# METHANE EMISSION FROM MUD VOLCANOES: TOWARDS A GLOBAL ESTIMATE

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Natural emission of methane from geologic sources has been recently recognised as an important component of atmospheric methane budget. While some authors focused their attention only to submarine gas seepage and gas hydrates (Judd, 2000; Kvenvolden et al., 2001), recent studies suggest that also mud volcanoes (MVs) on lands and microseepage in hydrocarbon-prone areas are significant geologic components (Etiope and Klusman, 2002; Etiope and Milkov, 2003; Etiope et al., 2003; Milkov et al., 2003). Methane flux from MVs is object of detailed studies only from 2001. Four preliminary independent estimates of global MV methane emission have been published by Dimitrov (2002), Kopf (2002), Etiope and Klusman (2002) and Milkov et al. (2003). Only Etiope's and Milkov's estimates were based on actual direct flux measurements and/or detailed statistical elaboration. A new estimate is being elaborated by Etiope and Milkov (2003) on the basis of new experimental flux data (including diffuse microseepage around craters and vents), and a new data-set on MV sizes. The emission results to be conservatively between 5 and 10 Mt/y, that is the same level of ocean and hydrates sources. The global geological methane flux, including MVs, submarine seepage, microseepage in petroliferous basins and geothermal flux, would amount to 35-45 Mt/y; these numbers are, indeed, of the same level of or higher than other sources or sinks considered in the IPCC tables (IPCC, 2001), such as biomass burning (40 Mt/y), termites (20 Mt/y), oceans (10 Mt/y), soil uptake (30 Mt/y).

The new estimate of mud volcano flux is derived thanks to the first direct and detailed flux measurements ever done, performed in the framework of a NATO project (Etiope et al, 2002; 2003). From that surveys, comducted in Italy and Romania, it was evident that the microseepage flux from MVs flanks and surrounding soil is a fundamental component of MV gas output and that MVs typically emit a specific flux in the range $10^2$ - $10^3$ t $km^{-2}$ $y^{-1}$.

To refine the global MV flux estimate it is essential to extend field measurements in other MV areas, mainly in Azerbaijan, where presently available data are rough estimates and do not take into account soil microseepage. Such studies should be promoted and carried out at international level.

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