Short summary of the "GEWEX workshop on the Climate System of the Pannonian Basin" (Osijek, Croatia, 9-11 November 2015)

The GEWEX-promoted workshop on the Climate System of the Pannonian Basin took place at the Faculty of Agriculture of the University of Osijek during 2.5 days (Monday 9 Nov to Wednesday 11 Nov 2015). It was organized by the University of Osijek, the Croatian Meteorological and Hydrological Service, and the Geophysical Institute of the University of Zagreb. 56 scientists of the Pannonian region attended the workshop, that had 23 keynote talks (54 authors) and 24 poster presentations (75 authors), followed by a discussion session on Wednesday.

The first day talks made a review of the current state-of-the-art of the different relevant research subjects for the workshop, namely atmospheric circulations, climatological characterization and modelling, air quality issues, hydrological monitoring and modelling, and agricultural practices and needs.

On Tuesday the status of the observational networks was discussed, as well as the review of some of the research infrastructures of the area. The research and operational past recent and current consortia were also introduced to the audience. In the afternoon, after an inspiring lecture by Prof. Mesinger, a poster session was held where some of the most recent research efforts could be discussed among participants.

Wednesday morning saw a two-step discussion session. In the first part a diagnosis of the current status of the research and operations related to the Pannonian Climate System was made, and it was concluded that the community has the necessary size, scientific level and will to undertake a supranational action at the scale of the Pannonian Basin. This action may be organized as a Regional Hydroclimate Project (RHP) under the umbrella of the GEWEX Hydroclimatological Panel. This initiative, with the acronym "Pannex", was seen as a good opportunity to foster cooperation between the different institutions and exchange of data, knowledge and expertise between partners, as well as a platform to obtain funding for the related activities.

The second part of the discussion aimed to establish the main flagship science questions and cross-cuts to define a framework for this collaboration. Five main topics and three cross-cut actions were defined that may give room to most of the scientific and operational activities while providing outputs of interest for the society. These subjects are listed as annex I to this short summary.

Finally, some agreements to proceed further were taken. A Pannex White Book (PWB) that develops the ideas expressed in the workshop must be prepared. A first draft of this PWB will be discussed in a meeting to be held in Budapest in the second half of June 2016, hosted by the Department of Meteorology of the Eötvös Loránd University at Budapest. A core group, namely the International Planning Committee (ICP), was proposed to manage the first steps of this action (members listed in annex II). The outcome of this workshop was to be reported to the GHP meeting at Endebbe (Uganda) in the following week for discussion. Once the PWB is under way, an implementation plan shall be defined. The status of the action must be reported by a representative of the ICP to the GHP general meeting in fall 2016 at Paris.

The workshop was closed at noon, the attendees expressing their gratitude to the organisers for the great work made.

(Summary written by JC, dated Nov 23rd 2015)

******Annexes in page 2******

Annex I: Flagship Questions (FQ) and Cross-cut actions (CC)

FQ1: Adaptation of agronomic activities to weather and climate extrems
* Weather scale predicions of yields and plant phenology
* Response to climate change (farming practices, crop types, pests and diseases)
* Water management and irrigation
* Land and soil use changes
* Perception of agricultural stakeholders and evolution of European policies
* Preserving ecological services

FQ2: Understanding of air quality under different weather and climate conditions
* How does a warmer climate affect air quality and human health
* Interaction of air quality and water cycle
* Interactions with agricultural practices (sol, water and air)
* Physics and chemistry of the boundary layer; improving forecasts
* Refinement of emission inventories
* Perception of populations, urbanisation

FQ3: toward a sustainable development
* Preserving ecological services
* Hydropower potential evolution
* Wind and solar energy potential
* Biomass production and conflict with agronomic needs
* Building the infrastructure for forecasting and coordination of the energy production
* Evolution of the energy needs (cooling and heating) in a warmer climate

FQ4: water management, droughts and floods
* Evolution of precipitation and temperature (weather) extremes and risk assessment
* Understanding the water cycle of the Pannonian basin (hydrological perspective)
* Hydrometeorological foreasting and early warning systems
* Anthropogenic influence (dams, reservoirs...) on the hydrological cycle
* Agronomic and environmental practices: water quality and usage
* Regulation of Danube and tributaries: management of floodplains
* Aquifers: sustainability and current usages.

FQ5: Education, knowledge transfer and outreach.

CC1: Data and knowledge rescue and consolidation

CC2: Process modelling
* Quantifying surface energy and water budgets
* Atmospheric chemistry
* Land-atmosphere interactions
* Precipitating systems
* Crop modelling
* Hydrological modelling

CC3: Development and validation of modelling tools
* Large-scale circulation: from weather to seasonal
* Climate change: decadal to centennial

Annex II: Proposed International Planning Committee
Branka Ivancan-Picek (DHMZ, Croatia)
Monika Lakatos (OMSZ, Hungary)
Adina Croitoru (University of Cluj-Napoca, Romania)
Danijel Jug (University of Osijek, Croatia)
Vladimir Djurdjevic (University of Belgrade, Serbia)
Tamás Weidinger (Eötvös Loránd University at Budapest, Hungary)
Ivan Guettler (DHMZ, Croatia)