

Regional aspects of climate-terrestrial-hydrologic interactions in non-boreal Eastern Europe: A Summary Statement of the Northern Eurasia Earth Science Partnership Initiative (NEESPI) Workshop held in Odessa, Ukraine, 23-28 August 2008

Topics raised during the Workshop (in 39 oral and 10 poster presentations as well as during the informal discussions) recounted various aspects of the general environmental security as well as of its components such as atmosphere, hydrosphere, coastal zone, and land cover. Different approaches (as well as their syntheses) were presented: (a) in situ and remote sensing tools to observe/monitor environmental changes in Eastern Europe; (b) modeling of environment and human impact in the region; (c) assessment of available databases; (d) accuracy assessment of modern observing techniques, sensitivity of modeling results to errors and uncertainties in initial conditions; and (e) projections of future environmental conditions in the region.

Workshop presentations revealed serious problems in water supply, soil erosion and water quality in the coastal areas of the Black, Azov, and Caspian Seas as well as within the entire steppe region of Eastern Europe. Modern global and regional climate models (GCMs and RCMs) projections generally agreed about drier future climate conditions detrimental to the region. Meanwhile observational data for validating the quality of these projections are absent or are not yet in a cohesive form. This raises an urgent need to invest resources into integrated environmental databases and regional-scale hydrometeorological modeling to better understand ongoing environmental processes in the region. Currently, we have to take the results of the modern regional model projections “with a grain of salt” due to deficiency in validation data. Therefore, the Workshop participants strongly support the efforts by the National Academy of Sciences of Ukraine to develop, or more accurately, revitalize an environmental monitoring network of “testbeds” that will cover each major biome of the nation and will be used to validate remote sensing products, RCMs, GCMs, terrestrial ecosystem models, and Earth System Models specifically in their ability to do the job for Ukraine. It is anticipated that these testbeds will have an international component spreading to neighboring countries of Eastern Europe.

Workshop participants noted that changes in terrestrial ecosystems and land use in non-boreal Eastern Europe have several specific features that include: (a) the presence within the region of two highly volatile biome boundaries, forest – steppe and steppe – semidesert; (b) a dense rural population with intense land use; and (c) socioeconomic hardships of the most recent political changes that are still unsettled. Taking into account the regional specifics and ongoing climate and environmental changes, the Workshop recommends the following directions of research as prioritized for the population well being in the region:

- A rigorous fulfillment of national reforestation plans. These plans exist in each nation of the region but their priority should be raised. There are many reasons for this, the main ones being: soil protection, flood protection, water availability and quality, carbon sequestration, aerosol and pollution sedimentation, and recreation needs.
- Much improved environmental data exchange and integration among the countries within the region is an urgent need and is strongly recommended. Contemporary climatic changes (in most cases) are large-scale and do not stop at national borders. To better account for these changes, ecosystem-bounded domains of study are required (e.g., steppe, forest-steppe, coastal zone of the Black Sea, etc.) and, therefore, international

collaboration to address consequences of these environmental changes and joint strategies to mitigate their detrimental components are difficult to overestimate. Currently, there is poor integration of existing projects (we all work separately) while a need for a better “network” is paramount. Going beyond the “boundaries” (countries, disciplines, biomes) has an additional advantage because the most important environmental changes frequently happen in transition zones and offshoot observations within one discipline might be of high value in resolving/explaining the problem for another.

- Coherence of projections of warmer and drier climatic conditions for the region associated with “global warming”, warrants special attention that should be paid to optimal land use and early mitigation measures to prepare for the future. In particular, efforts should be made to equip (or link to) the existing climatic and hydrological models in the region with “ecological” and “human wealth” blocks in order to be ready to account for, adapt, and mitigate the consequences of ongoing and future climatic changes.
- Better climate change scenarios and RCMs should be created for the region.

Workshop participants agree that nature itself, on any reasonable timescale, restore the damage that intense human use has already done to the region; therefore further human interference to restore and preserve the environment including water resources is inevitable. However, this interference must be smart, based on the latest scientific findings, and scrutinized under the oversight of an independent body of experts. Adaptation research in the region is currently underrepresented or compromised by past experiments lacking expert oversight or based on political motivations alone.

A decision to expand and strengthen the Partnership Initiative has been agreed to through establishing the coordination center (Regional NEESPI Focus Research Center for non-boreal Eastern Europe) at The University of West Hungary, Sopron, Hungary. Prof. Csaba Mátyás (cm@emk.nyme.hu) has kindly agreed to take the lead in the Center organization. The next Regional Workshop for environmental studies in non-boreal Eastern Europe is tentatively scheduled to be convened in Hungary in 2010.

To further extend the outreach of the Meeting, it was decided to:

- make the workshop presentations publicly available through the NEESPI website (http://neespi.org/meetings/Odessa_2008_presentations.html).
- submit a brief Workshop Report to *The EOS Transactions* of the American Geophysical Union in October 2008.
- compile *NATO Advanced Research Workshop Series Proceedings* “Regional aspects of climate-terrestrial-hydrologic interactions in non-boreal Eastern Europe” that will include extended abstracts of selected oral and poster presentations on the major themes discussed at the Workshop; and
- support a publication of the monograph “Earth Systems Change over Temperate Eastern Europe” under the auspices of the National Academy of Sciences of Ukraine. The monograph outline was drafted during the last day of the Meeting.