Multidisciplinary ENVIROMIS conference: new experience

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Abstract. A forced by the coronavirus disease pandemic (COVID-19) approach to organization of multidisciplinary conference is described. A hybrid format combining both online and offline presentations is presented and advantages and disadvantages of the used approach are evaluated as well as the received feedback.

Key words: environment, multidisciplinary conference, coronavirus pandemic, online presentations, virtual communications

1. Introduction
Multidisciplinary conference and early career scientists’ school ENVIROMIS has quite a long history [1]. It addresses critically important issues occurring in environmental sciences, namely, crossing disciplinary borders of this multidisciplinary research area, young scientists’ training and diminishing a gap between science and decision-making. Usually the event includes lectures, invited reports and contributed papers, as well as short oral presentations for posters. As a rule, one or more workshops are embedded in the conference program that dedicated to various international programs on environmental researches. In particular, first Northern Eurasia Earth Science Partner Initiative (NEESPI) [2] and now Northern Eurasia Future Initiative (NEFI) [3] program use the conference sidelines to overview their research results and present perspectives. This year also the workshop on Weather and Climatic Extremes: Data, Analysis and Impacts (WCEDAI) was held during the conference.

This year the COVID-19 pandemic brought new realities and made conference organizers to find new ways and forms of conference organization. In recent months, many conferences have been transformed from in-person into virtual meetings. A review by Katherine Kornei [4] presents both opportunities and challenges of such an approach.

The ENVIROMIS-2020 conference was not an exception. Due to the limitations caused by the coronavirus disease pandemic and travels appeared to be restricted, the usual format of the conference was impossible. That is why we had to change the traditional conference organization to a hybrid format combining both online and offline presentations. Experience gained shows some positives and negatives of this format, which are described below.

2. Approach
Since epidemiological situation in Tomsk was rather unstable, the decision has been made to organize a hybrid event combining both online and offline formats. Namely, for Tomsk participants it was full-time participation, whereas for nonresident, national and foreign scientists, it was online participation. The main technical challenge in this case was to organize the work in such a way that online reports should be broadcasted for participants in the conference hall, while reports of full-time participants should be available for online audience as well. The main organizational challenge was to save the inherent to conferences atmosphere of profound and detailed discussions of results presented.

To meet the technical challenge, the organizers studied various web platforms used for these purposes, assessed Internet facilities and made a survey on number of full-time and online participants.
Then the detailed instruction for participants was developed and made available on the event site. The week before the event we tested all equipment and made trial sessions.

All conference sessions were organized in the form of a recurring multi-day webinar hosted on the Zoom platform (https://zoom.us/). A separate recurring multi-day webinar was organized for the WCEDAI workshop. Within these webinars, conference participants presented reports either online directly from their personal computers, or in the conference hall with simultaneous online broadcasting using the laptop placed in front of a presenter. At the same time, current presentation (whether remote or local) had being demonstrated to Tomsk participants in the conference hall using another computer, a video projector, and loudspeakers. To avoid frequent switching between online and offline presentations, the reports were specially grouped within every session. The conference program was also adapted taking into account time difference for online participants’ habitat. Besides, the timing was scheduled and this schedule had to be strictly followed. It should be added that detailed bilingual (Russian and English) instructions explaining suggested approach were prepared and placed at the event web site.

To organize fruitful discussion of presented oral papers we divided remote participants into two categories, namely, presenters (panelists) registered at the relevant webinar and visitors (attendee). The audience of possible attendees was enlarged using calls for participations with instructions how to get an attendee access via the social media and the conference site. The remote presenters had the ability to broadcast audio, webcam and presentation directly from their computer to other conference participants either remote or gathered at the conference hall. They also had the ability to broadcast questions and comments after each report. Visitors were only able to watch and listen to reports. All participants were able to put questions to presenters throughout the report and after it either via the embedded webinar chat or via the Q&A system. To access the webinar, presenters received the event invitation email with a unique personal link that allowed them to enter the webinar with presenter rights. Those present at the conference hall were able to ask questions and make comments in conventional manner.

Traditionally, to give a poster presentation an additional vision, at the ENVIROMIS event those are preceded by the 5 minutes short oral presentation, while at the embedded WCEDAI Workshop this opportunity was not provided. To avoid massive participants gathering near posters and save the recommended 1.5 meters “social” distance between them, the poster sessions were run exclusively in online format. To do this, all posters in the form of PDF files were placed on the Google Drive cloud and were accessible via the provided links. After clicking on the link, the content of the Google drive opens in the browser, where the posters were placed in an orderly manner. Any file with a poster could be opened, scaled and viewed here. To comment and post questions to the posters, users should have a Google account. To access the commenting options, it was necessary to first obtain permission from the organizers of the event. This was done to prevent spam and zoombombing.

3. Results

The conference had traditional set of successive sessions covering the major research areas, which have always been present at the ENVIROMIS conferences. This year the conference program included 8 sessions that were dedicated to monitoring of climate changes over Northern Eurasia, climate and weather modeling, response of terrestrial ecosystems of Northern Eurasia to climate change, studying of air composition and pollution transport under impact of climate change, regional risks and socio-economic impacts, instrumental, information-measuring and information-computational infrastructure of a regional environmental study, Future Earth Program and Northern Eurasia Future Initiative.

Special attention was paid to challenges of the modern world concerning extreme weather and climate events. In the context of global climate change, the number of extreme events and their impact is growing around the world (https://www.ipcc.ch/report/ar5/wg2/). These phenomena cause serious damage to the environment, economy, and affect human health. Having this in mind, traditional session on extreme events had been integrated with topics devoted to methodological developments for analyzing and modeling extreme phenomena presented at the biannual international conference on
Data analysis and modeling in Earth sciences (DAMES, https://dames.pik-potsdam.de/). As a result, the session was converted into the workshop on Weather and Climatic Extremes: Data, Analysis and Impacts (WCEDAI), which was organized in collaboration with our German colleague, Prof. Reik Donner. Reports presented at the workshop covered topics on monitoring of weather and climate extremes, statistical methods for analysis and modeling of weather and climate extremes, modeling and forecasting of weather and climate extremes, impact of extreme weather and climate events on socio-economic, ecological systems and public health, spatial-temporal structures and mechanisms of formation of weather and climatic extreme events, air pollution transport and extreme events.

Geography of conference participants is quite large. In Russia it spans from Ulan-Ude to St-Petersburg. Foreign scientists were from Japan, Norway, USA, Austria, Belgium, Portugal, Germany, France, The Netherlands, Finland and Kazakhstan.

Totally, one hundred forty five participants took part in the ENVIROMIS-2020 conference and WCEDAI workshop, among them 18 leading foreign scientists. Key speakers delivered 3 lectures and 19 invited reports on the most important issues concerning climate change and extreme events studies. There were 61 contributed papers, where the authors presented detailed results on researches in particular areas. Also, 38 posters preceded by short oral presentations and 20 posters without those had been presented.

Since the conference program was very tense and time for questions and discussions was limited, we place all presentations on Google Drive cloud and give an access to them up to October, 15, 2020 to continue discussion. As a usual practice, conference materials will be posted on the conference site (http://www.scert.ru/en/conferences/ENVIROMIS-2020/) and available to everyone interested under a Creative Commons license.

Summarizing we can say that the employed hybrid format for conference organization proved its usability under such extreme situation. However, additional efforts and novel approaches should be implemented to give poster presentations relevant vision.

4. Conclusion
The described above approach has shown its viability and practical applicability. We used modern digital technologies and got new experience in organizing hybrid international conference. Owing to this approach, many Russian and foreign participants were able to participate in the conference. Otherwise, restrictions caused by the coronavirus disease (COVID-19) pandemic made it impossible. The conference participants emphasized that this year such a format was suitable and useful and allowed scientists proceeding communications and present new research results.

The approach reveals an opportunity of participation to those scientists who are in shortage of travel funds and also allows participating in several overlapping conferences. Obviously, online approach blurs geographic boundaries and also minimizes complications for participants from third world countries. At last but not least, reducing flights has a positive effect on the state of the atmosphere, significantly reducing carbon emissions.

As for disadvantages, they mainly connected with a fact that online communications require fluent English from participants and the technical impossibility of simultaneous translation support. It restricts a productive scientific discussion in some cases. One cannot fail to note the problem arising from the geographical spread of the participants. Wide range of participants’ time zones made a conference schedule too busy. It is also obvious that the lack of face to face communication negatively affects the establishment of scientific contacts between research groups for further fruitful joint work.

Thus, the hybrid format for conference organization proved its usability and can be applied in extreme situations such as pandemic. However, we think that it should only complement traditional format with virtual communication and discussion but not replace it.

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References
[1] Gordov E P, Lykosov V N, Gordova Yu E and Genina E Yu 2016 IOP Conf. Series: Earth and Environmental Science 48 doi:10.1088/1755-1315/48/1/012001
[2] Groisman P Y and Bartalev S A 2007 Northern Eurasia Earth Science Partnership Initiative (NEESPI): Science plan overview Global and Planetary Change 56 issue 3-4 215-34
[3] Groisman P, Shugart H, Kicklighter D et al 2017 Northern Eurasia Future Initiative (NEFI): facing the challenges and pathways of global change in the twenty-first century Prog Earth Planet Sci 4 (41) https://doi.org/10.1186/s40645-017-0154-5
[4] Kornei K 2020 Opportunities and challenges of virtual meetings Eos 101 https://doi.org/10.1029/2020EO150227