

# The IGU Commission on *Geography for Future Earth: Coupled Human-Earth Systems for Sustainability*

## Periodical report 2017-2018

The report includes information concerning the organization of the Commission, the progress of website construction, special issues hosting and journal establishment (publication issues), and provides to do list for IGU-GFE commission.

### 1. Organization of IGU-GFE Commission

#### 1.1 Steering committee

IGU Commission on *Geography of Future Earth: Coupled Human Earth Systems for Sustainability* (IGU-GFE) has been formally established in October 2017. IGU-GFE will initially focus on human-land systems and its interfaces with the coast, the ocean, and the atmosphere. It aims to promote wider analysis and innovative thinking about global land sustainability through the bridging and synthesis of physical geography, human geography, ecology, hydrology, atmospheric, climate and social sciences. It will provide a platform for communication among geographers globally with the aim of promoting research and innovation in relation to sustainability. Prof. Bojie Fu has been IGU vice President since August 2018, and he cannot be the Chair of our Commission based on the rule of IGU. The Executive Committee of IGU appointed Prof. Wenwu Zhao as the Chair of our Commission, and associate Professor Yan Li ([yanli.geo@gmail.com](mailto:yanli.geo@gmail.com)) as “Secretary and Treasurer” of our Commission. The present steering committee structure of IGU-GFE is as follows.

The steering committee structure for 2017-2018 is organized into three main sections: Leaders, Secretariat, and Committee members. The Leaders section includes the Chair, Dr. Prof. Wenwu Zhao, and the Vice Chair, Dr. Prof. Mark Stafford Smith. The Secretariat section includes the Secretary, Dr. AP. Yan Li. The Committee members section consists of eight members: Dr. Prof. Hanqin Tian, Dr. Prof. Peter Verburg, Dr. Prof. Sandra S. Luque, Dr. Prof. Toshiya Okuro, Dr. Prof. Soroosh Sorooshian, Dr. Prof. Francesco Cherubini, Dr. Prof. Walter Musakwa, and Dr. Prof. Dra. Nicole Bernex. The IGU-GFE Commission logo and the text '2017-2018' are also displayed.

Leaders	Secretariat	Committee members
 Chair Dr. Prof. Wenwu Zhao	 Secretary Dr. AP. Yan Li	 Dr. Prof. Hanqin Tian
 Vice Chair Dr. Prof. Mark Stafford Smith		 Dr. Prof. Peter Verburg
		 Dr. Prof. Sandra S. Luque
		 Dr. Prof. Toshiya Okuro
		 Dr. Prof. Soroosh Sorooshian
		 Dr. Prof. Francesco Cherubini
		 Dr. Prof. Walter Musakwa
		 Dr. Prof. Dra. Nicole Bernex

## 1.2 Commission website

The commission website is being constructed. The website of IGU-GFE Commission is a bilingual (English-Chinese) version website that contains seven modules as follows.

- Home: a comprehensive showcase of the Commission
- About IGU-GFE: to introduce the aim and tasks of the Commission
- IGU-GFE structure: to give a detailed introduction about the structure and steering committee members of the Commission
- News: to release news of recent conference the Commission involved or forthcoming events relate to the Commission.
- Journals: Introduction or links of journals on sustainability.
- Relative group links: to present relative international, intergovernmental, or inter- and multi-disciplinary groups around geography and sustainability.
- Downloads: Files, papers or descriptive documents published by members of the Commission

As for the domain name of the commission website, previously we applied the domain name (gfe.bnu.edu.cn) and Web server of the Commission from Beijing Normal University Information and Internet. Later, for the consideration of global identification, we bought a new domain name (igu-gfe.org) from Godaddy (the world biggest domain server authorized by ICANN) with suffix of “.org”. Due to Chinese laws, the new domain name need to be transferred to local China domain server and required ICP (Internet Content Provider) Licensing. At present people can use both “igu-gfe.org” and “gfe.bnu.edu.cn” to get access to the Commission website. The ICP licensing process still need some time.

## 1.3 Commission logo

The Logo of IGU-GFE commission is being designed. The Logo alternative proposals have been developed by considering the theme of the Commission (sustainability, future earth, development). After collecting suggestion feedbacks from the members of the steering committee, a final revised version will be chosen. The Logo plans are as follows.

Plan A Letter variants			
Plan B Projecting a future earth			
Plan C Future, earth, sustainability			

After several rounds of discussion and revision, Plan C was chosen as the final version of IGU-GFE Logo. The mother earth hemmed with rotational wings forms a wheel which means we will forge forward with hope and care in a sustainable way.

Final Version of IGU-GFE logo:



## 2. Meetings Related to IGU-GFE Commission

### 2.1 The organized meeting in 2017

IGU-GFE was formally established in October 2017. As a new commission, IGU-GFE did not organize some meetings at the end of 2017. While, some steering committee members (Prof Hanqin Tian and Prof. Bojie Fu) co-organized *1st CHES Workshop on Coupled Human-Earth System Solutions for Global Sustainability* on August 13-14, 2017. This workshop was held in Auburn University, USA. More than 40 scientists from USA, China and Indian attended this workshop. The chair of IGU-GFE Commission, Prof. Bojie Fu, delivered a keynote speech on *Ecosystem services in the changing landscape*. Besides, the oral speeches were focusing on providing effective solutions to the most pressing global and regional environmental challenges such as climate change, land use, water quality, soil loss, and poverty via coupled Climate-Human-Earth System pathways and modelling. During the workshop, the scientists agree that it is so important to establish a new commission on *Coupled Human Earth Systems for Sustainability*. The workshop unveiled the preface of the establishment of the IGU-GFE.



## 2.2 The organized Meetings in 2018

### 2018 IGU Regional Conference

The **2018 IGU Regional Conference** in the Québec City from August 6 to 10, 2018, and IGU-GFE Commission organized the session “Coupled Human-Earth Systems for Sustainability”.

Themes of the session include (but not limited to):

- Fundamentals of Geography for Future Earth, and especially new theories and hypothesis on coupled human-earth systems for sustainability;
- Open and inclusive platforms for Geospatial Big Data and observations of coupled human-earth systems;
- Integrated Earth system models to deepen our understanding of complex Earth systems and human dynamics across different scales;
- Linkages and dynamic analysis among ecological process, services, and human wellbeing;
- Human Contributions and Responses to global climate/environmental changes and sustainability;
- Evaluation tools for sustainable development, multi-scale sustainability evaluation, and sustainable scenarios for transformative development pathways.

Commission members and researchers from different countries got together to have thoughtful discussions about Human-Earth Coupling as well as effects caused by environmental changes. This session became the debut of the IGU-GFE Commission on international geography stage and enlarged the influence of the Commission.

## 3 Publications

### **Special issue on Global Environmental Change**

In order to serve for the sustainability research, Professor Bojie Fu initiated a special issue on *Global Environmental Change* in “Current Opinion in Environmental Sustainability” in 2018. The issue title is: *Understanding the interaction between the biophysical processes and social processes of global environmental change for preparedness for future changes*. According to original plan, the issue will be divided into five sections consisting 20-30 papers:

- Introduction including an editorial overview and an introductory paper on main concepts and biophysical processes, as well as its social linkage of global environmental change.
- Ecosystem structure and function change, presenting global and regional scale assessment of ecosystem structure and function changes and its drivers, ecosystem composition, type, and productivity.
- Hydrological processes and water resources, reviewing the findings of hydrological processes, eco-hydrological processes, socio-hydrological processes in the river basins and the implications of the changing human-water relationship on sustainable water resources management

- Land use and soil conservation, reviewing the results of land use processes, soil erosion and conservation, social processes of land use decision-making and the implications of the changing human-land relationship on land conservation practices.
- Policy and adaptation measures, synthesis of new understandings of global environment change in changing human-environment relationship and recommendation on policy and adaptation measures.

Now the special issue of The Current Opinion Journals: Current Opinion in Environmental Sustainability aims to track the emergence of a new innovative sustainability science discipline by integrating across regional and global systems with their typical dimensions, human-environment interactions and management challenges. Two out of eleven members of IGU-GFE steering community members were among the editors-in-Chief of this special issues. Current Opinion in Environmental Sustainability mainly focuses on the actual interdisciplinary sustainability research approaches, the solutions it provides and their dissemination and application.



## 4. Future Plans

**4.1 Upcoming Meetings The International Workshop on the Human-Earth System Dynamics and Modeling** going to be held in Beijing, on 22-23 October 2018, which is organized and sponsored by IGU-GFE commission and State Key Laboratory of Earth Surface Processes and Resource Ecology (ESPRE), Beijing Normal University (BNU).

The workshop aims to bring scientists around the world to share their achievements, have in-depth discussion on the current status of the Human-Earth System studies and explore future research directions. The workshop will focus on the following topical areas:

- Earth Surface System Modeling and Land-Use/Land-Cover Change (LUCC)
- Dynamics of Human Activity-Earth System Interactions
- Bi-directional Coupling of Earth System Models and Socio-economic Models
- Linkages and Dynamics among Ecological Processes, Services, and Human Well-being, and Coupled Human-Earth System processes at multiple scales

On behalf of the Commission and Beijing Normal University, we now welcome experts in this field join us and we will provide round way air-tickets and accommodation. Ms. Yan Guo

(guoyan@bnu.edu.cn) and Ms. Huizhen Mao (Maohuizhen1992@outlook.com) are responsible for all logistic issues related to the workshop.

**The 4<sup>th</sup> Asian Conference on Geography** going to be held in Sun Yat-sen University Guangzhou, China during December 6-10, 2018. IGU-GFE plans to organize a session based on Sustainability study to have in-depth discussion with geographer in Asia.

**The 10th IALE world congress that will be held in Milan (ITALY)** on 2019, July 1-5. The conference theme is 'Nature and society facing the Anthropocene: challenges and perspectives for landscape ecology. IGU-GFE Commission will organize a symposium under the title of Promoting Ecosystem Services for Sustainable Development Goals. We now have six co-organizers from different countries to distribute information and arrange the schedule of the symposium.

The year of 2019 marks the **100 anniversary the establishment of American Geophysical Union**. Prof. Qingyun Duan, fellow of AGU, as well as professor of Beijing Normal University, will serve as the liaison of AGU College of Fellows Centennial Subcommittee in Mainland China. To attract scientists majored in Earth Sciences and encourage those people to contribute to sustainability study, IGU-GFE will take this opportunity to join hands with AGU to co-organize series of centennial celebration activities: (1) Frontier Forum on Earth & Space Science, this forum will discuss frontier problems and challenges within the realm of earth & space sciences, especially topics related to Future Earth. (2) Summer science camps feature current frontline AGU leaders (i.e., section leaders and journal editors) to promote good science practice, train young early career scientists and students on scientific integrity and methods, communication skills, and career advancement. (3) Co-Organize workshops in China on special topics such as confronting water security in developing countries, adaptation and mitigation of global environmental changes, etc.

#### **4.2 The Journal of IGU-GFE**

Considering the location of secretariat and funding, the application process of journal were set out in China. Chinese Journal Internationalization Program funded by China Association for Science and Technology (category D-newly published journals) aims to promote the reputation of local Chinese academic journal, therefore, we applied for this program under the support from The Faculty of Geographical Science, Beijing Normal University and Beijing Normal University Publishing Group. After three-month-preparation, the journal of our Commission-- Geography and Sustainability was approved by CAST (China Association for Science and Technology) and the journal will get annual financial support from both Beijing Normal University and CAST (China Association for Science and Technology).

Themes of the journal include:

- Fundamental geographical comprehensive theory and methods towards sustainable development.
- Conjunction and dynamic analysis among ecological processes, eco-system services and human well-being.
- Multi-scale complexed human-earth coupling models.
- Human contribution and response to global change and sustainability.
- Monitoring and Integrative Platforms for Geo-big data.
- Multi-scale sustainability evaluation methods and pathways for sustainable development.

For further arrangements of the journal, six executive-editors will take in charge of paper calling tasks in different continents. For each issue we will pick one international hot-spot in research field of geography and sustainability as theme, trying to contact well-known experts for

special reports writing. Besides, we will also try to keep in touch with international information and analytics company like Thomson Reuters, Scopus, EI, etc., hoping to find ways for online publishing of the commission journal. We now plan to post full-time editor recruitment notification on LinkedIn or Research Gate, to find someone who can suits the position.

### **4.3 Special issues related to IGU-GFE**

In August 2018, IGU-GFE hosted one session at the 2018 IGU Regional Conference. The new conceptual cascade of “pattern – process – service – sustainability” was discussed in the session, which is new way to understand the dynamics of coupled human-earth systems, as well as the management policies and practices for improving sustainability. During the research processes of coupled human-earth systems, researchers should diagnose the response of land use or landscape PATTERN change (human activities) on ecological PROCESSES at multi-scales, and identify the ecosystem SERVICE among various ecosystem functions, and reveal the contribution of ecosystem service on human wellbeing. Human activities such as planning and governance are typical adaptations to regulate the natural components towards SUSTAINABILITY.

Based on the session discussion, IGU-GFE would like to organize a special issue on Pattern–Process–Service–Sustainability. The special issue will be published in Chinese Geographical Science in 2019, and the topics of this special issue are as follows (not limited to):

- Land use or landscape pattern change on ecological processes
- Coupling of natural and human processes
- Ecosystem service evaluation and integrations
- Effects of global environmental change on ecosystem service
- Ecosystem service evaluation and tradeoff analysis
- Simulation of human and nature system
- Sustainability evaluation and sustainable development
- Scale and scaling

Gest Editors of this special issue:

Prof. Wenwu Zhao, zhaoww@bnu.edu.cn, Beijing Normal University

Prof. Francesco Cherubini, francesco.cherubini@ntnu.no, Norwegian University of Science and Technology

Prof. Walter Musakwa, wmusakwa@uj.ac.za, University of Johannesburg, South Africa

### **4.4 International Programs**

Africa has been struck severely by the impacts of climate change. Given its geographical position, the continent will be particularly vulnerable due to the considerably limited adaptive capacity, and exacerbated by widespread poverty. Therefore it's essential to organize international co-operation programs about Africa, to lessen impacts of climate change and thus secure sustainable development of the continent.

At present we already have some research basis about Africa. Yan Li, secretary of IGU-GFE, has been focused on application of renewable energies in North Africa. We also have professors at BNU who have co-operated relationships with Johannesburg University. We now plan to co-operate with researchers at Chinese Academy of Science, as well as IUPUI, to apply for international co-operation program to integrate researches in aspects of ecology, landscape change, remote sensing, hydrology and climate change into a synthetical study. Hoping we can provide suggestions for policy-makers in Africa from multiple aspects.