Organic geochemistry of Anthropocene sediments in the sewer network of Orléans (France)

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Current debates on the status of the Anthropocene convey geologists and palaeoenvironmentalists toward new spatial and temporal targets. One of the most emblematic socio-ecosystem of the Anthropocene is urban areas in which the dynamics of materials are mainly controlled by human activities. This brings unprecedented elemental, molecular and isotopic concentrations and distributions of which the history and timing and release in ecosystems remains poorly known.

Here we propose that sediments accumulated in sewer networks can provide original, integrated, and multi-thematic chronicles for the recent history of man-made materials. We collected sedimentary cores in a decantation tank that collects stormwater and wastewater from the north of Orléans city. Sediments accumulated since 1942 over 17 m depth and were never cleaned out until 2015.

Sediments are organized into layers constituted by sands and gravels alternating with silts and organic layers. ^{7}Be and ^{14}C provide consistant results, allowing dating the sequence (1980 at 2.5m depth up to now). The high diversity of organic compounds (drugs, illict drugs, plant biomarkers, cosmetics…) afford a rather complete picture of urban metabolism and of its evolution through the last decades.