issue inside the international and national political agenda. It is beyond the scope of this thesis to draw definitive conclusions on the nexus between environmental change and its consequent migration impact. Yet, this thesis can be regard as a starting point for potential future investigations on this still hidden phenomenon of migration due to environmental change.

### Biography

Elena Giacomelli obtained a Bachelor's degree in Political Science and International Relations, participating in two exchange programs: one in Universidad de Valencia (one year), one in the University of Melbourne (one semester). She is currently enjoying and actively taking part in the Master's degree in International and European Studies at the University of Trento. Within this program she studied as an exchange student at the Metropolitan University Prague and at the University of Adelaide. She participated in the research project "Current Migration to Europe: Research of Smart Population Dynamics". She worked as an intern in the Australian Population and Migration Research Center. She developed her Master's thesis on the theme 'Environmentally Displaced Persons' taking as case study the Philippines. She won a scholarship to conduct her research in the Third World Studies Center in the University of the Philippines. She will graduate the 13 of October 2016.

elenagiacom@hotmail.it

### Notes:



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Scientific Tracks & Abstracts (Day 3)



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Status and prospect on CO<sub>2</sub> capture and sequestration in China

Dou Hongen<sup>1</sup>, Zhang Hujun<sup>1</sup>, Jiang Kai<sup>2</sup>, Song Lili<sup>2</sup> and Zhu Dan<sup>3</sup><sup>1</sup>Research Institute of Petroleum Exploration and Development, China<sup>2</sup>China University of Geosciences, China<sup>3</sup>China University of Petroleum, China

The paper presents the research achievements of CO<sub>2</sub> Capture, Utilization, and Sequestration in China. Criteria of CO<sub>2</sub> capture and geological sequestration (CCGS), CO<sub>2</sub> capture and utilization sequestration (CCUS) both are established in China, including screening criteria of the sites of CO<sub>2</sub> storage and storage security and risk assessment. Also, in order to study CO<sub>2</sub> storage capacity at different reservoirs and regions in China, the paper modifies existing evaluation methods, and shows clearly what problems existing in the previous methodologies. China's CO<sub>2</sub> storage potential in saline aquifers, depleted oil and gas reservoirs, deep brine-saturated formations and CO<sub>2</sub>-flooding enhanced-oil-recovery (CO<sub>2</sub>-EOR) and enhanced coal-bed methane recovery (ECBM) are evaluated by means of the modified method. Various trapping mechanisms of CO<sub>2</sub> storage are discussed in the paper. In addition, CCGS and CCUS technologies have been used to CCGS and CCUS (CO<sub>2</sub>-EOR) projects, CO<sub>2</sub> geological storage project of Shenhua group in Erdos basin, and CO<sub>2</sub>-EOR project of Jilin, Daqing, Shengli and Yanchang, both categories are introduced respectively. Final, prospect on China's CCUS will be sighted, CO<sub>2</sub> capture from coal-chemical plants where CO<sub>2</sub> has high purity and its price is relative cheap, thus offering a good opportunity for implementing CO<sub>2</sub>-EOR. It is practice verified that CO<sub>2</sub>-EOR as a practical CCUS technology is a good practical and economical way for reducing CO<sub>2</sub> emissions and enhancing oil recovery. The authors point out strategy of the CCUS technology R&D, innovation and low cost CO<sub>2</sub> use technologies to deal with the present low oil crude price.

### Biography

Dou Hongen is a senior Petroleum Engineer at Research Institute of Petroleum Exploration and Development (RIPED), Petro-China, Beijing, China. He has worked in the R&D area of oil and gas development and production since joining RIPED in June 1998. He was senior visiting scholar at the University of Tulsa in March to November 2010. He has published over 70 papers (including Chinese and English). He holds MS and PhD degree from the graduate school of RIPED, Beijing, China, and was a Post-doctoral researcher at Beijing University of Aeronautics and Astronautics from 1998 to 2000. He serves as Technical Editor for *SPEJ*, and also as Technical Reviewer for *Journal of Petroleum Science and Engineering*. He won 2012 SPE Outstanding Technical Editor award. He is as a committee member of SPE CO<sub>2</sub> capture, utilization and Storage (CCUS) from 2013 to present.

douhongen@petrochina.com.cn

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Laboratory scale monitoring of CO<sub>2</sub> sequestration using complex electrical conductivity and seismic property changes derived by seismic interferometry

Ranajit Ghose, Deyan Draganov, Alex Kirichek and Karel Heller  
Delft University of Technology, The Netherlands

In order to realize and maintain a successful CO<sub>2</sub> storage endeavor, a program of careful monitoring of the changes in reservoir properties is necessary. The way the reservoir properties change is generally case-specific, as such modifications are principally related to the distribution of pores, fluid composition, and the thermodynamic conditions. Of the various geophysical methods, so far seismic and electrical methods have been primarily used with varying success to monitor remotely the changes in a carbon capture and storage (CCS) reservoir. However, a quantitative characterization of the dynamic reservoir properties has remained difficult mainly due to three reasons. First, laboratory calibration of rock-physical models used to extract the reservoir properties from geophysical data is challenging. Second, quantitative and integrated geophysical approaches that are specifically sensitive to changes in fluid (supercritical CO<sub>2</sub> and brine) saturation, salinity and pressure are yet to be developed. Third, the difficulty to capture reliably in surface measurements the seismic signature of the changes in a CCS reservoir without the unwanted effects of overburden changes has been an obstacle. In order to address these issues, we have developed a laboratory facility where simultaneous seismic and electrical measurements can be performed on a reservoir rock under realistic pressure and temperature conditions. Changing saturation and salinity could be quantified on dynamic measurements of complex electrical conductivity. Application of seismic interferometry could resolve changes in seismic velocity in the reservoir due to fluid substitution. The approach of joint inversion of these two data types can be applicable to realistic, quantitative field-monitoring.

### Biography

Ranajit Ghose is an Associate Professor at Delft University of Technology, The Netherlands. His areas of research interest are high-resolution seismic with focus on shear wave, near-surface and geotechnical geophysics, quantitative integrated approaches in geophysics, seismic attenuation, poro-elasticity and property estimation, seismic wave propagation in fractured media and anisotropy and monitoring CO<sub>2</sub> sequestration. He is presently the Editor-in-Chief of the journal "Near Surface Geophysics".

r.ghose@tudelft.nl

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Challenges in global CCS projects and coping strategy

Hu Yongle<sup>1</sup>, Dou Hongen<sup>1</sup>, Song Lili Jiang Kai<sup>2</sup> and Zhu Dan<sup>3</sup><sup>1</sup>Research Institute of Petroleum Exploration and Development, China<sup>2</sup>China University of Geosciences in Beijing, China<sup>3</sup>China University of Petroleum, China

The paper investigates main sources of CO<sub>2</sub> emission and distribution of CO<sub>2</sub> emission in the world, and point out a relationship of temperature change trend between CO<sub>2</sub> concentration and CO<sub>2</sub> emission amount on the earth. The paper reviews the global typical CCS projects in the decade, including scales of CO<sub>2</sub> capture and storage, projects efforts and lessons learned, our research shows that CCUS project is system engineering. By systematic study of CCS chain, challenges of CCS are divided into two categories. The first is technology and operation of CCS, including CO<sub>2</sub> capture, pipeline and transportation, storage and monitoring of the above each link and CO<sub>2</sub> comprehensive management system. The second is various environments of implementing CCS, including public awareness, standards/criteria, policy ready and regulations/laws of the government, and risk evaluation, finance mechanism. Final, the authors focus on CCS' technology innovation, standards, regulations and policies to put forward strategies coping with the above challenges. It is emphasized that government needs to launch incentive tax policies and relative regulations between government and enterprise, enterprise and enterprise; the government must be a leading role in CCS/CCUS projects because global climate change is an event of the public concern in the present and the future. Further, eliminating green house gas effect is the biggest event for human beings; it has become the urgent matter that building alliance, sharing practical CCS technology realizes win-win between nations in the world for dealing with climate change.

hyl@petrochina.com.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Sequestration of atmospheric carbon dioxide as inorganic carbon in the unsaturated zone of semi-arid forests

Murray Moinester, Israel Carmi and Joel Kronfeld  
Tel Aviv University, Israel

We propose tackling CO<sub>2</sub> reduction using an economical and sustainable, low-tech method to reverse the secondary processes of deforestation, specifically in semi-arid regions. These areas, which comprise ~17% of the global land area, are characterized by erratic and low amounts (25-70 cm/yr) of precipitation, enough to support small trees. The Yatir forest in Israel is an example of reforestation in a semi-arid zone. The forest's trees act as pumps, taking in CO<sub>2</sub> through stomatal apertures in their leaves, and then pumping out CO<sub>2</sub> through root respiration underground into the thick water unsaturated zone (USZ). HCO<sub>3</sub><sup>-</sup> bicarbonate in the resulting USZ aqueous solution interacts with soil minerals to form and then precipitate a variety of secondary carbonate salts. Radiocarbon dating proves that this sequestration is long term. Consider a volume in the USZ of this forest (1 square km area, 6 m depth). Our measurements show that the carbonate salt precipitation within this volume of sediment is approximately equivalent to 37.8 tons CO<sub>2</sub> per year. The world's semi-arid zones cover approximately 23. million square km. Taking Yatir forest data to be representative, our very rough potential global CO<sub>2</sub> annual sequestration rate estimate in the world's (to be planted) semi-arid forests is then ~1 billion tons CO<sub>2</sub>/yr, precipitated as inorganic carbonate salts within the USZ. This value represents ~5% of the 20 billion tons CO<sub>2</sub>/yr rate by which the CO<sub>2</sub> in the atmosphere is currently increasing. Our estimates should be checked and refined by extending the Yatir forest studies to other semi-arid regions.

### Biography

Murray Moinester is an Emeritus Professor of Physics. He received his PhD from the University of Rochester in 1968 and then joined the faculty at Tel Aviv University. He served as guest Professor for extended periods at many leading universities and accelerator laboratories. He has extensive experience in experimental and computational methods. He carried out many research programs in high energy particle and nuclear physics. He published some 200 scientific papers in refereed journals, authored some 75 conference papers; worked as a patent writer, in the field of Archaeology on infrared imaging & scientific dating, on statistics analysis for the social sciences, and on climate engineering.

murray.moinester@gmail.com, carmiisr@post.tau.ac.il, joel.kronfeld@gmail.com

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Differentiated CO<sub>2</sub> efflux in the mycorrhizosphere of rice cultivated in paddy soil

Lili Wei<sup>1</sup>, Shen Yu<sup>1</sup>, Jing Din<sup>1,2</sup>, Miroslav Vosátka<sup>3</sup>, Bangping Cai<sup>4</sup>, Chengrong Chen<sup>5</sup>, Wenfei Yan<sup>6</sup>, Changyi Lu<sup>1,2</sup> and Jinghua Xu<sup>1,2</sup><sup>1</sup>Chinese Academy of Science, China<sup>2</sup>University of Chinese Academy of Sciences, China<sup>3</sup>Institute of Botany ASCR, Czech Republic<sup>4</sup>Xiamen Botanical Garden, China<sup>5</sup>Griffith University, Australia<sup>6</sup>Xiamen University, China

Arbuscular mycorrhizal fungi (AMF) are the most widespread obligate biotrophic plant symbionts and their extra-radical hyphae have the potential in the regulation of carbon (C) cycling by enhancing soil aggregation or by stimulating priming effect. When exposed to the elevated CO<sub>2</sub>, hyphae growth and colonization rate were increased, and consequently lead to more profound effects on C cycling. However, previous studies on AMF functions in the decomposition of organic C have focused on hyphosphere (i.e. at presence of hyphae), very limited information is available for myco rhizosphere (i.e. at presence of roots and hyphae). This study was set to test the differences in organic matter decomposition (indicated by CO<sub>2</sub> efflux) between myco rhizosphere and hyphosphere. Two microcosm experiments were carried out using rhizobox method to separate soil environment into root- and hyphae-compartment. AMF inoculation induced an increase of CO<sub>2</sub> efflux from the root-compartment, while there was no change in the hyphae-compartment. Stable C isotope analyses combing with the soil microbial abundance analysis is indicated that the increased production of CO<sub>2</sub> in root-compartment was related to the increase of the exudates (i.e. the easy decomposed organic C input) from roots which stimulated by AMF. The crucial role of AMF presence in C cycling was confirmed with differential CO<sub>2</sub> efflux associated with mycorrhizosphere vs. hyphosphere environment.

### Biography

Lili Wei is a Professor at Institute of Urban Environment, Chinese Academy of Sciences, China. Her research interests are Wetland Ecology, Plant Functional Ecology, and Stable Isotope Ecology. She has more than 20 publications in different international journals.

llwei@iue.ac.cn

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Carbon stocks and fluxes in the Andean tree line of *Polylepis reticulata* in Ecuador: Present balance and projected values for the 21<sup>st</sup> century

Carlos A Gracia<sup>1,2</sup><sup>1</sup>University of Barcelona, Spain<sup>2</sup>University of Cuenca, Ecuador

Trees in the tropical and subtropical mountains of South America are able to develop at high elevation, with some species forming the highest tree-line in the world at 5200m. Under these unique environmental conditions, only evergreen trees of the genus *Polylepis* are able to subsist. *Polylepis reticulata* is a very slow growth tree. The strategy of these trees to survive in such unfavorable conditions has been analyzed in the Cajas National Park (Azuay, Ecuador). In this work we measure for the first time, the carbon stocks and fluxes, particularly GPP, NPP, respiration and carbon allocation of *Polylepis reticulata* growing over 4000 m of altitude. From dendrometric measurements we have estimated the age of some trees (around 30 cm in diameter) to be more than 400 years. The temperature increase and changes in the rainfall pattern in these areas of the Andean cordillera can modify substantially the carbon fluxes between the forest and the atmosphere. From the 1151gC.m<sup>-2</sup> year<sup>-1</sup> uptake as GPP, 888gC.m<sup>-2</sup> year<sup>-1</sup> is returned to the atmosphere as growth and maintenance respiration. Most of the carbon retained as NPP is allocated to the leaves (194 from the 263 gC.m<sup>-2</sup> year<sup>-1</sup>). To produce one kg of dry biomass these trees transpire 5m<sup>3</sup> of water. The physiological response of *P. reticulata* under different RCP scenarios (IPCC, 2013) has been simulated using the GOTILWA+ model. The results show drastic changes in all the scenarios. For example growing under the RCP 2.6, at the end of the present century the NPP is projected to increase up to 362 gC.m<sup>-2</sup> year<sup>-1</sup> but, at the same time, the carbon allocated to leaves increase up to 325 gC.m<sup>-2</sup> year<sup>-1</sup> or 90 per cent of the NPP. In that scenario the water used to grow 1 kg of dry matter is projected to increase up to 20 m<sup>3</sup>. The exploration of other climate scenarios shows more drastic changes that put at risk the survival of this emblematic species endemic of the Andean cordillera.

### Biography

Carlos A Gracia is the Professor at the Department of Ecology, University of Barcelona. The ecophysiological responses of forest ecosystems to climate change, primary production, water and carbon balance are the core of his research work. He is the author of GOTILWA+, a process-based forest growth simulation model under different climate change scenarios. He has been the Vice-President of the Spanish Society of Terrestrial Ecology (AEET) and Member of the Directory Board of the Spanish Society of Forest Science (SECF), Member of the Scientific Advisory Board of the European Forest Institute (EFI). Since January 2014, he has joined the Prometeo fellowship from the SENESCYT (Secretaría Nacional de Educación Superior, Ciencia, Tecnología e Innovación) of Ecuador at the University of Cuenca (Azuay, Ecuador).

cgracia@ub.edu

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Photo-catalytic reduction of carbon dioxide by means of different titania-based catalysts synthesized with high pressure fluids

Rafael Camarillo, S Tostón, Fabiola Martínez, Carlos Jiménez, Isaac Asencio and Jesusa Rincón  
University of Castilla-La Mancha, Spain

According to the latest IPCC Climate Change Synthesis Report the human influence on the climate is clear, being recent anthropogenic emissions of greenhouse gases (GHGs) the highest in the history. In particular, CO<sub>2</sub> emissions from fossil fuel combustion contributed about 78% of the total GHG emission increase from 1970 to 2010, and these GHG emissions are expected to grow in all sectors. In order to reduce emissions and mitigate storage concerns, conversion technologies utilize the emitted CO<sub>2</sub> to produce other valuable products usually through catalytic chemical reactions. Given the high stability of CO<sub>2</sub> molecule, there is need for processes with high conversion and yield. These objectives can be achieved with improved catalysts and reaction systems designs. Our group has acquired experience in photo-catalytic reduction of CO<sub>2</sub>. In this sense, we have taken advantage of the special properties of compressed fluids (they can diffuse through solids like a gas but dissolve materials like a liquid) as particle formation media to synthesize TiO<sub>2</sub>-based catalysts with enhanced features. In particular, the photo-catalytic behavior of TiO<sub>2</sub> can be improved with the dispersion of metal atoms (Pt, Pd and Cu). This process has been undertaken simultaneously with supercritical synthesis in our ad hoc design experimental set-up, obtaining metal-doped TiO<sub>2</sub> with high surface area, crystallization degree, hydroxyl concentration, large pore volume, improved absorbance in visible range, etc. As a result, they show higher conversion rates than commercial catalyst (22-fold in methane and 5-fold in CO) in reduction experiments developed in an ad hoc designed experimental set-up.

### Biography

Rafael Camarillo is an Associate Professor of Chemical Engineering in University of Castilla-La Mancha, Spain. Although he completed his PhD about wastewater treatment with membrane processes, he has extended his area of interest to different operations with supercritical fluids (regeneration of used frying oils, extraction of valuable compounds from wastes, etc.). In last decade his group has specialized in CO<sub>2</sub> conversion through photo- and electro-catalysts obtained under supercritical conditions. He has published about 30 papers in reputed journals and has attended 47 international and national congresses (16 oral and 50 poster presentations).

rafael.camarillo@uclm.es

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Advanced electronics for space and studies on climate change

**Jose Sanchez Del Rio**

Alter Technology, Spain

In order to determine the most suitable capacitors that may satisfy the different Climate Change field applications demands, we have searched, between the different manufacture companies in today's market, the most reliable, miniaturized and high temperature resistant silicon capacitors. With the recent progress in the 3D Silicon Capacitors, this technique was the best candidate for manufacturing capacitors with such characteristics. In this paper, an evaluation and testing analysis of three different families of PIC 3D silicon capacitors is presented. Following tests were supported by these silicon capacitors: Voltage and thermal step stress, accelerated life endurance and environmental tests including mechanical vibrations, mechanical and thermal shocks and cross section analysis. Furthermore, radiation tests with gamma radiation and heavy ions in order to study the Single Event Effect (SEE) were performed. It is concluded that their excellent behavior to these tests makes them highly suitable for Space and Climate Change applications.

### Biography

Jose Sanchez Del Rio Saez has been working in Biotechnology with photonic biosensors for more than 4 years. He completed his PhD in photonic bio-sensing and DNA mutations detection at Madrid Microelectronics Institute (IMM-CNM-CSIC). Then he worked in a private company as a patent researcher in Biometrics and novel sensors and after as a Post-doc in the Face Recognition and Artificial Vision (FRAV) group of the Computer and Statistics department at Rey Juan Carlos University (URJC). He has done 2 Post-docs in the Nuclear Physics Department at the Matter Structure Institute (IEM-CSIC) and was specialized in high energy ions, protons and gamma radiation detection. Currently, he is working as a SW/HW testing engineer in the aerospace field for ALTER TECHNOLOGY.

josesrs@gmail.com

**Notes:**

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Framework agreement on climate change and humans responsibilities

Zeynep Zaimoglu<sup>1</sup>, Orhan Altürk<sup>1</sup> and Reyhan Erdogan<sup>2</sup><sup>1</sup>Cukurova University, Turkey<sup>2</sup>Akdeniz University, Turkey

Climate change which emerges as a result of global warming is one of the main problems human being faces in 21st century. Because of its negative effects that can pose a big threat such as human health, ecosystems, even increase in new generations the climate change which is regarded as a problem causing very serious socio-economic results has much importance in the international platform especially in recent years. It is scientifically proven that countries located in Mediterranean Basin including our own country will be affected from climate change seriously. In Paris summit (2015) enough countries agreed to support the agreement about the new climate regime that is about to set up and the emission increase rate was restricted. The aim of this is to restrict the emission increase rate. It was agreed to put the law into force that was accepted in COP 21 (2015) from 2020 on. Our country thinks that the new system should be fair which evaluates every country with its own socio-economic data. In other words, all of the countries in the new regime should take responsibilities according to the principle “common but differentiated responsibilities” and “specific opportunity and abilities”. But the new protocol which will be accepted with the agreement should be in harmony with necessity and realities of the 21st century, the idea that responsibilities demand dynamic quality should be taken into consideration. In this study, strategies about climate change in Turkey and possible precautions that can be taken as a result of Paris summit are mentioned. Turkey is making the necessary arrangements in harmony with the development aims, improving the cooperation among other countries, joining the influential participation to the national and international studies in order to prevent previous negative experiences, compensate the current loss, leave a clean environment for the next generations.

### Biography

Zeynep Zaimoglu has completed her PhD in Agricultural structure and irrigation at Cukurova University in 1999. She has published more than 13 international, 8 national and in addition to writing 2 educational books. Her expertise includes watershed management, water resources, constructed wetland, soil and ground water pollution, soil pollution and water treatment in constructed wetlands. She is an ERA-NET on Sustainable Animal Production evaluation committee. She is Professor at Cukurova University since 2013.

zeynepzaimoglu6@gmail.com

### Notes:



World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Use of satellite imagery, remote sensing and GIS related technologies to improve sustainability of marine ecosystems. Special reference to Copernicus/MyOcean program

**Jordi Sandalinas**

Toulouse 1 Capitole University, France

Remote sensing is understood as a hardware association related to Satellite Earth Observation technology and Earth Observation activities are those identified with the use of remote sensing equipment to provide data on earth observation and global climate change. For Earth observation satellites, technological advancements will lead to better resolution, increase in observation area and reduction in access time, i. e time taken between the request of an image by the user and its delivery. Plans for future missions and instruments include entirely new types of measurement technology, such as hyperspectral sensors, cloud radars, lidars and polarimetric sensors that will provide new insights into key parameters of atmospheric temperature and moisture, soil moisture and ocean salinity. Several new gravity field missions aimed at more precise determination of the marine geo id will also be launched in the future. These missions will also focus on disaster management and studies of key Earth System processes – the water cycle, carbon cycle, cryosphere, the role of clouds and aerosols in global climate change and sea level rise. Effectively, in this regard the so-called Group on Earth Observations gathered different member countries and non-governmental entities aiming to provide for initiatives beneficial for the humankind by applying also a global system of systems named the Global Earth Observation System of Systems.

### Biography

Jordi Sandalinas is a PhD Candidate at University of Toulouse 1 Capitole and serves as an External Research Assistant for the Space Institute of Research, Innovation and Uses of Satellites. He has participated in many lectures related to space law and published articles in this regard. He also obtained in 2012 an award of the Best Legal Communication during the Toulouse Space Show Symposium. He is the Founder of Sandalinas Advocats and Image Sea Solutions, an environment consultant company devoted to marine environment protection and risk prevention.

jordi@sandalinas.com

### Notes:



**conference**series.com



**conference**series.com  
778<sup>th</sup> Conference

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Young Researchers Forum (Day 3)



# Climate Change

October 24-26, 2016 Valencia, Spain

## Study of ash removal from activated carbon and its result on CO<sub>2</sub> sorption capacity

Michał Zgrzebnicki, A Gęsikiewicz-Puchalska, R J Wrobel, B Michalkiewicz, U Narkiewicz and A W Morawski  
West Pomeranian University of Technology, Poland

It is being observed that average temperature on Earth increases each year. This phenomenon can be explained by a theory known as a greenhouse effect. Thermal radiation, which is being emitted from the Earth's surface, is being absorbed by molecules in the atmosphere. Mainly, these molecules are methane, carbon dioxide and water vapor. The greater their concentration in the atmosphere, the more thermal radiation is being absorbed. To mitigate further intensification of the greenhouse effect by reducing CO<sub>2</sub> emission, some technologies are being developed. They are known as a Carbon Capture and Storage (CCS). One of those technologies is post-combustion capture of CO<sub>2</sub> on solid sorbents, like activated carbon (AC). AC is a porous material with well developed specific surface area. It is obtained through carbonization of a precursor with predominating carbon element and next activation- physical, chemical or combined. Depending on precursor's source, the amount of impurities, also known as ash, in final AC may vary from less than 1 wt% to even 15 wt%. Nevertheless, the content of these impurities might be lowered in sorbent by acid treatment. AC BA11 delivered by Carbon, Poland contains 11 wt% of inorganic impurities. Acid treatment (HCl, HNO<sub>3</sub> and HF) was performed to remove ash and its result on CO<sub>2</sub> sorption capacity was measured for each sample. Samples were characterized in terms of texture (BET) and chemical composition (XRF, XRD and XPS). The highest enhancement of 44% CO<sub>2</sub> sorption capacity was achieved for activated carbon after hydrofluoric acid treatment.

### Biography

Michał Zgrzebnicki has graduated from West Pomeranian University of Technology in Szczecin, Poland in 2016. He has been working in Polish-Norwegian research project called "Post-Combustion CO<sub>2</sub> Capture on New Solid Sorbents and Application in a Moving Bed Reactor" since February 2015.

michal\_zgrzebnicki@zut.edu.pl

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Reed biomass carbon sequestration potential within Danube Delta biosphere reserve

Marian Mierla, Iulian Nichersu and Mihai Doroftei

Danube Delta National Institute for Research and Development, Romania

Danube Delta Biosphere Reserve is situated in the South-East part of Romania. It is rich in biological diversity and consists in Danube Delta and surroundings. It is well-known that the Danube Delta Biosphere Reserve has the largest compact reed-bed from the entire Europe. This paper presents an efficient way to estimate the biomass for the entire potential reed areas from the territory of Danube Delta Biosphere Reserve (D.D.B.R.). The data that were used for accomplishing this study consist in LiDAR data with the focus on the vegetation height and orthophotos in Infra Red spectrum division, with 0.25 m resolution. These data were used in order to highlight the reed vegetation by knowing the vegetation height and its chlorophyllian activity. After elaborating the map of potential reed areas, the biomass amount for each region was calculated. Having these numbers and using a specific ratio it could be revealed the amount of sequestered carbon within reed vegetation. On the D.D.B.R.'s territory there are areas that are used for reed harvesting every year for constructions. Thus, it is important to know the potential of reed in carbon sequestration in order to mitigate climate change.

mihai.doroftei@ddni.ro

**Notes:**

# Climate Change

October 24-26, 2016 Valencia, Spain

## CO<sub>2</sub> EOR and sequestration technologies in petro China

Mingqiang Hao, Yongle Hu and Wenhui Li

Petro China Research Institute of Petroleum Exploration & Development, China

CO<sub>2</sub> flooding technologies which can reduce CO<sub>2</sub> emission while enhancing oil recovery, is the best way to realize CO<sub>2</sub> emission in present economic and technology condition. Therefore, the major oil companies and some government organizations have keep an eye on it. China conducted laboratory study of CO<sub>2</sub> flooding in Daqing Oil Field and Shengli Oil Field in the mid of 1960s. Some pilot tests were conducted in Daqing Oil Field, Jiangsu Oil Field and Shengli Oil Field in the mid of 1990s. But eventually the CO<sub>2</sub> flooding technology was developing slowly in some reasons such as the lack of natural CO<sub>2</sub> resources in China, the prominent contradiction of gas channeling. During the 10th five-year planning stage, a large number of high CO<sub>2</sub> reservoirs have been found in Songliao Basin. The following, some national projects, company projects and oil field company projects were implemented to restart tackling the key problem of the CO<sub>2</sub> flooding technology for the characteristics of our continental reservoirs and significant technology achievements have been achieved. The results show that besides C<sub>2</sub>-C<sub>6</sub>, C<sub>7</sub>-C<sub>15</sub> also has strong ability of mass transfer and it is useful for phase mixing. We have synthesized hydrocarbon surface active agent CAE to reduce the MMP and defined a new hydrocarbon component factor  $X_f = (C_2 - C_{15}) / (C_1 + N_2 + C_{16} +)$  that better describe the relationship between component and MMP. Promoted and applied WAG injection, and development indices variation, such as gas/oil ratio, replacement ratio, and water content for CO<sub>2</sub> flooding in high water cut reservoirs were. We also established WAG flooding characteristic curve equation that includes the effect of miscible phase degree; uniform replacement in heterogeneous reservoir could be reached through adjustment of injection-production ratio. Two separated layer gas flooding processes are conducted and then transformed from commingled gas injection to separated layer gas flooding technology. We developed an on-line anti-corrosion monitoring system, core lift equipments and three kinds of effective lift technology. Studied on the phase characteristic of CO<sub>2</sub> under different velocity and impurity were conducted, and we established the optimization method and process of pipeline design. Several technologies like circularity water, gas/liquid mixture transportation, centralized separation and measurement, airtight gathering and transportation, and studied on separation and purification technologies and formed three kinds of CO<sub>2</sub> flooding produced gas injection technologies are formed. CO<sub>2</sub> geological storage capacity calculation method was formulated to compute the relative parameters. We also collected CO<sub>2</sub> emission data for more than 600 enterprises in eight major industries, and conducted primary plan of sinks and sources matching features. And some pilots were conducted in block Hei59, Hei79, Hei46 of Daqingzijing Oil Field, the oil recovery can improve more than 10%, and the CO<sub>2</sub> geological sequestration rate is above 90%.

### Biography

Mingqiang Hao is currently working at Petro China Research Institute of Petroleum Exploration & Development, China. Mingqiang Hao research interests are CO<sub>2</sub> Capture and Sequestration, Climate Change and Health etc.

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Cost-risk trade-off of solar radiation management and mitigation-considering regional disparities under long-tailed climate sensitivity probability density distributions

Elnaz Roshan, Mohammad Mohammadi Khabbazan and Hermann Held  
University of Hamburg, Germany

Solar radiation management (SRM) might be able to alleviate the anthropogenic global mean temperature rise but unable to do so for other climate variables such as precipitation, particularly with respect to regional disparities. Here we evaluate the optimal trade-off between SRM and mitigation by applying cost-risk analysis (CRA) with the probabilistic knowledge about climate sensitivity density distribution. CRA trades off the expected welfare-loss from climate policies costs against the climate risks from overshooting an environmental target. Using the spatial resolution of 'Giorgi regions', we generalize CRA in order to represent the regional precipitation risks as a prominent side-effect of SRM. We introduce three scenarios, considering alternative relative weights of risks: temperature-risk-only, precipitation-risk-only, and equally weighted both-risks scenarios. Our results suggest that, by considering regional precipitation risks in optimization, SRM in conjunction with mitigation would only save about a half of welfare-loss (in terms of BGE) compared to mitigation-only analysis. In temperature-risk-only scenario, perfect compliance with 2°C-temperature target is achieved while a very high precipitation risk in half of the regions is demonstrated. In precipitation-risk-only and both-risks scenarios, temperature is complied with its threshold for about 95% of all numerical representative climate sensitivities in 2100. However, expected regional precipitation risk would increase at least in four regions compared to mitigation- only portfolio.

### Biography

Elnaz Roshan is a Doctoral candidate in Economics at University of Hamburg and at International Max Planck Research School in Earth System Modeling. She started her PhD in August 2014 and this work is a part of her Doctoral research.

elnaz.roshan@uni-hamburg.de

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## Decarbonizing the global economy-An integrated assessment of low carbon emission scenarios

Mohammad Mohammadi Khabbazan  
University of Hamburg, Germany

Given damages from climate change are highly uncertain and have the potential to be catastrophic; the precautionary principle provides a strong incentive to policymakers for mitigating of and adapting to climate change. In 2015 the Conference of the Parties (COP 21) agreed on pursuing efforts to limit the temperature increase to 1.5°C above preindustrial levels while finding no consent on decarbonizing the global economy and instead, the final agreement called for enhanced scientific investigation of "low carbon emission scenarios." While many studies focus on carbon concentration, targeting low carbon emission can be considered as one innovation of this paper, which is also more in line with recent climate policy proposals. We employ a cost-effectiveness analysis using the coupled climate-energy-economy integrated assessment model of investment and endogenous technological Development (MIND), which consists of a one-box climate module with ocean heat uptake, a stylized energy sector module and a Ramsey-type economic growth module. To better capture ocean sink, we extended MIND's climate module to the two-box version by the Dynamic Integrated model of Climate and the Economy (DICE). Our results indicate recent climate policy proposals might not comply with the 1.5° C target, and even achieving the 2°C target is prohibitively expensive. Specifically, we find decarbonizing the global economy by 2080 seems to become feasible at a cost of 0.59 percent in terms of Balanced Growth Equivalents, if the investments in renewable energy production peak at more than 2 percent of global gross domestic product in 2040 and decline thereafter.

### Biography

Mohammad Mohammadi Khabbazan is Associate Researcher and Scientific Programmer at Center for Earth System Research and Sustainability (CEN), Cluster of Excellence (CliSAP), at University of Hamburg. He acquired his PhD in Economics from Tarbiat Modares University (Tehran) in 2015 and wrote his thesis on "The economic effects of sanctions on Iran's Economy". His main research interests focus on Political Economics, International and Trade Economics, Economics of Climate Change, Natural Resource and Energy Economics, Integrated Assessment Modeling, General Equilibrium Theory and Agent-Based Modeling.

sascha.hokamp@uni-hamburg.de

### Notes:

World Conference on

# Climate Change

October 24-26, 2016 Valencia, Spain

## China's participation in climate change negotiation

**Chime Youdon**

Jawaharlal Nehru University, India

For China, the environment was a neglected issue for a long time while emissions continued to rise because of its rapid industrialization and urbanization. A modest shift has taken place in Beijing's approach to environmental governance. China had moved from a state of ignorance and denial about the possibility of global climate change to a situation where the Chinese leadership recognises its growing importance. In reality, China is already the world's largest Green House Gas emitter. China's environmental problems are mounting. Water pollution and scarcity are burdening the economy. Rising levels of air pollution are endangering the health of millions of Chinese. As China's pollution increases, so do the risks to its economy, health, stability and international reputation. While, China argued that since developed countries polluted the atmosphere as they become wealthy, so they ought to reduce their emission before they expect China to do so. In a way, China does not want to bind GHG emission targets until China becomes a wealthy and developed nation. However, under a plan submitted to the UN ahead of crucial climate change talks in Paris November 2015, China aimed to cut its greenhouse gas emission per unit of gross domestic product (GDP) by 60-65 percent from 2005 levels. However, the core question is: will China make a commitment to the reduction targets set at COP21? The total aggregate size of China and its growing assimilation with the rest of the world mean that what it does or does not do in the environmental sphere will increasingly impact the world. Thus, climate diplomacy has become an essential component of Chinese foreign policy with its growing ambition to become a major world power. Above all, the response to the existential threat posed by a global warming was subdued by the priority given to economic growth. The politics of climate change becomes no more than a means to the end of economic development and growth. In this backdrop, this research seeks to analyze the role and performance of China in climate change negotiations.

### Biography

Chime Youdon is a PhD candidate in Centre for European Studies, Jawaharlal Nehru University. She is currently working on her PhD thesis titled "The European Union and China in Climate Change Negotiations: From Copenhagen (2009) to Paris (2015)". She has completed her MPhil dissertation, titled "The EU-China Strategic Partnership: Arms Embargo and Human Rights". She has participated in many national and international conferences. Her areas of research interest are climate change, foreign policy, gender issues, human rights and the EU and China Strategic Interest and Tibet and China-related issues.

cheesdron@gmail.com

### Notes: