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## Chennai's urban river systems – environmental changes, anthropogenic pollution and flood-induced remobilization

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With a projected increase in frequency and magnitude of extreme weather events, the fast-growing coastal population centers of the Asian Global South experience a higher susceptibility to flood-related pollution. This is fueled by rapid land-use changes, urbanization, a multitude of emission sources, as well as anthropogenic- and flood-induced remobilization and relocation of pollutants. To yield a more comprehensive understanding of riverine and coastal floods in conjunction with these rapid urban and land-use changes, their impact on the environment and the health risks posed to local communities, sedimentary archives need to be studied.

Meandering through densely populated urban areas, Chennai's rivers (Cooum and Adyar) and coastal systems have been affected by monsoon-induced floods (e.g., 2015 South Indian floods) and the 2004 Indian Ocean tsunami. Simultaneously, Chennai experienced an explosive population growth over the past 30 years, with the coinciding changes in land-use, urbanization, anthropogenic alterations to aquatic systems (e.g., damming, dredging), and (unregulated) environmental pollution. Especially the missing regulations, as well as growing volumes of sewage and physical waste have an enormous toll on the aquatic systems, but also pose threats by remobilization during floods.

To investigate potential flood-induced strata and chemostratigraphic changes over time, a total of nine sediment profiles along the Adyar and Cooum rivers are subject to GC-MS analyses of organic pollutants in correlation to stratigraphic changes in the obtained sediment profiles.

First results indicate that organic pollutants, such as petrogenic compounds (hopanes, PAHs), urban wastewater compounds (LABs, DEHA, methyl-triclosane), technical compounds (Mesamoll<sup>®</sup>, DPE, NBFA) and pesticides (e.g., DDX) allow for the identification of past flooding events and their characterization in terms of release and distribution of pollution. These proxies are used to assess (chemo-)stratigraphical alterations preserved in these sedimentary archives. However, sedimentary archives in fast-growing, urbanized environments are influenced by physical anthropogenic alterations leading to superimpositions or a hiatus in the sedimentary archives, thus hampering with the (chemo-)stratigraphic reconstruction of past flooding events and

environmental changes.