

Explaining the methane mystery

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Scientists have explained why atmospheric levels of the greenhouse gas methane have stabilised in recent years, but warn that increases could resume in the near future.

In research published in *Nature* this week, an international team of scientists – including CSIRO researchers – has shown that it was a decline in emissions of methane from human activities in the 1990s that resulted in the recent slower growth of methane in the global atmosphere.

Since 1999, however, sources of methane from human activities have again increased, but their effect on the atmosphere has been counteracted by a reduction in wetland emissions of methane over the same period.

According to one of the authors of the *Nature* paper, Dr Paul Steele from CSIRO Marine and Atmospheric Research, prolonged drying of wetlands – caused by draining and climate change – has resulted in a reduction in the amount of methane released by wetlands, masking the rise in emissions from human activities.

"Had it not been for this reduction in methane emissions from wetlands, atmospheric levels of methane would most likely have continued rising," he says.

"This suggests that, if the drying trend is reversed and emissions from wetlands return to normal, atmospheric methane levels may increase

again, worsening the problem of climate change."

The researchers used computer simulations of how the gas is transported in the atmosphere to trace back to the source of methane emissions, based on the past 20 years of atmospheric measurements.

The results indicate that a reduction and/or more efficient use of natural gas in the Northern Hemisphere was largely responsible for the drop in methane emissions in the 1990s, and that the more recent increase stemmed from strongly increasing emissions from fossil fuel use in north Asia.

The scientists also showed how changes in emissions from wetlands and, to a lesser extent, bushfires, accounted for variations in atmospheric methane from year to year.

The research is expected to help reduce uncertainties in future projections of climate change and to help design effective strategies to reduce methane emissions from human activities.

To date, reductions in major sources of methane from human activities include improved piping of natural gas and the capture of methane from landfill sites to generate electricity.

Methane is the second most important greenhouse gas after carbon dioxide and is estimated to have been responsible for a fifth of the enhanced greenhouse effect over the past 200 years. In addition to emissions from natural wetlands and many other natural sources, human activities including agriculture and the mining and use of fossil fuels produce large amounts of the gas.

Source: CSIRO Australia

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