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Renewed Increase in Atmospheric Methane Concentrations

Global Monitoring Division - **ESRL-GMD**
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After nearly a decade with constant atmospheric concentrations, methane began increasing globally again in 2007. Scientists from the University of London, UK; Le Laboratoire des Sciences du Climat et de l'Environnement, France; and NOAA ESRL have discussed the potential causes of the renewed increase in a Science Perspectives article published January 31, 2014. Based in good part on methane measurements from NOAA ESRL GMD's ~70-site Global Cooperative Air Sampling Network, they show that total global emissions of methane increased by 15 to 22 Tg CH4 yr-1 starting in 2007. Changes in the spatial patterns of the measurements suggest the likely causes are increased emissions from tropical wetlands during wetter-than-normal periods and increased anthropogenic emissions from northern mid-latitudes. They conclude that better understanding of the global methane budget requires a more extensive in situ observation network.
Background: Methane is important as a greenhouse gas, second only to CO2 in increased radiative forcing since the pre-industrial era. It also affects climate through its atmospheric chemistry, which produces tropospheric ozone and stratospheric water vapor. Global total emissions of methane to the atmosphere are well-constrained by atmospheric methane measurements, but there is still uncertainty in individual source terms and how emissions from each source are changing over time.
Significance: Quantitative understanding of the global methane budget is necessary to develop reasonable climate forcing mitigation strategies. While the relative proportions of tropical wetland and northern mid-latitude anthropogenic emissions to the renewed atmospheric methane increase are still not clear, the authors are certain that the present increases are not from thawing permafrost and methane hydrates in the Arctic.

http://www.sciencemag.org/content/343/6170/493.full
http://www.esrl.noaa.gov/gmd/ccgg/flask.php

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