International Geographical Union

Environment Evolution Commission

REPORT OF COMMISSION ACTIVITIES IN 2015

1. MEMBERSHIP

A. Steering Committee

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B. The number of commission members in total and by country as of 31 December 2015.

Russia – 120
Belarus -8
Ukraine – 8
Kazakhstan - 2
Azerbaijan -2
Estonia - 1
Lithuania - 3
Kirgizstan - 1
Turkmenistan -1
Germany -10
Czech Republic – 2
Poland -2
Japan - 7
China -10
Israel -1
Australia -1
Great Britain -2
Canada - 1
USA – 6
Netherlands -2
India -3
Chile - 1

Total - 194

C. URL of the Commission/Task Force website

http://eecomm.org

2. MEETINGS

A. The meetings your commission organized in 2012-2016 with information on their locations, dates, and numbers of participants.

2012

May 15, 2012. The workshop "Climate changes and problems of human and environment interactions" held in the Institute of Geography (Russian Academy of Sciences), organized by two IGU Commissions: Environment Evolution (C08.09) and Karst (C08-23), 26 participants.

August, 26-30, 2012. The special session of the Environment Evolution Commission in a frame of the 32nd International Geographical Congress in Cologne-2012. Title: Human-Environment Interactions and Evolution in the Late Pleistocene and Holocene. 6 timeslots, 24 oral presentations, 32 participants.

2013

August, 4-9, 2013. The special session in a frame of Kyoto Regional Conference of IGU. Title: “Environment Evolution and Human Activity in the late Quaternary: Geographical Pattern”. 16 oral presentations (4 time-slots), and a lot of people (about 20) took an active part in discussions.

2014

April, 16-19, 2014. International Conference and Young Scientists School «Methods of palaeoenvironmental researches» Moscow, Geological Institute of Russian Academy of Science, 148 participants.

2015

August, 17-21, 2015, the IGU Regional Conference 2015, Moscow, Russia. The Environment Evolution Commission organized 3 special sessions: 1) Environment Evolution and Human Activity in the late Quaternary; 2) Landscape dynamics and human impacts during the last millennium; 3) Climate - vegetation interaction under current and future climate change scenarios. In total - 55 oral presentations and 19 posters, about hundred participants including discussions.

B. A brief summary of the topics addressed at each meeting and the findings or conclusions resulting from the discussions if appropriate

1) May 15, 2012. The workshop "**Climate changes and problems of human and environment interactions".** The scientific action was devoted to the following subjects: karst objects at the List of World Natural Heritage, management and conservation of karst landscapes, climatic dynamics in the Pleistocene and the Holocene, initial occupation of the Eurasia and North America by men, men and environment interaction and land use in the Holocene and in the recent past. The special attention was paid to the problems of scientific collaboration between two commissions and to the development of general strategy of the cooperative activities.

The seminar included 2 oral presentations by Dr. Elena Trofimova (chair of Karst Commission) and professor Andrei Velichko (chair of the Environment Evolution Commission) and short talk of the secretary Dr. Elena Novenko.

26 colleagues from different scientific institutions of Moscow (Institute of Geography RAS, Institute of Soil Science RAS, A.N. Severtsev Institute of Ecology and Evolution RAS and Moscow State University) took part at the discussions around the presentations. The president of IGU, Dr. Vladimir Kolosov (honorary guest and participant of the seminar) emphasized the importance of scientific collaboration between Commissions and Task Forces of IGU.

2) August, 26-30, 2012. The special session of the Environment Evolution Commission in a frame of the **32nd International Geographical Congress in Cologne.** The session was designed to address this shortcoming by bringing together scholars of diverse backgrounds for an open discussion of the appropriate methods, scales, units, and data for evaluating the complex interactions and feedbacks between environmental change and human evolution. The context for this discussion is the late Pleistocene and early-middle Holocene, roughly 100,000 years marked both by extreme environmental variability and unprecedented change in human biogeography, demography, and social complexity. During this time Eurasia witnessed the influx of anatomically modern humans and the disappearance of archaic hominid forms; the Americas received hominids for the very first time; hunter-gatherers domesticated plants and animals and intensified their agricultural efforts in numerous independent locations around the world; and human society diversified, specialized, and stratified in novel ways and degrees. All of these developments took shape against a background of local and global variability in atmospheric composition and circulation, ecological succession, and biological evolution unfolding on a variety of different scales.

3) August, 4-9, 2013. The special session in a frame of **Kyoto Regional Conference** of IGU. Geographers from 8 countries (Russia, Japan, Germany, China, USA, Cambodia, India and Indonesia) participated in the session; those were focused on studies of the landscapes evolution and human activity in different geographical regions during the Pleistocene and the Holocene.

The principal topics of the presentations were:

- Landscape dynamics: participants presented the results of investigations the landscape dynamics during the Late Pleistocene and Holocene (the last 120 kyr) in a scale of Northern

Hemisphere. The main ideas and conclusions were in possibility of paleo-analog approaches for assessing the position of modern environments in the general evolutionary system.

- Natural Processes: participants presented the results of the experimental and theoretical studies in the key-regions: paleontological information (pollen, macrofossil, diatoms, etc); geomorphological data, paleolimnic and paleohydrological materials, radiocarbon dates, stable isotope data and the evidence about beginning of human activities. The presented results have shown that human activity in late Pleistocene and Holocene become a more and more important factor in the environment evolution system

4) The International Conference and Young Scientists School **«Methods of palaeoenvironmental researches»** held April, 16-19, 2014 in the Geological Institute RAS and was organized by Environment Evolution Commission of IGU, Russian Academy of Science, Moscow State University and Russian Palynological Commission. 148 participants from 8 countries (Russia, Germany, Ukraine, Belorussia, Estonia, Azerbaijan, Kazakstan, Abkhazia and Kyrgyzstan) took part in the conference. The programme included 16 key-note lectures, 40 oral and 32 poster presentations and 5 master classes.

The Conference was focusing on the methodological issues of paleoecological studies and aimed to provide a comprehensive overview of the most current and innovative techniques.

The main topics of the conference were follow:

1) Multy-proxy approaches in palaeoecology;
2) Relationships between composition of recent pollen assemblages and vegetation; problems in interpretation of pollen data;
3) Palaeoenvironmental analysis by archeological studies;
4) Morphology of pollen and non-pollen palynomorphs;
5) Methodical problems in studies of pre-Quaternary deposits;
6) Software for palaeoenvironmental data .

Each topic included keynote plenary lectures by experts in the field of paleoecological research, short talk session and seminars on a range of relevant palaecology related topics, providing a lively and comprehensive conference. The first day of the conference consist completely of keynote lectures on radiocarbon, TL and OSL methods of dating, pollen, diatom, charcoal, testate amoeba, stable isotope data, application of methods from soil science and archaeological findings for reconstructions of the environmental conditions in the past. Attendees were exposed to new methods currently being developed by high-profile senior researchers, and expanded their knowledge in traditional methods of interpreting the results of paleoecological studies.

A special emphasis in the conference was placed on data handling: chronology; data analyses: zonation, ordination techniques, diversity estimates, rate of change. 5 practical exercises (such as master-classes in morphology of pollen and non-pollen palynomorphs and software used for data analyses) were organized in a frame of the conference.

5) August, 17-21, 2015, the IGU **Regional Conference 2015, Moscow,** Russia. The Environment Evolution Commission organized 3 special sessions: i) Environment Evolution and Human Activity in the late Quaternary (Conveners: A.A. Velichko and T. Boettger). The session was focused on the long-term studies of landscapes evolution, climate dynamics and human activity in different geographical regions during the Pleistocene and the Holocene. The special attention was paid to the problems of palaoeogeography of Caspian basin and environment evolution of arid zone in the Late Quaternary.

ii) Landscape dynamics and human impacts during the last millennium (Conveners: E.Yu. Novenko and D.N. Koslov). The session was focused on a review of available knowledge on the forced and unforced climate variability and dynamics of human-environment interactions during the last millennium and the late Holocene. Fruitful discussion needs presenting and analysis of already existed data sets and results of new observations, data from natural archives, results of modeling experiments, etc. One of the key scientific questions of the session was to explain how

human activities have influenced and changed natural ecosystems during the last millennium and in the recent past.
iii) Climate - vegetation interaction under current and future climate change scenarios (Convener: A.A. Olchev).
The session was aimed to bring together the specialists working in the fields of climate, vegetation and land use changes. Modern climate changes have significant impact on growth and functioning of the different plant community. On the other hand, the climate is very sensitive to land cover and vegetation changes. What is the main mechanisms of climate - atmosphere interactions, how the vegetation and land use changes influence the climate system and what is the response of the different plant communities to climate change are key questions for discussions in the session. The specialists working in the different scientific areas (meteorologists, climatologists, forest ecologists, paleogeographers, modeling experts, etc.) were take part in the session.
The program included 55 oral presentations and 19 posters. The participants from Russia, Denmark, Kazakhstan, Rumania, India, China, Egypt, Saudi Arabia, Israel, Brazil and Peru took part in these special sessions.

C. The meetings or other events Commission plans to hold in 2016 and later years, including locations, dates, and themes if known. Highlight in particular your plans for participation in the Beijing International Geographical Congress.

2016
May, 2016, Moscow. The workshop "Human impact on landscapes: retrospective analysis" will be organized together with the Commission on Physical Geography of Russian Geographical Society. M.V. Lomonosov Moscow State University, expected 50 participants.

21-25 August, 2016. Beijing, China. The 33rd International Geographical Congress. The IGU Environment Evolution Commission organizes 4 special sessions in a frame of this Congress:
1) Environment Evolution and Human Activity in the late Quaternary;
2) Climate - vegetation interaction under past and future climate conditions;
3) Prehistoric Human Occupation and Environmental Changes on Tibetan Plateau and Surroundings;
4) Climate Change and Human-Environment Interaction from Neolithic to Historical Periods.
The main topics that will be discussed on the special sessions: landscape and climate dynamics in the Pleistocene and the Holocene in different region of the World, initial occupation of the Eurasia by men, men and environment interaction and land use in the Holocene and in the recent past, modern forest ecosystems and prognosis of their dynamics in future.

October, 2016. Moscow. The workshop “The International Year of Global Understanding and physical geography” IGU Environment Evolution Commission together with the Commission on Physical Geography of Russian Geographical Society. M.V. Lomonosov Moscow State University, expected 30-40 participants.
The main topic of the workshop:

- How everyday actions matter for global climate change?
- How do we transform nature?
- How societies and cultures influence on nature.

2017
April-May, 2017, Moscow. International Conference and Young Scientists School “Modern perspectives of Palaeoecology”. Institute of Geography Russian Academy of Science. 200 participants are expected.

The knowledge gained from Palaeoecology and Quaternary research, particularly from past records of unusual events and abrupt changes, is invaluable for understanding nature and taking appropriate actions to mitigate natural risks. The main aim of the Conference will be to contribute palaeoecology to help minimize the effects of disasters from hazardous natural processes.

2018. Quebec, Canada, IGU Regional Conference 2018. Special sessions of the IGU Environment Evolution Commission.
2020 Istanbul, Turkey, International Geographical Congress 2020. Special sessions of the IGU Environment Evolution Commission.

C. Networking

A. Ways your Commission/Task Force has collaborated with other IGU Commissions and Task Forces in the period 2012 - 2016.

The Commission works in tight collaboration with IGU Commission of Cold Region Environments (C12.06) and IGU Commission of Karst (C12.23) these are located in the Institute of Geography RAS, Moscow. Ways of our collaborations were joint sessions, workshops and publications.

B. Collaboration with other international, intergovernmental, and inter- and multi-disciplinary if relevant

1. The activities of the Commission are carried out in close cooperation with the Northern Eurasia Earth Science Partnership Initiative (NEESPI) that is aimed at developing an enhanced understanding of the interactions between the ecosystem, atmosphere, and human dynamics in northern Eurasia (http://neespi.org/).
2. In 2015 the Environment Evolution Commission continued the tight collaboration with the European Dry Grassland Group (www.edgg.org) with aim to stimulate active cooperation among scientist deal with landscape ecology, biodiversity, land use history, agriculture and nature conservation.
3. The Environment Evolution Commission has permanent relationship with All-Russian non-governmental organization 'Russian Geographical Society" (http://www.rgo.ru/ru).
4. The Environment Evolution Commission has relationship with INQUA - International Union for Quaternary Research, Commission on Palaeoclimates (http://www.inqua.org/).

4. Publications

1. The IGU Environment Evolution Commission publishes annual newsletter since 2014.
Newsletter 1_2013/2014
Newsletter 2_2015
Available on-line http://eecomm.org/newsletter.html

2. The Special Issue of Geographical review of Japan ser. B on "Environment Evolution and Human Activity in the Late Quaternary: Geographical Pattern"
All papers of the special issue are available on web-site:
https://www.jstage.jst.go.jp/browse/geogrevjapanb/87/0/_contents
References:

1. O. Rudenko and E. Taldenkova. Holocene vegetation and climate history of the Cheshskaya Bay Region, SE Barents Sea, inferred from the first pollen archives. // *Geographical review of Japan ser. B.* 87(2), 2015.P. 82-90.

2. E. Novenko. The middle and late Holocene vegetation and climate history of the forest-steppe ecotone area in the central part of European Russia. // *Geographical review of Japan ser. B.* 87(2), 2015.P. 91-98.
3. K. Matsunaga. Balancing Afforestation with Grain Production and Water Use for Sustainable Effects of Soil Conservation in the Chinese Loess Plateau // *Geographical review of Japan ser. B.* 87(2), 2015. P. 99-102.
4. N. Sasaki and T. Sugai. Distribution and Development Processes of Wetlands on Landslides in the Hachimantai Volcanic Group, NE Japan. // *Geographical review of Japan ser. B.* 87(2), 2015.P. 103-114.
5. N. Nagumo, T. Sugai, S. Kubo. Flood Geomorphology and Characteristics of Modern Channel Bars in the Lower Stung Sen River, Cambodia. // *Geographical review of Japan ser. B.* 87(2), 2015.P.115-121.
6. Oltchev A. and Gravenhorst G. Effects of climate changes on net ecosystem exchange of CO2 and evapotranspiration of a tropical rain forest. // *Geographical review of Japan ser. B.* 87(2), 2015.P. 122-130.

3. Books of abstract of the International Conference and Yang Scientist School **«Methods of palaeoenvironmental researches»** Moscow, April, 16-19, 2014, M.V. Lomonosov Moscow State University -press, 2014, 92 pp. (in Russian).
Available on web-site http://pollendata.org/news.html

4. Expected publications. The Environment Evolution Commission organizes a special issue of "Russian Journal of Ecosystem Ecology" dedicated to the topics of Commission's session in frameworks of Moscow Regional Conference of IGU, 17-21 August, 2015.

5. Archival Contributions

Newsletters of IGU Environment Evolution Commission for 2013/2014 and 2015.

6. Continuation

A. The name of the Commission/Task Force

Environment Evolution Commission

B. A concise (100-200 words) statement of the mission of the Commission/Task Force.

The main goal of the Commission activity is to study human and environmental interaction including climate, landscapes and culture in the Late Quaternary and recent past. The principal lines of research are: **Landscape dynamics, Natural Processes and Human impact.** The main activities of the Environment Evolution Commission for the period up to 2020 will be mainly focused on analysis of culture changes in the different regions during the Late Quaternary, climate and landscapes evolution in past epochs and projection of their changes under different scenarios of environmental changes, estimation of climate and human induced vegetation changes and their influence on local and regional climate, vegetation response to environmental changes in past, present and future. The principal objectives of the Commission are: i) to build a network to better link up the specialists in different scientific areas including paleoecology, landscape evolution, climate changes and human-environment interaction; ii) to stimulate active cooperation among scientists (data exchange, developing common data standards, joint research projects and publications); iii) to compile and to distribute information on paleoenvironmental studies beyond national borders.

C. A list of the individuals who will comprise the steering committee from 2016-2020.

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D. A summary of the work plan for the Commission/Task Force for the 2016-2020 period.

The work plan of the Environment Evolution Commission includes an arrangement of follow meetings and providing media for the exchange of information between specialists

- special sessions in a frame of the International Geographical Congresses and IGU Regional Conferences;
- Commission's meetings (Conferences, Workshops and young scientists school dedicated to different problems of environment evolution and paleoecology);
- special issues on environment evolution-related topics in various peer-reviewed journals;
- homepage of the Commission on Environment Evolution (http://eecomm.org);
- The annual newsletter of the Commission

In the period 2016-2020 the Commission will organize special sessions on the 33rd International Geographical Congress (2016, Beijing, China), the IGU Regional Conference in Quebec (2018, Canada) and the 34th International Geographical Congress (2020, Istanbul, Turkey).
In 2017 the Commission will organize the International Conference and Young Scientists School "Modern perspectives of Palaeoecology" (Moscow). We have also planes to organize and take

parts in preparations of 4-5 workshops and trainings for young scientists during the period 2016-2020.

In 2016-2020 the Environment Evolution Commission will organize special issues of peer-reviewed Journals: Quaternary International, Russian Journal of Ecosystem Ecology, the Open Geography Journal.