

Home

Online Library ACP

- ▣ Recent Final Revised Papers
- ▣ [Volumes and Issues](#)
- ▣ Special Issues
- ▣ Library Search
- ▣ Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact  
Factor  
4.865

ISI  
indexed



▣ [Volumes and Issues](#) ▣ [Contents of Issue 12](#)

Atmos. Chem. Phys., 6, 5173-5182, 2006

[www.atmos-chem-phys.net/6/5173/2006/](http://www.atmos-chem-phys.net/6/5173/2006/)

© Author(s) 2006. This work is licensed under a Creative Commons License.

## Effects of methane outgassing on the Black Sea atmosphere

K. Kourtidis<sup>1</sup>, I. Kioutsioukis<sup>1</sup>, D. F. McGinnis<sup>2</sup>, and S. Rapsomanikis<sup>1</sup>

<sup>1</sup>Laboratory of Atmospheric Pollution and Pollution Control Engineering of Atmospheric Pollutants, Dept. of Environmental Engineering, Democritus University of Thrace, P.O. Box 447, 67100 Xanthi, Greece

<sup>2</sup>Surface Waters – Research and Management, Swiss Federal Institute of Aquatic Science and Technology, Eawag, 6047 Kastanienbaum, Switzerland

**Abstract.** Methane in air and seawater was measured in the Eastern Black Sea during the 10–18 December 1999 BIGBLACK project cruise. The measurements allowed for the calculation of supersaturation ratios and methane fluxes across the air-sea interface. CH<sub>4</sub> mixing ratios in air were generally in the 1.8–2.0 ppmv range, while surface (4 m depth) seawater concentrations varied from 4 to 93 ppmv. Above active seep areas, the water was supersaturated to around 500% with respect to the overlying atmosphere. Accordingly, flux densities varied greatly and were up to 3300  $\mu\text{mol m}^{-2} \text{day}^{-1}$ . In the Sevastopol harbour, supersaturations up to around 3000%, similar to those at the Danube Delta, were observed, while in the Istanbul harbour supersaturations could not be determined because the very high values of water concentrations led to detector saturation. Simple modelling shows that the observed fluxes do not have any substantial impact on the methane content of the Black Sea atmosphere, as they would only raise its concentrations by less than 50 ppt. On the other hand, calculations performed as part of the CRIMEA project show that mud volcano eruptions could episodically raise the methane concentrations well above their regional background for several tens of kilometres downwind. These calculations, which also apply to mud volcano eruptions elsewhere on the globe, indicate that the spatial extent and the magnitude of the atmospheric perturbation is such that its observation might lie within the capabilities of existing satellite instrumentation such as SCIAMACHY on ENVISAT.

▣ [Final Revised Paper](#) (PDF, 9800 KB) ▣ [Discussion Paper](#) (ACPD)

Citation: Kourtidis, K., Kioutsioukis, I., McGinnis, D. F., and Rapsomanikis, S.: Effects of methane outgassing on the Black Sea atmosphere, *Atmos. Chem. Phys.*, 6, 5173-5182, 2006. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)

Search ACP

Library Search

Author Search

News

- ▣ [Sister Journals AMT & GMD](#)
- ▣ [Financial Support for Authors](#)
- ▣ [Journal Impact Factor](#)
- ▣ [Public Relations & Background Information](#)

Recent Papers

01 | ACP, 19 Jan 2009:  
Effects of regional-scale and convective transports on tropospheric ozone chemistry revealed by aircraft observations during the wet season of the AMMA campaign

02 | ACPD, 16 Jan 2009:  
Antarctic stratospheric warming since 1979

03 | ACP, 16 Jan 2009:  
Parameterizing the competition between homogeneous and heterogeneous freezing in cirrus cloud formation –