4th World Congress on

Climate Change and Global Warming

August 06-07, 2018 Osaka, Japan

Special Session

Day 1

Vladimir Babeshko et al., J Earth Sci Clim Change 2018, Volume 9
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Block element method and its application in seismology

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A new mathematical method based on high-level mathematics called the block element method was developed. The method is applicable to boundary value problems for partial differential equations and their systems. The method includes a number of other mathematical approaches and has numerous applications in various fields. Thanks to this method, it was possible to investigate and solve a number of problems that could not be solved by other methods. The method, despite numerous applications, is in the development stage and penetrates into an increasing number of scientific problems. The advantage of the method is the representation of solutions of boundary problems in analytical form, in the form of integrals, which makes it possible to identify those properties of solutions that are not visible when applying traditional numerical methods. The applications of this method in seismology are given for the different examples of the lithospheric plates. Comparisons of the theoretical results with the consequence of real earthquakes are given.

Biography

Vladimir Babeshko has completed his PhD (Doctor of Mechanics) from Russian Academy of Sciences, Russia. He is a Chief of Scientific-Research Center for Forecasting and Preventing Geoecological and Technologenic Disasters, Kuban State University and Southern Research Center, Russian Academy of Sciences. He has 20 patents, published 7 monographs and more than 450 papers in reputed journals to his credit.

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Scientific Tracks & Abstracts

Day 1

Mukhtar Yusubovich Bekkiev, J Earth Sci Clim Change 2018, Volume 9
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Degradation of glaciation of the slopes of Mount Elbrus due to climate change

Mukhtar Yusubovich Bekkiev
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The major node of the glaciation of the Caucasus Mountains - Elbrus (5642 m) in Russia continues to be explored in terms of global climate change. According to the results of such works, the dynamics of the change in the Elbrus glaciers at the end of the 20th and the beginning of the 21st centuries is given. The Figure-1 shows how glaciers have degraded over the period 1957-2015. The data are obtained as a result of comparison of aerial photographs since 1957 and space images of Canopus-B1, Pleiades, GeoEye of different years. The process of degradation of Elbrus glaciation proceeds unevenly in time and space. In the 20th century, periods of retreat and increase of glaciers have been replaced several times. The glaciers of the northeastern foothills of Elbrus considerably decreased in size. The total decrease in the area of glaciers during this time was almost 15%, the position of the snow line on the glaciers changed drastically. When the Elbrus glaciers recede, the directions of the glacial water flow change and new glacial lakes form, the relief changes and the more frequent dangerous hydro meteorological phenomena become more pronounced. Based on the data of weather stations, data are given on the temperature change and some other climatic parameters.

Biography

Mukhtar Yusubovich Bekkiev has worked for a long time at universities and was the Head of the Faculty of Environmental Engineering. He is an expert on the safety of structures. For several years he has been the Director of a High-Mountain Geophysical Institute, Russia. His area of scientific interests is in geography, mechanics, safety of natural objects and structures under various force impacts.

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Suree Chooprateep et al., J Earth Sci Clim Change 2018, Volume 9
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Patterns of daily average US temperatures over the period 1975-2016

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In this study, various statistical methods were used to analyze models of climatic variations of air surface temperatures in daily average temperatures in the USA from 1975 to 2016. Average daily temperature data was obtained from the US National Oceanic and Atmospheric Administration (NOAA). The temperatures collected from 115 stations in USA, over a period of 42 years were analyzed to account the temperature variability. Temperature data recorded on the leap years were omitted in order to maintain equal observations for each year. To reduce the serial correlation between daily temperatures for each station, the 5-day average temperature was compute and used in this study. For each station, the first model was fit for year and 5-day average temperatures and the fitted models were displayed as the seasonal patterns. Next, factor analysis was applied to account for spatial correlations and also to consolidate all stations into five regions, specifically West, North East, East, South and South West regions. The classification from factor analysis can be explained 66.6% of the total variance. For each region, the second model was fit for year and month variables and this model contains the year and month effects only. For five regions, the average temperature in each month of year and annual temperature were estimated with 95% confidence interval. The temperature patterns for all regions can be showed in the same graph. For each month of year the estimated minimum temperatures in January were different among the regions. The temperature increased sharply from February to July, then decreased from August to December. For the annual trend, the highest temperature was in the south region and the lowest temperature was in the northeast region.

Biography

Suree Chooprateep has her expertise in Applied Statistics. She has experience in research and teaching applied statistics, time series analysis, statistical methods and statistical analysis of data at the Department of Statistics, Chiang Mai University, Thailand. Her most recent research involves modeling of temperatures, such as temperatures in Southeast Asia, sea surface temperatures of the North Atlantic Ocean and solar absorption by clouds in Australia. She continues to do research related to modeling of temperatures in the United States and rainfall patterns in Thailand.

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Young Researchers Forum

Day 1

Pan Mengting et al., J Earth Sci Clim Change 2018, Volume 9
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Evaluation and superensemble forecasting for decadal predictions of sea surface temperature

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Using decadal prediction experiments from BCC-CSM1.1, GFDL-CM2.1, MPI-ESM-LR, FOAM-EAKF and FOAM-NUDGING initialized every year from 1960-2004, we evaluate the prediction skill of sea surface temperature over the North Pacific and North Atlantic. The evaluation results show that the prediction skill in the Atlantic is substantially higher than in the pacific. The poor skill in the North Pacific is caused mainly by the failure to predict the warm events in the 1960s and the climate shift in the mid 1975s at the leads of 2-5 years and 6-9 years. In terms of Anomaly Correlation Coefficient (ACC), the Coupled Global Climate Models (CGCMs) has a better prediction skill than the persistence in the North Pacific for forecast leads greater than 6 year, albeit not significant at the 10% level. In the Atlantic, the Multi-Model Ensemble mean (MME) of Atlantic Multi-decadal Variability (AMV) resembles closely the observation and shows a climate shift from the cold to warm years around 1990. The multi-model Superensemble (SUP) forecast is compared with the MME and individual models for the average of forecast leads 2-5 year. It is found that the prediction skill of SUP is significantly higher than the best single model but only slightly higher than the MME for the 30-year running period during the forecast period 1990-2004.

Biography

Pan Mengting is a Doctoral candidate majored in Meteorology from Nanjing University of Information Science and Technology, China. She has made some researches on the evaluation and improvement of decadal predictions based on CMIP5 models. In recent years, She has participated in many projects focusing on ensemble forecast.

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Fatemeh Askarinejad et al., J Earth Sci Clim Change 2018, Volume 9
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Study on natural leaf packaging: Developing date packaging design with palm leaf

Fatemeh Askarinejad, Mostafa Moradi and Rozita Farzam
University of Tehran, Iran

Nature has a lot of hidden potentials, especially in the direction of packaging for perishables and goods. Natural material for packaging is a topic that has been around since the dawn of civilizations, especially in the Iranian tradition. The advantages of using natural leaf packaging are the antibacterial effect of that on foods and keeping them fresh. As Iran has a great date harvest from palm trees, providing suitable packaging for dates has a positive effect on encouraging people to use this product daily. Packaging for dates has different design in the market. But there is no serious usage and design with natural material and for dates with palm leaf. The surveys got done through local observation and ethnographical research. Locals in south of Iran weave baskets with palm leaves to keep dates for their annual usage, these baskets have simple design, through interviews we realized that local people believe this kind of baskets keep dates fresh comparing to plastic or paper-based materials. In this research we have a closer look to advantages of using traditional ways of wrapping dates with palm leaf and in general using natural leaf for food packaging. Advantages of that are positive impression of natural material on consumer food preferences, job opportunities for local people, keeping traditional designs updated and introducing sustainable packaging to the market and users more and more. The methodology used in this study is based on ethnographical research and analysis. The main goal of this project is to introduce the potential of using natural material as packaging.

Biography

Fatemeh Askarinejad is pursuing her Master's course in Industrial Design from Tehran University. Her enthusiasm mainly shaped in ethnographical research, design for user behavior and sustainability to explore the exact need of people and providing them a better life.

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Notes:

Ojetunde A Ojewola et al., J Earth Sci Clim Change 2018, Volume 9
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A qualitative approach to climate change resilience: Park manager's perceptions in the Midwestern United States

Ojetunde A Ojewola, Mark Morgan and Sonja Wilhelm Stanis
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Climate change associated with parks and protected areas can affect visitor experiences, management priorities and legislative requests for disaster relief funds. Impacts are unequal in geographic distribution and so are the perceptions of those who live in different regions of the country. People have a tendency to be climate change deniers in areas where this phenomenon is less obvious, which could affect how they respond to its mitigation and adaptation. Some factors that often influences one's perception of climate change include personal experience with climate related environmental impacts and observable changes in the environment such as biodiversity loss, habitat degradation and more invasive species. Using a deductive approach focused on community resilience framework, qualitative interviews were conducted with eleven district managers to examine their perceptions of climate change impacts in Missouri State Parks and historic sites. An implication of this study focuses on vulnerability, resilience and adaptation strategies. This research is part of a larger effort to understand climate change in the Midwestern US, an area plagued by drought and flooding, prolonged heat waves, reduced air quality and new disease ecologies. Although the social construction of climate change by every park managers differs especially based on its causation and occurrence, every manager agrees that climate impacts are evident over time. Flooding is the most reoccurring identified stressor. Each of the stressor is often characterized by one or more dimensions, severity, frequency, predictability, duration and distribution. To build a more resilient system, identifying pre-existing vulnerabilities to reduce risk, strengthening adaptive capacities through monitoring, partnering with relevant agencies, team work in the system and including place based climate change communication are paramount. This study provides helpful insights to understand perceptions of resilience in park settings which are important determinants of environmental decision making behavior, policy formation and communication with relevant stakeholders such as park visitors.

Biography

Ojetunde A Ojewola is currently pursuing Doctoral degree at the University of Missouri majoring in Human Dimensions of Natural Resources. His research interest is in understanding how social and natural sciences can be integrated to improve resource management. Presently, he is working with a team of researchers who are studying vulnerability and resilience of Missouri State Parks to climate change.

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Notes:

Ly Baila et al., J Earth Sci Clim Change 2018, Volume 9
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What is the outcome for marine turtle conservation face to climate change? Could the danger be avoided?

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Climate change has become the cross-cutting issue, the challenge to conservation activities. This research has been done for several years on the conservation of marine ecosystems, especially with sea turtles as an emblematic species. Today the activities of conservation on the beaches are hindered by the disappearance of certain beaches. This research has shown the results of monitoring activities of nesting sea turtles over 10 years from 2000 to 2010. Comparison of work done from 2011 to 2016 affected by the disappearance of beaches due to the rise of the oceans has been done. In this research the results difficulties and solutions are discussed.

Biography

Ly Baila is currently a researcher in PROTOMAC, Gabon.

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Scientific Tracks & Abstracts

Day 2

Jae Gang Kim et al., J Earth Sci Clim Change 2018, Volume 9
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A study on carbon dioxide desorption in amino acid salt

Jae Gang Kim, Jin Sik Choi, Ju-Yeol Lee and Byung Hyun Park
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The indoor carbon dioxide concentration in the domestic liquor factory working environment is over 20,000 ppm. So, in order to maintain the indoor carbon dioxide standard value of 5,000 ppm or less, the outside air is introduced. A very large energy loss occurs in order to maintain the room temperature changed by the inflowed of outside air. In order to minimize energy loss and provide a pleasant work environment to the workers, we intend to secure indoor comfort while enhancing energy efficiency through the removal of carbon dioxide, which is a pollutant in the mainstream plant and indoor air circulation. In this study, the regeneration efficiency of the amino acid salt absorbent which can be applied to carbon dioxide absorption/regeneration process was confirmed. The regeneration efficiency has a great influence on the economical judgment of the process. So, continuous regeneration experiment was conducted to establish economical process. The amino acid salts used in the experiments are potassium L-lysinate and potassium L-alaninate. Each amino acid and Potassium Hydroxide (KOH) was mixed at a 1:2 molar ratio. In order to confirm the regeneration efficiency of the absorbent, carbon dioxide was absorbed in two materials and the carbon dioxide desorption experiment was carried out by heating. The initial reaction rate was L-alanine was faster. Over time, L-lysine, desorption higher concentrations of carbon dioxide. L-lysine showed higher regeneration efficiency than L-alanine, (L-alanine 47.26% and L-lysine 62.11%). As a result of the continuous regeneration experiment using the L-lysine having good absorption and regeneration efficiency, it was confirmed that the regeneration efficiency decreases as the number of regeneration increases.

Biography

Jae Gang Kim has his research in environment. He mainly conducts his research on air pollutant removal, carbon dioxide capture and utility and waste resources. He is conducting experiments on a new clean, reusable method that does not generate secondary pollutants.

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Chandan Surabhi Das, J Earth Sci Clim Change 2018, Volume 9
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Living with changing climate and encouraging climate resilient sustainable livelihoods in Sundarban, India

Chandan Surabhi Das
West Bengal Educational Services, India

Sundarban, the world's largest contiguous mangrove swamp and world heritage site faces several challenges due to climate change. Rising sea level forces islands to disappear and the increasing salinity in the water and soil has severely threatened the health of mangrove forests and agricultural crops. The present study includes last habited island (Gosaba block), surrounded by Sundarban reserve forest on three sides. Participatory Rural Appraisal (PRA) tool, such as Focus Group Discussion (FGD) was conducted during a period of March 2016 to April 2017 with village heads, panchayat members and members of the forest development committees to get the overview of the impact of the climate change on their livelihood, income, fishing practices as well as socio economic conditions including migration or climate refuges. Climate change is triggering a silent yet drastic livelihood change in the agricultural fields and water bodies of Gosaba. The study identified 14 primary occupations with consideration of both earning and time engagement, along with other two occupations as Secondary and Tertiary. Different occupants were made into four broad groups viz., Resource Dependent (RD), Wage Earner (WE), Self-Resilient (SR) and Government Servant (GS). Resource dependent shared 63.9% among others. A Relative Occupational Priority Index (ROPI) was developed, assessing the degree of strength among primary occupations. Fin fish, shell fish and crab (Af) scored 60.97 numbers, followed by agricultural activities (Aal) with 21.38 numbers. Livelihood Asset Status Tracking (LAST) method will be an attempt to measure the changes in five capital asset groups (social, financial, human, physical and natural assets) for suggesting climate resilient sustainable livelihood in the low-lying forest dependent coastal areas like Sundarban.

Biography

Chandan Surabhi Das is an Assistant Professor in West Bengal Educational Services (WBES) and currently in the Department of Geography, Barasat Government College, West Bengal, India. He has pursued his PhD from the Vidyasagar University, India. His research focuses on socioeconomic aspects of the human wildlife conflict in the protected areas of developing countries.

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Rozita Farzam, J Earth Sci Clim Change 2018, Volume 9
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Study of the relationship between natural light and green windows at traditional Iranian architecture

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Light is considered as the manifestation of God. A glance at Iranian traditional architecture with around six thousand years of history shows the richness of this architecture in many aspects of design including the way it provides natural light for the building. In traditional architecture, people showed great respect to nature and nature had a major effect on shaping of their buildings, especially in terms of climate and attention to the four elements (sun, water, wind, earth) so that Iranians had a great respect for the sunlight since long ago. Before and after Islam, Iranian architecture was spiritual and inspired by light. Light is the symbol of God and a sign of spiritual and holy places, so that in Iran's Islamic architecture is expanded to a great and beautiful extent, inside the places and gives a spiritual atmosphere to the heavy spaces. The aim of this paper is to discover the secrets of light in architecture in Iran. From all Iranian places including castles, bathrooms, passageways, bazaars and gardens, three types i.e. mosques, houses and schools were chosen as case studies. The methodology of this paper is research developing. After survey of several windows in traditional light in Iran, role of daylight in Iranian traditional architecture in 1500-year historical period was finally evaluated; the result of the researches will be presented in two parts. Firstly, light is lexically defined and its status in Iranian culture in two historical periods of before and after Islam is examined; classification of historical age in Iran and the way light is used in each period. In the second part we review the light usage and classification of historical monuments such as; mosque, house and school. The philosophy of light in Iran in the pre and post-Islamic periods affected the window's shape and led to the creation of 20 different kinds of windows with the functions of lighting. As conclusion should say, In Iranian mosques, light didn't enter the main courtyard directly for the following reasons: (1) Giving more spirituality to the mosque; (2) Controlling glare in mosques; (3) Creating a peaceful environment; (4) Climatic functions and controlling the heat (especially in warm dry climates); (5) Function of beauty and play of light in a variety of ways. In Iranian houses, in addition to playing and breaking the light, it is tried to create a beautiful interior by mixing the daylight and colored glasses. Light enters traditional Iranian houses in four patterns from view point of comfortable. In Iranian traditional architecture, daylight was given more importance with an attempt to enter daylight delicately into the building. Unfortunately, we do not see this today. In modern Iranian architecture, it is better to pay more attention to light in different places especially educational ones and suggest suitable guidelines for tackling glare in educational places. Even today with the help of new construction material and all different technological devices, our present buildings are very expensive to build and costly to maintain.

Biography

Rozita Farzam has been graduated in the Industrial Design from the University of Art in Tehran and has completed her Master and PhD from the University of Kobe Design, Japan. She is leading the design of Gensai products in Iran, which is also in partnership with the SDAFST Association in Japan. Her field of work is in product design, interactive design and creativity in packaging design and lighting. She has a membership in scientific and executive teams and judges at national and international conferences and competitions and has numerous articles in the field of design and environment in her scientific work, as well as a collaboration with packaging companies in Japan and she is teaching at the Design College Japan, as well as joint Iranian and Japanese workshops on lighting, packaging, origami and Gensai design to promote Japan's rich culture among Iranian students and to collaborate on collaborative research projects with Japanese universities.

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A study on climate change solutions: From first earth summit to Paris meet

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For the better future of our children it is necessary to take a strong and solid step to tackle the climate change afflictions. The Stockholm conference on human environment in 1972 would have been a challenging task for scientists, climatologist and environmentalist. But that beginning resulted in sustainable development of mankind in various sectors of environment i.e. urban environment, rural environment, industrial environment, agricultural environment, population environment, transport and trade environment, tourism environment and technological environment. And currently in 2018 after Paris meet of Dec. 2015, it still is a challenging task to find solutions, because every nation is coming forward for its economic growth and technological development. The aim of the study is to evaluate all summits and conferences held on the world platform. During these summits, world economists, leaders and environmentalists discussed on reduction of emission of CO_2 to cut the use of coal energy for producing electricity as in the Paris meet in 2015. According to data presented by CSE at the India pavilion in Paris meet, there is a rich poor divide over carbon space. As per IPCC estimates carbon space of 2,900 Gt. (giga-tonnes) should stay below 2 degree Celsius mark. World will emit another 748.2 Gt of CO_2 by 2030. World has already emitted 1,900 Gt of CO_2 between 1850-2001, mostly by burning coal for energy. India is the biggest emitter after China, U S and E U but its rank is 120th in terms of per capita emission. With 17% of world population, India accounts for only 4.49% of the world electricity consumption and 4.6% of the world's energy consumption. Even in 2030 India will be far behind rich nations and China in terms of per capita emission. The author is emphasizing that there is a need to control on all fossil fuel and cut down the emission of greenhouse gases. While constructions of fly-overs continue to happen, the growth of number of cars on road should halt. Rich and developing countries should think about least consumption of fossil fuel and pay attention towards spirituality and less interest in physical comfort.

Biography

Shashi Bala Singh has been teaching Geography in graduate and postgraduate classes since 1998. She has been teaching Climatology as a subject in postgraduate classes since last 12 years. She has published 17 papers in international journals and edited books. Her research interest is in regional planning, rural development, population and demographic dividend. She has varied research interests and thus she was able to complete three projects of UGH and 1 of Council for Scientific and Industrial Research.

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Xiuli Liu et al., J Earth Sci Clim Change 2018, Volume 9
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Evaluating the impacts of waste treatment management modes on product price by sector in a macro economic system

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This paper established an Input-Occupancy-Output (IOO) table that was integrated with several alternative waste treatment management modes. Based on this table, a Ghosh price model was developed to evaluate the price changes in each sector compared with their traditional prices for the direct and indirect impacts of costs of waste treatment management modes. The model was applied to the waste water treatment case in China. In each waste treatment management mode, the price change of each sector was evaluated. The results revealed that different waste treatment management modes generate different ranks for the price changes by sector. There are 22 sectors whose prices increase are mainly caused by other sectors' added waste water treatment costs. An optimal combination of two waste treatment management modes for 42 sectors generates the minimum price increase for all sectors. The model can help to set reasonable price for each sector systematically when a waste treatment management mode is adopted.

Biography

Xiuli Liu is a Professor from Chinese Academy of Sciences and a Visiting Scholar of the University of Illinois at Urbana-Champaign in 2008 and 2012. Her research fields are mainly focused on input-output analysis linked with econometric model, water, energy, population management and sustainable development. She had published over 80 articles in national and international journals and 3 monographs (1 in English, 2 in Chinese) and co-edited 10 books. Over 50 international conference papers were authored by her, of which 5 were specially invited presentations. She has been Principal Investigator of 15 research projects and Co-PI of another 14 research projects. She is the Secretary Vice General, Executive Member of China Input-Output Association (2010-2019). She is also an Editor of *Frontiers in Environmental Science, Journal of Systems Science and Mathematical Sciences* (2014-2019) etc. and reviewers of many international and national journals.

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