



ÓBUDA UNIVERSITY
REJTŐ SÁNDOR FACULTY OF LIGHT INDUSTRY
AND ENVIRONMENTAL ENGINEERING



IJCELIT 2019

21-22
NOVEMBER
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7th International Joint Conference on
Environmental
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STUDIES ON SURFACE WATER QUALITY IN ROMANIA – SERBIA CROSS-BORDER DANUBE BASIN. RORS-462 IPA PROJECT FIRST STEPS AND PERSPECTIVES

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⁴ Citizen Association Village - Movement for Rural Development, Serbia

Abstract:

The paper presents the objectives and expected results of a new started research project that involves two relevant education and research Balkan institutions, University Politehnica Timisoara and University of Belgrade.

The project teams aim an extensive Evaluation of environmental current situation in cross border “sister” Danube banks nature reservation Djerdap (Serbia) and national parks Iron Gate (Romania), and on several Danube tributaries and two wet lands: Carska-Bara special nature reserve and Delta Nera nature reservation. Also a study on the impact of mining activities from Bor and Moldova-Noua on the environment, with focus on water quality is proposed.

Thru the RORS-462 project, specific water quality analysis will be performed on Danube and its main tributaries (Nera, Cerna, Berzasca, Porecka and Pek): COD, CBO5, ammonia, nitrates, nitrites, phosphates, conductivity and for the first time in the area heavy metals contaminants will be analysed (mercury, lead, nickel, zinc, copper, arsenic, cadmium, uranium).

Keywords:

Danube, heavy metal, water quality, cross-border pollution.

1. INTRODUCTION

The environmental issues and especially air and water quality are not of local concern but by definition a regional or global concern. On both sides of Danube authorities developed national monitoring network for water quality. However, this networks are strictly limited to the EU minimal requirements for data collection. The data that will be measured, collected analysed and publically available for any interested parties (thru project web page) will be COD, CBO5, ammonia, nitrates, nitrites, phosphates, conductivity and for the first time in the area heavy metals contaminants will be analysed, mercury, lead, nickel, zinc, copper and others. One should understand that any effort in environmental protection in cross-border regions is futile if the effort is not conducted equally on both sides of the border. We have in mind that the analysed border region is unique: a hub for global trade and commerce, multicultural home to over 1 million people, beauty of the landscape, the mild climate, a richness of fauna and flora, common history and traditions, and employment and investment opportunities, numerous natural protected areas and Natura 200 sites. The multidisciplinary attempt of the project is a proof that there are high chances to add value to the local existing state of art knowledge, concerning this particular region.



The cross-border area is not only in need of developing its environmental protection network and knowledge level but also in need to educate and raise the awareness of general public and young generation on the importance of environmental conservation and protection, especially in border area, that has a rich and diverse natural heritage.

In our opinion the main territorial challenge is to conserve our natural heritage, as this heritage is the most important asset. The economic/industrial investments in the area can raise or fall (especially in crisis situations) but the natural heritage is here forever ... There are not many cross-border areas as rich as our – snowing mountains, great rivers, richness and diversity of flora and fauna, agricultural plains – heritage that we should conserve and protect, designing all our future developing strategies starting from the regional nature protection towards sustainable development.

By the means of this project the project partners will address two regional challenges: first, the development of public environmental research and education infrastructure and second, to contribute to raise the level of awareness not only of experts but mainly to children's and students on the importance and significance on protecting our natural heritage: our natural richness and diversity.

2. COOPERATION AND FOCUS AREA

The project is developed in a joint management system between 4 partners, University Politehnica Timisoara, University of Belgrade thru its Technical Faculty in Bor, Pro-Mehedinti Association and Citizen's Association "Village" from Zlot.

Project activities are financed thru Interreg – IPA CBC Romania – Serbia, with a total budget of 626,979.15 euro and an EU contribution of 532,932.26 Euro. The period of implementation is from 21.08.2019 to 13.02.2021.

The cooperation is based on rules and application of Interreg - IPA CBC Romania – Serbia Programme 2014-2020, and focuses on the development of the border area through improvement of the accessibility to the labour market and promoting employment, environment protection and tourism. In our case the focus is on environmental protection and raising awareness of regional population on necessity to protect our common environment, regardless the border. The programme area that we focus on is dealing with the significant common challenges in the environment and in specific aspects of local/regional preparedness in relation to cross-border emergency situations and not at least on overcoming the border as a perceived "division", and promoting greater cooperation and contact between regions and communities on both sides of the border.

The purpose of cooperation and the development of our partnership started from 3 needs that we observed, related to eligibility area and programme specific objectives:

- The observed unsatisfied quality of surface waters of Danube in our area, lead us to focus on common nature reservation – called Djerdap in Serbia and Iron Gate in Romania – by analysing water quality on its main tributaries
- Observed lack of knowledge, understanding and acting on preserving common environment of our citizens – and our ONG partners will focus in in-situ awareness campaigns focusing especially on young generation.
- And also the need to develop and strengthen our universities and their infrastructure and research capabilities on water quality analysis



Figure 1: View of Djerdap / Iron Gate nature reserve – the big gorge

The picture above illustrates the beauty and uniqueness of the target area, specifically the Danube river and its unique gorges that separate Romania and Serbia on borders not on common history and cultural heritage.

3. EXPECTED RESULTS

Certainly, none of the objectives described above can be reached without cross-border cooperation. First of all because surface water pollution has no borders or nationality ... what one does will affect the other, especially in cross-border areas where we share most of the water basin (with emphasis on the Danube). As the Danube is our nations' border, the way that each of us acts on its territory will influence directly the life and the environment of the other. It is futile to increase the awareness on the need to protect the environment in one site if on the other side no actions are taken.

The joint team's scientific tasks in the project development are clear and by the end of the implementation period (2020) we must provide, freely available on the project website aeps.upt.ro three extensive scientific studies:

- Scientific study on surface water quality in the Djerdap/Iron Gate protected area.
- Study on evaluation of surface water quality in two regional significant and unique sites, Carska-Bara special nature reserve and Delta (Balta) Nera nature reservation, the newest delta in Europe. In our region we have two unique sites: Carska Bara and Nera Delta. They are both unique wetlands environments, both being basically deltas. The Carska Bara is a UNESCO RAMSAR protected wetland and Delta Nera is classified as an IV IUCN protected area of national interest. We will perform extensive measurement of water quality in both sites, measuring COD, CBO5, ammonia, nitrates, nitrites, phosphates, conductivity and for the first time in the area heavy metals contaminants will be analysed, arsenic, mercury, lead, nickel, zinc, copper and others.
- Extensive Study on the influence of the copper mining activities in Majdanpek on the Danube River.



- Intensive copper mining and processing in Majdanpek (part of the “Mining and smelting cooper basin BOR”) throughout the past long-term period, has led to the environmental degradation. Huge amount of deposited mining waste causes the air, water and the soil pollution. We recognized that Mali Pek and Pek are the most vulnerable rivers which has a huge potential risk to the natural resources. Rivers are constantly in indirect contact with pollution throughout the permanent leachate from the mining waste sites, or occasionally, but not in less extent, during the rivers flooding which yields to the expanding of the pollution to the surroundings agricultural soil. The significance of the research on the environmental quality in this area is raised because of the vicinity of the National Park Đerdap and international Danube River. The study will also include the mapping of the most endangered areas with elevated heavy metal concentration in soil on the river banks, as a consequence of the flooding of the polluted rivers.

In addition state-of-art analytical equipment’s will be purchased for University Politehnica Timisoara and Technical Faculty in Bor, Graphite Atomic Absorption Spectrometer with Zeeman and Deuterium background correction; N/C analyser (TOC, NPOC, POC, TC, TIC, TNb) with NDIR detector for liquid samples; X-ray fluorescence spectrometry analyser.

The novelty of project proposal consists in its approach: we first address the children’s teaching, explain and consolidate their future actions in protecting the environment, then we address the university students training them on new and modern techniques and equipment’s for surface water analysis and in the end, thru the in-situ surface water quality monitoring campaigns and published results we address the cross-border society in general, providing new and reliable data on our environment, to support region society (municipalities, HGO’s, industry) in their future decisions on environmental protection.

Collaborative efforts to increase the knowledge in environmental protection and to raise awareness of region inhabitants on the necessity to protect our environment, for a better quality of life, are and should be constant and continuous.

4. REFERENCES

- [1] ***: ACADEMIC ENVIRONMENTAL PROTECTION STUDIES ON SURFACE WATER QUALITY IN SIGNIFICANT CROSS-BORDER NATURE RESERVATIONS ĐERDAP / IRON GATE NATIONAL PARK AND CARSKA BARA SPECIAL NATURE RESERVE, WITH POPULATION AWARENESS RAISING WORKSHOPS., AVAILABLE FROM [HTTP://WWW.AEPS.UPT.RO](http://www.aeps.upt.ro) ACCESSED: 2019-11-01
- [2] POPESCU, F.: A PERFORMANT STATE-OF-ART TOOL TO ASSESS CROSS-BORDER IMPACT OF INDUSTRIAL ACTIVITIES. A TRANSBOUNDARY AIR POLLUTION CASE STUDY, *PROCEDIA TECHNOLOGY*, VOL. (2016) NO. 22, PP. 440-444, ISSN 2212-0173

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PROGRAM

22 November , Friday



Session 1	Session Chairs		
10:00 – 10:50	Bogdana Vujić - Francisc Popescu	Presentation	Time
HOSAM E.A.F. BAYOUMI HAMUDA, LYUDMYLA SYMOCHKO	RECYCLING ORGANIC WASTES TO AGRICULTURAL SOIL TO IMPROVE ITS QUALITY: BENEFITS AND RISKS	KEYNOTE SPEAKER (ORAL)	10:00- 10:20
EDMOND HOXHA	3D MODELLING OF BERAT CASTLE USING DRONE AND GIS TECHNOLOGY	(ORAL)	10:20- 10:30
OYA AYDIN URUCU, ESRA DUYGU ARACIER	A GREEN SEPARATION/ PRECONCENTRATION METHOD FOR DETERMINATION CADMIUM IN ENVIRONMENTAL SAMPLES	(ORAL)	10:30- 10:40
GYÖRGYI GELYBÓ	ENVIRONMENTAL ASPECTS OF AGRICULTURE - GHG EMISSIONS, FOCUSING ON CO ₂	(ORAL)	10:40- 10:50
COFFEE BREAK AT FACULTY HALL			10:50- 11:00
Session 2	Session Chairs		
11:00- 11:40	Edmond Hoxha - Györgyi Gelybó	Presentation	Time
LYUDMYLA SYMOCHKO, HOSAM E.A.F. BAYOUMI HAMUDA,	ENVIRONMENTAL CONTAMINATION BY ANTIBIOTICS:	(ORAL)	11:00- 11:10

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RUSLAN MARIYCHUK, OLENA DEMYANYUK, VITALIY SYMOCHKO, OLGA GAFIAK	SOIL MICROBIOME AND RESISTOME		
HOSAM E.A.F. BAYOUMI HAMUDA	EVALUATION THE IMPACTS OF SOME FUNGICIDES ON SOIL MICROBIAL BIOMASS AND ENZYMATIC ACTIVITIES	(ORAL)	11:10-11:20
ZORAN ČEPIĆ, LJILJANA RADOVANOVIĆ, BOGDANA VUJIĆ, DRAGAN ADAMOVIĆ, JELENA RADONIĆ	IMPACT OF USE WASTE TIRES IN CEMENT PRODUCTION ON NITROGEN AND SULFUR EMISSIONS	(ORAL)	11:20-11:30
OYA AYDIN URUCU, ESRA DUYGU ARACIER, EMRAH ÇAKMAKÇI	THIOL-ENE PHOTOCURED ADSORBENTS FOR AU(III) ADSORPTION	(ORAL)	11:30-11:40
COFFEE BREAK AT FACULTY HALL			11:40-11:50
Session 3	Session Chairs	Presentatio	n
11:50- 12:40	Lyudmyla Symochko, Hosam Bayoumi Hamuda		
FRANCISC POPESCU, NADA STRBAC, IOAN LAZA, MILAN TRUMIC, BOGDANA VUJIC, CARMEN RADESCU, MAJA TRUMIC, ANTONJIEVIC VUKOSAV	STUDIES ON SURFACE WATER QUALITY IN ROMANIA – SERBIA CROSS-BORDER DANUBE BASIN. RORS-462 IPA PROJECT FIRST STEPS AND PERSPECTIVES	(ORAL)	11:50-12:00
TUĞÇE ÇAĞLAYAN, OYA AYDIN URUCU, EMRAH ÇAKMAKÇI	CELLULOSE ACETATE BUTYRATE BASED HYDROGELS FOR METAL RECOVERY FROM AQUEOUS MEDIA	(ORAL)	12:00-12:10
ÁGNES BÁLINT, RICHÁRD KOSZTOLÁNYI, CSABA MÉSZÁROS	ANALYSIS OF HEAT TRANSPORT IN SOIL COLUMN MEASUREMENTS SIMULATING SUN CYCLE	(ORAL)	12:10-12:20
ALI DAWOOD SALMAN, TATJÁNA JUZSAKOVA, ENDRE DOMOKOS,	RECOVERY OF RARE EARTHS FROM RED MUD BY HIGH-PRESSURE ACID	(ORAL)	12:20-12:30

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THAMER ADNAN ABDULLAH	LEACHING		
TUĞÇE ÇAĞLAYAN, OYA AYDIN URUCU, EMRAH ÇAKMAKÇI	AMPS-ACMO BASED HYDROGELS FOR METAL RECOVERY FROM AQUEOUS MEDIA	(ORAL)	12:30-12:40
COFFEE BREAK AT FACULTY HALL			12:40-12:50
Session 4	Session Chairs	Presentatio	n
12:50-13:40	Ágnes Bálint - Beyza Karanlık		
TATJANA JUZSAKOVA, ÁKOS RÉDEY, ENDRE DOMOKOS	ENVIRONMENTAL APPLICATIONS OF ZEOLITES	(KEYNOTE: ORAL)	12:50-13:10
BERCIS PEKTAŞ, HATICE BIRTANE, OYA AYDIN URUCU, MEMET VEZIR KAHRAMAN	THIOL-ENE BASED MEMBRANES AND APPLICATIONS IN HEAVY METAL IONS REMOVAL	(ORAL)	13:10-13:20
KRISZTINA DEMÉNY, RITA BODÁNE-KENDROVICS, ZOLTÁN JUVANCZ, FANNI TÓTH	SUMMER PRACTICE FOR ENVIRONMENTAL ENGINEER STUDENTS IN THE AREA OF BÁNK	(ORAL)	13:20-13:30
COFFEE BREAK AT FACULTY HALL			13:30-13:40
Session 5	Session Chairs	Presentatio	n
13:40 - 14:10	Bashkim Lushaj - Mariem Chaâbane		
ÁGNES BÁLINT, RENÁTA BARNA	ANALYSIS OF ATMOSPHERIC HEAVY METAL DEPOSITION WITH THE ANALYSIS OF MOSSES IN WESTERN HUNGARY	(ORAL)	13:40-13:50
BEYZA KARANLIK, HATICE BIRTANE, OYA AYDIN URUCU, MEMET VEZIR KAHRAMAN	FUNCTIONAL THIOL ENE MEMBRANE FOR METAL UPTAKE	(ORAL)	13:50-14:00
THAMER ADNAN ABDULLAH,	METHYLENE BLUE REMOVAL FROM	(ORAL)	14:00-

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RASHED TALEB RASHEED, TATJÁNA JUZSAKOVA, ENDRE DOMOKOS, ALI DAWOOD SALMAN, AL-LAMI MUNAF	WATER USING MNO ₂ NANOPARTICLES MODIFIED MWCNTS		14:10
LUNCH BREAK			14:10-15:10
COFFEE BREAK AT FACULTY HALL			15:20-15:30
Session 6	Session Chairs	Presentatio n	Time
15:30 – 16:50	Rita Bodáné-Kendrovics - Visnja Mihajlovic		
ROQUIA I. RIZK, TATJANA JUZSAKOVA, ENDRE DOMOKOS, RAWASH MOHAMED ALI	BIO REMOVAL OF HEAVY METAL BY USING OF WATER HYACINTH PLANTS	(ORAL)	15:30-15:40
OYA AYDIN URUCU, ASLI BEYLER ÇİĞİL, EMINE ARMAN KANDIRMAZ	COLORIMETRIC DETERMINATION OF VANADIUM IN WATER SAMPLES	(ORAL)	15:40-15:50
LARBI EDDAIF, ABDUL SHABAN, JUDIT TELEGDI	CALIX[4]RESORCINARENE AND CALIX[4]ARENE IONOPHORES: A HEAVY METALS IONS DETECTION APPLICATION	(ORAL)	15:50-16:00
BALÁZS GYULA URBÁN, CSABA MÁTÉ KASSAI, NÁNDOR MÉSZÁROS	BLURRED TIRE TRACKS QUANTITATIVE DATA ON MICROPARTICLES FROM TIRE WEAR ON ROAD SURFACE WASHING INTO SURFACE WATER	(ORAL)	16:00-16:10
MUNGUNZAYA GANBAT, KATALIN KOVÁCS, JUDIT PLUTZER, HOSAM BAYOUMI HAMUDA	EVALUATION OF THE POSSIBLE ADVERSE EFFECT OF WASTEWATER DISCHARGES WITH ACUTE TOXICITY TESTS	(ORAL)	16:10-16:20
VERA MALSIA LUSHAJ, BASHKIM LUSHAJ	MODULE ON SOCIO-ENVIRONMENTAL IMPACT ASSESSMENT (EIA) IN ECO-	(ORAL)	16:20-16:30

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	ARCHITECTURE IN ALBANIA		
ILDIKO DOBI	SATELLITE INFORMATION ON CLIMATE FOR ENVIRONMENTAL EXPERTS	(ORAL)	16:30- 16:40
LÓRÁNT SZABÓ	FOUR YEARS OF A SOLAR POWER PLANT	(ORAL)	16:40- 16:50
COFFEE BREAK AT FACULTY HALL			16:50- 17:00
Poster Session	Session Chairs	Presentatio n	Time
17:00 – 17:30	Krisztina Demény - Lóránt Szabó		
BOGDANA VUJIĆ, JELENA MIĆIĆ, UNA MARČETA, VIŠNJA MIHAJLOVIĆ	ASSESMENT OF THE NO ₂ CONCENTRATIONS FROM TRAFFIC	(POSTER)	1
GYÖRGYI GELYBÓ, RÉKA DELI, MÁRTON DENCSŐ, BERNADETT KÓSA, VIKTÓRIA MATEIKA, MÁRTON TÓTH, EMESE UJJ, TAMÁS ÁRENDÁS, NÁNDOR FODOR, HOSAM E.A.F. BAYOUMI HAMUDA	MEASURING CO ₂ FLUXES IN MAIZE UNDER CONTRASTING NITROGEN FERTILIZATION TREATMENTS	(POSTER)	2
HOSAM E.A.F. BAYOUMI HAMUDA	TEMPERATURE INFLUENCING THE FUNGICIDES ACTIVITY ON BIOLOGICAL PARAMETERS IN AGRICULTURAL SOIL	(POSTER)	3
MEDIHA SEFI, M CHAÂBANE, A ELWEJ, S BEJAQUI, R MARREKCHI, K JAMOSSI, N GOUIAA, T BOUDAWARA-SELLEMI, M EL CAFSI, N ZEGHAL, N SOUDANI	MANEB-INDUCED OXIDATIVE STRESS, GENOTOXICITY AND HISTOPATHOLOGICAL CHANGES IN KIDNEY OF ADULT MICE	(POSTER)	4
MEDIHA SEFI, A ELWEJ, M CHAÂBANE, S BEJAQUI, R	BENEFICIAL ROLE OF VANILLIN, A POLYPHENOLIC FLAVORING	(POSTER)	5



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MARREKCHI, K JAMOSSI, N GOUJIAA, T BOUDAWARA-SELLEMI, M EL CAFSI, N ZEGHAL, N SOUDANI	AGENT, ON MANEB-INDUCED OXIDATIVE STRESS, DNA DAMAGE, AND LIVER HISTOPATHOLOGICAL CHANGES IN SWISS ALBINO MICE		
MARIEM CHAÂBANE, MEDIHA SFAR SEFI, MOHAMED KOUBAA, CHOUMOUS KALLEL, KAMEL JAMOSSI, SEMIA ELLOUZE CHAABOUNI, NEJLA SOUDANI, NAJIBA ZEGHAL	THERAPEUTIC EFFICACY OF NITRARIA RETUSA FRUIT AGAINST HEMATOLOGICAL AND MINERAL PROFILE DISORDERS IN RATS EXPOSED TO PENCONAZOLE, A TRIAZOLE FUNGICIDE	(POSTER)	6
VISNJA MIHAJLOVIC, UNA MARCETA, MASA MANJULOV, BOGDANA VUJIC, DEJAN JOVANOVIĆ	PESTICIDE CONTAINER MANAGEMENT – GOOD PRACTICE EXAMPLE FROM SERBIA	(POSTER)	7
ARNISA LUSHAJ, ANESI GJIPALI, ARVJEN LUSHAJ, VERA MALSIA, BASHKIM LUSHAJ	REVITALIZATION OF TRADITIONAL ARCHITECTURE TOWARDS SUSTAINABLE ECOTOURISM FOR DEVELOPMENT OF THE DISADVANTAGED AREAS IN POOR VILLAGES OF KUKES, DIBER, BERAT (SKRAPAR) REGIONS	(POSTER)	8

STUDIES ON SURFACE WATER QUALITY IN ROMANIA – SERBIA CROSS-BORDER DANUBE BASIN. RORS-462 IPA PROJECT FIRST STEPS AND PERSPECTIVES

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Academic Environmental Protection Studies on surface water quality in significant cross-border nature reservations Djerdap / Iron Gate national park and Carska Bara special nature reserve, with population awareness raising workshops

UNIVERSITY POLITEHNICA TIMISOARA



UNIVERSITY OF BELGRADE
TECHNICAL FACULTY IN BOR



PRO MEHEDINTI ASSOCIATION



CITIZEN'S ASSOCIATION "VILLAGE"
MOVEMENT FOR RURAL DEVELOPMENT ZLOT



AEPS facts:

Programme priority:

PA 2 Environmental protection and risk management

Programme priority specific objective:

2.1 Environmental protection and sustainable use
of natural resources

Implementation period: 21.08.2019 – 13.02.2021

Total budget value: 626,979.15 EURO

EU contribution: 532,932.26 EURO

Partners budget:

UNIVERSITY POLITEHNICA TIMISOARA: 299,250.00 EURO

TECHNICAL FACULTY IN BOR: 223,366.50 EURO

PRO-MEHEDINTI ASSOCIATION: 71,688.75 EURO

CITIZEN'S ASSOCIATION "VILLAGE" ZLOT: 32,673.90 EURO



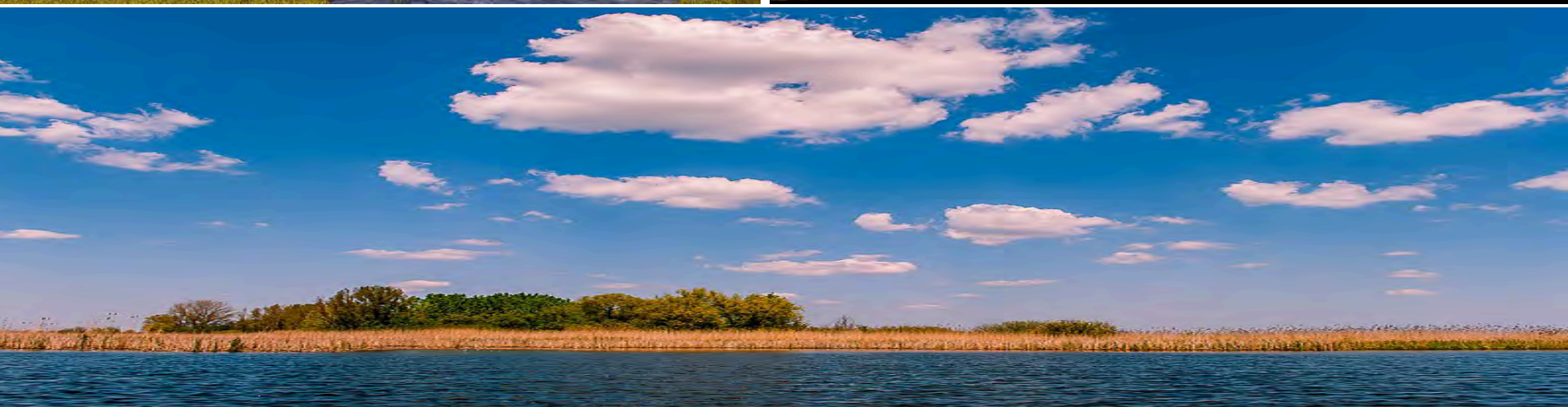
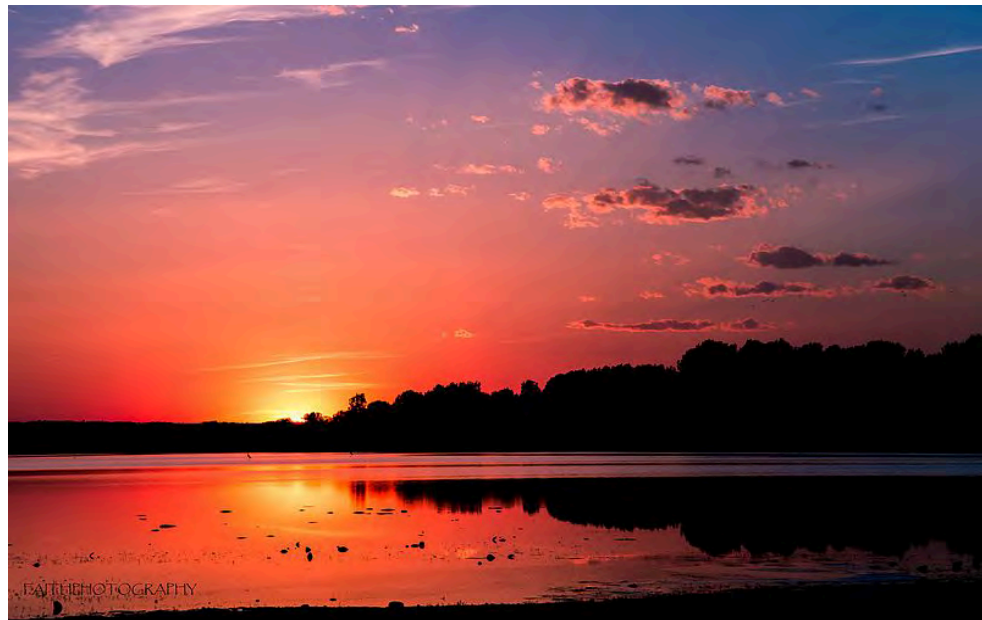
Environmental protection
and risk management

Balta Nera – newest European Delta – nature protected area



Objectives

CARSKA BARA – special nature protected area



Objectives

2. Raising the awareness of young generations on both sides of the border on the immediate need to protect the region remarkable natural heritage and also raising the awareness of local society on the advantages of sustainable use of natural resources and environmental protection.

3. Development of **University Politehnica Timisoara** and **Technical Faculty in Bor** - infrastructure thru state-of-art analytical equipment for environmental analysis, to increase their research capabilities in order to assure their goals for the future: significant contribution to education of next generation of experts.



Scientific outputs

- Scientific study on surface water quality in Djerdap/Iron gate protected area
- Study on evaluation of surface water quality in two regional significant and unique sites, Carska-Bara special nature reserve and Delta (Balta) Nera nature reservation, the newest delta in Europe
- Study on the influence of the copper mining activities in Majdanpek on Danube river. Intensive copper mining and processing in Majdanpek.

Analytical methods:

X-ray fluorescence spectrometry, Atomic Absorption Spectrometer, N/C analyser, Scanning electron microscopy with chemical composition analysis EDS

Pollutants:

heavy metals – arsenium, lead, mercury, cadmium, manganese, zinc, iron, magnesium, uranium, aluminium – COD, CBO5, ammonia, nitrates, nitrites, phosphates, a.o.



**The overall project objective is to raise the awareness of
society on the need of
natural heritage protection and conservation
and to promote scientific state-of-art tools for surface water
quality monitoring in cross-border area thru case studies
and onsite measurements.**

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