DISC2025

5th International Student Conference

ABSTRACT BOOK

5th DIFENEW INTERNATIONAL STUDENT CONFERENCE

DISC2025

Faculty of Technical Sciences
University of Novi Sad

Hybrid event
11th & 12th December, 2025
Novi Sad, Serbia

Organizers:

Department of Environmental Engineering and Occupational Safety and Health
Faculty of Technical Sciences, University of Novi Sad, Serbia

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PREFACE

This Abstract Book presents the collected contributions of the International Student Conference DISC2025, a hybrid academic event held on 11–12 December 2025 at the Science Technology Park Novi Sad. DISC2025 continues the conference's mission of fostering interdisciplinary dialogue and encouraging the active involvement of students, early-career researchers, and professionals in addressing contemporary sustainability challenges.

Under the central theme *Sustainability in Action*, this year's conference emphasizes the transition from conceptual frameworks to practical implementation. The abstracts included in this volume reflect a broad spectrum of research and project-based contributions that connect academic knowledge with real-world applications across environmental protection, occupational safety and health, sustainable project management, strategic human resource and business management, civil engineering and infrastructure, and Education 3.0, with a particular focus on digital and inclusive learning.

DISC2025 provides a collaborative platform where participants from academia, industry, and the public sector engage through paper presentations, interactive panels, and applied project exhibitions. Particular attention is devoted to emerging topics such as the Green Agenda, ESG principles, circular economy models, and digital innovation in engineering and management practices, underscoring their importance for sustainable development at local, regional, and global levels. In addition to the main conference sessions, DISC2025 features a dedicated *Project Promotion* session within Jean Monnet Square, highlighting project-based initiatives that strengthen the link between academic research, European policy frameworks, and practical implementation.

We extend our sincere appreciation to all authors whose work contributes to the quality and diversity of this publication, as well as to the members of the Scientific, Program, and Organizing Committees for their dedication and professionalism. Their collective efforts have been instrumental in shaping a conference that promotes knowledge exchange, critical thinking, and interdisciplinary cooperation.

It is our hope that the abstracts presented in this book will serve not only as a record of DISC2025, but also as a source of inspiration for further research, collaboration, and innovation in the development of a more sustainable future. Looking ahead, the DISC conference series will continue with DISC2026, further strengthening its role as an international platform for student engagement, interdisciplinary research, and applied sustainability initiatives.

With kind regards,

Dr. Maja Petrović

President of the Organizing Committee and Editor

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ISOTOPIC EVIDENCE OF NITROGEN DYNAMICS IN OXIC AND ANOXIC GROUNDWATER

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Abstract: Groundwater is a very important resource, providing nearly half of the world's drinking water and supporting around 70% of agricultural needs. Sustainable management requires understanding groundwater origin, age, flow paths, and recharge dynamics. Environmental isotopes, particularly stable isotopes, offer powerful tools for tracing these processes, identifying pollution sources, and evaluating contaminant transport. Nitrate is one of the most widespread groundwater pollutants, originating from untreated sewage, fertilizers, manure application, and the oxidation of soil organic matter. Due to a wide range of sources and the prevalence of different transformation processes under specific conditions, accurate interpretation requires a comprehensive analysis of hydrogeological, physicochemical, microbiological, and isotopic data. During nitrification, ammonia is oxidized to nitrate via nitrite, preferentially incorporating lighter isotopes. Denitrification reduces nitrate to nitrogen gas and enriches the residual nitrate in heavier isotopes. Dissimilatory nitrate reduction to ammonium may compete with denitrification under high carbon-to-nitrate ratios, while anaerobic ammonium oxidation and ammonium oxidation coupled to Fe(III) reduction further influence nitrogen cycling in oxygen-depleted environments. This study highlights contrasting nitrogen isotopic signatures in the oxic Ključ spring and the anoxic Kovin–Dubovac drainage system, revealing differences in nitrogen origin and transformation processes in shallow, agriculture-influenced groundwater. At the oxic site, $\delta^{15}N–NO_3^-$ values ranged from +6.70 to +12.90‰ and $\delta^{18}O–NO_3^-$ from +0.28 to +9.70‰, revealing three distinct influence zones: sewage and manure impact, mixed sewage–fertilizer inputs, and riparian denitrification. At the anoxic site, $\delta^{15}N–NH_4^+$ values were lower from −0.84 to +6.93‰, indicating contributions from soil organic matter mineralization, fertilizer application, and autotrophic denitrification. The research assesses the impact of agricultural practices and the aquifer's potential for nitrogen compound attenuation and self-purification.

Keywords: *Groundwater; Nitrogen isotopes; Nitrogen transformation processes.*