



Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025





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Publication prepared and funded under Erasmus+JM Project
«EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD –
ERASMUS-JMO-2022-HEI-TCH-RSCH



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Petro Mohyla Black Sea National University,
Mykolaiv, Ukraine, 2025
<https://chmnu.edu.ua/>

Proceedings of the the International Conference
«European Green Dimensions: Fundamental, Applied, and Industrial Aspects»,
June 5–7, 2025, Mykolaiv: PMBSNU, 2025.

UDC 502.131.1+551.58] =111

Approved for publication by the Academic Council of Petro Mohyla Black Sea National University, Mykolaiv, Ukraine (№7, 29.05.2025).

Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025 [Electronic resource], Mykolaiv : PMBSNU, 2025, 100 p.

ISBN 978-617-8176-45-7

Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025 present abstracts of the reports of the Conference, which had place on June, 5–7, 2025 at Petro Mohyla Black Sea National University, Mykolaiv, Ukraine, prepared and funded under Erasmus+JM Project [«EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD – ERASMUS-JMO-2022-HEI-TCH-RSCH.](#)

The Proceedings covers such questions: European Green deal; Climate change; Energy efficiency, renewable energy; Conservation of biodiversity; Water resources management; Water quality, wastewater treatment; Protection of atmospheric air, environmental control and monitoring systems; Industrial and household waste management; Sustainable development and education for sustainable development.



**Co-funded by
the European Union**

Printed by: FOP Shvets V.M., Phone: +3806660946881;
Certificate subject publishing DK № 5078 from 01.04.2016.

The authors are responsible for the reliability of the results.

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them.”

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Co-funded by
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Publication prepared and funded under Erasmus+JM [Project «EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD – ERASMUS-JMO-2022-HEI-TCH-RSCH](#)

FOREWORD

Dear colleagues!

This collection of abstracts represents the culmination of the International Conference "European Green Dimensions: Fundamental, Applied, and Industrial Aspects," held on June 5–7, 2025, at Petro Mohyla Black Sea National University in Mykolaiv, Ukraine.

In an era where the planet's vital signs are flashing red, the International Conference isn't just timely – it's a critical intervention. We're operating in a complex system, where the European Green Dimensions represents a bold attempt to recalibrate humanity's relationship with Earth. This isn't solely about policy; it's a call to reimagine our industrial DNA, redefine energy itself, and resuscitate ecosystems gasping for breath.

From the thermodynamics of climate change to the intricate web of biodiversity, and from the chemistry of wastewater to the physics of renewable energy, the conference's scope mirrors the interconnectedness of the challenges. It's a recognition that sustainability isn't a niche concern—it's the operating system upgrade our civilization desperately needs. This isn't an academic exercise; it's a solution-focused sprint. The urgency is palpable, and the stakes couldn't be higher.

The Proceedings covers such questions: European Green deal; Climate change; Energy efficiency, renewable energy; Conservation of biodiversity; Water resources management; Water quality, wastewater treatment; Protection of atmospheric air, environmental control and monitoring systems; Industrial and household waste management; Sustainable development and education for sustainable development. The issues of ecology and sustainable development are of paramount importance and growing urgency for the future of humanity, demanding innovative solutions and collaborative efforts.

The International Conference attracted participants from a wide geographical distribution, fostering a rich exchange of ideas and perspectives. The contributions herein reflect the diverse approaches and innovative solutions being explored across various contexts.

It is our hope that the ideas presented within these pages will spark inspiration for further research, and facilitate the building of bridges for future collaboration and partnerships among scientists and practitioners.

We extend our sincere gratitude to the Erasmus+JM Programme, whose funding made this important event and this publication possible.

Prof. Olena Mitrysova

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CONTENT

<i>Anna ALEKSIEIEVA</i> European Green Deal: Challenges for Ukraine in the Post-War Period	11
<i>Iryna BABANINA</i> War-Related Impacts on Water Resources as an Additional Challenge Towards European Standards: Selected Communities of the Lower Dnipro	12
<i>Yuliia BASHYNSKA</i> Ensuring Sustainable Development of Ukrainian Communities on the Basis of the European Green Deal Through the Development of Renewable Energy	13
<i>Lenka BOBULSKÁ, Gabriela PINČÁKOVÁ</i> Educating for Sustainability: the Importance of Environmental Learning	14
<i>Olena BOIKA</i> The State of Forest Belts Under War Conditions	15
<i>Juliya BONDAR, Oleh ZLOBIN</i> The Impact of Climate Change on Water Bodies in Vinnytsia Region	16
<i>Valentyna BORYSOVA, Yevhen KRYSHTOP</i> Integration of Ecological and Digital Technologies into the Forest Sector Reform in Ukraine: From Biodiversity to Carbon Neutrality	17
<i>Anna BOZHENKO</i> The Role of Environmental Law in the Era of Reindustrialization	18
<i>Yevhen BRODSKY, Kateryna DEREVSKA</i> Ecological State of the Aquatic Environment of the Territory of the Capstone Mining of the Korosten Pluton	19
<i>Olena BUDIAKOVA</i> <i>Bioeconomy for Achieving Sustainable Development Goals</i>	20
<i>Dmytro CHERNENKO</i> Electromagnetic Stress Measurements in City Mykolaiv in the Conditions of Military Operations	21
<i>Yelizaveta CHERNYSH, Lada STEJSKALOVÁ, Libor ANSORGE</i> Applying the Grey Water Footprint to Assess Urban Micropollution	22
<i>Galyna DRABYNIUK, Oleksandr SHYNDER, Vitalii KOLOMIYCHUK</i> The Role of the "Yelanetsky Steppe" Nature Reserve in Biodiversity Conservation of the Steppe Zone	23
<i>Nataliia DUSHECHKINA</i> River Basin Management in Ukraine	24
<i>Alina DYCHKO, Yuliia MINAIEVA</i> Effective Approach to Natural Resources Monitoring	25

<i>Elvira DZHUMELIA</i> Environmental Monitoring for Sustainable Development of Post-Liquidation Mining Areas	26
<i>Elvira DZHUMELIA, Nataliya BERNATSKA, Vladyslav DZHUMELIA, Orest KOCHAN</i> Hydrochemical Trends and Transboundary Challenges in the Western Bug River, Ukraine	27
<i>Iryna GALCHYCH, Alla YAROSHENKO</i> Developing Mediation Skills in Future Social Workers as Part of Education for Sustainable Development: Impact on Addressing Social and Environmental Issues	28
<i>Iryna GONCHAROVA, Dominique GUICHAOUA, Bouchta SAHRAOUI</i> Laser-Induced Breakdown Spectroscopy Application for Metallic Ions Detection in Natural Waters	29
<i>Kostiantyn GRYGORIEV</i> Improving the Informational Content of Radiation Monitoring of Atmospheric Air During the War	30
<i>Liudmyla GRYGORIEVA</i> Modeling of Radiation Risk from Natural and Anthropogenic Sources of Ionizing Radiation in the South of Ukraine	31
<i>Mykola HRUBYY</i> Biotechnia as a Tool for Monitoring the Tyligul Estuary	32
<i>Maryna HRYHA</i> Surface Water Pollution Assessment in the Dnipro River Based on Hydrochemical and Satellite Data	33
<i>Yuliia KALIUZHNA</i> The Digital Transformation of the EU as a Factor in Sustainable Development	34
<i>Dmytro KARPUK</i> Strategies for Improving Pharmaceutical Wastewater Treatment Processes	35
<i>Valentyn KHILCHEVSKYI, Jingyao HOU, Myroslava ZABOKRYTSKA</i> Modern Water Resources Management in China	36
<i>Oleksandra KHOZIAINOVA, Olena MITRYASOVA</i> Formaldehyde Atmospheric Air Pollution in Mykolaiv City	37
<i>Oleksii KOFANOV, Olena KOFANOVA</i> The Role of Artificial Intelligence in Advancing Sustainability and the European Green Deal	38
<i>V.P. KORBUT, O.P. MYRONENKO</i> Autonomous Air Conditioner with Eco-Friendly Combined Thermoelectric-Evaporative Cooling for Crane Operator Cabins in Thermally Intensive Industrial Workshops	39

<i>Andrii KOROL, Olena KOROL</i> Monitoring and Visualization of Renewable Energy Facilities in Ukraine Using Remote Sensing and GIS Technologies	40
<i>Natalia KOROI, Vladyslav ARTAMONOV, Serhiy LEHKYI</i> Restoration of Indigenous Steppe Natural Habitats	41
<i>Illia KOROVIN, Oleksandr MASIUK</i> Monitoring of Mine Waste Dumps for Toxicity	42
<i>Oleksandra KOVALSKA, Olena MITRYASOVA</i> Access to Water During Armed conflicts: Environmental and Humanitarian challenges	43
<i>Yevhen KRYSHTOP</i> Integration of Waste Recycling Technologies into Urban Sustainable Development Strategies	44
<i>Olha KRYVENKO, Kateryna PUSHKAROVA</i> Energy-Efficient Materials and Structures in Modern Architecture	45
<i>Tetiana KRYVOMAZ, Artem TSYBA, Roman HAMOTSKYI</i> Digitization Improve ESG and Energy Efficiency	46
<i>Pawel KUT, Katarzyna PIETRUCHA-URBANIK</i> Forecasting of PV Energy Production Using Machine Learning Methods	47
<i>Pawel KUT, Katarzyna PIETRUCHA-URBANIK</i> Integration of Artificial Intelligence and MCDM Methods in the Evaluation of Renewable Energy Systems in a Hybrid and Critical Perspective	48
<i>Svitlana MADZHD</i> European Green Deal	49
<i>Antonina MALYUSHEVSKAYA, Serhiy PETRICHENKO</i> Electric Discharge Iron Tungstate as a Catalyst for Wastewater Purification from Azo-Dyes	50
<i>Tetiana MANUSHKINA</i> Current Status and Prospects for the Use of Biomass of Phytoenergy Crops to Ensure the Energy Security of Ukraine	51
<i>Ruslan MARIYCHUK</i> Recent Advances in the Green Synthesis of Nanoparticles: Properties and Applications	52
<i>Ruslan MARIYCHUK, Janka PORACOVA</i> Erasmus+ International Credit Mobility KA171: Opportunities for Partner Countries	53
<i>Ruslan MARIYCHUK, Romana SMOLKOVA, Adriana ELIASOVA, Vira HOVORUKHA, Oleksander TASHYREV</i> Evaluation of the Antimicrobial Properties of Phytosynthesized Metal Nanoparticles	54

<i>Adam MASŁOŃ, Maksymilian CIEŚLA, Renata GRUCA-ROKOSZ, Małgorzata FRANUS, Katarzyna KALINOWSKA-WICHROWSKA</i> Autoclaved Lightweight Artificial Aggregates from Bottom Sediment and Other Mineral Waste	55
<i>Andrii MATS</i> Reservoir Dynamics and Overregulation in the Southern Buh River Basin: Regional Analysis and Challenges	56
<i>Andrii MATS, Olena MITRYSOVA</i> Assessing Climate Change through Atmospheric Temperature Dynamics	57
<i>Dmytro MATS, Evheniya ZHARIKOVA</i> Implementation of European Environmental Legislation in the Field of Climate Change in the Mykolaiv Oblast Territory	58
<i>Yevhenii MELNYK</i> Improving the Accuracy of Grinding Rotational Bodies as a Strategic Direction in the Development of the Mechanical Engineering Industry	59
<i>Olena MITRYSOVA, Ruslan MARIYCHUK, Chad STADDON, Vadym CHVYR, Viktor SMYRNOV, Andrii MATS</i> Educational Course «European Green Dimensions» in Preparation of Ecologists	60
<i>Olena MITRYSOVA, Ruslan MARIYCHUK</i> Higher Education in the Context of Digitalization, Implementation of Sustainable Development Principles	61
<i>Olena MITRYASOVA, Vadym CHVYR, Andrii MATS, Stella Mariia IVANOVA</i> Resource Potential of Demolition Waste by Main and Associated Components	62
<i>Pavlo MUZYKA, Oksana SALAMIN, Dmytro SOLOMONKO</i> Strategy of Regional Dairy Subcomplex Development in the Context of European Integration	63
<i>Oksana NIKISHYNA</i> Rebuilding of "Green" and Circular Systems of Agro-Industrial Markets in Ukraine	64
<i>Natalia NOSOVA</i> Waste Disposal in Ukraine as A Component of Environmental Safety	65
<i>Maksym NYCHYK, Roman MUKOID, Oksana NYCHYK</i> Innovative Wastewater Treatment Solutions for Craft Breweries	66
<i>P.O. OLIINYK</i> The Great Meadow as a Green Frontier of Climate-Neutral Europe	67
<i>Nataliia OMETSYNSKA, Oleksandr GUIDA</i> The European Green Deal in the Context of Achieving Climate Neutrality	68

<i>Vladislav OSTAPENKO, Olena MAKAROVA, Liudmyla GRYGORIEVA</i> Accumulation of Radionuclides by Aquatic Plants in Water Bodies in the Vicinity of the South Ukrainian NPP	69
<i>Olha PALANYCHKO</i> Assessment of Climate Change Effects on River Landscapes in the Ukrainian Carpathians Using GIS	70
<i>Larysa PATRUSHEVA, Hanna NIEPIEINA, Tetiana UCHEN</i> Analysis of the Dynamics of Atmospheric Air Temperature in Mykolaiv	71
<i>Sofiia PASHKO, Olha SAHURA, Oksana NYCHYK</i> Assessment of Environmental Risks Associated with Meat Processing during Wartime Conditions	72
<i>Priscila Pini PEREREIRA, Isabela Pacola GONÇALVES, Yuliya S. DZYAZKO, Luiza C.A. MOLINA, Carolina Moser PARAISO, Rosangela BERGAMASCO</i> 3D Printed Ultrafiltration Membranes: Preparation from Polylactic Acid and Practical Application	73
<i>Olga PERLOVA, Yuliia DZYAZKO, Nataliia LYTVYNIUK</i> Adsorption Treatment of Wastewater for the Removal of Dissolved Uranium(VI) Compounds	74
<i>Svitlana PUSTOVA</i> Formation of the Foundations of Environmental Awareness: the History of Education for Sustainable Development in the Works of Global Scholars	75
<i>Tetyana RAKITSKAYA, Tetyana KIOSE</i> Physico-Chemical Justification of Methods for Purifying Air from Gaseous Toxic Substances and Requirements for Catalysts for Respiratory Purposes	76
<i>Konstantin REDINOV</i> About the Impact of Climate Change on Birds	77
<i>Mykhailo RETMAN, Oleksandr YEVCHENKO, Olha MARCHENKO</i> Research of the Irrigation and Soil Cultivation Impact on the Biodiversity of Soil Microorganisms at to Grow Corn in the Forest-Steppe of Ukraine	78
<i>Olexandr RYLSKY, Yuliia PETRUSHA</i> The Most Important Natural and Anthropogenic Factors of Climate Change in Ukraine and the Planet	79
<i>Olexandr RYLSKY, Konstantin DOMBROVSKYI, Yuliia PETRUSHA</i> Biotechnology for Water Purification of Small Rivers	80
<i>Ivan SALAMON</i> Radioactivity Monitoring of Selected Plant Fruits During Tree Year Period	81
<i>Uliana SEMAK, Ivan LUCHAK</i> Conservation of Self-Seeded Forests as a Component of the European Green Deal Implementation in Ukraine	82

<i>Maria SMYRNOVA, Viktor SMYRNOV</i> Investigation of Biologically Active Compounds in Berries of the Carpathians and the Black Sea Region as a Tool for Environmental Education	83
<i>Svitlana SMYRNOVA, Mariia SMYRNOVA</i> Intelligent Systems for Monitoring the Atmospheric Air Quality in Ukraine	84
<i>Liudmyla SOLDATKINA, Oleh KAVAZHY</i> Achievements and Challenges in the Application of Nanoparticles for Water Treatment	85
<i>Liudmyla SOLDATKINA, Mykyta PARKHOMENKO</i> Adsorptive Removal of Paracetamol Using Activated Carbon	86
<i>Kateryna SOROKINA</i> Prospects of Using Chlorine-Containing Reagents for Water Disinfection	87
<i>Svitlana SOVHIRA, Olena KOCHUBEI</i> Environmentally Safe Chemical Technologies of Ukraine	88
<i>Denys STETSENKO</i> Using Artificial Intelligence Tools in Ecology	89
<i>Nataliia STETSENKO</i> Methods of Processing Food Industry Waste	90
<i>Sun XIAODONG, Vitalii ISHCENKO</i> Environmental Impact and Flows of Waste Batteries in China	91
<i>Tetiana TKACHENKO, Viktor MILEIKOVSKIY</i> New Ukrainian Green Construction Standards	92
<i>Garcia Camacho Hernan ULLIANODT, Igor VASYLKIVSKIY</i> Water Reservoir Pollution Control System	93
<i>Dmytro VESELOVSKY, Olena MAKAROVA, Liudmyla GRYGORIEVA</i> Regulation of Discharges Through the Assessment of the Radioactivity Factor of the Southern Bug Ecosystem	94
<i>Larysa YEPYK</i> Sustainable Tourism Development Through the Training of Tourism Industry Professionals	95
<i>Oleksandra VOROBIOVA</i> Main Vectors of Increasing the Added Value of Nature Reserve Areas	96
<i>Dmytro ZELINSKY, Igor VASYLKIVSKIY</i> Impact of Air Pollution on the Disease of the Population of Ukraine	97

Water Reservoir Pollution Control System

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For effective study and analysis of the state of the environment, and making appropriate decisions regarding its improvement, adequate information is necessary, which is associated with a huge number of measurements of various parameters carried out using automatic, constantly operating analyzers.

Water pollution leads to the death of flora and fauna of water bodies. Water resources are one of the most important and, at the same time, the most vulnerable components of the environment, which can change very quickly under the influence of human economic activity. When conducting analysis more than 3-4 times a day, it is economically feasible to use automatic systems for monitoring the state of the environment. In these systems, the cost of information is 2-6 times lower than when using laboratory methods.

The control of natural water bodies is complicated by the presence in them of hydrophysical fields of temperature, electrical conductivity, salinity, density, pressure and flow velocity, the parameters of which constantly change both with depth and in the horizontal plane and have a pronounced stochastic nature. Therefore, solving problems in the field of ecology, hydrophysics (hydrochemistry, hydrobiology, etc.) requires higher accuracy of the controlled parameters in the designed control means. Considering that the studied water-dispersed systems belong to rapidly changing thermodynamic systems, it is necessary that the measuring control system perceives quantitative measuring information directly from the control object in real time without prior transformation of the analyzed sample.

The proposed system for monitoring water resources pollution via radio channel consists of a computing center that collects, processes and analyzes measurement and diagnostic information received via radio channel from a network of automatic radio buoys. Each radio buoy automatically determines the integral indicator of water pollution and transmits measurement results via radio channel from the studied location of the water body (hydrological section) to the computing center for collecting, accumulating and processing measurement information.

The proposed automated system for monitoring and locating water resources pollution can be used in a wide spectral range for recording parameters of water environments in hydrophysical and ecological studies, conducting ecological monitoring of surface water parameters, in particular for the content of suspended solids.

The obtained optical information about the state of the light field inside the studied light-scattering water-dispersed medium is entered into the computer memory, where it is coordinated, processed and displayed on the monitor screen in the form of tables, analytical or graphical dependences of the brightness functions of the studied water-dispersed medium. In this case, special attention is paid to reducing the dynamic measurement errors that are dominant in hydrophysical studies.

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Abstracts were reviewed by the members of the Scientific Committee



Co-funded by
the European Union

ISBN 978-617-8176-45-7

The authors of the sections are responsible for the reliability of the results.

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them.”

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Format 60x90 1/16 Smart print sheet 6,25.
100 hard copies. Deputy № 40 from 26.05.2025.
Printed by: FOP Shvets V.M., Phone: +3806660946881;
Certificate subject publishing DK №5078 from 01.04.2016.

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**Publication prepared and funded under Erasmus+JM Project
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