soil systems

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Soil Metabolism and Biogenic Emissions of CO_2 and N_2O

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Deadline for manuscript submissions:
closed (10 October 2023)

Message from the Guest Editors

Soils provide many essential ecosystem services, such as climate mitigation and adaptation, as they constitute the main carbon reservoir in terrestrial ecosystems. The roles of SOC in the climate system and in the scenarios of climate change, land vertical development and degradation, biodiversity loss, and increased demand for food production have been widely recognized. Maintaining and increasing SOC stocks is not only crucial for reducing greenhouse gas emissions and removing CO_2 from the atmosphere, but also to preserve soil health and fertility by improving resilience and resistance of all the terrestrial ecosystems. Millions of organisms, micro- and mesofauna included, exert a variety of functions which contribute to ecosystem-level processes as they degrade organic compounds and release nutrients, by contributing to soil respiration, with O consumption and CO_2 emission. In this context, new research should seek to fill the gaps into knowledge of the factors influencing soil metabolism, the fate of C and N along the soil profile, and the resulting greenhouse gas emissions in different environments, from forest to agroecosystems, by including urban contexts.