

**O. M. Beketov National University of Urban Economy in Kharkiv**

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**PEEX-e-Conference  
Session I, 01.04.2026**

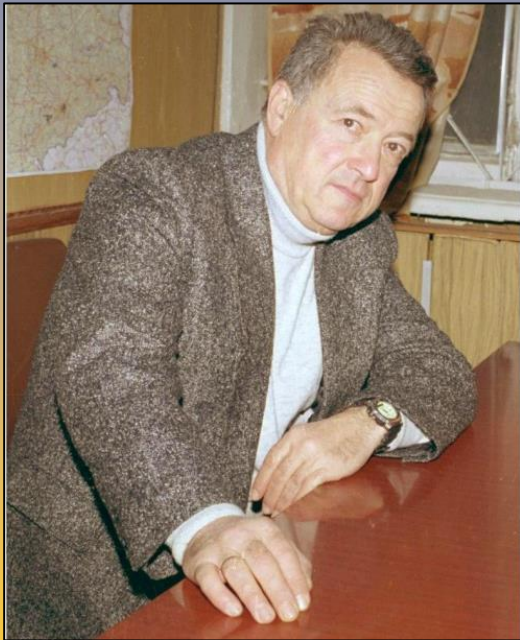
**RESEARCH AND EDUCATION IN THE FIELD OF  
EARTH AND ENVIRONMENTAL SCIENCES  
AT THE O.M. BEKETOV NATIONAL UNIVERSITY OF  
URBAN ECONOMY IN KHARKIV, UKRAINE**



*Yuriy Vergeles*  
*Senior Lecturer, Senior Researcher*  
Department of Urban  
Environmental Engineering and  
Management

# The Beginning

1990



Prof. **Felix V. Stolberg** (1938-2020)  
Head of the Department (1990-2020)

The Department of Urban Environmental Engineering & Management was established and the first of a kind university degree programme in Ukraine an **Applied Environmental Science and Engineering** was launched.

# Early Research Directions

1991

- ❖ environmental geochemistry of urban areas
- ❖ environmental impacts of ferrous slags
- ❖ municipal solid waste management
- ❖ mathematical modelling of wastewater treatment processes

1999

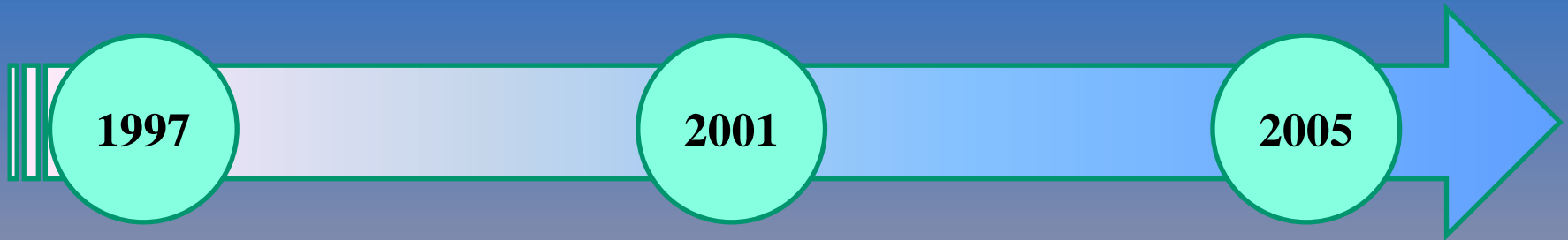


**CHAPTER 22**  
**Environmental Effects of Ferrous Slags**  
**- Comparative Analyses and a Systems Approach in Slag Impact Assessment for Terrestrial and Aquatic Ecosystems**

Dr. Lidija Svirenko, Jurij Vergeles, Oleksandr Spirin

Department of Urban Environmental Management & Engineering (UEME),  
Kharkiv State Academy of Municipal Economy (KSAME),  
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UA-61 002 Kharkov  
Ukraine

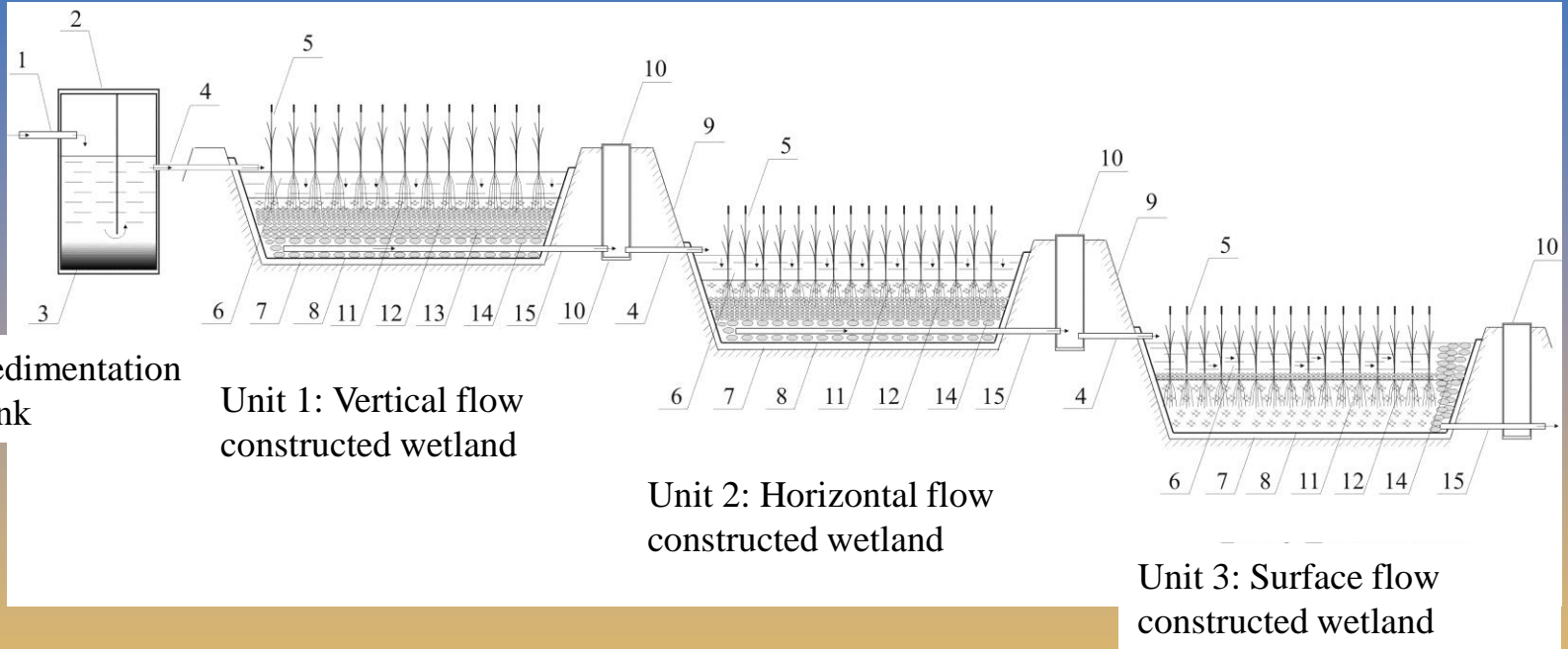
# EU-funded projects in Eco-technologies



**“Research and Information on Water Purification by Means of Constructed Wetlands (*Bioplantos*) in Ukraine, Supported by Studies in Estonia, Finland, the Netherlands and Sweden”**  
**(INCO-COPERNICUS)**  
1997-2001

**“Investigations on the pollution of the Kola river and adjacent aquatory of the Barents Sea and development of ecotechnological measures towards their ecological restoration”** (INCO-2)  
2001-2005

**Fig. 1 - The experimental constructed wetland site for domestic wastewater treatment (“Bioplato”) at the Velyki Prokhody village, Kharkiv Region**



**Table 1. - The pollutants removal efficiency at the Velyki Prokhody constructed wetland site, Ukraine**

<i>Compound</i>	<i>Season</i>	<i>Mean concentrations, mg/l</i>		<i>Mean removal, %</i>
		Input	Output	
<b>Suspended solid</b>	Summer	208.5	17.4	<b>88.60±3.80</b>
	Winter	133.4	4.4	<b>91.81±6.53</b>
<b>COD</b>	Summer	277.3	46.0	<b>82.38±2.93</b>
	Winter	204.0	28.6	<b>81.92±3.09</b>
<b>BOD<sub>5</sub></b>	Summer	99.7	6.6	<b>93.23±1.40</b>
	Winter	49.0	4.3	<b>90.74±1.98</b>
<b>NH<sub>4</sub>-N</b>	Summer	54.6	9.2	43.47±8.27
	Winter	23.5	12.2	52.70±11.26
<b>N<sub>tot</sub></b>	Summer	4.59	3.66	29.05±14.30
<b>PO<sub>4</sub>-P</b>	Summer	0.293	0.247	28.68±14.91
	Winter	0.284	0.162	50.41±6.31
<b>P<sub>tot</sub></b>	Summer	6.80	3.91	30.58±18.44
<b>Laundry detergents</b>	Summer	0.462	0.076	<b>79.66±5.98</b>
	Winter	0.305	0.081	77.65±4.88
<b>Coli-forms, 10<sup>5</sup>, l<sup>-1</sup></b>	Summer	9133.3	22.3	<b>99.13±0.78</b>
	Winter	4497.5	4.0	<b>99.76±0.14</b>
<b>Coli-phags, 10<sup>3</sup>, l<sup>-1</sup></b>	Summer	2619.0	6.5	<b>98.15±0.97</b>
	Winter	861.9	15.3	<b>98.49±0.61</b>

**Table 2. - Pollutant removal efficiency of different constructed wetlands in the participating countries (only data from the warm periods of year were used for comparison, UA – Ukraine, EE – Estonia, SE – Sweden)**

Constructed wetland name	Country	Year of construction	Inflow m <sup>3</sup> /d	Estimated residence time, d	Removal efficiency (%)			
					BOD	NH <sub>4</sub> -N	N <sub>tot</sub>	P <sub>tot</sub>
Velyki Prolhody	UA	1997	20-40	6-7	91	49	13-25	32
Põltsamaa	EE	1997	600	7-10	80	43	60	35
Kodijärve	EE	1996	-	-	82	36	41	81
Oxelösund	SE	1993	5500	7-8	65	-	36	90 <sup>[1]</sup>
Alhagen	SE	1998	5000	14	83	-	64	86 <sup>[2]</sup>

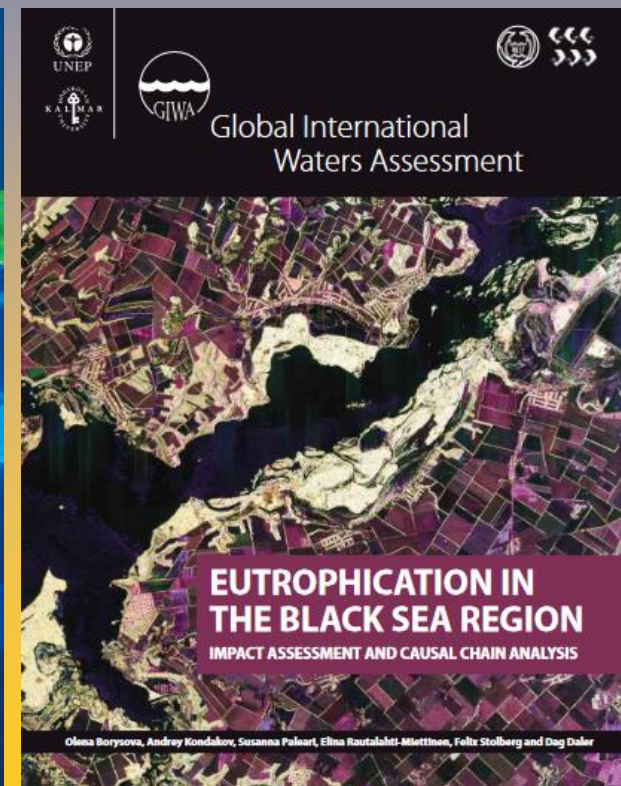
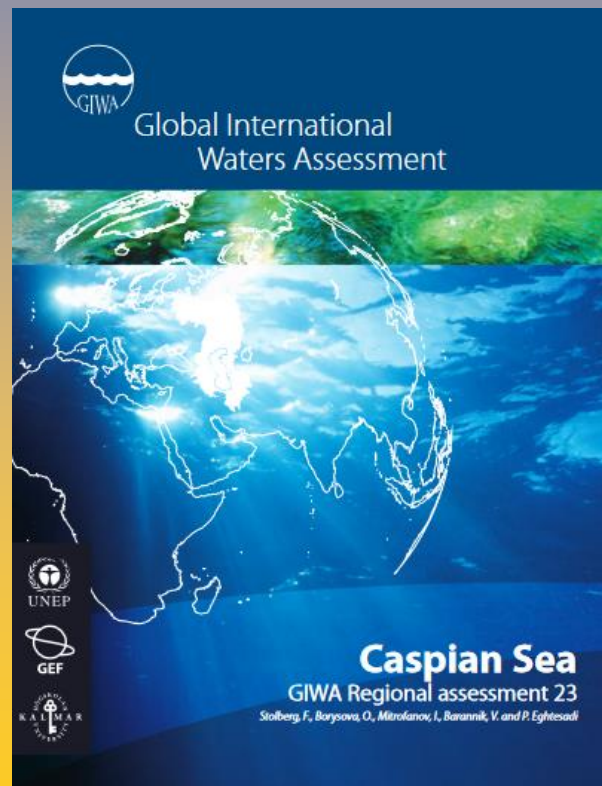
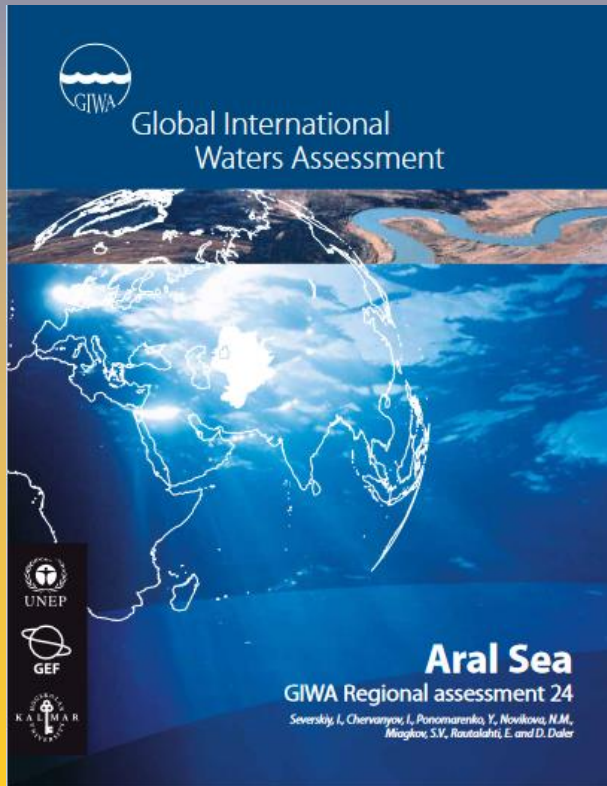
[1] low input from the wastewater treatment plant

[2] low input from the wastewater treatment plant

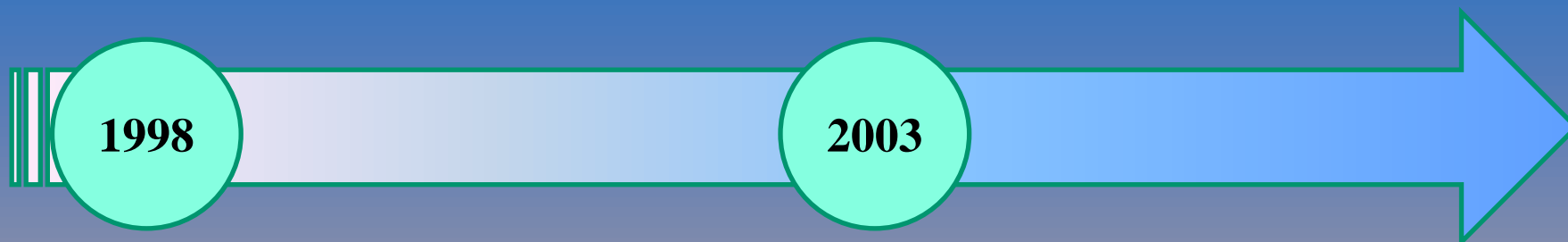
# UNEP's Global International Water Assessment Programme

2001

2003



# EU-funded TEMPUS, ERASMUS projects



## **JEP “Environment & Energy”**

**(1998-2002):**

**Ukraine (KNAME) – Finland (VAMK; WFREC, Vaasa) – The United Kingdom (University of Abertay Dundee, Dundee)**

## **JEP “Higher Education & Labour Market for the EnvironmenT” – HELMET (2003-2006):**

**Ukraine (KNAME; MES; MEP; ‘Ekopolimer’ Company) – Finland (VAMK, Vaasa) – The United Kingdom (University of Abertay Dundee, Dundee)**

## **JEP “Development of SUSTainable BUSiness patterns in Ukraine”**

**(2003-2006):**

**Ukraine (KNAME; URIEP; NGO ‘Novi Resursy’) – Finland (VY; WFREC, Vaasa) – The United Kingdom (Leeds Metropolitan University) – Sweden (Högskulan I Kalmar)**

# ERASMUS MUNDUS Partnership

2007

EM Lot 6/7

2011

## Ukraine:

KNAME

Taras Shevchenko NU Kyiv

O.O. Bogomolets NMU

V.I. Vernadsky NU Tavria

Ivan Franko NU L'viv

Oles' Honchar NU Dnipro

## Belarus:

BSU, Brest SU

## Moldova:

MSU, SU din Cahul

**Spain** (U. de Deusto, Bilbao)

**France** (U. Bordeaux-1)

**Germany** (W. Humboldt U. Berlin)

**Greece** (Aristotle U. Thessaloniki)

**Italy** (U. Bologna)

**Lithuania** (Vilnius University)

**The Netherlands** (Erasmus U. Rotterdam)

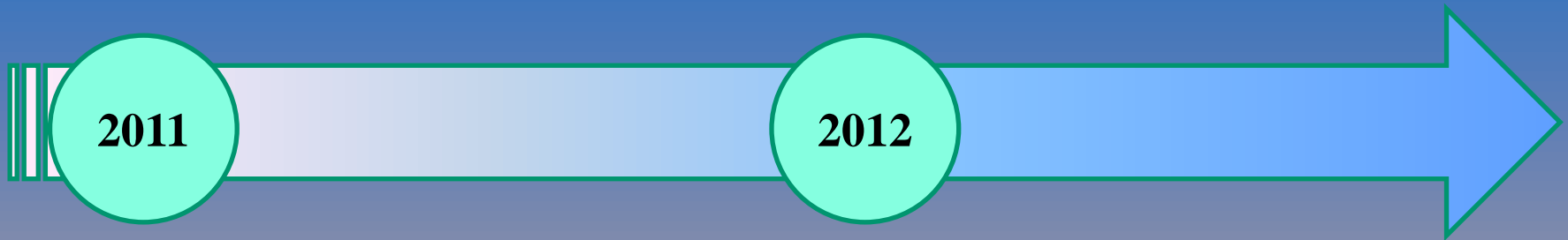
**Poland** (AH im. A. Giejstora Pultusk)

**Portugal** (U. do Algarve, Faro)

**Turkey** (ODTÜ-METU, Ankara)

**Finland** (Turun Yliöpisto)

# EU-funded TEMPUS, ERASMUS+ projects



**JEP “ENvironmental  
Governance for Environmental  
Curricula” (2011-2014): Ukraine  
(NUUEK, IEC) – Belarus (BSTU;  
BRU, NGO ‘Ekaprayekt’, A.D.  
Sakharov IEU) – RF (PSU, SFU,  
NGO ‘EkoPravo’) – Slovak  
Republic (Univerzita Jana  
Komenskeho v Bratislave) –  
Hungary (CEU) – Austria (Alpen-  
Adria Universität Klagenfurt) –  
Poland (PAR, Warszawa)**

The logo for the European Commission TEMPUS program. It features the European Union flag (a circle of twelve gold stars on a blue background) on the left. To the right, the text 'European Commission' is written in a smaller font above the word 'TEMPUS' in a large, bold, blue font. Below this, on a dark blue background, is the SUCSID logo, which consists of a green circle containing a white lightbulb icon, followed by the word 'SUCSID' in white capital letters. Underneath the SUCSID logo, the text 'Inter-university Start-up centers for students' innovations development & promotion' is written in white, followed by the project ID '530349-TEMPUS-1-2012-1-FR-TEMPUS-JPHES' in white.

# EU-funded TEMPUS, ERASMUS+ projects

2014

## ENVIRONMENTAL GOVERNANCE FOR CITIES, MUNICIPALITIES AND COMMUNITIES

Mária Kozová, Felix Stolberg, Yuriy Vergeles, Anna Skrigan  
(editors)

This publication is the textbook for university students and should be cited as follows:  
M. Kozová, F. Stolberg, Yu. Vergeles, A. Skrigan (Eds.). 2014. Environmental Governance  
for Cities, Municipalities and Communities, Published by Comenius University in  
Bratislava, Slovak Republic, 1<sup>st</sup> Edition, 322 p. ISBN 978-80-223-3611-6

### Authors:

Prof. Dr. Volodymir Babayev (Chapter 3); Drs. Dmytro Dyadin (Chapter 3); Prof. Jiřina Jílková (Chapters 2, 3); Prof. Mária Kozová (Chapters 1, 2, 3, Annex 1), Prof. Galina Martsinkevich (Chapter 3); Assoc. Prof. Eva Pauditřová (Chapter 2, Annex 1); Assoc. Prof. Iryna Shchasnaya (Chapter 3); Assoc. Prof. Anna Skrigan (Chapters 1, 2, 3, Annex 1); M. Eng. Barbora Slabeciusová (Chapter 2); Prof. Felix Stolberg (Chapter 3); Dr. Iryna Usova (Annex 1); Drs. Yuriy Vergeles (Chapter 3, Annex 1); MSc. Angelika Tamášová (Chapter 1, Annex 1); MSc. Alexandr Zvoznikov (Chapter 3)

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**Number of copies:** 300

2014

COMENIUS UNIVERSITY IN BRATISLAVA

# EU-funded ERASMUS+ projects

**2013**

**EM Lot 5 “INFINITY” (2013-2016):**

**Ukraine (NUUEK)**

**Belarus (BSTU)**

**Moldova (MSU)**

**Georgia (Saint Iliya U.)**

**Azerbaijan (Baku U.)**

**Armenia (Yerevan U.)**

**Slovenia (U Nova Gorice)**

**Italy (Milano PU)**

**Portugal (Lisbon UT)**

**Estonia (TU Tallinn)**

**2017**

**ERASMUS+  
METU (Ankara)  
Turkey**



# Monitoring and assessment of contaminants of emerging concern (CEC) in the aquatic environments

2008

2025



The image shows the cover of a report titled "UNESCO-IHP Regional Consultation Meeting Water Quality in Europe: Challenges and Best Practices". The cover features logos for bfg (Bundesanstalt für Gewässerkunde), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the International Centre for Water Resources and Global Change. The text on the cover includes the meeting location (Koblenz, Germany) and dates (1-4 December 2015). It also mentions that the report is organized under the UNESCO-IHP International Initiative on Water Quality (IIWQ) and hosted by the Federal Institute of Hydrology, Germany.

**bfg** Bundesanstalt für Gewässerkunde

United Nations Educational, Scientific and Cultural Organization

International Centre for Water Resources and Global Change under the auspices of UNESCO

**UNESCO-IHP Regional Consultation Meeting**  
**Water Quality in Europe:**  
**Challenges and Best Practices**

Koblenz, Germany  
1-4 December 2015

Organized under  
UNESCO-IHP International Initiative on Water Quality (IIWQ)

Hosted by  
Federal Institute of Hydrology, Germany  
International Centre for Water Resources and Global Changes, under the auspices of UNESCO



The image shows the cover of a report titled "Emerging pollutants in surface and waste water of East Ukraine: occurrence, fate and regulation". The cover features a photograph of a river flowing through a lush green landscape. The text on the cover includes the authors' names (Yuliya Vystavna, Yuriy Vergeles) and their affiliation (O.M. Beketov National University of Urban Economy in Kharkiv, Ukraine). It also provides the university's website (www.kname.edu.ua) and the authors' email address (yuri\_vergeles@hotmail.com).

**Emerging pollutants in surface and waste water**  
**of East Ukraine: occurrence, fate and**  
**regulation**

**Yuliya Vystavna, Yuriy Vergeles**

O.M. Beketov National University of Urban Economy in  
Kharkiv, Ukraine, vul. Revolutsii 12, 61002, Kharkiv,  
Ukraine, [www.kname.edu.ua](http://www.kname.edu.ua)  
[yuri\\_vergeles@hotmail.com](mailto:yuri_vergeles@hotmail.com)

# Experimental constructed wetland site at Khorosheve village, Kharkiv region, Ukraine



Ecological Engineering  
Volume 108, Part A, November 2017, Pages 50-58



Recommended articles   
Citing articles (7)   
Article Metrics   
Citations  
Citation Indexes: 7  
Captures  
Readers: 35  
 [View details >](#)

## Removal efficiency of pharmaceuticals in a full scale constructed wetland in East Ukraine

Y. Vystavna <sup>a, R. B.</sup>, Z. Frkova <sup>a</sup>, L. Marchand <sup>b, c</sup>, Y. Vergeles <sup>d</sup>, F. Stolberg <sup>d</sup>

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<https://doi.org/10.1016/j.ecoleng.2017.08.009> [Get rights and content](#)

### Highlights

- Removal of pharmaceuticals was surveyed on a full scale

[Feedback](#) 

# Waste Management in Transition Economies

2015

## Partners:

**University of Natural Resources  
and Life Sciences (BOKU), Vienna  
Technische Universität Dresden  
(TUD)**

**O.M. Beketov NUUEK  
State institution of higher  
professional education  
“Belarussian-Russian  
University” (BRU)**

## **The goal:**

support for a sustainable reform process in the waste management sector in Belarus and Ukraine by strengthening international cooperation and the capacity of partner universities from Austria, Germany, Ukraine, and Belarus in the field of municipal waste management

# The «HANDFUL OF WATER» Social Investment Project funded by the Royal Dutch Shell/“Shell Exploration and Production Ukraine Investments B.V.”

2016

The project aimed at improving rural communities' access to clean drinking water through technical and educational initiatives and the use of alternative drinking water sources



 Applied Geochemistry  
Volume 53, February 2015, Pages 71-78

**Nitrates in springs and rivers of East Ukraine: Distribution, contamination and fluxes**

Yakovlev, Valeriy <sup>a</sup>, Vystavna, Yuliya <sup>b</sup>, Diadin, Dmytro <sup>c</sup>, Vergeles, Yuriy <sup>b</sup>

Show more

<https://doi.org/10.1016/j.apgeochem.2014.12.009> [Get rights and content](#)

Highlights

- Hydrogeological settings, seasonal flow and anthropogenic inputs influence nutrients dynamic.
- Level of nitrate contamination in springs was higher than the limit

Recommended articles

Citing articles (13)

Article Metrics

Citations

Citation Indexes: 13

Captures

Readers: 16

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# Secondary Cities Partnership

2020

Mapping Secondary Cities for Resiliency, Human Security and  
Emergency Preparedness

## Partners:

**U.S. Department of State,  
American Association of  
Geographers (USA)**

**Aim:** collection of geodata by means of mobile GIS-applications regarding the safety and accessibility of urban infrastructure and urban groundwater sources; creation of web maps based on the collected geodata.



# IAEA-funded projects

2013

2018



**CRP 18409 “Evaluation of human impacts on water balance and nutrients dynamics in transboundary Russia/Ukraine river basin”**

**CRP 17862 “River water quality assessment in the transboundary Russia/Ukraine water basin of the Seversky Donets River using environmental isotopic methods”**



[Environmental Monitoring and Assessment](#)

October 2017, 189:509 | [Cite as](#)

Determination of dominant sources of nitrate contamination in transboundary (Russian Federation/Ukraine) catchment with heterogeneous land use

Authors Authors and affiliations

Y. Vystavna , D. Diadin, V. Grynenko, V. Yakovlev, Y. Vergeles, F. Huneau, P. M. Rossi, J. Hejzlar, K. Knöller

Article  
First Online: 18 September 2017

234

5

Downloads Citations

Abstract

Nitrate contamination of surface water and shallow groundwater was studied in transboundary (Russia/Ukraine) catchment with heterogeneous land use. Dominant sources of nitrate contamination were determined by applying a dual  $\delta^{15}\text{N}-\text{NO}_3$  and  $\delta^{18}\text{O}-\text{NO}_3$  isotope

# Recent Curricula Development



2016

## Environmental Studies

- B.Sc. Degree Programme (240 ECTS credits)
- M.Sc. Degree Programme “*Urban Ecology*” (90 ECTS credits)

## Environmental Protection Technology

- B.Sc. Degree Programme (240 ECTS credits)
- M.Sc. Degree Programme (90 ECTS credits)
- Ph.D. Programme (180 ECTS credits)

# Recent Research Developments

2021

- tracking, modelling and assessment of urban systems' vulnerability and adaptability to the climate change

