

# Causes of methane growth revealed

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Following an international study into how methane levels in the atmosphere have evolved during the past 2000 years, atmospheric scientists have a new insight on methane, one of the world's most influential greenhouse gases.

“This is a great result that generated some scientific surprises and will help us to understand what controls methane in the atmosphere and its links with climate,” says Dr David Etheridge, from CSIRO Marine and Atmospheric Research.

In an article appearing in this week's edition of the international scientific journal, *Science*, scientists from Australia, New Zealand and the US reveal the causes of methane concentrations more than doubling in the atmosphere over the past 250 years.

The increase was due to agricultural sources, leakage during fossil fuel use, and other human sources, as well as the burning of trees and other vegetation. The research also identified wild variations in the carbon isotope ratio of methane over the last 2000 years – a surprising result as it had previously been thought to have been steady before the industrial revolution.

Methane increases have had the second highest impact on climate change over the past 250 years, accounting for about 20 per cent of the warming from all greenhouse gas increases. It does this by slowing the release of radiated heat away from the earth.

The team used their expertise in ice core research, chemical analyses and modelling of atmospheric composition to achieve the result.

They analysed air bubbles trapped in Antarctic ice from the Law Dome ice sheet near Casey Station, together with air samples collected since 1979 from the Cape Grim Baseline Air Pollution Station in Tasmania. The Cape Grim program, to monitor and study global atmospheric composition, is a joint responsibility of the Bureau of Meteorology and CSIRO.

The study team was led by Dr Dominic Ferretti of both the USA's University of Colorado and New Zealand's National Institute of Water and Atmospheric Research, and included scientists from CSIRO Marine and Atmospheric Research, the Australian Antarctic Division and Antarctic Climate and Ecosystem Cooperative Research Centre, and the University of Colorado.

Dr Etheridge says the study attempted to answer some important questions, including: why the atmospheric composition of methane has changed; how much of that change was due to human factors and why pre-industrial levels were apparently so stable. Such answers will help to understand how the composition may change in future and what could be done to manage methane emissions.

Source: CSIRO

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