

NEWSLETTER

Commission on Climatology

N° 20

December 2020

Dear Friends and Colleagues,

The extraordinary year of 2020 is coming to a close. The rapid worldwide spread of COVID-19 has changed everything. We have needed to halt almost all international and long-distance travel. Most international and domestic academic conferences have been cancelled or postponed or replaced with conferences organized remotely on-line. Our 34th International Geographical Union Congress (to be held in Istanbul, Turkey) was directly affected and is postponed to 2021. We are still not sure if we can meet in Istanbul next year, but hopefully we will at least hold a virtual conference in August. As shown on P13 we are still accepting abstract submission for this conference.

Our university lives have also been severely affected. University campuses have been closed for extended periods, with some still currently affected. Lectures and seminars were forced on-line with students learning remotely in isolation. We also organized our Commission meeting on-line (see report on P14). Thanks to the advances in information technology and telecommunication, we could manage these activities. But the economic activity all over the world has also significantly declined. Maybe the only good thing from this is for our climate as air pollution has been dramatically reduced in many places. However, the National Oceanic and Atmospheric Addministration (NOAA), USA reported that this year's global mean land and ocean temperature from January to November was the second highest since 1880. We need to continue to struggle with this big issue even under the shadow of the COVID-19 crisis.

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 (Chair of the Commission on Climatology)

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1. Membership of the CoC Steering Committee

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HONORARY MEMBERS:

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SENIOR MEMBERS:

A. Douguedroit (France), R. Brazdil (Czech Republic), T. Mikami (Japan), N. Tapper (Australia), R. S. Pulwarty (USA)

2. A Report on "SOUTHERN REGION OF BRAZIL - EXTREME CLIMATE EVENTS" Mendonça, F.; Fontão, P.; Roseghini, W.F.F. UFPR/LABOCLIMA (<u>http://www.terra.ufpr.br/portal/laboclima/</u>) - Brazil

Extreme natural events pose risks to human populations. They can have an impact on productive activities / economy, infrastructure installed in cities, security of life and human settlements. Extreme climatic events are among the most important natural hazards, having intensified their repetition and intensity in recent decades in the context of global climate warming.

Extreme climatic events are gaining more and more importance for different societies and are increasingly disseminated by the media. In recent years, in the midst of the various scenarios projected for global climate change, the need to gradually understand the climate variability and the occurrences of these phenomena has gradually increased. The risks and vulnerabilities of the population associated with these episodes have become a topic of first order on the international political agenda, especially as human susceptibility becomes quite evident in the face of the impacts resulting from exceptional events.

In this context, there was an increase in the number of extreme climatic events in Brazil, especially those related to the concentration of rainfall (floods, soil movements, etc.) or its lack (droughts), thermal excess (heat and cold waves, environmental-thermal discomfort, etc.) and the conditions of strong gales (storms, tropical cyclones, etc.). Although particularly striking episodes such as these occur in the rest of South America and across the planet, Brazil stands out due to its significant impacts on the population. The rapid and chaotic urbanization registered in the country in the last decades (85% of the population is urban), in which an expressive population stands out living in poverty, especially in big cities and metropolitan regions, accentuates the social vulnerability to climate risks in Brazilian cities.

An example that well illustrates the Brazilian case is the metropolis of São Paulo, a location that registered a very severe drought between the years 2014 and 2015, a fact that resulted in widespread problems in urban supply, among others. In the following years, that city faced 61 extreme precipitation events (between 2016 to 2019), totaling 47 deaths caused by episodes of intense rain (Travassos et al, 2020). As it is the largest metropolis in the entire Southern hemisphere, the repercussions of these extreme hydrometeorological events were of greater international relevance, but it should be noted that several other cities in the country were strongly impacted by similar episodes in the same period.

In this text, our attention is focused to the Southern region of Brazil, mainly due to the expressive drought registered in this part of the country in 2020. However, because it is located on the edge of the tropical zone and, therefore, due to the recording of important climatic-meteorological contrasts, it also seemed important to record a historic event of excessive rainfall in the region, such was the impactful year of 2008. Let's go to them.

It is important to highlight that the Southern region of Brazil, due to its geographical location, is characterized by a diversity of atmospheric systems (frontal and tropical, oceanic and continental). The predominant climatic type is the humid subtropical (Cfa and Cfb - Koeppen), presenting variable climatic situations and quite different from the rest of the country, since most of its territory is in the subtropical zone, south of the Tropic of Capricorn. This region also records high agricultural and industrial production, in addition to a high density urban and road network; it is the region of greatest economic and social development in the country, hence the fact that the impacts resulting from extreme climate events become so important. In 2008, the Southern region of Brazil recorded one of the most impacting extreme hydroclimatic event associated with excess precipitation.

Due to its Southern location, Southern Brazil is influenced by frontal systems that are the main cause of rainfall throughout the year. With regard to temperatures, a greater penetration of cold air masses is observed in the winter period, contributing to the predominance of low temperatures, while the equatorial and tropical systems ensure the highest temperatures in the summer. The Southern region has a very particular atmospheric dynamics that demands a careful look at the different atmospheric systems that operate in the region. It should already be noted that the genesis of regional rainfall and thermal dynamics is extra-regional.

Some intra-region climatic events have a strong connection with large-scale processes, such as the case of El Niño-Southern Oscillation (ENOS), which manifests itself in severe climatic disturbances (abnormal droughts or, on the contrary, cyclones and intense rainfall extremely high in relation to local and regional normals) in regions usually exempt from such events. In the Vale do Itajaí (SC) region, the average annual temperature is approximately 20.1°C, while the minimum average temperature is around 15.8°C. The average annual total rainfall in the region is 1,596.2 mm. In their normal climatic state, rainfall is uniformly distributed throughout the year, only divided into two characteristic seasons (one in spring and one in summer), with an average rainfall of 130 mm / month, and two periods considered to be of low rainfall (April and August, and November, with about 80 mm / month).

The 2008 floods lasted almost the entire month of November, characterized by two weather systems, a high pressure or anticyclone system (blocking anticyclone) and a low pressure or cyclone system, which remain semi-stationary and persist with this condition. for a considerable period of time, at least 05 days, featuring an atmospheric block over the region.

A low altitude system associated with the intense transport of moisture from the Atlantic to the continent (east winds), intensified the instability and rains, mainly between the east of Santa Catarina and Parana States. The established blocking pattern favored the continuity of the rains, mainly in the east of Santa Catarina State. In this area, the rains occurred intensely and the daily accumulated values reached 340 mm in some locations (Salto Jusante Station). Cities were flooded, more than 115 deaths were recorded, hundreds were injured, thousands of displaced / homeless families, dozens of cities declared a State of Emergency / Calamity.

The State of Santa Catarina has long-term records of extreme climatic events, with a considerable number of human victims and also significant financial losses. The most intense natural disasters of climatic order, registered by the Civil Defense of Santa Catarina, occurred in the years of 1974, 1983, 1984, 1995, 2004, 2005 and 2008.

According to the Civil Defense of Santa Catarina, the event left more than 80 thousand homeless or displaced, 14 municipalities in a state of public calamity and more than 85 municipalities in a state of emergency; the socioenvironmental vulnerability to these risks showed, once again, the largest number of victims as belonging to the low-income population. 135 deaths were recorded.

Contrary to episodes of extreme rainfall, the Southern region often records extreme events of water scarcity due to reduced rainfall. Despite the fact that drought is a climatic phenomenon that is difficult to forecast in the medium and long term, as it is not a phenomenon that occurs quickly, there are records that significant episodes of meteorological droughts have been so intense (or more) than the current one, as is the case in the years 1933, 1985 and 2006.



Figure 1 - Southern Brazil: Negative precipitation anomaly (Sep-2019 to Oct-2020) and intensity of drought (early November 2010).

In this year of 2020 a severe drought has been registered in the Southern region of Brazil. It is an area with a population of more than 29 million inhabitants distributed in three states: Paraná, Santa Catarina and Rio Grande do Sul. In this region the rains are below what is usually recorded since mid-2019, configuring a meteorological drought with different intensities across the region, also involving parts of eastern Paraguay and northeastern Argentina (Figure 1). The lack of rain triggered a hydrological drought that affected rivers and reservoirs in Southern Brazil, causing a lack of water for agriculture and urban supply in several cities, in addition to economic losses and social impacts in the region.

The most emblematic case of this extreme event in 2020 occurred in the city of Curitiba, capital of the State of Paraná and largest metropolis in the entire Southern region of Brazil, with a population of more than 3 million inhabitants in its urban core. Due to the drought, the level of the water supply reservoirs is extremely low, a factor that caused an unexpected and disturbing situation: the implementation of a water supply rotation in the city's neighborhoods. The attitude adopted by the water supply company impacted the entire population of the metropolis and turned on the alert for possible climatic risks, motivating the Government of the State of Paraná to decree, on May 7, 2020, a water emergency situation for 180 days due hydrological drought, extending the decree for another 180 days on October 29.

In this case, the situation can be understood as a natural hazard, a phenomenon of climatic order that differs from the usual condition or pattern of the region and has resulted in impacts on the population. This fact has required great effort and apprehension from authorities and researchers involved in planning and management of the territory, especially with the relationship of man with his environment due to the adverse conditions of the moment. In the midst of the COVID-19 pandemic that hits the country in 2020, a situation in which hygiene is becoming increasingly necessary to prevent the transmission of the new coronavirus (SARS-COV-2), water is lacking in the taps of homes from Curitiba.

Performing permanent monitoring of the formation and occurrence of extreme weather events has become an imperative of our day. It is an attitude that involves scientists, decisionmakers and the population in general, because only with prior knowledge of synoptic situations within the scope of regional atmospheric dynamics can one predict the occurrence of such

phenomena. Studies and records of victims of impacts resulting from extreme events show the extremely high vulnerability of poor and miserable populations to them; this situation shows that it is necessary to invest both in systems for monitoring the atmosphere and, if not more, in reducing social inequalities. Atmospheric forecasting and the detection of climatic risks will not succeed in reducing victims and economic losses if income concentration and social injustice are not tackled in the countries of the south.

3. Conference Report: the IGU-India International Conference

R.B. SINGH (University of Delhi)

XIV INTERNATIONAL GEOGRAPHICAL UNION (IGU)-INDIA International Conference under the auspices of five IGU Commissions: Commission on Biogeography and Biodiversity, Commission on Land Use and Land Cover Change, Commission on Hazard and Risk, Commission on Climatology, and Commission on Geo-Heritage was held during 6-8 March 2020. The focal theme of the conference was "Agriculture, Food, Water, Biodiversity and Health in Changing Climate". This mega conference was organized by the Department of Geography, The University of Burdwan, West Bengal, India in collaboration with Association of Bengal Geographers.



Dignitaries present on the dais in the Inaugural Session of XIV IGU-INDIA International Conference

Inaugural Session

IGU UGI Inaugural function of XIV IGU-INDIA International Conference was held in the Central Auditorium of the University of Burdwan at Golapbag Campus on 6th March 2020. In the inaugural session, the dignitaries present on the dais were Mr. Shyamal Santra, Hon'ble Minister-of-state in charge of Public Health Engineering & Panchayats & Rural Development, Government of West Bengal, Prof. R. B. Singh, Secretary General & Treasurer, International Geographical Union; Dr. Tapati Banerjee, Director, National Atlas & Thematic Mapping Organisation, Government of India; Prof. Abhijit Mazumdar, Registrar, Prof. Pabitra Kumar Chakraborti, Dean, Faculty Council of Science, The University of Burdwan; Prof. Jayant K. Routray, Professor Emeritus, Asian Institute Technology, Thailand; Dr. Suraj Mal, Chair: IGU Commission on Biogeography and Biodiversity; Prof. N. C. Jana, Convener, Prof. Giyasuddin Siddique, President, Dr. Biswaranjan Mistri, Organizing Secretary of this conference, and Dr. Namita Chakma, Head of the Department of Geography.



Dignitaries releasing the Abstract Volume of XIV IGU-INDIA International Conference

The inaugural session started with the Welcome Address by Prof. N. C. Jana, Convener of this conference followed by the Greetings (video message) of International Science Council and Address (audio message) by Prof. Yukio Himiyama, President of International Geographical Union, who was supposed to deliver the Keynote Address as Guest-in-Chief. It may be mentioned in this context that he did not come as his Visa was suspended at the last moment due to worldwide COVID-19 Pandemic. Prof. R. B. Singh, Secretary General & Treasurer, International Geographical Union, and Mr. Shyamal Santra, Hon'ble Minister-of-state in charge of Public Health Engineering & Panchayats & Rural Development, Government of West Bengal addressed the august gathering followed by other dignitaries present on the dais.



Mr. Shyamal Santra



Prof. R. B. Singh



Prof. N. C. Jana



Snapshot of the participants in the inaugural session of XIV IGU-INDIA International Conference

In addition, other renowned Geographers and Resource Persons present in the conference were Prof. D. K. Nayak, North Eastern Hill University, Shillong; Prof. Anuradha Banerjee, Jawaharlal Nehru University, New Delhi; Prof. Ravi S Singh, Banaras Hindu University, Varanasi; Prof. Bimal Kar, Gauhati University, Guwahati; Prof. V. Nagarale, SNDT Women University, Pune; Prof. Sahab Fazal, Aligarh Muslim University; Prof. Nandini Chakravarty Singh, Rajiv Gandhi University; Dr. Amitanshu Pattanaik, DTRL, Defense Research Development Organization, Delhi; Prof. A. R. Siddiqui, University of Allahabad; Dr. Pankaj Kumar, University of Delhi; Dr. Komali Yenneti from Australia, Chair, IGU-YECG; Dr. Md. Iqbal Sarwar, University of Chittagong, Bangladesh; Dr. Gaurav Sikka, L.N. Mithila University, Bihar; Dr. Chhering Tandup, Jammu University; Dr. K. K. Das, IIRS, Dehra Dun; Dr. P. Kirishanthan, University of Colombo, Sri Lanka; Dr. K. M. Rezaul Karim, Department of Sociology, Government M. M. College, Bangladesh; Prof. Md. Mujibor Rahaman, Khulna University, Bangladesh; Prof. Manjural Hassan, Jahangirnagar University; Prof. G. P. Chattopadhyay, Visva Bharati; Prof. Ranjan Roy, North Bengal University and many others.



Dignitaries and other reputed Geographers on the dais of the inaugural session of the conference

Plenary Sessions

During 6-8 March there were three Plenary Sessions. On 6th March, *Plenary Session-I: Disaster Risk Reduction and Resilience in Changing Climate* was organized. The renowned speakers were Prof. R. B. Singh, Secretary General & Treasurer-IGU, Delhi University, India; Dr. Tapati Banerjee, Director, NATMO; Prof. Takashi Oguchi, University of Tokyo, Japan (video recorded lecture). Prof. Oguchi could not come because of his suspension of Visa at the last moment.

On 7th March, *Plenary Session-II: Urban Health and Social Wellbeing in Changing Climate* was organized. The renowned speakers delivered lectures in this session were Prof. D. K. Nayak, North Eastern Hill University, Shillong, India; Prof. Anuradha Banerjee, Jawaharlal Nehru University, New Delhi, India; Prof. Ravi S Singh, Banaras Hindu University, Varanasi, India; Prof. Bimal Kar, Gauhati University, Guwahati, India; and Prof. V. Nagarale, SNDT Women University, Pune, India

In the *Plenary Session-III: Sustainable Development Goals and Future Earth Initiatives* on 8th March, the renowned speakers were Prof. J. K. Routray, Asian Institute Technology, Thailand; Prof. Sahab Fazal, Aligarh Muslim University, India; and Prof. Nandini Chakravarty Singh, Rajiv Gandhi University, India

Special Lecture Sessions

IGU UGI In the last two days of the conference, there were Special Lecture Sessions. The speakers were Prof. Kazuo Tomozawa, Hiroshima University, Japan; Dr. Sandeep Narayan Kundu, NUS, Singapore; Dr. Amitanshu Pattanaik, DTRL, Defense Research Development Organization, Delhi, India; and Dr. Komali Yennetti, Chair: IGU-YECG, Australia. Prof. Tomozawa and Dr. Kundu could not come because of their suspension of Visa due to COVID-19 Pandemic but the video recorded lecture of Dr. S. N. Kundu was displayed.

Late Dr. Manju Singh Memorial Young Scientist Best Paper Award 2020

On 8th March, open competition was held in the University Auditorium. 09 Research Scholars appeared in this competition for this prestigious award. This competition was organized under the auspices of *International Geographical Union Taskforce for Young and Early Career Geographers* under the leadership of Dr. Komali Yennetti, Chair and Dr. Gaurav Sikka, Secretary General. A Panel of Judges selects Sri Soumen Ghosh of the Department of Geography, The University of Burdwan, for this award.



Best Paper Awardee, IGU-YECG Office Bearers, Prof. R. B. Singh, Prof. N. C. Jana and others



Dr. Suraj Mal and Dr. Pankaj Kumar (Trainer) with the participants of Training Programme

Training on Snow Cover Dynamics and Glacier Fluctuations in the Himalaya

In the venue of XIV IGU-INDIA International Conference, Two-days software training on Snow Cover Dynamics and Glacier Fluctuations in the Himalaya were organized during 7-8 March 2020, supported by IGU Commission on Biogeography and Biodiversity. Prof. R. B. Singh introduced the programme. Dr. Suraj Mal and Dr. Pankaj Kumar of Delhi University conducted the training programme. 14 candidates participated in this training programme.

Valedictory Session

IGU UGI On 3rd day of the conference Valedictory Session was held in the Conference Hall of the Department of Geography. Prof. R. B. Singh; Prof. L. N. Satpati, Director-HRDC, University of Calcutta; Prof. N. C. Jana and Prof. Giyasuddin Siddique and a number renowned Geographers and Scientists were present. Some of them highly appreciated the organizers for organizing such a high quality smart conference.



Prof. R. B. Singh, Prof. L. N. Satpati, Prof. N. C. Jana and Prof. G. Siddique in the Valedictory Session

Conference of Inter-Disciplinary Nature

436 abstracts had been received and nearly 400 participants presented their papers in 38 parallel technical sessions under the sub-themes: (i) Agricultural Development, Forestry and Biodiversity; (ii) Development and Sustainability; (iii) Ecosystem Management, Monitoring and Modelling; (iv) Environment, Human Health & Well-being; (v) Globalization, Industrialization and Environmental Issues; (vi) Land Use Land Cover and Climate Change; (vii) Land Use Land Cover Change and Biodiversity; (viii) Population Pressure, Natural Resource Use and Climate Change; (ix) Role of GIS Technology; (x) Sustainable Natural Resource Management and Development; (xi) Tourism Potential of Geo-Heritage Sites in South Asia; (xii) Urbanization and Environmental Issues; and (xiii) Water Resource Management.

'Agriculture, Food, Water, Biodiversity and Health in Changing Climate', the focal theme of the conference is contemporary and relevant issue that has attracted the attention of the geographers, planners and decision-makers all over the world. This conference has dealt in detail the diverse issues of agriculture, food, water, biodiversity and health in the light of climate change at the global, regional and local level. A vision document has been prepared for future plan of action. Keeping in view the inter-disciplinary nature of the conference, a volume will be brought out very shortly from an internationally reputed publisher.

Acknowledgements

IGU UGI This historical mega event could not have been possible without the support from sponsoring agencies. The organizers have received financial assistance from the Ministry of Water Resources, Government of India; Defence Research and Development Organisation, Government of India; Indian Council of Social Science Research, New Delhi; Anthropological Survey of India, Kolkata; National Atlas & Thematic Mapping Organisation, Government of India; Department of Science & Technology, Government of West Bengal; IGU Commission on Biogeography and Biodiversity; National Bank for Agricultural and Rural Development (NABARD), Government of India.

4. Upcoming Conference: The 34th IGC in Istanbul, Turkey Barbaros GÖNENÇGİL (Istanbul University, Head of LOC 2021 IGC İstanbul)

Dear Colleagues

As it is known, the 34th IGC, which should be held between 17-21 August 2020, was postponed between 16-20 August 2021 due to the Covid-19 pandemic that affected the whole world.



We were aware that this decision has many consequences, but the very real health risks and the capacity to travel for the Congress participants leave us with no other alternative.

All registration fees received, abstracts accepted, travel grants awarded, and the conference programme already developed for this year will be carried over to 2021.

Unfortunately, the tragic events happening all over the world have shown us how correct this decision was after the delay. However, our hopes for the next year continue. There is no such thing as the cancellation of the congress, and it is planned to be held next year. Our wish is to hold the congress face to face as planned. However, if the pandemic process is not suitable for this situation, we also have alternative plans. We will announce the evaluations of how the congress will be held and the decision to be taken together with the IGU EC in March 2021 at the latest. Please visit https://www.igc2021.org (also https://www.igc2021.org (also https://www.igc2020.org).

However, the system continues to send abstracts to the Covid-19 sessions we recently uploaded. Important dates regarding the congress are as follows;

IMPORTANT DATES

Deadline for abstract papers and posters submission 11th January 2021

Notification of acceptance (new abstracts) 08th February 2021

Early bird registration deadline 05th April 2021

Authors' registration deadline 05th April 2021

The process is the same for the Geography Olympiad organized together with the congresses and the final decision regarding this will be shared at the same time. There will be no cancellation for iGEO either. It is planned to be carried out either face to face or in an on-line system, depending on pandemic conditions. Please visit <u>https://www.igeo2021.org</u> (also <u>https://www.igeo2020.org</u>).

Stay safe

Best regards,

Barbaros Gönençgil 34th IGC 2021, Head of the Local Organizing Committee

5. A Report on CoC Business Meeting

Yoshihiro IIJIMA (Mie University, Secretariat of CoC SC)

The CoC business meeting was held on 19 August 2020, from 11.00 pm to 12.00 pm UTC. The meeting was set via Zoom web meeting system due to the influence of COVID-19 instead of face to face meeting which had been planned during IGC 2020 in Istanbul.

In the meeting, discussions were made on 1) the replacement of membership in 2022 for several SC members, 2) nomination of honorific senior member, 3) list of members of the CoC and/or climatology researchers in each country or region, 4) current situation and additional plans of the 2021 IGC in Istanbul, Turkey, and 5) other upcoming conference and future activity plans.



An online group photo during the CoC Business Meeting.

Participants:

Jun Matsumoto <CoC SC Chair> Hadas Saaroni <CoC SC Vice-Chair> Barbaros Gönençgil (Observer, Head of LOC 2021 IGC Istanbul) R.B. Singh (Observer) Guillaume Fortin (CoC SC) Jennifer Salmond (CoC SC) Francisco Mendonça (CoC SC) Zahide Acar (CoC SC) Agnieszka Wypych (CoC SC) Yoshihiro Iijima (CoC SC Secretary)

Summary of the meeting:

We have started from self-introduction of participants. Replacement of membership in 2022 for several SC members should be discussed and find alternative persons in the next year. Roger S. Pulwarty who is replaced in 2020 will be honorific "Senior member". List of members of the CoC and/or climatology researchers in each country or region will be useful for the nomination.

The CoC need to contact to related climatology and meteorology association in each region. As for the 2021 IGC in Istanbul, abstract submission is extended until 11 June 2021. Currently there are no cancelation of the CoC proposed sessions. New sessions on COVID-19 is also open for abstract call. If some sessions fit the climatological aspects, the CoC members should encourage (or invite) to submit abstracts. Otherwise, session on climatology and COVID-19 will be set by Dr. Barbaros Gonencgil. Possibility of publishing special issue on the CoC proposed session in the IGC Istanbul will be discussed in parallel. If the IGC Istanbul will be changed to online conference due to prolonged COVID-19 situation, CoC need to discuss it and make proper online discussion style. Finally, for future plans, proposal of collaboration with other commission(s) in IGU (by Dr. Singh), summer school in Paris (by Dr. Guillaume Fortin and Dr. Francisco Mendonça), and summer program during the IGC Istanbul for early career scientists are proposed.

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. We would try to involve all the people to meet together in the Istanbul IGC 2021 to discuss further perspectives and plans for CoC activities.

CoC website

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

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