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Cities as a compartment of Biosphere: exploring options for investigating matter flows on its territory and forecasting cross-boundary pollution

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The method first deals with detailed analysis of urban metabolism in order to further investigate the influence of urban territories on the Global Cycles in an attempt to forecast future greenhouse gases emissions. It has been shown before that although at the present moment cities constitute only 2% of the total land area they are responsible for up to 97% of all anthropogenic carbon emissions. The urban population is growing rapidly, especially in the developing countries that creates additional pressure by over-populated unsustainable cities on the environment and drastically changes the cycles. New important factor to consider in our research is NOx emissions from transportation. However, nitrogen cycle is very complex and is closely interlinked with the other major biogeochemical cycles, such as oxygen and water. The system of water supply and liquid waste carried by water out of the system "city" is investigated. When we know the yearly amounts of carbon and nitrogen, produced by a hypothetical city, we are capable of coming up with what could be called a complex "biogeochemical portrait" of urban territory and its functions; and based on the scenarios of population dynamics, would allow us to forecast emissions of greenhouse gases.