ISTerre
Institut des Sciences de la Terre

Grand Séminaire
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Nutrient dynamics in soil-based wastewater treatment systems: Implications for greenhouse gas emissions

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Sustainable sanitation and wastewater treatment are at the forefront of the international development agenda, and a key target of the post-2015 Sustainable Development Goals will be to provide hygienic sanitation to the 2.5 billion people who currently lack access to these services. Decentralized and on-site wastewater technologies will be heavily utilized in this initiative, since populations lacking adequate sanitation are disproportionately located in rural areas where the costs of sewered systems are high. In contrast to centralized wastewater treatment plants, there is limited knowledge of nutrient dynamics in on-site, soil-based treatment systems like pit latrines and septic systems. Consequently, the implications of on-site sanitation infrastructure choice for greenhouse gas emissions, water quality protection, resource recovery, and other design considerations are poorly understood. This seminar focuses on characterizing methane (CH4) emissions from organic matter decomposition in pit latrines, which are used by approximately 1.8 billion people globally. A geospatial model integrating hydrology, engineering mass balances, and socio-demographic data is used to determine that pit latrines contribute 1-2% of global anthropogenic CH4 emissions. Concepts from environmental soil biogeochemistry will then be used to evaluate potential greenhouse gas (GHG) emissions and opportunities for nutrient recovery from alternative on-site systems like composting toilets and septic systems. The seminar will conclude by identifying knowledge gaps around nutrient and GHG dynamics in soil-based treatment systems, and suggesting a role for soil biogeochemistry in the design of sustainable sanitation infrastructure.

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Salle de conférences d'ISTerre

OSUG-C, 1381 rue de la piscine, Campus Universitaire
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