(69-240403-C) **CarbonTracker-CH_4 – Towards Operational Estimates of the Atmospheric Methane Budget**

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Observations indicate accelerating growth of atmospheric CH_4, a challenge for meeting the Global Methane Pledge that aims to achieve 30% cuts in global emissions by 2030. A recent UNEP report proposes that feasible CH_4 emission cuts could result in a 45% reduction in anthropogenic emissions, avoiding 0.3 ºC of warming by mid-century while having a positive impact on human health through air quality improvements. However, given that the most feasible methane emissions reductions are in the oil and gas sector, it will be difficult to achieve the goals of the Global Methane Pledge with current signatories without also addressing agriculture and waste emissions.

Measurements of the ^{13}C stable isotope of CH_4 could be useful for partitioning emissions between fossil fuel and microbial sources, and global analyses imply that recent increases in atmospheric growth are dominated by microbial sources. Atmospheric observations of methane and $^{13}CH_4$ were used to constrain the NOAA CarbonTracker-CH_4 inversion modeling system. Results show that the largest share of recent growth in CH_4 is due to increasing microbial and fossil fuel emissions in the developing economies of Asia with a smaller contribution from increasing microbial emissions in tropical South America and Africa, possibly a combination of emissions from natural wetlands and agriculture. At global scale CarbonTracker-CH_4 estimates show reductions in fossil fuel emissions, implying either significant increases in oil/gas production efficiency even as global production has rapidly increased, or a bias in CarbonTracker-CH_4 related to the use of isotope data. In this presentation we explore the continuing challenges of using isotope observations, as well as the challenges and lessons learned from attempting to use CarbonTracker-CH_4 in a more “operational” mode with more frequent analyses of the atmospheric methane budget.

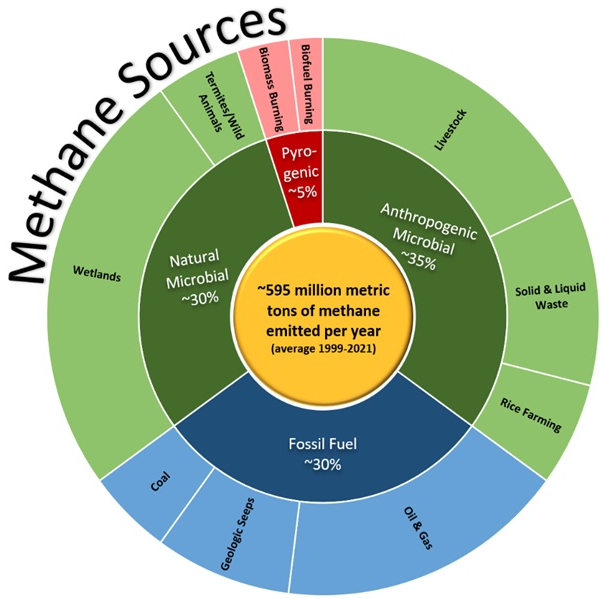

Figure 1. Average annual global methane emissions estimated by CarbonTracker-CH_4

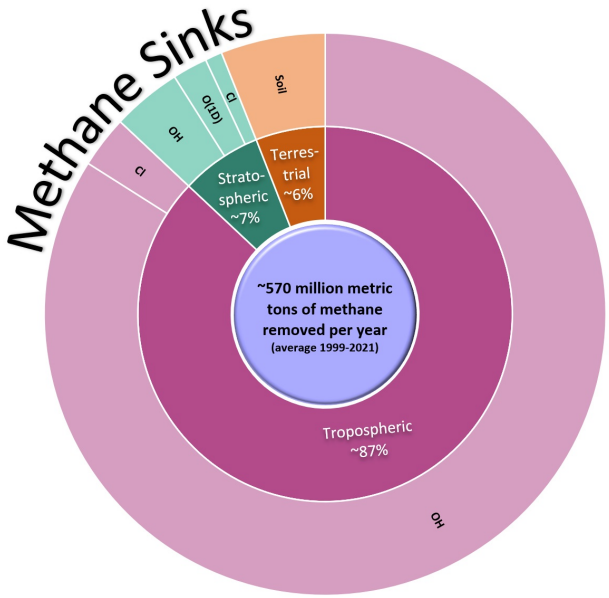

Figure 2. Average global methane sinks used in CarbonTracker-CH_4