

Methane Production by Forests

Can Expansion of
Forest Cover Reduce
Greenhouse Gases
and Attenuate
Global Change?

Greenhouse Gasses

Include:

Carbon dioxide CO_2

Water Vapor H_2O

Methane CH_4

Methane sources, Traditional Knowledge:

- Microbial anaerobic processes:
 - Wetlands
 - Cow burps
 - Termite farts
 - Rice cultivation
- Wild and Controlled Fires (source of CH_4 ?)
- Methane leaks

Seminal paper Frank Keppler et. al.
Nature Magazine, 12 Jan 2006

“Methane emissions from terrestrial
plants under aerobic conditions ”

Per Keppler, Methane is:

- Formed in terrestrial plants
- Under oxic conditions
- By hitherto unrecognized processes

Is this the first published indication?

C. Frankenberg et. al. of
Institute of Environmental Physics in Heidelberg
published a paper in 13 May 2005 entitled:

“Assessing Methane Emissions from global
space-Borne Observations”.

“The underestimate may be related to biogenic
methane emissions, because there is a strong
spatial correlation between the discrepancies
and the presence of broadleaf evergreen forest.”

Is methane an important greenhouse gas?

- Atmospheric CH₄ has more than doubled during the last two centuries.
- Molecule for molecule, methane is about 20 times as effective as carbon dioxide
- Is responsible for about 20% of the Green House forcing.

Reality Check

Martin Heimann, director of
Max Planck Institute for Biogeochemistry

“It means we neglected a big driving force
for the climate.”

CH₄, QUANTATITIVELY:

- Total annual production CH₄
500-600 million tonnes
- Keppler's first estimate of CH₄ from plants
60-240 million tonnes

The Other Side of the Story:

News Brief in 20 July 2006 *Nature*
states that Australian scientists claim
that Keppler made an error when he
extrapolated his lab data to the global
scale, as he'd not deducted roots and
other woody material from the total
plant mass.

CH₄, QUANTATITIVELY:

- Global production of methane
500-600 million tonnes / yr
- Keppler's first estimate of CH₄ from plants
60-240 million tonnes / yr
- Per Australians
10-60 million tonnes / yr

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CONCLUSION:

- This is a big issue regardless of how the total emissions are calculated.
- This issue is likely to drive estimates of the extent of Global Change *way up*.
- Planting trees in order to sequester carbon may not work.