



PannEx: Towards a Regional Hydroclimatology Project in the Pannonian Basin - tasks and opportunities

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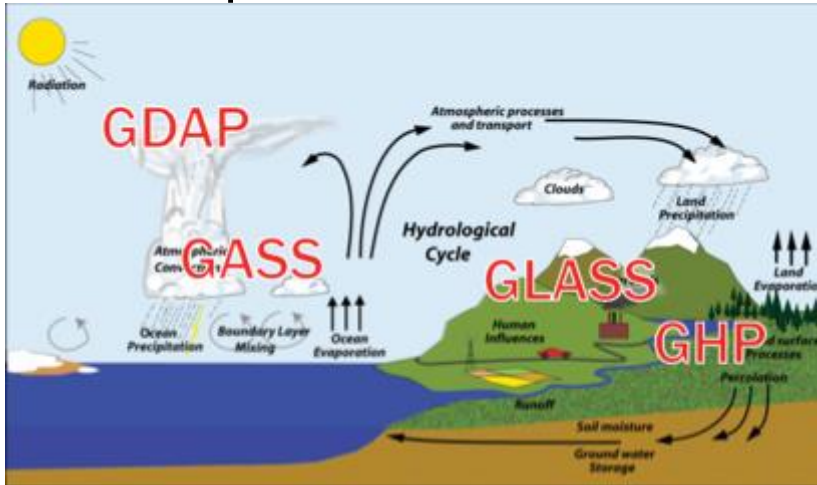
OUTLINE

- ▶ WCRP – GEWEX core project
- ▶ GEWEX Hydroclimatology Panel (GHP) – Regional Hydroclimatology Projects (RHP)
- ▶ Initiation of PannEx
- ▶ PannEx flagship questions and cross cut subjects
- ▶ Activities till now
- ▶ Future plans



GEWEX: Global Energy and Water Cycle Exchanges Project

GEWEX panels:

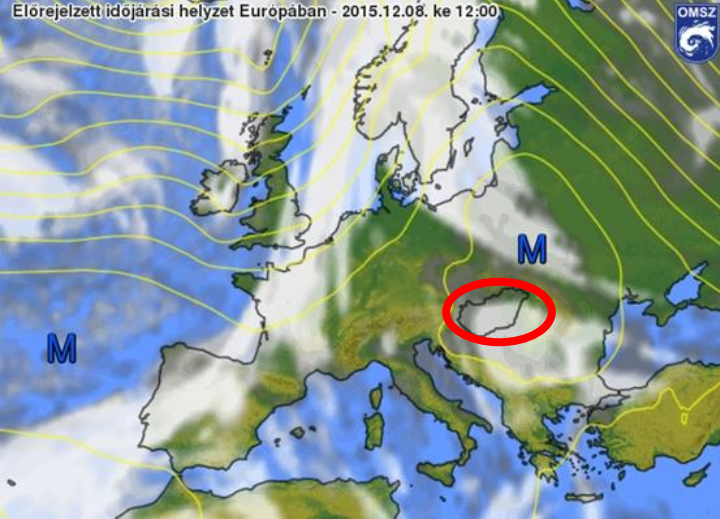


GEWEX

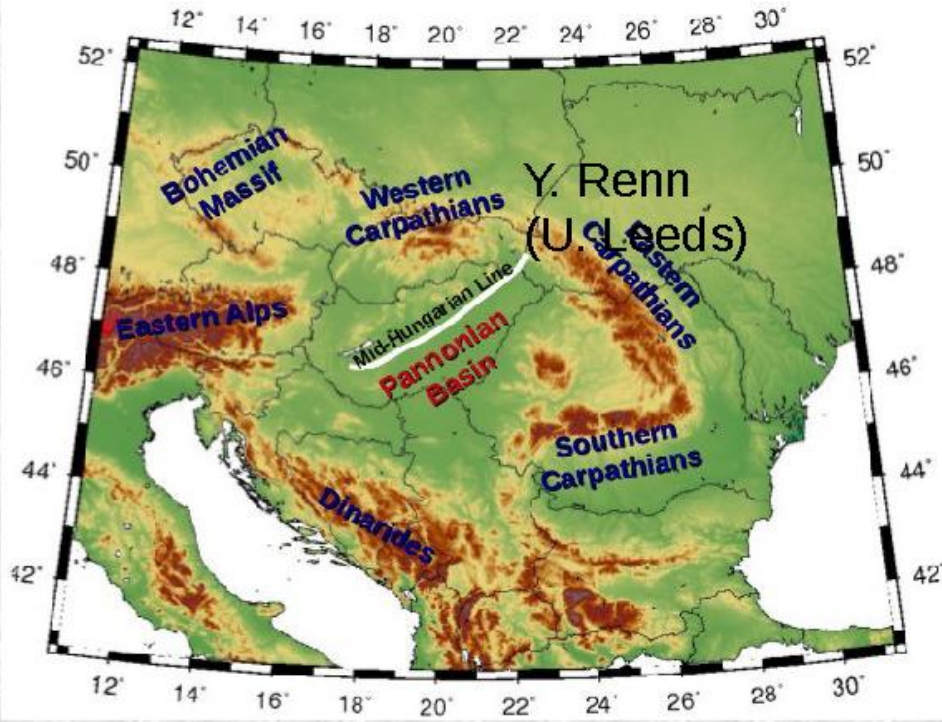


The GEWEX Hydroclimatology Panel (GHP) aims to understand and predict continental to local-scale hydroclimates for hydrologic applications.

RHPs are generally large, regionally-focused multidisciplinary projects that aim to improve the understanding and prediction of that region's weather, climate and hydrology.



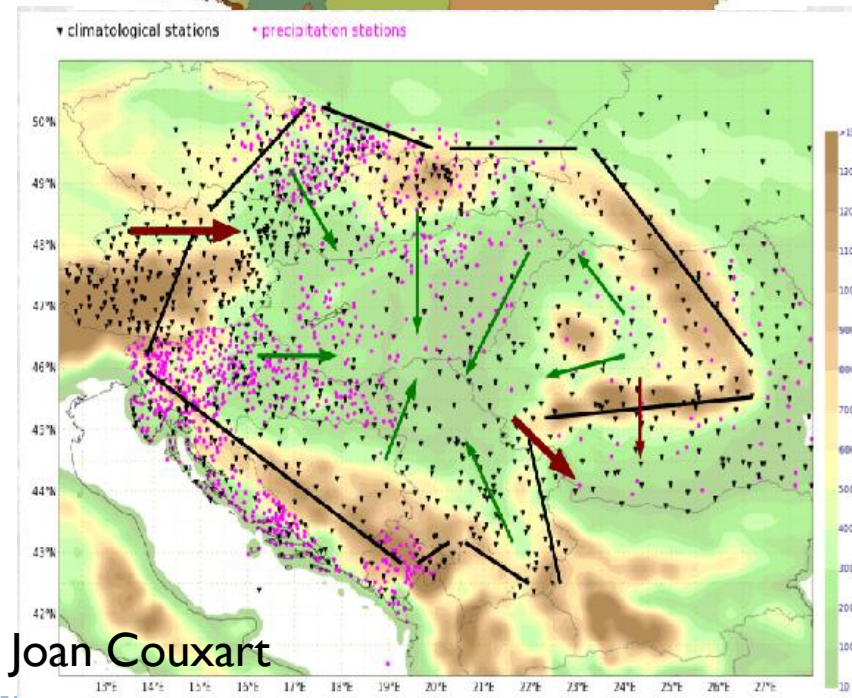
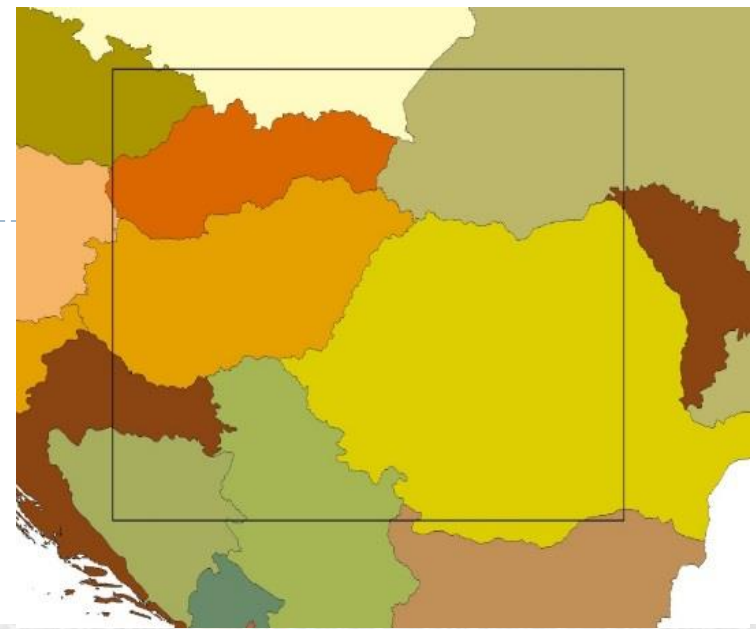
Physical motivation



- ▶ A **closed** basin with only one outflow, the wind gates
- ▶ **large low central plain** (100 m asl) surrounded by mountains with elevations nearing 2000 m asl
- ▶ being a very good **test area** for many geophysical processes (natural or human-induced)
- ▶ The Pannonian basin is a **transition area** between mediterranean, atlantic and continental climates

Opportunity

- ▶ The area is **fragmented** in many different countries, sometimes with difficult communication amongst them
- ▶ Several **research institutions and universities** are well recognized, some recent activities of **networking** are established, but the recognition of them is not widespread
- ▶ Countries are in good position to apply EU research **funding**.
- ▶ Pannonian Basin lies in between the **HyMeX and Baltic Earth** areas with opportunity for future collaboration



PannEx Workshops

- ▶ 1st WS: The GEWEX-promoted workshop took place at the Faculty of Agriculture of the University of Osijek, 9 - 11 November 2015, Organized by the Hydrometeorological Service of Croatia, the University of Osijek, the University of Zagreb and the GEWEX Hydrological Panel
- ▶ 2nd PannEx WS Budapest, 1-3 June, Hungarian Meteorological Service, GEWEX travel support



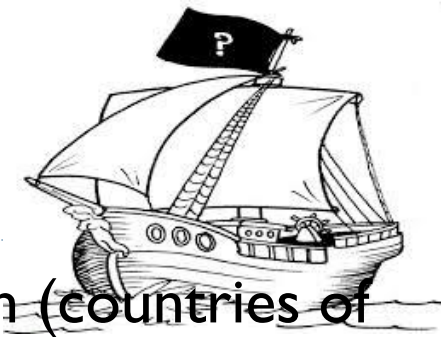
1st PannEx WS
Osijek

~Half year



2nd PannEx
WS Budapest,
1-3 June

Results of the 1st Workshop



- ▶ 50 **attendees** from institutions of the Pannonian Basin (countries of Croatia, Hungary, Serbia, Slovakia, Romania, Czech Republic and Austria) were present
- ▶ **state of the art of research** of meteorology, climatology, hydrology, agronomy and other environmental issues in the region
- ▶ explore the status of the **networks** and the different recent transnational initiatives related to the regional Climate System
- ▶ discussion on the opportunity and the likely subjects of interest of the potential PannEx RHP **flagship science questions and cross cut subjects**
- ▶ a **Core Group** formed
- ▶ a preliminary **agreement** was reached on that the first draft of a **white book** will be discussed in Budapest in June 2016



International Planning Committee formed

- ▶ Branka Ivancan-Picek (DHMZ, Croatia) *member of the GEWEX SSG from 2017 January*
- ▶ Monika Lakatos (OMSZ, Hungary) *PannEx chair*
- ▶ 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) *PannEx secretary*
- ▶ *Joan Couxart UIB and Jan Polcher GHP co-chair Laboratoire de Meteorologie Dynamique, Paris – members of PannEx Scientific Committee*



The PannEx Flagship science Questions and Cross Cut subjects

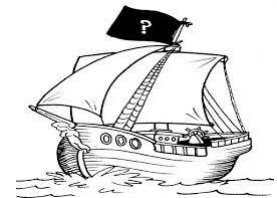
FQ1: Adaptation of agronomic activities to weather and climate extremes

FQ2: Understanding of air quality under different weather and climate conditions

FQ3: toward a sustainable development

FQ4: water management, droughts and floods

FQ5: Education, knowledge transfer and outreach



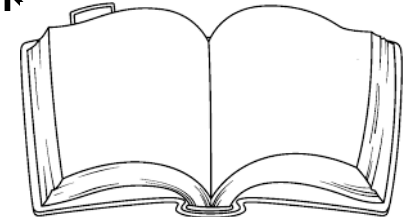
CCI:
Data/knowledge rescue and consolidation

CC2: Process modelling

CC3:
Development and validation of modelling tools

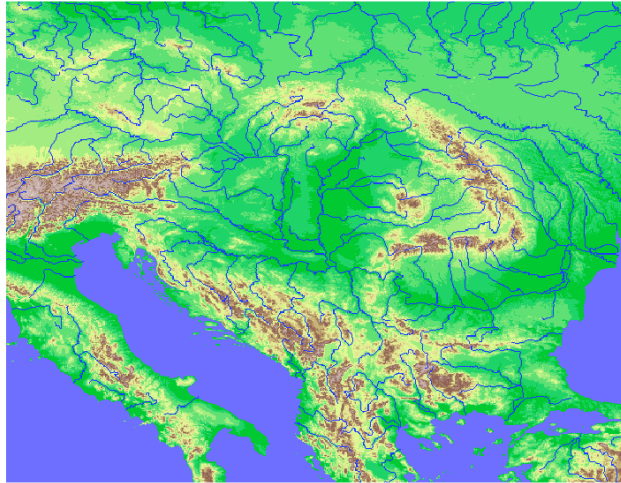
Results of the 2nd Workshop

- ▶ Host: Hungarian Meteorological Service (OMSZ), ELU poster boards
- ▶ 70 attendees from institutions of the Pannonian Basin (countries of Hungary, Croatia, Romania, Serbia, Slovenia, Ukraine, Slovakia, Bosnia-Herzegovina and representatives of WCRP and AgMP)
- ▶ GEWEX support
- ▶ **The main objectives of the workshop were:**
 - ▶ i) to consolidate and enlarge the PannEx community
 - ▶ ii) to review and revise the draft of the White Book
 - ▶ iii) to define further steps



Regional hydro-climate project (RHP) over the Pannonian basin (PannEx)

White Book

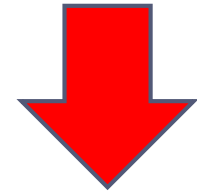


version: 0.0.7

September 2016

<https://sites.google.com/site/projectpannex/>

**WB ver0.0.1
opened for
suggestions and
comments**



Ver.0.0.7.

76 pages,

~60 contributors

Open for discussion
at GHP

Will be uploaded to
the webpage early
2017

FQ1: Adaptation of agronomic activities to weather and climate extremes

FQ1 chapter – group of writers - Coordinator: Danijel Jug (*status 2016-05-31*)

Contributors	Field of expertise	Country	Contact
Danijel Jug	Conservation agriculture, agroclimatology	Croatia	djug@pfos.hr
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Marijana Tucak	Perennial forage crops, breeding, genetic diversity	Croatia	mtucak@poljinos.hr

FQ1 (Flagship Questions) identified in Osijek:

[Adaptation of agronomic activities to weather and climate extremes]

- Weather scale predictions 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 air quality under different weather and climate conditions

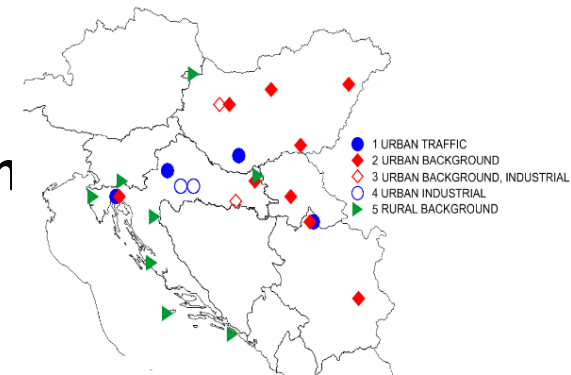
3.1 How does a warmer climate affect air quality and human health?

3.2 What kind of interactions do the soil, water and air have with agricultural practices?

3.3 Physics and chemistry of the surface and of the PBL; improving forecasts.

3.4 Refinement of emission inventories.

3.5 Perception of populations, urbanization



Stations for gridded PM_{10} emissions dataset (EMEP4HR)

FQ2: Understanding air quality under different weather and climate conditions

Steering Group:

<u>Tamás Weidinger</u>	– Eötvös Loránd University, Budapest,
Györgyi Baranka	– Hungarian Meteorological Service, Hungary
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László Bozó	– Hungarian Meteorological Service, Hungary
Lalic Branislava	– University of Novi Sad, Serbia
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Maja Telišman Prtenjak	– University of Zagreb, Croatia
Inna Semenova	– Odessa State Environmental University, Ukraine
Sonja Vidic	– Meteorological and Hydrological Service, Croatia

Hungarian Co-authors: Zita Ferenczi, Judit Kerényi, Krisztina Labancz, Dóra Lázár, Attila Machon, Balázs Szintai

PannEx – FQ3 Toward a sustainable development

Current drafting team: Vladimir Djurdjevic, Imelda Somodi, Ákos Bede-Fazekas, Wantuchné Dobi Ildikó, Birone Kircsi Andrea, Maja Telišman Prtenjak, Andreina Belušić, Alica Bajić, Kristian Horvath, Maja Božićević Vrhovčak, Tijana Nikolic, Sonja Trifunov

Subtopics:

1. Preserving ecological services
2. Hydropower potential evolution
3. Wind and solar energy potential
4. Biomass production and conflict with agronomic needs
5. Building the infrastructure for forecasting and coordination of the energy production
6. 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 forecasting and early warning systems

Anthropogenic influence (dams, reservoirs...) on the hydrological cycle

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FQ5. Education, knowledge transfer and outreach

- ▶ **5.1.1. Status of Higher education in Meteorology and Hydrology in PannEx countries**
- ▶ **5.1.2. Development of higher education in Meteorology and Hydrology under the framework of PANNEX project**
- ▶ **5.2. Knowledge transfer**
- ▶ **5.3. Outreach**

Coordinator: Adina-Eliza Croitoru

Contributions: Adina-Eliza Croitoru, Ivan Guttler, Vladimir Djurdjevic, Rita Pongracz, Martina Zelenakova, Livia Labudova, Jeffrey Wilson, Janos Unger, Valeriya Ovcharuk

Vision of the Science Plan

- ▶ Science Plan will be developed based on the White Book
- ▶ PannEx community needs to work on **defining the objectives and the methodologies** which could be used to reach the goals
- ▶ What type of **observation** (geophysical, ecological, economical, social, ...) and **modelling efforts** need to be undertaken



PannEx activities



- ▶ Science Plan will be developed this year
 - ▶ Next WS in Romania, Cluj, 20-22 March, 2017
 - ▶ National PannEx Seminars in Hungary:
 - ▶ 17 November 2016: Adaptation of agronomic activities to weather and climate extremes (José Camacho, scientific officer, World Meteorological Organization) – related to **FQ1**
 - ▶ 8 December 2016: Land Degradation Neutrality (Representative of UNCCD: The LDN Programme) – related to **FQ1, FQ3**
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Potential funding in the region

- ▶ *Horizon2020*
- ▶ Interreg, **Danube Transnational Programme 2014-2020**
- ▶ **Balkan-Mediterranean Transnational Programme (2014-2020)**
- ▶ **COST (cost.eu)**
- ▶ *The International Visegrad Fund (visegradfund.org/home/)*
- ▶ *The NATO Science for Peace and Security Programme*
(nato.int/cps/en/natolive/78209.htm)
- ▶ CEEPUS (Central European Exchange Program for University Studies, ceepus.info/default.aspx#nbb)
- ▶ Bilateral calls



Recent bilateral calls responded by the PannEx community

- ▶ **Hungarian-Croatian** and **Hungarian-Serbian** cooperation were launched
- ▶ **Two submissions** from the PannEx community (with ELU, Budapest, Hungary)
- ▶ to **strengthen the cooperation** in PannEx (travel expenses and the daily allowance for the visits)



Joining to the community and more info
on the PannEx webpage:

<https://sites.google.com/site/projectpannex/home>





Thank you for your kind
attention!