



IGU-Commission on Geoheritage

**2021 Annual Work Report of Commission on Geoheritage
(January,2021--- December,2021)**

Edited by
Dongying Wei, Chair

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Commission on Geoheritage (COG) of the International Geographical Union (IGU) is to promote the development of Geoparks from the Geographical perspectives. The objectives of the COG include:

- communicating the role of geoheritage as tools of education, recreation and nature conservation;
- further developing the concept of sustainability as applied to geoheritage;
- communicating the importance of understanding a broad range of processes that affect the sustainable development of geoheritage, including the natural environment, political, and socio-economic processes;
- communicating the results of the research by members of the Commission to various academic, industry and policy arenas in order to influence policy in an effective and appropriate manner.

In the last five years, IGU-CoG focused on the development of comparative studies on geoheritage, tourism and corresponding social, economic, environmental and political change and concentrated on the communication and transfer of research results in policy relevant terms to policy makers and industry as well as continuing the scientific publishing programme of the Commission. The Commission seeks to continue its activities as outlined in relation to its existing objectives.

This work report will introduce the COG work in 2021 from the aspects of MEMBERSHIP, MEETINGS, NETWORK, PUBLICATION respectively.

1 Membership

The Steering Committee of Commission on Geoheritage (2020-2024) is comprised of 10 executive members from 9 countries, the detailed information about the ten executive members are listed in Table 1.

Table 1 2020-2024 Executive Members of Commission on Geoheritage

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2 Meetings

In order to promote the development of the geoheritage and national parks globally, the *2021 International Symposium on Geoheritage and National Parks* was held in November and December. The symposium aimed to (1) carry out in-depth research on geoheritage and national parks; (2) disseminate and share the knowledge and experience of geoheritage and national parks; (3) collect best practice cases; (4)

promote the further improvement and implementation of protection policies; (5) build a platform for cooperation and communication between government, enterprises and research institutes in the field of national park and natural heritage protection.

The 2021 International Symposium on Geoheritage and National Parks gathered global researchers in the fields of geoheritage and national parks. Participants shared the experience of promoting the sustainable development of geoheritage and national parks, discussed strategies for protecting geoheritage and national parks in new era, and provided a conservation platform for international researchers to communicate and build opportunities to cooperate with each other. Affected by COVID-19, the symposium was held online. All participants entered the conference room through the online conference platform. The symposium was comprised of 12 thematic presentations and 5 theme-centered sessions (Table 2 & 3).

2.1 Thematic presentations

Professor Guangyu Wang of the University of British Columbia (UBC) in Canada and his doctoral student, Christina Dehui Geng, gave the presentation entitled *Challenges and Responses Amid the Pandemic: Experience from Canadian National Parks*. They introduced the national park research at UBC, the pandemic challenges and actions, the case study from Banff National Park, and opportunity for changes beyond COVID-19.

Professor Vic Semeniuk of the University of Notre Dame gave the presentation entitled *Western Australian Tidal Flats: Their Morphology, Sedimentology, Biology, and Geoheritage Values*. The coast is one of the most complex environments on the .

Table 2 The agenda of thematic presentations

Date	Presenter	Beijing Time	Affiliation of Presenter and Local Time	Conference Access
November 20, 2021	Guangyu Wang	9:00 AM	University of British Columbia 11.19 17:00PM	Room ID: 126 565 294 Conference Room Link: https://meeting.tencent.com/dm/vwFBhGA8uC0a
November 27, 2021	Vic Semeniuk	9:00 AM	Unversity Notre Dame 9:00 AM	Room ID: 616 485 693 Conference Room Link: https://meeting.tencent.com/dm/ZTsUVbTWmDTG
November 28, 2021	Haixia Zhang	20:00 PM	Zhejiang Gongshang University 20:00 PM	Room ID: 294 778 903 Conference Room Link: https://meeting.tencent.com/dm/J0iQKq88fHKQ
November 30, 2021	Adolfo Quesada-Román	9:00 AM	University of Geneva 12.03 19:00 PM	Conference Room Link: https://us02web.zoom.us/j/81397694129? pwd=ZzEzR2ZSeDFhSVpvcFpaOXBYQk5pZz09 Room ID: 813 9769 4129 Passcode: 489913
December 5, 2021	Dan Tormey	9:00 AM	Catalyst Environmental Solutions 2021.12.04 15:00 PM	Conference Room Link: https://us02web.zoom.us/j/87449755458? pwd=MVh0MXh0bjg1ckN2NGxHUGVNL0Nvdz09 Room ID: 874 4975 5458 Passcode: 873929

Date	Presenter	Beijing Time	Affiliation of Presenter and Local Time	Conference Access
December 6, 2021	David Newsome	9:30 AM	Murdoch University 9:30 AM	Conference Room Link: https://us02web.zoom.us/j/88398177494?pwd=eHNZTG1TTUpIMWN5YVdMTDIDVIN1UT09 Room ID: 883 9817 7494 Passcode: 397622
December 6, 2021	Ross Dowling	20: 00 PM	Edith Cowan University 9:00 AM	Conference Room Link: https://us02web.zoom.us/j/89409592875?pwd=ZGJBYSm1DRjkrUnBIZzI0YTBaTTJSUT09 Room ID: 894 0959 2875 Passcode: 199449
December 8, 2021	Fabien Van Geert	17:00 PM	Université Sorbonne Nouvelle-Paris 3 17:00 PM	Conference Room Link: https://us02web.zoom.us/j/86972776083?pwd=NHRPMXlaNENqMk5XdUINMUE2eFpFZz09 Room ID: 869 7277 6083 Passcode: 512149
December 11, 2021	Murray Gray	16:00 PM	Queen Mary University of London 8:00 AM	Conference Room Link: https://us02web.zoom.us/j/88328545817?pwd=dVpDUWVNRHowSmJyd2NTQTZQeTRGQT09

Date	Presenter	Beijing Time	Affiliation of Presenter and Local Time	Conference Access
				Room ID: 883 2854 5817 Passcode: 967750
December 18, 2021	Benjamin van Wyk de Vries	15:00 PM	Université Clermont Auvergne 8:00 AM	Conference Room Link: https://us02web.zoom.us/j/82135834205?pwd=WHlNd3ExRnNCREV6WVNxZlRaMjQxZz09 Room ID: 821 3583 4205 Passcode: 271982
December 19, 2021	Margaret Brocx	9:00 AM	IUCN WCPA Geoheritage Specialist Group 9:00 AM	Conference Room Link: https://us02web.zoom.us/j/86191897406?pwd=L1N4SXJnREZRSml6dFpRa2Fqc1ArZz09 Room ID: 861 9189 7406 Passcode: 911451

Table 3 The agenda of then theme-centered sessions

Session theme	Date	Beijing Time	Guest	Guest Affiliation	Conference Access
The sustainable development of geoheritage and national parks	November 24, 2021	18:00 pm	Dongying Wei	Beijing Normal University	Zoom Room ID: 815 328 29838 Passcode: 608310
			Yasin Sayyad Salar	Ferdowsi University of Mashhad	
			Mengting CHEN	China University of Geosciences	
			MAI Thi Khanh Van	Okayama University	
			Jinxi Zhang	Beijing Normal University	
			Marius Kalinauskas	Mykolas Romeris University	
			Huang Cheng	China University of Geosciences	
			Xi Wu	Hainan Tropical Ocean University	
National park and its standardization	December 16, 2021	15:00PM	Xiaoping Tang	National Forestry and Grassland Administration of China	Conference Room Link: https://meeting.tencent.com/dm/NA0lucWQHARx Room ID: 559-931-116 No Password is needed
			Jianming Liu	Ministry of Culture and Tourism of China	
			Panyan Wang	China Urban Construction Design & Research Institute	
			Han Li	Standardization Administration of China	
The national park system in United States	December 12, 2021	8:00AM	Rudy D'Alessandro	U.S. National Park Service	ZoomRoom ID: 824 2527 4194 Passcode: 525973
			Tom Medema	U.S. National Park Service	
			Jeanette Koelsch	Bering Land Bridge National Preserve	
			Yenyen Chen	Yosemite National Park	
			Rick Toomey	Mammoth Cave National Park	
			Chris Groves	Western Kentucky University	
			Tom Fish	Cooperative Ecosystem Studies Units Network (CESU)	
			Mike Martin	U.S. National Park Service	

Earth's surface, being a zone of intersection and interaction of land, sea, groundwater, and atmosphere and the processes therein. It carries processes and products that are either not present or only weakly developed elsewhere. With other matters such as lithology, structure, or geological framework being equal, the coastal zone is one that generally results in greater geodiversity than elsewhere. Tidal flats, with their low gradients, provide a setting where gradations in energy, hydrochemistry, diagenesis, intersection of the different oceanographic and coastal processes, grainsize partitioning, generation of emergent and/or erosive landforms (e.g., cheniers, tidal creeks), habitat differentiation, biota zonation, and effects of biota on sediments are amplified and made more evident. Tidal flats also function as geoheritage features of significance in terms of their Cultural Values, Geohistory, and as Type Sections and Type Localities. Given the diversity of tidal flats in relation to climate, coastal setting, provenance, and biology, there is a need for geoconservation of tidal flats as globally significant coastal features in the category of Modern Processes. Western Australia spanning a latitude of 14° to 35°, with its diversity of regional geology, climate, and oceanography (wave-dominated, tide-dominated, or mixed wave- and or tide-dominated), presents a diversity of tidal-flat types morphologically, sedimentologically, and stratigraphically, reflecting variation from tropical humid, tropical arid, to temperate humid, and from siliciclastic-dominated to carbonate-dominated. Tidal flats are important in terms of geological heritage because they provide examples of extant geological processes and products in sedimentology and stratigraphy, provide models for ancient sequences, and provide diverse and

extensive habitats for biota.

Professor David Newsome from the School of Environment and Conservation Science, Murdoch University gave the presentation entitled *Regolith as a Topic for Geotourism Engagement*. Regolith is an underappreciated part of the Earth's surface and vital to human existence. Its apparent low public profile compared to scenic areas and impressive rock formations is related to a lack of understanding of its value and ignorance regarding the diversity of its expression in the landscape. Identification of locations where a story about how humans and biodiversity are influenced by the nature of regolith can add to the overall experience when tourists visit various landscapes. Accordingly, the value of regolith as a topic for geotourism engagement is explained for a range of regolith types from southwestern, Australia and in the case of a tectonically active landscape in Indonesia. Preliminary guidance is offered on indicative interpretive content that could be delivered by trained guides. It is argued that successful engagement depends on simplifying the science and by helping geotourists recognise the importance of regolith in their lives. Many geotourism programs around the world can be enhanced by such an approach.

Professor Haixia Zhang of the Zhejiang Gongshang University gave the presentation entitled *Franchise during the Pilot Period of China's National Park System: Common Problems and Institutional Innovation*. Professor Haixia Zhang pointed out that 2021 is a significant year for China, it is the first year of China's national park. But at this time, we may think more about how to build national parks in China in the future. During the pilot period of the national park system, everyone

may pay more attention to ecosystem protection, which is the most fundamental mission of building a national park. Another important historical mission of the national park is to provide high-quality ecological services to the public. She stressed that the historical lesson of China's natural heritage sites is to take the natural heritage sites as natural consumption space, where consumerism prevailed and economic benefits were maximized. In the future, national parks should be natural experience spaces advocating ecological friendliness and a community of destiny between man and nature. The report expounded the thinking on the common problems and system innovation of franchising during the pilot period of China's National Park System from four angles, including the current situation of franchising during the pilot period of China's National Park System, the common problems of franchising during the pilot period of China's National Park System, and the relevant concepts, principles and objectives, institutional innovation of franchise of national parks in China.

Professor Ross Dowling AM of Tourism at Edith Cowan University gave the presentation entitled Essential Elements for Interpreting Geology. This presentation conveys some of the 'Essential Elements' of Geotourism's Interpretation. This is best understood through three 'ABC' elements. They are the 'Abiotic' or Non-living – climate and land (primarily geology and landforms); 'Biotic' or Living - plants (flora) and animals (fauna); and 'Culture' or people – past and present. When understood and presented in this format then people can easily see the links between how climate and geology have determined the plants and animals which live in an area, which in turn has shaped the way people have lived in a region in the past, as well as today.

Thus it is geology which is the key building block to our understanding of all components of the environment and the way in which we live in it. A second central element of geotourism is the presentation of geology interpreted through its components of 'Form' (landforms and landscape), 'Process' (how the landforms originated) and 'Time' (when the processes occurred and how long they lasted). By putting this Interpretive approach to Geotourism into action it promotes awareness of geological features within the context of the biota and culture of a region. This 'interpretive bridge' is a central, but often missing, link in bringing geology to life. Once understood and put into practice through geotourism, it can be a powerful tool in the development of both National Parks and Geoparks.

Dr. Fabien Van Geert of the Sorbonne Nouvelle University in Paris gave the presentation entitled The Exhibition of Geoheritage in Geological and Geopark Museums. Based on French and Spanish examples, this presentation has focused on the exhibition of geological collections, both in museums located outside geosites (ex situ), and in museums located within geoparks (in situ). By observing the different logics at work in these two types of institutions, this presentation has explored their common points as well as their differences in the treatment of their collections. By postulating the fact that these two institutions may take very different forms, this presentation seeks to question the ways in which the emergence of geoheritage in geoparks and their museums (especially in the form of interpretation centres) may have influenced the renovation of ex situ geological museums in recent years.

Professor Murray Gray of the Queen Mary University of London, United

Kingdom gave the presentation entitled The UN's Sustainable Development Goals (SDGs) and the Role of the Geosciences. In 2015, the UN's Sustainable Development Summit adopted an ambitious list of 17 Sustainable Development Goals (SDGs) and 169 Targets to be achieved by 2030. The general aims are to end poverty, ensure access to basic services, tackle inequalities,, ensure sustainable consumption and promote inclusive economic growth, social development and environmental protection. Despite the relevance of geodiversity to achieving these goals, the geosciences were not taken into account in framing them. However, a number of studies have demonstrated the links between geodiversity and the SDGs and this presentation will outline these links.

Professor Benjamin van Wyk de Vries of the Université Clermont Auvergne gave the presentation entitled Science Socialisation using Geoheritage: A Way to Integrate Science with Real Problem. Professor Benjamin van Wyk de Vries first introduced his own understanding of geoheritage, he thinks “Geoheritage is made up of all the tangible and intangible elements of geology expressed in the form of outcrops, landscapes, but also in geophysical data, and cultural elements such as drawings and stories of geological territories”. All these elements can be used together to create a holistic approach through geoheritage incorporating geological environments, local peoples, scientists, administrators. To promote understanding between all actors to deal with all the challenges that we have in a geological environment. In addition, based on the UNESCO International Geosciences Programme - Project 692, Professor Benjamin van Wyk de Vries discussed "Geoheritage for Resilience". "Geoheritage for

Resilience" concentrates on developing this kind of holistic approach to sustainable development that places science in an overall context of societal resilience.

Professor Margaret Brocx of the IUCN WCPA Geoheritage Specialist Group gave the presentation entitled Coastal Geoheritage: A New and Important Subdivision of Geoheritage. The coast is one of the most complex environments on the Earth's surface, being a zone of intersection and interaction of land, sea, groundwater, and atmosphere and the processes therein. It carries processes and products that are either not present or only weakly developed elsewhere. With other matters such as lithology, structure, or geological framework being equal, the coastal zone is one that generally results in greater geodiversity than elsewhere. Given the diversity of sites of coastal geoheritage significance in relation to climate, coastal setting, provenance, and biology, there is a need for their geoconservation as globally significant features. Sites of coastal geoheritage significance also function as geoheritage features in terms of their Cultural Values, Geohistory, and as Type Sections and Type Localities.

Professor Hoang Van Sam of the Vietnam National University of Forestry gave the presentation entitled Protected Areas Management Related Conversation on Facilitating Biodiversity Conservation in Vietnam. Vietnam is situated in Southeast Asia. The total land area of Vietnam covers about 330,000 km². Three quarters of the country are mountainous. Forest covers about 42.00% of total country. The population of Vietnam is 97 million, and there are 54 ethnic groups in Vietnam. Professor Hoang Van Sam introduced the international biodiversity-related treaties and conventions and Vietnam's participatio, including Convention concerning the Protection of World

Cultural and Natural Heritage (WHC), Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Biological Diversity (CBD), The Cartagena Protocol on Biosafety to the Convention on Biological Diversity, The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits (ABS). Vietnam is an early and active participant in the biodiversity-related convention 🌿 the policy-makers and managers have highly paid attention on biodiversity conservation. It is showing the high commitment: the rapid development stage of national reserves and national parks came right after the most important convention ratified. Following the green growth development, Vietnam acknowledges the importance and urgency of the conservation and sustainable use of biodiversity. The demonstration on conservation-oriented community livelihood models in and around the buffer zones of protected areas is also opportunities for Vietnam, which can links with poverty-alleviation programs, reduction of resource exploitation. But there are also challenges for Vietnam to implement the international biodiversity related conventions, including overlapping institutional mandates, a financial shortage for biodiversity conservation and special use forest in Vietnam, a lack of biodiversity database on special-use forest systems in Vietnam.

2.2 Session on the sustainable development of geoheritage and national parks

Session on the sustainable development of geoheritage and national parks was organized by Dr.Dongying Wei, the chair of COG. Seven scholars from China,

Lithuania, Japan and Iran brought us seven wonderful lectures.

Mengting Chen, a scholar from China University of Geosciences (Beijing), based on her research on the Dabie Mountain World Geopark as an example, made a lecture entitled Comprehensive Evaluation of Tourism Ecological Security in Huanggang Dabieshan UNESCO Global Geopark. This study explores the tourism ecological security evaluation indicators of geoparks, analyzes the evaluation results and diagnoses the influencing factors, and then puts forward corresponding countermeasures and suggestions. The research shows that the geological park can adopt the scientific planning led by the government. When planning the geological park, we should not only consider the tourism development, but also consider the ecological environment protection. Mengting Chen suggested to actively support tourism enterprises, increase investment in environmental protection, and establish an ecological protection compensation mechanism according to the local fiscal revenue for environmental protection. Mengting Chen also stressed that the geopark should strengthen the ability of scientific popularization, actively carry out popular science activities in local schools and communities, enhance the awareness of local residents on ecological protection and geoscience heritage protection, so that they can voluntarily participate in the ecological protection of the geopark.

Jinxi Zhang, a scholar from Beijing Normal University, made a lecture entitled *Evaluating the Supply and Demand of Cultural Ecosystem services in the Tibetan Plateau of China*. Taking China's Qinghai Tibet Plateau as the study area, the lecture introduces the quantitative evaluation of the supply and demand of cultural ecosystem

in the Qinghai Tibet Plateau. Based on the analysis of relevant media data, environmental data and statistical data, and combined with solves model, she draws the following conclusions: (1) the combination of solves model and media data can effectively evaluate the supply and demand of cultural ecosystem services on the Qinghai Tibet Plateau; (2) The research object shows obvious signs of spatial mismatch, and more than a quarter of the basin area shows the mismatch pattern of supply and demand of ecosystem services; (3) The geographical location away from the central city is identified as an important reason for the high supply and low demand of sewage treatment plants.

Mai thi Khanh van from Okayama University, Japan, based on her research on Phong NHA Ke Bang National Park in Vietnam, gave a lecture entitled *Local Benefits from Tourism Development in Phong Nha-Ke Bang National Park, Vietnam*. Through questionnaire survey and in-depth interview, she investigated and studied the changes of Phong NHA Ke Bang National Park in terms of local income, infrastructure, natural resource assessment and local activities. Research shows that the development of local tourism has improved infrastructure construction, and local residents benefit from it. The life of local residents is also deeply affected by the development of tourism. The source of income of residents has changed from agricultural income to service income.

Marius Kalinauskas, a scholar from Lithuania, made a lecture entitled *Landscape Aesthetic Quality Mapping and Assessment: The Lithuanian Case Study*, and took Lithuania as a case to explore the mapping and evaluation of landscape aesthetic

quality. He stressed that the mapping and evaluation of landscape aesthetic quality (Laq) at the national level can provide scientists and decision makers with valuable insights into the overall situation of cultural ecosystem services (CES). The general view based on uniform methodological standards allows the comparison of Laq between countries, thereby promoting international environmental management policies. In his research, he collected information on the accessibility and conditions of Laq in Lithuania. GIS modeling and spatial statistics are used for analysis. The results showed that the landscape diversity, naturalness, uniqueness and Laq of agricultural and urban areas were the lowest, while the Laq scores of high-intensity areas, forests, protected areas, natural relics and heritage sites were the highest. The analysis shows that due to topographic energy and fluctuation, visibility is limited in most areas of Lithuanian territory with the highest Laq value. The banks of Curonian Spit and nemunas are one of the few high Laq areas with high visual accessibility potential. The patches with high Laq value are concentrated in protected areas, while the patches with the lowest Laq value are concentrated in agricultural land and urbanization areas. The laq-ces assessment is essential for higher quality environmental management regulation practice. High Laq areas may need better protection and welfare for residents, while low Laq areas may need additional recovery work.

Yasin Sayyad Salar, a scholar from Iran, made a lecture entitled *Environmental Justice for Elderly Groups: Spatial Perspective in Mashhad*. She took Mashhad as an example to explore the environmental equity of the elderly group. She found that only

a small proportion of the elderly were regarded as vulnerable groups and enjoyed open space and air; In Mashhad, there is air pollution in the green space where nearly 90000 elderly people live. She believes that it is very necessary to solve the air pollution problem of Mashhad outdoor urban green space.

Finally, Huang Cheng and Xi Wu, scholars from Wuhan and Hainan, China, made brief reports on whether nature reserves can protect ecosystem services and how to evaluate ecotourism activities based on ecotourism impact and tourist experience.

This session had a strong atmosphere of academic exchange, enthusiastic discussion and complete success, and would play a positive role in promoting the scientific research and technological research and development of geoscience heritage and the sustainable development of national parks.

2.3 Session on national park and its standardization

There were four experts invited for the session on national park and its standardization. They were Xiaoping Tang, from National Forestry and Grassland Administration of China; Jianming Liu from Ministry of Culture and Tourism of China; Panyan Wang from China Urban Construction Design & Research Institute; Han Li from Standardization Administration of China.

First, Xiaoping Tang brought a lecture entitled *Framework for the Construction of National Park Standard System*. Starting from the relevant background of what is China's National Park, why the national park system is established, and the positioning, functions and concepts of the national park system, and drawing on the reference experience of foreign national park standards, the lecture introduced the

construction ideas of the national park standard system, the framework of the national park standard system, and expounded the norms for the establishment of national parks technical specifications for overall planning of national parks and ecotourism specifications for nature reserves.

Jianming Liu brought a lecture entitled *Development Trend and Key Points of National Park Tourism Standards*. The lecture pointed out that with the construction of national parks and the development of tourism functions, only by building perfect national park tourism standards could we achieve a more reasonable and effective unity of ecological, economic and social benefits, further promote the scientific protection and rational utilization of natural resources, promote the harmonious coexistence between man and nature, and promote the construction of a beautiful China.

Han Li brought a lecture entitled *Analysis of Service Industry Standardization Situation and Policy*. The lecture completely introduced the development status and trend of service standardization from three aspects: the proposal of service standardization, the development situation of service standardization at home and abroad and the suggestions on service standardization.

Panyan Wang brought a lecture entitled *Review of Standards for Scenic Spots*. The lecture mentioned the value of natural and cultural heritage resources with Chinese characteristics, and systematically introduced the three stages of the development of scenic spot standards, the current scenic spots and relevant standards.

Participants had an in-depth discussion on the theme of "national parks and its

standardization". The participating experts agreed that a number of national parks have been established, which should give full play to the leading and normative role of standards, support the rational and orderly development of comprehensive functions of national parks, promote the improvement and standardization of ecotourism service quality of national parks, and realize the ecological and sustainable development of national parks.

2.4 The session on the national park system in United States

The convener and moderator of the session on the national park system in United States is Rudy D'Alessandro, an international cooperation specialist of the U.S. National Park Service. Nine experts from the U.S. National Park Service (NPS), Mammoth Cave National Park, Bering Land Bridge National Reserve, Yosemite National Park and West Kentucky University brought us seven wonderful lectures.

Tom Medema, the Associate Director for Interpretation, Education and Volunteers in NPS, made a lecture entitled *The Interpretation and Education Project of the National Park Service*. He pointed out that although all staff of the National Park Service can meet the needs of tourists in various ways, interpretation and education staff represent the face and voice of the National Park Service. The National Park Service usually carries out formal educational activities with educational partners such as schools or institutes. Educational experts, commentators or patrolmen often cooperate with local school districts; Teachers, youth, families or adult organizations can use the National Park as a unique learning laboratory and outdoor classroom. Tom Medema emphasized that the best, most unforgettable and most effective educational

projects have the characteristics of "interpretation", that is, they use many of the same communication skills to reveal the meaning and relevance of specific age groups through a series of projects, activities and media.

Jeanette Koelsch, the Superintendent of Bering Land Bridge National Preserve in Alaska, USA, presented a lecture entitled *Bering Land Bridge National Reserve*. She said that we acknowledge that the preserve is the homeland of the Inupiat peoples. Indigenous people remain an integral part of the environment of the preserve, as their ancestors have for thousands of years. To protect and interpret examples of arctic plant communities, volcanic lava flows, ash explosions, coastal formations, and other geologic processes, the Bering Land Bridge National Preserve has attached importance to visitor and resource protection activities (patrols), environmental and cultural education programs, website information, social media posts, Junior Ranger Programs, Tundra Tots- preschool students and parents.

Rick Toomey from the Mammoth Cave National Park and Chris Groves from Western Kentucky University jointly gave a lecture entitled *Resource Protection and Partnerships in the US National Park Service: Case Study of Mammoth Cave National Park, Kentucky*. The Mammoth Cave National Park is a national park, but also designated by the United Nations as a World Heritage Site and International Biosphere Reserve. It is the world's longest known cave with the length of 672 km and still being explored. Ancient explorers visited nearly 20 kilometers of Mammoth Cave. The purpose of Mammoth Cave National Park is to preserve, protect, interpret, and study the internationally recognized biological and geologic features and

processes associated with the longest known cave system in the world, the park's diverse forested, karst landscape, the Green and Nolin rivers, and extensive evidence of human history; and to provide and promote public enjoyment, recreation, and understanding. All management decisions are guided by sound science in Mammoth Cave National Park. Mammoth Cave National Park also works with partner, including local communities through the UNESCO Mammoth Cave Biosphere Region, university scientists and students, and UNESCO Sister Park Arrangements (South China Karst World Heritage Site and Puerto Princessa World Heritage Site, Philippines).

Tom Fish, the national coordinator of the Cooperative Ecosystem Studies Units Network (CESU), gave the lecture entitled *Cooperative Ecosystem Studies Units (CESU) Network Overview*. CESU Network is a national consortium of federal agencies, tribes, academic institutions, state and local governments, nongovernmental conservation organizations, and other partners working together to support informed public trust resource stewardship. The CESU Network includes over 498 partner organizations across 17 regional CESUs encompassing all 50 states, District of Columbia, and U.S. insular areas, as well as partners in Canada and Mexico. CESUs bring together scientists, resource managers, educators, students, and other conservation professionals, drawing upon expertise from across the biological, physical, social, cultural, and engineering disciplines (from “A”nthropology to “Z”oology) to conduct collaborative and interdisciplinary applied projects that address natural and cultural heritage resource issues at multiple scales and in an

ecosystem context.

Yenyen Chan of Yosemite National Park made a lecture entitled *Yosemite National Park*. Yosemite National Park is located in central California. The Yosemite National Park shows us a large number of granite relief forms formed by glaciation, including "hanging" valleys, waterfalls, ice bucket lakes, ice domes, moraines and U-shaped valleys. Using the new definition of interpretation proposed by the National Association for interpretation (NAI), Yenyen Chan briefly introduced how Yosemite National Park connects tourists with the precious natural and cultural resources of Yosemite National Park through interpretation and education projects. Yosemite National Park provides visitors with a variety of interpretation and education projects, including interpretive talk on different themes, hiking guided by commentators, special theme exhibitions, speeches and reports, nature and history projects, photography and walking projects, outdoor exploration projects, Yosemite cinema projects, etc.

Tyler Gilkerson and Mike Martin, the hydrogeologists of NPS Water Resources Division, together gave a lecture entitled *National Level Floodplain and Wetland Policy in the NPS*. NPS National Floodplain Policy is NPS policy to preserve floodplain functions and minimize hazardous conditions associated with flooding. Potential Hazards include: 1) threats to human health/life, 2) risk to capital investment, and 3) impacts to natural and beneficial floodplain values. If a proposed action is in a floodplain and relocation to a non-floodplain site is not an alternative, then a formal analysis (Floodplain Statement of Findings) must be prepared. The floodplain

analysis must: 1) quantify flood conditions and hazards, 2) justify selecting a floodplain site, 3) disclose risk associated with the site, and 4) explain flood mitigation plans. Mitigation is designed to protect human life and health, protect capital investment (infrastructure), and preserve/restore floodplain values. The NPS will provide leadership and take action to minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial values of wetlands; and avoid new construction in wetlands unless there are no alternatives, and the construction includes all practicable measures to minimize harm to wetlands.

Li-Wei Hung, a night skies research scientist at NPS Natural Sounds and Night Skies Division, gave a lecture entitled *Wilderness Resource Science and Management Natural Sounds & Night Skies*. The night skies research scientists at NPS Natural Sounds and Night Skies Division are a group of experts specialized in acoustics and astronomy. NPS Natural Sounds and Night Skies Division is a national level office, which provides measurements, modeling, critical analysis, and knowledge synthesis for informed decision making to all 423 park units managed under the National Park Service. Wilderness is often associated with vast landscape, tall mountains, crystal clear blue lakes, wild animals, and beautiful plants and flowers. But wilderness is more than just that. Natural sounds and night skies are also wilderness characteristics. These resources are not new but understanding these resources and learn how to protect and manage them is new. There are many health benefits from hearing the sounds of nature. Improves mood and sense of well being. Improves cognitive performance, sleep quality, and recovery from stress and pain. It is important to

wildlife too. But we often encounter challenges in trying to manage and preserve natural soundscape in parks. Some of noise comes from recreational activities such as air tours, motorized vehicles, and watercraft. Some comes from the administrative use such as construction, landscape maintenance, and emergency operations. So what do we do? We often help parks to measure what sounds are currently present in the parks, both natural sounds and noise. Knowing the current condition is the key for successful management actions. When noise is controlled and managed, the reward can be huge. Natural sounds exist worldwide. Natural spaces, species, and traditional cultural practices are disappearing around the globe as the modern human footprint expands. Coupled with this loss is the associated loss of natural and cultural soundscapes. The Sounds of Your Park initiative is a continuously growing collection of sounds intended to celebrate the acoustical beauty and diversity of the world's national parks and other protected areas. She encouraged other national parks to check it out and even considering submitting sound clips. She also mentioned that nearly half the species on Earth are nocturnal. Many species rely on natural patterns of light and dark to navigate, nest, mate, hide from predators, and cue behaviors. Night sky is an inseparable element of nature to many cultures, including the ancient Chinese society.

2.5 Session on international institutions making contributions to the development of nature protected areas

Yan Zhang, the director of International Union for Conservation of Nature (IUCN) Representative Office in China, was the convener and moderator of the session on international institutions making contributions to the development of nature protected

areas. Four experts from UNESCO Representative Office in China, The Nature Conservancy (TNC) — China, World Wildlife Fund Representative Office in Beijing, World Conservation Union (IUCN) Representative Office in China brought four wonderful lectures.

Jianxin Mu from UNESCO Representative Office in China gave the lecture entitled *UNESCO Man and Biosphere Programme and Nature Protection*, which included four aspects: introduction to UNESCO, overview of Man and Biosphere Programme, main work of China's Man and Biosphere Programme, Man and Biosphere Programme and the growth of young children. Through education, science, culture, information and communication, UNESCO promotes dialogue and mutual understanding among people, promotes cooperation among countries, and contributes to world peace and security, poverty eradication, sustainable development and cross-cultural dialogue (UNESCO's purpose and mission). Man and Biosphere Programme (MAB) is an intergovernmental and interdisciplinary comprehensive research program implemented by UNESCO in 1971 in response to the global population, resources and environmental problems. MAB was the first to clearly put forward the concept of sustainable development in the world. The main work of UNESCO China MAB includes the declaration and evaluation of World Biosphere Reserves, the dissemination and practice of the concept of "man and biosphere plan", international cooperation, science popularization, etc. Mu stressed that according to the technical guide for World Biosphere Reserves, in order to promote the whole society's

understanding, understanding and collective action of the World Biosphere Reserves, education and communication should be carried out for key groups, and teenagers are one of the key groups. Therefore, UNESCO and its partners have carried out a series of youth education activities, such as forest experience, looking for the beauty of the countryside and the collection of paintings with the theme of "ecological civilization and biodiversity".

Tong Jin, from Nature Conservancy (TNC) — China made a lecture entitled "Twenty years of development of the Nature Conservation Association (TNC) and China's Nature Protected Areas". Founded in 1951, the Nature Conservation Association (TNC) is one of the largest non-profit natural environment protection organizations in the world. It has been committed to protecting the land and water areas with important ecological value in the world, maintaining the natural environment and improving human well-being. TNC has made two outstanding contributions to the development of protected areas in China in the past two decades. First, provide scientific methods and capacity-building. Climate change, ocean, fresh water and protected areas are the four areas most concerned by TNC. Adhering to multi-party cooperation, science based protection methods and standardized analysis methods are the premise for TNC to carry out all protection work. On this premise, TNC can select the biodiversity that must be protected and the priority areas to be protected, formulate protection plans, and measure the protection effectiveness. This set of conservation methods and standardized analysis methods constitute the core content of Conservation by Design (CbD). Nature conservation system engineering is

a long-term protection tool and method used by TNC. In order to reduce the uncertainty in protection decision-making, TNC often uses two methods under this framework, Eco Regional Assessment (ERA) and Conservation Action Plan (CAP). Relying on the "nature conservation system project", TNC has provided training and technical support for the planning and management of protected areas in China, such as China biodiversity conservation strategy and action plan (2011-2030), Sichuan climate change and biodiversity conservation action plan, etc; Second, explore a new model of protected areas. China has built more than 2600 nature reserves, and the protected land accounts for more than 15% of the land area. In order to better solve the ecological problems caused by the shortage of funds and limited management capacity, TNC is still continuing to explore the ideal management mode of different protected areas, and has successively created protected areas and ecological restoration projects in Northwest Yunnan, Sichuan and Inner Mongolia, so as to provide innovative forces for China's natural conservation.

Wenbin Huang from World Wildlife Fund Representative Office in Beijing gave a lecture entitled *Coexistence of Man and Wildlife: Management of Human and Animal Conflict in National Parks and Protected Areas*". He first gave a brief introduction to the "human animal conflict". Human animal conflict refers to the direct or indirect interaction between human and wildlife that has a negative impact or even harm to either party. It mainly includes four forms: destroying food crops or cash crops, predating livestock, damaging houses and other property, and directly attacking human beings. From 2001 to 2010, 191 human tiger conflicts occurred in Hunchun

National Nature Reserve, including one death, three injuries and a variety of livestock injuries; From 2012 to 2015, 172 conflicts between people and Tibetan brown bears occurred in Qinghai Province, involving 2 prefectures and 7 counties, resulting in varying degrees of damage to housing construction, cash crops and villagers' personal safety. He stressed that human and animal conflict is a systematic long-term problem, which will become a new topic for China to strengthen wildlife protection with the in-depth promotion of China's ecological civilization construction. Human and animal conflict management should be taken as an important part of wildlife protection, and the long-term development goal of human and animal conflict management should be established. Huang then introduced the safe system, a safety management method for human animal conflict. The safe system includes four processes: (1) improve the human animal conflict information, including understanding the conflict trend and basic information (hot spots, influence and community attitude); (2) Rapid assessment, including establishing safe benchmark and building execution process; (3) Develop safe strategy and work plan; (4) Implementation and monitoring.

Yan Zhang from World Conservation Union (IUCN) Representative Office in China made a lecture entitled *Application of IUCN Natural Protected Area Knowledge products in China*. IUCN is a representative of natural protected areas knowledge products. There are 32 best practice guides for nature reserves, covering planning, planning, management, tourism, climate change, training, financing, etc. In addition, there are three knowledge products of great significance to the development of China's protected areas, two of which are born to commemorate the 60th

anniversary of the construction of China's natural protected areas. Finally, taking Laohegou land trust reserve in China as an example, Zhang introduced the application of IUCN public welfare governance natural protected areas (PPA) in China. Public welfare governance natural protected areas is a natural protected area managed by non-governmental organizations (individuals or groups, non-profit organizations, for-profit institutions, scientific research institutions and religious groups), which is defined by IUCN as "public welfare governance natural protected areas". Laohegou land trust reserve is the first social welfare reserve in China. The establishment of the foundation is very important to the Laohegou land trust model; The foundation is the fund carrier, the appropriate entity that signs the agreement and holds the management power. Local participation in the management of laohegou protected area and linking the protected area with the development of surrounding communities is very important for developing a sustainable and diversified fund plan.

2.6 Session on geological culture village construction

Session on theory and practice of geological culture village construction under the background of Rural Revitalization Strategy invited four experts, they were Ying Dong, the director of the Geological Relics Investigation and Monitoring Office of China Geological Survey, Professor Xujiao Zhang of China University of Geosciences (Beijing), Professor Jinbing Peng of the Chang'an University, and Guan Fengjun, the director of the Geological Environment Department of the former Ministry of National Land and Resources. The speaker and the guests had an in-depth discussion on the theme.

Ying Dong made a lecture entitled *Theory and Practice of Geological Culture Village Construction under the Background of Rural Revitalization Strategy*. Starting from the demand, development process, technical standard documents and leadership instructions issued by the geological Culture Village, the lecture comprehensively interpreted the construction foundation, basic theory, investigation and planning, Rural Revitalization and practical exploration of the geological Culture Village, which would provide reference and experience for the construction of geological culture villages throughout the country, and an in-depth understanding of the geological and cultural village.

Xujiao Zhang brought a lecture entitled *Resource Excavation and Rural Development of Geological and Cultural Village: Taking Ahetan Geological Culture Village, Hualong County, Qinghai Province as an example*. Through the detailed investigation of various resources in Ahetan Village, Hualong County, we found out the resource background and resource endowment of ahetan village, excavated the scientific connotation of tourism resources in Ahetan Village, and achieved fruitful results in the construction of Ahetan Village address cultural village. In the process of rural revitalization, it would further focus on the development of geoscience tourism, help the development of characteristic tourism in Hualong County.

The participating experts agreed that as a new thing and an important means of rural revitalization, geological culture village has been highly valued by relevant departments and widely recognized by the society. In the next step, it should promote the pilot construction of other geological culture villages, integrate the strengths of all

parties, strive to build ecotourism and help rural revitalization.

3 Networking

The chair of the IGU-COG, Dr.Wei, has built a bond cooperating relationship with several international organizations, including the International Union of Geological Sciences (IUGS), World Commission on Protected Areas (WCPA) in IUCN, The Nature Conservancy (TNC), UNESCO Representative Office in China. Experts from these international organizations were invited to participate in the international conferences supported by IGU-CoG. Meanwhile, Dr.Wei, had several online meetings with the experts, and discussed how IGU-COG would cooperate with them to promote the sustainable development of geoheritage.

IGU-COG also builded good relationship with some national government, like National Forestry and Grassland Administration of China, Ministry of Culture and Tourism of China, Standardization Administration of China, China Ministry of Environment Protection etc. to promote the education and protection of the geoparks. IGU-COG also cooperated with many local governments to promote the sustainable development of geoparks, like Qinghai Province, Xiuwu County in Henan Province, Shangrao City in Jiangxi Province, Taining County in Fujian Province etc.

IGU-CoG tired to drive change for the co-creation of sustainable solutions through leading international communication, learning and knowledge and promoting cooperation from all aspects related to geoheritage. So as to achieve the goal, IGU-CoG continue to work with IGU Commission on Geography for Future Earth: Coupled Human-Earth Systems for

Sustainability, and ProGeo (European Association for the Conservation of the Geological Heritage).. IGU-CoG invited the members to organize quality papers in the field of geoheritage and parks, which are written by authors from, and is concerned with geoheritage sites and parks in various regions and countries, especially the geoheritage sites and parks in developing and under-developed countries and regions, and the ones that are normally ignored but of great value and significance in the field of geoheritage.

4 Publication

4.1 General summary

International Journal of Geoheritage and Parks (IJGP) is an **OPEN ACCESS** international journal that publishes original geoheritage and parks-oriented papers addressing a broad range of fields including management, planning, policies, education, tourism, interpretation, economics, protection and sustainable development of global geoheritage and parks (including geoparks, national parks, protected areas, World Heritage sites, and other globally significant sites recognized for their geologic and geographical value). All articles published in *IJGP* are subject to rigorous peer view, based on initial editor screening and anonymous refereeing by independent expert referees.

The journal was established in 2003, and it is funded by Beijing Normal University and supported by the Commission on Geoheritage of the International Geographical Union (IGU-CoG). IJGP is indexed in Scopus, GeoBase, Directory of Open Access Journals (DOAJ), and a member of Committee on Publication Ethics

(COPE). The journal website is

<https://www.keaipublishing.com/cn/journals/international-journal-of-geoheritage-and-parks/>

In 2021, 40 articles were published in 4 issues, with a completion rate of 100%. According to the Scopus Cite Score Tracker, the Cite Score for *IJGP* in 2020 is 1.2, and it is 2.6 by December 2021.

Special Issue on Exploration of Geoheritage, Geoparks and Geotourism was also proposed and completed by , Dr. Subhash Anand, Professor in Geography, Delhi School of Economics, University of Delhi (India); Vice Chair of IGU-CoG; Dr. Dongying Wei, Associate Professor in Geography, Beijing Normal University, Beijing, China, Chair of IGU-Co; Bathula Srinagesh: Professor in Department of Geography, Osmania University, Hyderabad, India, Executive Member, IGU Commission on Local & Regional Development; Dr. R. B. Singh, IGU Secretary General and Treasurer.

In 2021, *IJGP* submitted the application materials of GeoBase database on May 7, 2021, and the notice that our journal was successfully included by GeoBase database was received on August 13, 2021; For the application of ESCI database, the application materials were submitted on August 17, 2021. At present, the evaluation process has not been completed and we are still waiting for it.

4.2 *IJGP* editorial board updates

The reorganization of the editorial board of *IJGP* was completed in early 2021. The structure of the editorial board changed from the original single members of the

editorial board to a new structure with three parts: *Editorial Managing Committee*, *Advisors* and *Editorial Board Members*(Table 4). Editorial Managing Committee is comprised of 7 members, they perform the functions of decision-making, supervision, guidance and participation (including 2 academician members); Advisors is comprised of 3 consultants, including 1 international expert, Mike Medows, IGU Chair and 2 experts from China (including 1 academician member); Editorial Board Members has been updated and replaced on the basis of the original members of the editorial board, which is currently composed of 30 experts and scholars from 16 countries.

The *IJGP* editorial office organized and held three online editorial board meetings on January 7, February 24 and August 11, 2021 respectively. The progress, challenges and development strategy were well and deeply discussed.

Table 4 IJGP editorial board (2021-2023)

Editors-in-chief & Associate Editors-in-chief
Editors-in-chief Dongying Wei Beijing Normal University, China Benjamin van Wyk de Vries University of Clermont Auvergne, France Associate Editors-in-Chief Rui Yang Tsinghua University, China Kyung Sik Woo Kangwon National University, South Korea Guangyu Wang

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Editorial Board Members
Luis Alcalá Fundación Conjunto Paleontológico de Teruel-Dinópolis, Spain Alexandru Andrasanu University of Bucharest, Romania Peter Bobrowsky
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Geological Survey of Canada, Canada

Junzhi Chen

Academy of Forest and Grassland Inventory and Planning, National Forestry and Grassland Administration, China

José Luis Sánchez Cortez

University of Guayaquil, Ecuador

Lary M. Dilsaver

University of South Alabama, USA

Ross Dowling

Edith Cowan University, Australia

Dorothy Hill

Mount Royal University, Canada

Ramesh Krishnamurthy

Wildlife Institute of India, India

Yu-Fai Leung

North Carolina State University, USA

Lynn Moorman

Mount Royal University, Canada

Carole M. Murphy

University of Missouri-St.Louis, USA

Virendra Nagarale

S.N.D.T. Women's University, Pune Campus Pune (MS), India

David Newsome

Murdoch University, Australia

Bruce Prideaux

Central Queensland University, Australia

Lloyd I. Richardson

University of Missouri-St.Louis, USA

Artur Abreu Sá

University of rás-os-Montes e Alto Douro (Vila Real, Portugal), Portugal

Hoang Van Sam
Vietnam National University of Forestry, Vietnam

Vic Semeniuk
University Notre Dame, Australia

Rinekso Soekmadi
IPB University Bogor Indonesia, Indonesia

Alvaro Soutullo
CURE, Universidad, de la Republica, Uruguay

Daniel Tormey
Catalyst Environmental Solutions, USA

Nemanja Tomić
University of Novi Sad, Serbia

Helena Tukiainen
University of Oulu, Finland

4.3 *IJGP* promotion

First, the official WeChat account of *IJGP* was created at the end of November 2020. In 2021, the official WeChat account of *IJGP* released 58 posts, and the number of followers is 526, which has increased 456 compared to 2020.

Second, *IJGP* editorial office sent 1874 push emails, and the proportion of emails opened was 18.8%. The proportion of relevant links in e-mail content opened was 6.91%.

Third, 222 e-mails were sent to international scholars throughout the year by *IJGP* editorial office to invite paper submission, paper review.

4.4 *IJGP* Most Cited Articles Top 10

- [Geodiversity, geoheritage and geoconservation for society](#)
- [Geoconservation principles and protected area management](#)
- [Exploring the potential for geotourism development in the Danube region of Serbia](#)
- [Linking geoconservation with biodiversity conservation in protected areas](#)
- [Geomorphological heritage inventory of Irazú Volcano, Costa Rica](#)
- [A Genealogy of UNESCO Global Geopark: Emergence and Evolution](#)
- [Geotourism potential of Thethi National Park \(Albania\)](#)
- [Analyzing the Impacts of forest Ecosystem Services on Livelihood Security and Sustainability: A Case Study of Jim Corbett National Park in Uttarakhand](#)
- [Conservation of geoheritage in Ecuador: Situation and perspectives](#)
- [Inventory and assessment of significant scientific Algerian geoheritage: Case of remarkable geosites from Orania \(Western Algeria\)](#)

4.5 *IJGP* 2021 Most Downloaded Articles Top 10

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- [Geothermal energy provinces in India: A renewable heritage](#)
 - [The post COVID-19 tourism dilemma for geoparks in Indonesia](#)
 - [Application of hybrid SWOT-AHP-FuzzyAHP model for formulation and prioritization of ecotourism strategies in Western Himalaya, India](#)
 - [Economic impact of UNESCO Global Geoparks on local communities: Comparative analysis of three UNESCO Global Geoparks in Asia](#)
 - [Promoting intangible cultural heritage \(ICH\) tourism: Strategy for socioeconomic development of snake charmers \(India\) through geoeducation, geotourism and geoconservation](#)
 - [Geoproducts – Innovative development strategies in UNESCO Geoparks: Concept, implementation methodology, and case studies from Naturtejo Global Geopark, Portugal](#)
 - [National parks best practices: Lessons from a century's worth of national parks management](#)
 - [Geotourism of mining sites in Iran: An opportunity for sustainable rural](#)

development

- Badlands of Gangani in West Bengal, India: An assessment on account of geotourism development
- Continuities and changes of Kamakhya at Nīlācala: A geo-heritage and geo-tourism perspective

5 Work plan for 2022

Commission (2020–2024) will continue to focus on the development of comparative studies on geoheritage, tourism and corresponding social, economic, environmental and political change and will concentrate on the communication and transfer of research results in policy relevant terms to policy makers and industry as well as continuing the scientific publishing programme of the Commission. The Commission therefore seeks to continue its activities for 2022 as outlined in relation to its existing objectives. The planned activities are as the following:

- To organize regular commission member meeting;
- To participate IGU conferences;
- To host an international conference related to geoheritage;
- To continue network with national and international organizations and authorities;
- To promote *the International Journal of Geoheritage and Parks* to publish 4 issues, 40 articles.