



## Summer School “Understanding Poland: Economy, Society and Science” 2019

### PROGRAMME

at the Faculty of Biology and Environmental Protection  
University of Lodz, Poland

**22 - 24 of July 2019,**

**Polish Science Achievements - Ecohydrology.**

### 22 of July, Monday

**Presentation of the Faculty, 9:30 -10.00 (aula D)**

**Dr hab. Maciej Bartos, prof. nadzw. UŁ, Faculty vice-Dean**

**Module: Ecohydrology (part 1), 10:00-12:00 (aula D)**

**LECTURE: Presentation of the Ecohydrology scope, projects and publications.**

**MSc Paweł Jarosiewicz, [pawel.jarosiewicz@biol.uni.lodz.pl](mailto:pawel.jarosiewicz@biol.uni.lodz.pl)** (assistant editor of the International Journal of Ecohydrology & Hydrobiology)

**Module: Ecohydrology (part 2), 14:00-15:30 (aula D)**

**LECTURE: Ecohydrology in river science and management.**

**Dr Małgorzata Łapińska, [malgorzata.lapinska@biol.uni.lodz.pl](mailto:malgorzata.lapinska@biol.uni.lodz.pl)**

The main objective of the lecture is to highlight the potential of use of the ecohydrology concept and ecohydrological biotechnologies (Nature-based Solutions) in the river restoration and sustainable management. Rivers are highly impacted ecosystems in the world mainly due to habitat fragmentation caused by millions of man-made barriers, many of them are no longer in use. Thus, especially improving river connectivity together with restoring river habitat, are key priorities for more efficient stream restoration. Lecture will describe the goals and preliminary achievements of the HORIZON 2020 project – “Adaptive Management of Barriers in European Rivers – AMBER” that will apply adaptive barrier management to help reconnect European rivers, the smart way also with use of the ecohydrology approach (<http://amber.international>).

### 23 of July, Tuesday

**Module: Urban ecohydrology (part 1), 9:30-12:00 (aula D)**

**FIELD TRIP (bus at 9.15 from the Faculty Building A, 12/16 Banacha street)**

**Urban Ecohydrology - case study in Lodz – FIELD TRIP to Arturówek in Lodz (venue of the project LIFE08 ENV/PL/000517 “Ecohydrologic rehabilitation of recreational reservoirs “Arturówek” (Łódź) as a model approach to rehabilitation of urban reservoirs” <http://www.en.arturowek.pl/> - “Best of the Best” LIFE Environment project 2016-2017).**

**Dr Agnieszka Bednarek, [agnieszka.bednarek@biol.uni.lodz.pl](mailto:agnieszka.bednarek@biol.uni.lodz.pl)**

**Dr Zbigniew Kaczkowski, [zbigniew.kaczkowski@biol.uni.lodz.pl](mailto:zbigniew.kaczkowski@biol.uni.lodz.pl)**

The main objective of the field trip is to present the results of the LIFE project EH-REK in “Arturówek” in Łódź (from [www.arturowek.pl](http://www.arturowek.pl)). “Arturowek” in Łódź is a recreational site located in the northern part of Łódź, in the district of Bałuty, on the edge of Łągiewnicki Forest, which is the largest forest complex in Europe, comprising over 1200 hectares. The area of Łągiewnicki Forest, is a site of a special importance due to its recreational potential and natural diversity of the region. Its

recreational reservoirs located in the upper catchment of the Bzura River, near Arturówek, represent one of its major strengths. Similarly to most water bodies within urban areas, these reservoirs also remain subject to significant anthropopressure, which affects water quality, leading to limited usability of this area. Attempts to improve quality of this water taken in the past (such as the removal of bottom sediments), due to their limited nature, improved the situation only temporarily. That is why an attempt of implementing comprehensive rehabilitation solutions was taken, which implemented comprehensive measures based on the systemic approach using the concept of ecohydrology to rehabilitate this recreational area. Measures implemented under the EH-REK Project facilitate improved attractiveness of Arturówek site and the project was selected as one of three "Best of the Best" LIFE Environment project 2016-2017.

### **Module: Phytotechnologies & Phytoremediation, 14:00-15:30 (aula D)**

**LECTURE: The innovative remediation methods and techniques with special focus on phytoremediation and phytotechnologies and solutions based on ecohydrological biotechnologies.**

**Dr hab. Edyta Kiedrzyńska, prof. nadzw. PAN, e.kiedrzynska@erce.unesco.lodz.pl**

The main objective of the lecture is to provide the knowledge about the innovative remediation methods and techniques with special focus on phytoremediation and phytotechnologies and solutions based on ecohydrological biotechnologies. The lecture provides a scientific rationale for the use of various physical, chemical and biological methods to remediate environmental threats in drainage basins due to accidental discharges and long term pollution.

## **24 of July, Wednesday**

### **Module: Ecotoxicology, 9:30-12:00 (aula D)**

**LECTURE: Why ecotoxicology is an essential element of ecohydrology?**

**Prof. dr hab. Joanna Mankiewicz, j.mankiewicz@erce.unesco.lodz.pl**

The main objective of the lecture is to provide the knowledge about ecotoxicology and its relations and connections with biological and environmental sciences. The student will get the knowledge about the environmental danger of chemical compounds including their sources (natural and anthropogenic), fates and impact on the organism, populations and communities; how to conduct and interpret an environmental and health risk assessment in context of monitoring of toxic substances and how to prevent and eliminate pollution. The problem of toxic blooms of cyanobacteria (occurrence, management and elimination) will be presented as an example of a serious threat to the environment on a global scale.

### **Module: Urban ecohydrology (part 2), 14:00-15:30 (aula D)**

**LECTURE: ECOHYDROLOGY for urban water management and adaptation to climate changes.**

**Dr Tomasz Jurczak, tomasz.jurczak@biol.uni.lodz.pl**

Quality of life and health in cities becomes critical nowadays, due to increasing human population, urban sprawl and climate change. New ways of planning and managing for sustainable cities are needed. Ecological components of urban systems should be recognised as essential regulatory drivers, critical for enhancing the capacity of ecosystems against the increasing impact, providing ecosystem services and cost-efficient solutions to the cities' issues. Understanding interrelations between hydrological and biological processes provide, according to ecohydrology theory, methods and tools to do so. Examples of ecohydrological system solutions in cities will be presented. Within the SWITCH project (SWITCH, GOCE 018530), the Blue-Green Network concept provided new perspectives for sustainable development and adaptation to global climate change. The EU LIFE project "Ecohydrologic rehabilitation of recreational reservoirs "Arturówek" (Łódź) as a model approach to rehabilitation of urban reservoirs" (EH-REK) (LIFE08 ENV/PL/000517) was implemented in a cascade of small urban reservoirs intensively used for recreation. It implemented a number of simultaneous rehabilitation actions to prevent the reservoirs eutrophication, including: removal of bottom sediments, construction of sequential sedimentation-biofiltration and hybrid systems, development of shoreline vegetation, floating islands, and regulation of the biological structure of the ecosystems. City of Radom is implementing LIFE-RADOMKLIMA project - „Adaptation to climate change through sustainable water management in urban space of Radom" (LIFE14 CCA/PL/000101). The goal of this project is to adapt the city to climatic extremes, by application of blue-green infrastructure and nature-based solutions.