

Editorial

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Sustainability means enabling the earth to continue supporting human life for future generations, and environment is included among its three pillars. From this perspective, the sustainable use of environmental resources has become one of the main goals of today's global scientific community.

From the recent European Green Deal to the USEPA Sustainability Plan, and including the Asian transition to net-zero emissions, global societies share common targets of implementing reuse practices and searching for innovative technical solutions to reduce overall waste generation, thus limiting landfilling and carbon emissions (ASPI, 2022; European Commission, 2021; USEPA, 2020).

Environmental geotechnics can surely contribute to reach these goals, as it is a distinctive subject area that covers a wide range of environmental-related topics (Johnston and O'Kelly, 2014) such as geotechnical issues in landfill design and polluted soil and groundwater remediation, ground improvement techniques and the management of mine tailings and dredged sediments. The recent contribution of Roque *et al.* in the April 2022 issue of *Environmental Geotechnics* addresses several thematic areas discussing potential sustainable solutions and future improvements, such as the re-entry of construction and demolition waste, excavated materials, industrial waste and marine sediments into the production cycle, among others (Roque *et al.*, 2022).

In the framework of reuse of resources, the papers by Fujikawa *et al.* (2023) and by Bilgen *et al.* (2023), included in this issue, explore the possibility of recycling coal fly ash in mixed materials (CAMMs) and assess the environmental compatibility of recycled concrete aggregate (RCA) in the base layers of pavement structure, respectively. In particular, Fujikawa *et al.* (2023) present an experimental study investigating the durability and the leaching properties of fly ash-cement-water mixtures, while Bilgen *et al.* (2023) demonstrate the hydraulic compatibility of recycled concrete aggregate with an underlying geotextile filter and its environmental suitability if coupled with a clayey subgrade. For the interested reader, similar studies published in *Environmental Geotechnics* include Chen *et al.* (2022), Najafi *et al.* (2023) and Mahedi *et al.* (2022).

Focusing on dredged sediments management, the article by Alimohammadi *et al.* (2023) presents a research work in which a 160ha lagoon in north Canada is used as a 'field-lab' for evaluating different sampling techniques for contaminated sediments. This is done in order to capture the variability of their physical characteristics across the lagoon system prior to the dewatering and remediation phases. They conclude, after statistical analyses, that composite sampling can provide good results if compared with both the more time-consuming discrete gravity coring and the vacuum-based sampling methods.

From the sampling stage, we move to the testing phase with the contribution by Liu *et al.* (2023), in which the non-destructive investigation technique by X-ray-computed tomography is optimized in order to take into account a possible heel effect. This effect becomes significant when analysing fine soils with high density as well as when using high-scan energies. The authors highlight that the heel effect artefact is able to compromise interpretation of results in terms of soil properties (e.g. porosity) and propose an effective correction technique.

Other studies in previous issues of *Environmental Geotechnics* (e.g. Lieske *et al.*, 2022; Vucenovic *et al.*, 2021) highlighted that experimental testing and preparation procedures should be carefully evaluated and selected to minimize the possibility of error when processing output data related to soils and geosynthetic materials.

The last paper, by Zhang and Xu (2023), examines the migration of ions in unsaturated soil systems by means of custom-designed column test equipment. This study concludes that soil water content is capable of significantly affecting the advection and diffusion migration parameters. The mobility of chemicals within the environmental media (or through barriers) is a factor that can potentially drive risk assessment results for polluted sites and consequently influence the remediation actions to be undertaken. Therefore, using conservative and reliable migration parameters in transport modelling is crucial for obtaining a realistic output of risk. This type of research contributes to one of the main tasks of research, that is, to offer useful instruments and to make research results available to practitioners and professionals. This contribution also allows for the optimisation

of assessment procedures. Further papers on this topic can be found in *Environmental Geotechnics* by Zuo *et al.* (2023) and in the themed CPEG issue by Malusis *et al.* (2020) and by Xie *et al.* (2020).

The articles included in this issue have been made available Ahead of Print in *Environmental Geotechnics* months ago. Readers are encouraged to check the ICE Virtual Library to access other recent content and to stay tuned for the latest advancements in geo-environmental engineering.

The research work presented by the papers in this issue is evidence of the current need to approach geotechnical problems while bearing in mind that the sustainability feature in projects cannot be neglected. From this perspective, innovative solutions and updated sampling and testing procedures in environmental geotechnics are topics of sure interest for the scientific community.

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