



NEWSLETTER

Commission
on Climatology

N° 21

December 2021

Dear Friends and Colleagues,

The year of 2021 is coming to a close. The worldwide spread of COVID-19 has continued, and several pandemic waves repeatedly occurred everywhere in the world. Most international and domestic academic conferences have been replaced with conferences organized remotely on-line or on-site and on-line hybrid way. Our postponed 34th International Geographical Union Congress (IGC) in Istanbul, Turkey was organized remotely on-line. It was for the first time in our IGC history to be organized on-line. As shown on our website we will organize our 150-yr anniversary IGC in August in Paris, but it is still not sure how this meeting will be organized. We are accepting abstract submission for this conference, and we encourage all of you to submit your abstract, and join the congress even on-line.

Our university lives have also been continuously affected by COVID-19 infection. Lectures and seminars were forced on-line with students learning remotely in isolation. We also organized our Commission meetings on-line (see the 2020/2021 activity report, available also on-line). This year, the great progress was made in the 26th United Nations Conference of Parties (COP26) in Glasgow to force all the countries to reduce carbon emission. However, carbon emission is not the only factor of climate change. Our role to understand our global as well as regional climate has been more and more important.

Our commission structure changed this year. At the Istanbul Congress, I took over my chair role to Dr. Agnieszka Wypych. I hope we will continue our effort to expand our commission activities under her leadership.

Finally, I wish you all the best for the New Year, stay safe, and I hope all of your research efforts will be productive.

Best Regards,

Jun Matsumoto
(Former Chair of the Commission on Climatology)

Dear Friends and Colleagues,

Thank you for giving me your trust. I feel honored that I can continue the work of my outstanding predecessors. I wish to express special thanks to Prof. Jun Matsumoto, the former Chair of the Commission, for his commitment and all his efforts designed to make the Commission's work effective. Despite a number of contemporary difficulties the Commission is active and I do hope that we will be able to actively promote good practices in climatology and geography.

Climate issues, always important, become crucial nowadays. I am sure that working together within a framework of the Commission on Climatology IGU we can bring them forward keeping high standards of interdisciplinary research. Let's start with already proposed common publication with a still draft title: *Climate change and variability: Geographical dimensions regarding risks, mitigation and adaptation.*

Wishing us a fruitful cooperation,

Agnieszka Wypych
(Chair of the Commission on Climatology)

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1. MEMBERSHIP OF THE CoC STEERING COMMITTEE

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SENIOR MEMBERS:

R. Brazdil (Czech Republic), T. Mikami (Japan), N. Tapper (Australia), R. S. Pulwarty (USA), Alain A. Viau (Canada)

2. THE MEMORIAL TRIBUTE FOR PROFESSOR R.B SINGH

An accolade to our beloved mentor: Prof. R. B. Singh
(b. 3 February 1955 ~ d. 22 July 2021)



“There is gap between academician, policy makers and policy implementing organisations. Successful implementation of any policy across landscape requires bridging this gap in a harmonised manner”.

Prof. R.B Singh
Former Secretary General,
International Geographical Union (IGU)

by Pankaj Kumar¹

Professor Ram Babu Singh (Prof. R.B Singh, popularly known among well-wishers as RB) was a distinguished geographer of national and international repute. Prof. Singh was born on 3rd February 1955 at village Majhanpura, district Saran situated on the left bank of river Ghaghara in the state Bihar of India. He was a prolific researcher, dedicated academician, popular teacher, writer, respected scholar, great speaker and an able administrator. His simple life, generous outlook, humble and down to earth behaviour with excellent senses of humour distinct him as great human being as well.

Education

Prof. Singh completed his primary and secondary education from his home district. He earned his Bachelor (1975), Master Degree (1977) and PhD Degree (1981) from one of the prestigious institutes of India, Banaras Hindu University (BHU) and also completed diploma course in Statistics from BHU in 1979 in the able guidance and guardianship of brother Prof. Rana P.B Singh, former Professor & Head, Department of Geography, Institute of Science, Banaras Hindu University, Varanasi. In the length of 37 years of his professional career he served as CSIR Pool Officer (1983-1985) and Lecturer (1985-88) at BHU, UGC

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Assistant Secretary General, International Geographical Union (IGU)

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Research Scientist-B/Reader (1988-1996), UGC Research Scientist- C/Professor (1996-2002) and Professor (2002-2020) at Department of Geography, Delhi School of Economics, University of Delhi, Delhi and retired as Head and Professor on 29th February, 2020.

National and International Assignments

Prof. Ram Babu Singh had dual distinction of holding positions of the Secretary General and Treasure of IGU and International Science Council (ISC) earlier known as ICSU prestigious scientific committee –Health and Wellbeing in changing Urban Environment System Analysis for 2019-22. He was also elected Vice president of IGU (2012-16 and 2016-18) and was first Indian to be bearing double distinction as IGU Vice President and Scientific Committee member at International Science Council Geo Union Committee (IGSU). At International forum he held several prestigious responsibilities as chair ISC-CODATA-PASTED, member Earth System Governance and IAP-Global Network of Science Academics representative on Disaster Risk Reduction since 2020. He was member of IGU Commission on Land use and Land cover (2000-08) and Mountain Geoecology and Resource Management (1988-92). He also served Vice Chair in Commission on Biogeography and Biodiversity (2008-12). From 2019-2020 Prof. Singh was elected President of Earth System Science Section of Indian Science Congress Association.

Prof. RB Singh was an expert in prestigious Committees of the Government of India which are working in the field of climate namely Ministry of Environment, Forest and Climate Change (MoEFCC), Department of Science and Technology (DST) Gol. He was Chair, taskforce of Landslide Awareness in NDMA (National Disaster Management Authority), Government of India (2019-20) and held important position in CSIR (Center for Scientific and Industrial Research), Gol. He was member, Niti Ayog, Gol in preparing Vision India: 2025, member UGC in preparing National Learning Outcome Based Curriculum Framework (2018) and member NCERT Social Science Education to contribute in National Education Policy (2020).

Publications

Through his relentless contribution in research and academics he has 16 books, 40 edited research volumes: Springer, oxford and IBH, Concept and Rawat and above 260 research papers to his credit. Prof. Singh was Editor of Springer Nature Series - Advances in Geographical and Environmental Sciences, 2014-2021 and published around 25 volumes. His publications have featured in reputed international journals such as Climate, Climate Dynamics, Remote Sensing, Theoretical and Applied Climatology, Physical Geography, Environmental Science and Policy, Ecosystem and Environment, Mountain Research and Development, Journal of Mountain Science, Frontiers in Environmental Science, Advances in Earth Science, Advances in Limnology, European JI. of Geography, Asian Geographer, Environmental Economics, Cities and Health, Tourism Recreation Research etc. He was Special Guest Editor of the journals like Sustainability, Advances in Meteorology, Physics and Chemistry of the Earth. He was on the Editorial Committee of JI. of Mountain Science.

His significant contribution in research and to the subject 'geography' in India in a decisive way has brought him recognition not only in India but from across the globe. He was awarded the Japan Society of Promotion of Sciences (JSPS) fellowship at Hiroshima in 2013. The United Nation (UN) invited him as moderator on January 2016 of a working group on Exposure and Vulnerability at UNISDR on Sendai Framework of Disaster Risk Reduction, 2015-2030, Geneva. In 1988, the UNESCO/ISSC (Paris) awarded Research and Study Grant Award in Social and Human Sciences. He was also the founding member of 'Centre for Himalayan Studies' in 2020 at University of Delhi where his expertise and exposure would have helped diffusion of geographical research in India.

Prof. Singh insisted and inspired to work on contemporary and multidisciplinary themes believing in proverb "Geography is what geographers can do". Prof. Singh advanced concept of 'Sixth Industry' (Primary (01) + Secondary (02) + Tertiary (03) = 06) to promote livelihood security in rural India. His research work can be summed up in eleven sub fields of geography which majorly fall under Environmental Studies, Climate Change, Urban Studies, Mountain Geography, Disaster Management,

Remote Sensing and GIS, Health and Wellbeing. His affinity towards climate investigative study was because of his close association with nature and natural environment in his formative years. The lush environment of village ecology around him influenced his studies and research orientation towards this direction. His research areas in climate studies can be classified in different categories such as Climatic Change, Climatic Variability, Monsoon, Air Pollution, Urban Environment and Urban Heat Island.

Prof. R. B Singh was a vehement supporter of use of big data, open data, open cloud computing platforms and open source models and software in climate studies. His team extensively used open data sets such as Atmospheric Infrared Sounder (AIRS), Tropical Monsoon Measuring Mission (TRMM), Moderate Resolution Imaging Spectroradiometer (MODIS), CHIRPS and PERSIANN-CDR, Providing Regional Climates for Impacts Studies (PRECIS) data, Landsat series, SRTM DEM, India Meteorological Department (IMD) stations and grid data, APHRODITE, NASA POWER, Cordex and Giovanni data sets etc.

Authored Books

Prof. Singh authored three seminal books on Climate Variability, Climate Change and Livelihood. Roy and Singh, 2002 beautifully dwelled upon topics of critical issues in climate variability, most vulnerable area and sectors under mountain regions, nature of extreme events occurring through nature/human interactions and how agriculture and horticulture activities are being influenced by climate change. The book has also tried to look into mitigation policies and strategies being implemented in the region. Whole narrative of the book is to contribute towards India's efforts in fulfilling the goals of the Kyoto Protocol, IPCC and the U.N. Framework Convention on Climate Change (UNFCCC). Kumar and Singh, 3003 titled Urban Development & Anthropogenic Climate Change; Experience in Indian Metropolitan Cities focuses on urban development, atmospheric quality, air pollution and urban effects on climatic parameters in selected metropolitan cities of India. The book combines an academic understanding with an empirical approach to look the problems together with policy perspectives in the Indian metropolitan cities. Singh and Singh, 2021 identified and provided reasoning for computed methods of local climate dynamics and the livelihood vulnerability indices assessment in the mountainous region of Himachal Pradesh, India. The outcomes of this study agree with the focused objectives on simulating climate change and its impact on livelihood security. It deals with several crucial methodologies to analyze livelihood security with and without climate change. The explorative deductive approach was used to observe climatic changes since the 1970s and simulated the climate until 2080. Additionally, the composite livelihood vulnerability index (LVI) without climate change and the climate change livelihood vulnerability index (CCLVI) with climate change impact were prepared.

Springer Series Edited Volumes

Professor R.B Singh published several edited volumes on climate change keeping in center man and nature relationship. The topics of the Springer volumes, Climate Change and Biodiversity, Environmental Geography of South Asia, Climate Change, Glacier Response and Vegetation Dynamics in the Himalaya, Climate Change, Extreme Events and Disaster Risk Reduction, Simulating Climate Change and Livelihood Security are self explanatory to understand that he always preferred to look climate in relation to some or the other societal challenges such as biodiversity loss, disasters and livelihood.

Research Papers

Professor Singh always propounded a narrative that science and social science are complementary to each other. His perspective was to integrate analysis and findings of climate parameters with social components such as land use, agriculture, water availability, health, disasters and livelihoods. Prof. Singh travelled extensively in the Himalayan Mountain in India under the aegis of CIDA-SICI Partnership Project-I & II Sustainable Development of Mountain Environment in India and Canada and Urban Development and Environmental Impacts in Mountain Context, University of Delhi & University of Manitoba, Canada (1994-1997 & 1998-2002). The CIDA-SICI project oriented his research focus to mountain and urban

environment. Professor Bruno Messerli's work on highland-lowland linkages was always guiding element for his research scholars.

Prof. R.B. Singh believed in a vision of 'Future Earth' which is inclusive, equitable, ethical, healthier, happier, prosperous, sustainable, and eco-friendly. He with his research student Mansi Janmajaya did extensive research revolving around monsoon, aerosols, greenhouse gases, surface and atmospheric temperature and clouds, studied various climatic processes, their variability over time and space and association with various human processes.

Professor Singh established a weather station in the premise of Department of Geography, University of Delhi with the vision to develop climate data sharing platform. He always encouraged students to use state of the art research tools and techniques. Janmajaya, M et al., 2018 in her work "Detection of temperature variability and trends in the lower troposphere over Delhi: A study of joint influence of ENSO and Landuse/ Land cover during 1980–2015" used radiosonde observations for temperature over a period of 35 years to study the influence of atmospheric oscillations and geophysical events like El Niño-Southern Oscillation (ENSO) on tropospheric temperature variability over Delhi. They also examined the inter-annual variation in surface temperature and its relationship with land use changes and land cover changes (LULCC). Singh, R.B et al., 2015 "Study on the association of greenhouse gas (CO₂) with monsoon rainfall using AIRS and TRMM satellite observations", studied the effect of atmospheric CO₂ on the monsoon rainfall over the Indian-Indonesian region (8–30°N, 65–100°E). Prof. Singh was very popular for his insight as regular columnist for national newspapers. His writings always revolve around climate change, SDGs, disaster preparedness and mitigation, health and well being and livelihood security.

Few studies on rainfall trends such as Singh and Mal, 2014; Mal et al., 2022 reveals century long rainfall trends in Uttarakhand, Central Himalayas, India based on the station data obtained from India meteorological department (IMD) which clearly indicates decline in rainfall, which is more pronounced after 1960s. These rainfall trends corroborates well with a large-scale phenomenon, i.e. southern Oscillation Index (SOI). Banerjee et al., 2020 based on gridded precipitation data (CHIRPS and PERSIANN-CDR) in the Bilangana basin, Uttarakhand, reveals an overall decline in the rainfall since the 1980s across all seasons, which are more pronounced in the last decades. Singh, R.B., Singh, S., and Sengupta, S. 2016 have examined and analyzed the past 43 years temperature and precipitation trend since 1970 and found out that the exchanges between airflow and temperature across the hills, plains, and monsoon may significantly lead to variations in the microclimate. The mean monthly maximum and minimum temperature and precipitation together with annual minima and maxima for the period 1970–2013 have been calculated where the differential decadal and annual trend exhibits inconsistent signals of cooling in the high-altitude northeastern block in the district as compared to other parts in the region. Thakur and Singh, 2014 published study on climate variability in the foothills of Indian Central Himalayan Region. Based on instrumental records for climate data for a period between 1950-2009, the study documented increase in Diurnal Temperature Range (DTR) in recent 30 years along with reduction in average rainfall of rainiest month. The foothills region represented by Dehradun, Kotdwara and Roorkee showed significant trend whereas no such trend was found in Mussoorie. The impending threat due to changing climate has accentuated the vulnerability of all ecosystems. The study on Bageshwar station of Pindari Glacier reveals that annual temperature has substantially increased by around 1°C from 1901 to 2010 while there is no significant change in rainfall. The main trunk of the Pindari Glacier has been in a continuous state of recession during the past century (Singh, et al., 2016). Singh and Kumar, 2014 in his research paper titled Climate Change and Glacial Lake Outburst Floods in Himachal Himalaya, India deals with relationship between climate change and glacial lake outburst. Temperature and data of Bhuntar, Manali, Dharamsala and Mandi for the period 1977-2007 shows an increase in mean minimum temperature. A total 65 glacial lakes have been identified in the region. Prof. Singh contributed frequently to national and international electronic media as panellist on various issues of climate variability, climate change and its impact on livelihoods.

Some studies analysed the teleconnection of different regions with climate indices. Sahu et al., 2020 investigated the associated major Indo-Pacific climate indices with rice production and analysis revealed

a negative (positive) correlation of rice productivity with the Niño 3 and Ocean Niño Index (Southern Oscillation Index). Panda et al., 2019 evaluates the potential impact of climate variation on agricultural in Odisha and found that in comparison to many indices, Monsoon Index has a determining impact on crop yield. Sahu et al., 2014 examined the extreme discharge events of the Paranaíba River basin during the austral summer season (December–February, DJF) and revealed the clear connection between the modified Walker circulation. Sahu et al., 2016 analysed the probabilistic forecasts of Citarum River streamflow using the general circulation model (GCM) output, for the September– November (SON) season and demonstrated promising ability to forecast below/above normal streamflow for the Citarum River flow during the SON season. Sahu et al., 2013 examined the impact of land use to the streamflow at the Fazenda Santa Maria gauge stations. It is asserted that La Niña phase is important component to understand and predict the streamflow variations in the Paranaíba River basin. Apart from climate variations the anthropogenic and land use changes also influence streamflow variations. Sahu et al., 2011 shows the underlying mechanisms that cause variation in the seasonal streamflow of the Citarum River at the Nanjung gauge station. Results showed that the down most outlet of the upper catchment, shows a strong correlation with the Indian Ocean Dipole (IOD) and the El Niño /Southern Oscillation (ENSO) events. Besides that, Mani et al., 2021 examined human health vulnerabilities in Odisha and found that the factors such as meteorological conditions, vulnerable population and infrastructure, educational and health care capacity had a significant impact on the vulnerability of the population.

Professor R.B. Singh, till last breath, was Secretary General and Treasurer, International Geographical Union (IGU), the Chair, Research Council, CSIR-Central Food Technological Research Institute, Mysore; Member-Research Council- CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow; Member of International Science Council (earlier ICSU) Scientific Committee-Health and Wellbeing in Changing Urban Environment-System Analysis Approach since 2016. He was playing lead role in preparation of Definitional Dictionary of Climatology in Hindi for the Commission for Scientific and Technical Terminology of the Ministry of Education, Government of India.

Unfortunately, we lost Prof. R.B. Singh ‘the icon of Indian Geography’ on 22nd July, 2021. Prof. R.B Singh a visionary architect of modern geography, worked tirelessly day and night for the realisation of United Nation’s IPCC Climate assessment, Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR) and Future Earth initiatives of International Science Council (ISC), would always be remembered for his wisdom, scholarship and dedication in the expansion of geography as a science in India and abroad. A humble tribute to a visionary and legendary geographer who has left a legacy to carry forward.

General References:

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Professor R.B. Singh Publications related to Climate Science can be found in the Source: Singh 2021, pp. 177-179).

3. CONFERENCE REPORT: THE 34TH IGC IN ISTANBUL, TURKEY

The 34th International Geography Congress was held on-line between 16-20 August 2021, in Istanbul, Turkey. At the 34th International Geography Congress, 4 sessions were held in 6 slots proposed by the Commission on Climatology. They are “Climate variability and change from global to local scales”, “Hydroclimatic extreme events: risks, vulnerabilities and management”, “Mediterranean climate”, and “Urban climate” sessions. A total of 15 presentations were made as follows.

16 August 2021 Slot 3: Climate variability and change from global to local scales

Chair: Zahide ACAR

3517 - Variations in the geomagnetic field and critical frequency of the F2-layer in the range of quasi-16-day planetary wave by Svetlana Riabova - Sadovsky Institute of Geosphere Dynamics of Russian Academy of Sciences, Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences, Sergei Shalimov - Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences

3363 - Analysis of maximum and minimum temperatures in Turkey's Ege coastal region by Barbaros Gönençgil - İstanbul University Faculty of Letter, Sevilcan Dün - İstanbul University Social Sciences Institute

16 August 2021 Slot 4: Climate variability and change from global to local scales

Chair: Babatunde ABIODUN

Summary of the Session

The session was very interactive and interesting. The three oral presentations planned for the session took place. All the presenters gave live presentations instead of recorded presentation. The first presentation (3244) was given by Agnieszka Wypych (Poland), who spoke on the spatial and temporal variation of the growing season in the central Europe in response to contemporary climate changes. The second presentation (2164) was given by Yoshihiro Iijima (Japan). He discussed the characteristics of summer precipitation in the North-eastern Eurasia and showed how the characteristics might change in the future. The third presentation (1591) was given by Jun Matsumoto (Japan), who talked on the synoptic climatology of the wet and dry conditions in the pre-summer monsoon season of the Philippines.

3244 - Spatial and temporal variability of the growing season in central Europe in response to contemporary climate changes by Agnieszka Wypych - Jagiellonian University, Zbigniew Ustrnul - Institute of Meteorology and Water Management - National Research Institute, Poland, Michal Marosz - Institute of Meteorology and Water Management - National Research Institute, Poland

2164 - Summer precipitation characteristics and its possible future changes in north-eastern Eurasia by Yoshihiro Iijima - Mie University, Kensuke Komatsu - Mie University, Kaoru Tachiiri - JAMSTEC, Kazuhito Ichii - Chiba University, Yasunori Kurosaki - Tottori University

1591 - Synoptic climatology of the wet and dry conditions in the pre-summer monsoon season of the Philippines by Jun Matsumoto - Tokyo Metropolitan University / JAMSTEC, Lyndon Mark Olaguera - Manila Observatory

17 August 2021 Slot 7: Hydroclimatic extreme events: risks, vulnerabilities and management

Chair: Zahide ACAR

2844 - Climate extreme and natural disasters in Chilean cities by Cristian Henriquez - Pontificia Universidad Católica de Chile, Hugo Romero - Pontificia Universidad Católica de Chile

3268 - Potential impacts of climate change on future droughts over major river basins in southern Arica by Babatunde Abiodun - University of Cape Town, Cape Town, South Africa, Nokwethaba Makhanya - University of Cape Town, Cape Town, South Africa, Brilliant Petja - Water Research Commission, Pretoria, South Africa, Abayomi Abatan - School of Geosciences, University of Edinburgh, Edinburgh, UK, Philip Oguntunde - University of Technology, Akure, Nigeria

1789 - Intensifying effects of el niño on winter precipitation extremes in southeastern China by Tao Gao
- Heze University, Qiang Zhang - Beijing Normal University, Ming Luo - Sun Yat-sen University

18 August 2021 Slot 8: Hydroclimatic extreme events: risks, vulnerabilities and management

Chair: Jun MATSUMOTO

Summary of the session:

The hydroclimatic extreme events seem to occur more frequently all over the world. Proper understanding of their risks and vulnerability, and wiser management are important for coping with such events. Originally, two papers were submitted, but one paper was cancelled, and only one study was presented.

1587 - Winter time extreme rainfall in the southern Philippines by Jun Matsumoto - Tokyo Metropolitan University / JAMSTEC, Lyndon M. Olaguera - Manila Observatory, Julie M. Dado - Manila Observatory, Gemma T. Narisma - Manila Observatory

18 August 2021 Slot 9: Mediterranean climate

Chair: Hadas SAARONI

Summary of the session:

The Mediterranean region is known as a hot spot of climate change. This vulnerable region, located between the arid and the mid-latitudes temperate climate regions, is projected to further warming, larger than the global rate, and severe drying. Present and future precipitation regime is at the center of climatological research in the Mediterranean basin. The four studies of this session presented different aspects of precipitation regime and trends.

1506 - Identifying and classifying the active Red-Sea trough by Baruch Ziv - The Open University of Israel, Ran Shimer - Tel Aviv University, Pinhas Alpert - Tel Aviv University, Tzvi Harpaz - Tel Aviv University, Ron Drori - Tel Aviv University, Hadas Saaroni - Tel Aviv University

3677 - Changes and trends in precipitation the example of Sinop-Hopa (Black Sea) coastal zone in Turkey by Barbaros Gönençgil - İstanbul University, Zahide Acar - Çanakkale 18 Mart University

3677 - Detection of change points in precipitation sample eastern Mediterranean coastal in Turkey by Zahide Acar - COMU, Barbaros Gönençgil - İstanbul University

19 August 2021 Slot 12: Urban climate

Chair: Jun MATSUMOTO

Summary of the session:

Urban areas are growing exponentially everywhere in the world. As a result, understanding and predicting the unique interactions between urban areas and the atmosphere, at a variety of scales, is critical to ensuring sustainable growth of cities. This is especially true in an era of anthropogenically induced climate changes which maybe both caused by, and enhanced by, urbanization. The four studies of this session presented different aspects of urban climate from various parts of the world.

2002 - Effect of station relocation on minimum temperature trends: Egirdir (Isparta) meteorological station sample by Cihan Şen - İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü

3524 - The impacts of coastal reclamation areas on cooling of the urban environment by Çağdaş Kuşçu Şimşek - Faculty of Science, Derya Arabacı - Atça Vocational School, Ufuk Çelik - Institute of Natural and Applied Sciences

2102 - Some features of park cool island intensity of botanical garden of faculty of science in Zagreb by Mladen Maradin - University of Zagreb, Faculty of Science

2091 - The urban planning and design of Santiago de Chile and its contribution to climate change and social injustice by Hugo Romero - Universidad de Chile

4. UPCOMING CONFERENCE: IGU CENTENNIAL CONGRESS PARIS, FRANCE

For Paris IGU Centennial Congress, the Commission on Climatology calls for abstract for the following sessions:

EXTREME WEATHER AND CLIMATE EVENTS

Chair: **Guillaume Fortin**

Co-chair: **Francisco Mendonça**

Description:

Extreme events can affect communities in many ways, depending on whether they bring too much water (flooding) or not enough (drought) for example. Recently researchers have worked to better characterize spatial and temporal climate variability and extremes events in terms of their frequency, duration, and intensity. Vulnerable communities everywhere are searching for innovative ways to be more resilient and to reduce the negative impact of weather and climate extreme events. This session will present examples of how extreme events can be better either monitored, estimated, modelled, prepared for and/or adapted to.

CLIMATE AND HEALTH

Chair: **Francisco Mendonça**

Co-chair: **Ana Monteiro**

Description:

The climate influences human health, directly and indirectly. The WHO (World Health Organization), the WMO (World Meteorological Organization) and the IPCC / AR6, among other institutions, consider, in several of their documents, that there will be an intensification of the occurrence of diseases as a result of present and future global climate changes. The scenarios beckon for a greater record of outbreaks, epidemics and pandemics (as COVID19), both existing and non-comparable diseases, many of them directly related to specific climatic conditions. Communicable diseases (as neglected, for example), chronic and neoplasms, among others, have a geographic distribution that, once evidenced, can contribute to public policies for disease control and prevention. The purpose of this Section of the CoC-IGU is to create opportunities for making contributions to advance knowledge of the relationship between climate and human health. It will be an opportunity to highlight the types of weather and climates on the living conditions of the population, as well as prospect the present and future situations.

GEO-ENGINEERING AND CLIMATE CHANGE

Chair: **Babatunde Abiodun**

Description:

The greenhouse gas-induced climate change continues to devastate socio-economic activities globally. The international negotiation on reducing greenhouse gas emissions is slow while the emissions themselves continue to rise. Geoengineering has been proposed as faster solution. Geoengineering is the intentional large-scale modification of the Earth's system to end climate change and reverse global warming. Geoengineering techniques range from sucking carbon dioxide directly out of the atmosphere (e.g., ocean fertilization or afforestation using non-native species) to exerting a cooling influence on the Earth by reflecting sunlight (e.g., putting reflective particles into the atmosphere, putting mirrors in space, increasing surface reflectivity, or altering the amount or characteristics of clouds). The interest in geoengineering techniques is growing as more people seek to understand the possibility of cooling the Earth. However, the deployment of any geoengineering technique requires prior evaluation of the price, efficiency, and potential

impacts of the technique. This session welcomes presentations on the physical and socio-economic impacts of geoengineering techniques at any scale.

SYNOPTIC CLIMATOLOGY

Chair: **Agnieszka Wypych**

Description:

Atmospheric circulation is unquestionably listed among the fundamental causes of weather and climate. The session is dedicated to all aspects of relationships between large-scale atmospheric circulation and surface climate and environmental variables. Contributions concerning theoretical aspects of circulation classifications development and their applications in various tasks (meteorological, climatological, and environmental), and different scales are particularly welcome as well as submissions on recent climate variability and change studied by tools of synoptic climatology.

REGIONAL ADAPTATION AND MITIGATION FOR CLIMATE CHANGE

Chair: **Yoshihiro Iijima**

Co-chair: **Babatunde Abiodun**

Description:

Global warming is more than an undeniable fact, but it is occurring at a faster pace than expected. From low latitudes to the polar regions, direct natural disasters such as extreme high temperatures, heatwaves, droughts, and enhanced hydrological cycles such as torrential rains and tropical cyclones significantly impact human life. In this session, we expect to present the case studies of global and regional climate change adaptation and mitigation, taking into account the events that could not have occurred without considering global warming in various world regions. This session welcomes topics on climate-based agricultural transformation, renewable energy, efforts to limit environmental change, and measures against climate disasters based on the climatological background of warming events in each region.

URBAN CLIMATE

Chair: **Jun Matsumoto**

Co-chair: **Jennifer Salmond**

Description:

Understanding and predicting the unique interactions between urban areas and the atmosphere, at a variety of scales, is critical to ensuring sustainable growth of cities. This is especially true in an era of anthropogenically induced climate changes which maybe both caused by, and enhanced by, urbanization. Such changes have the potential to have a disproportionate impact on urban areas, infrastructure and populations. We therefore invite papers on all aspects of urban climate including (but not limited to): urban air pollution, impacts of extreme weather on cities, urban heat islands and their mitigation, heat stress and urban bio-meteorology, urban design, smart cities and urban energy balances. Papers based on original research from a variety of perspectives (including conceptual, empirical, experimental, theoretical or modelling studies) are welcome.

CLIMATE VARIABILITY AND CHANGE

Chair: **Zahide Acar**

Co-chair: **Hadas Saaroni**

Description:

Both global and regional climate models predict future change in climate conditions. Such changes, including increase in extreme events, are already being observed worldwide and are

attributed to anthropogenic factors. They have far-reaching environmental impact and are among the most serious challenges to society in coping with a changing climate. However, long-term and short-term trends in climate conditions are affected also from natural climate variations. A prominent aspect of our climate is its variability. This variability ranges over many temporal and spatial scales and includes phenomena such as El Niño/La Niña, droughts, multi-year, multi-decade, and even multi-century changes in temperature and precipitation patterns. The purpose of this session is to highlight the importance of climate variability analysis as part of climate change studies and introduce climate variations and changes research in various spatio-temporal scales. Studies dealing with climate variability and trends, from global to the regional scales, are invited to this session.

5. A REPORT ON CoC BUSINESS MEETINGS

CoC Business Meeting 1 – 14th July 2021

The first CoC business meeting was held on 14th July 2021, from 11:00 to 12:00 UTC. The meeting was conducted via the Zoom web meeting system and was devoted mostly to incoming Istanbul Congress (sessions arrangements) and planned Paris 2022 event. Meeting participants were: CoC SC members: Jun Matsumoto (SC Chair), Hadas Saaroni (Vice-Chair), Zahide Acar, Francisco Mendoca, Agnieszka Wypych, Ana Monteiro, Babatunde Abiodun, Yoshihiro Iijima (Secretary), Observers: Barbaros Gönençgil (Vice President of IGU, Head of LOC 2021 IGC Istanbul).

During the meeting discussions were held regarding 1) Session program in the Istanbul IGC2021, 2) Session proposals for the coming Paris IGC2022, 3) Selection of a new chair from 2022, 4) Membership renewals, and 5) other upcoming conference and future activity plans.

First, we summarized the Istanbul IGC submissions (29 presentations in total: 12 in Climatology and 17 in Climate Change) and updated sessions chairpersons (also in the following e-mail discussion). As for the session proposal for the IGC2022, a few open suggestions have been made, e.g.: “Extreme hydrometeorological events, their spatial and temporal variability and impact”, “Adaptation measure to extreme temperatures in Urban area”, “Climate and health”, “The role of climate conditions in the COVID dispersion” or “Solar radiation management and climate change mitigation”. Regarding the extended deadline for sessions proposals until October the additional meeting was scheduled. Concerning the new chair of the CoC Agnieszka Wypych was proposed as the next chair since 2022 and accepted by all CoC members. Membership renewals in 2022 are necessary for Jun Matsumoto, Francisco Mendonça and Ana Monteiro. The nomination of Yoshihiro Iijima was accepted to replace the Asian delegate. Two other candidates will be introduced and accepted before August 2022. CoC members discussed also the necessity of any book edition or the special issue edited by the commission. The issue will be recognized and hopefully initiated as changing climate conditions are crucial for a wide range of environmental studies.

CoC Business Meeting 2 – 19th August 2021

The second CoC business meeting was held on 19th August 2021, from 13:40 to 14:40 UTC during International Geographical Congress Istanbul. The meeting was conducted via the Zoom web meeting system. Meeting participants were: CoC SC members: Jun Matsumoto (SC Chair), Hadas Saaroni (Vice-Chair), Agnieszka Wypych, Babatunde Abiodun, Guillaume Fortin, Yoshihiro Iijima (Secretary).

During the meeting discussions were held regarding 1) Session summary of the Istanbul IGC2021, 2) Final session proposals for Paris IGC 2022, 3) Membership renewals, and 5) Joint declaration on the climate and biodiversity emergencies.

We summarized participant activity regarding Istanbul IGC2021 – finally only 16 presentations were given in 4 sessions. For Paris IGC 2022 CoC will submit 7 session proposals – there is a necessity to announce the event and suggested topics to climatological community (e.g. via Climlist) to attract more people and

assure interesting presentations. CoC decided to approve Joint declaration on the climate and biodiversity emergencies document. Regarding other issues, following the suggestion by Yoshihiro Iijima, Babatunde Abiodun will be applied to become an editor of the Human geoscience section of the on-line Progress in Earth and Planetary Science (PEPS) journal in Japan Geoscience Union (JpGU). Concerning the idea of CoC common publication it will be possible to propose a special issue (SPEPS) on the CoC proposed session(s) in IGC conference in the future (further discussion is needed on this matter).

6. OTHERS

Corresponding Members

We kindly remind and ask every Commission on Climatology Full Member to prepare the potential list of Corresponding Members: people who are interested in cooperating in the frame of CoC, who find the CoC activities important and have the possibility and – what's more important – desire to sustain the international research cooperation and studies on the field of climatology, encourage the exchange of relevant documents and information and organize conferences or meetings.

For those who would like to become a corresponding member of the Commission on Climatology (to be informed about current CoC activities, incoming conferences, project proposals, etc.):

<http://www.klimat.geo.uj.edu.pl/www%20CoC/corresponding.htm>

CoC website

<http://www.klimat.geo.uj.edu.pl/CoC.htm>