The Impact of Tasmanian Biology on the Emission of Methyl Halides

J.M. Cainey[1], C.R. Parr[1,2], C. Lane[2], P. Fraser[3], and A. McMinn[2]

[1]Cape Grim Baseline Air Pollution Station, 159 Nelson Street, Smithton, Tasmania 7330, Australia; + 61-3-6452-1629, Fax: + 61-3-6452-2600, Email: j.cainey@bom.gov.au.
[2]Institute of Antarctic and Southern Ocean Studies, University of Tasmania, Hobart, Tasmania 7001, Australia.
[3]CSIRO Atmospheric Research, Aspendale, Victoria 3195, Australia

Iodated species have been suggested as the necessary initiators for new particle formation in the marine environment. Biogenic emissions of dimethylsulfide do not lead to new particles, because the oxidation product, sulfur dioxide, is taken up by larger seasalt aerosols. However in the presence of other biogenic gases, such as methyl iodide, new particle formation may commence.

Recent work at Couta Rocks, Tasmania, indicates that the species composition of the local plankton communities has a critical role in controlling the levels of methyl halides in surface waters and in the air immediately above these waters (e.g., Figure 1). Individual cases are assessed to determine the likely scenarios that result in significant methyl halide release to the ocean and subsequently to the atmosphere.

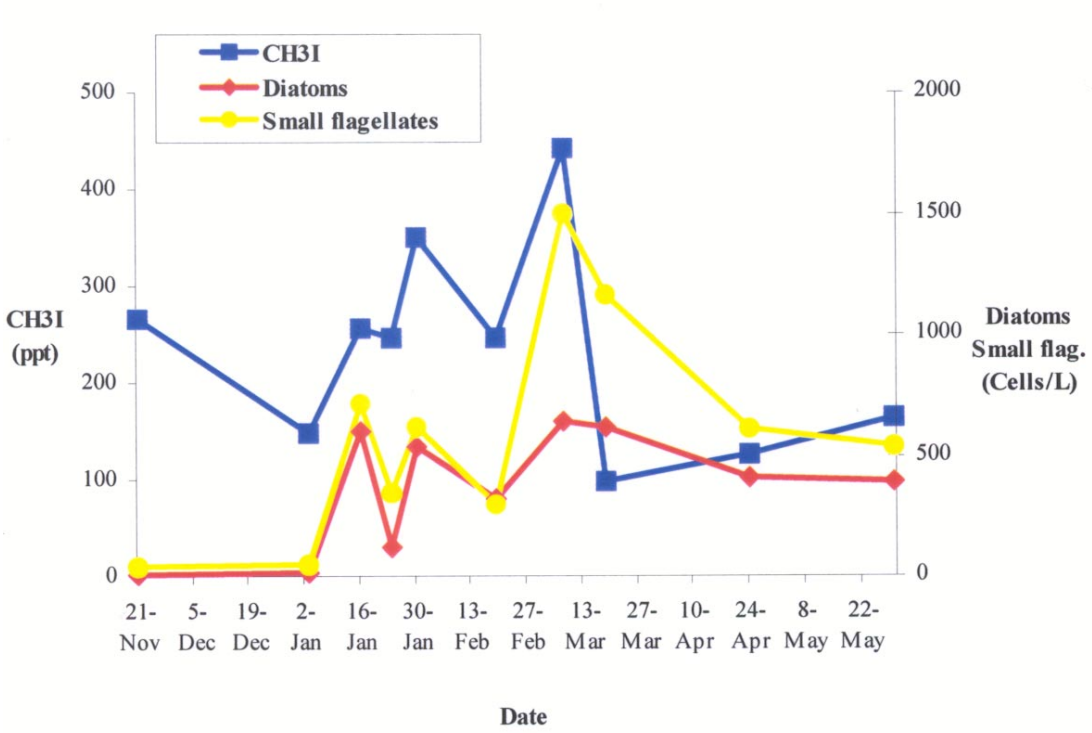

Figure 1. Variations in methyl iodide, diatoms and small flagellate abundance at Couta Rocks in 2000-2001 (G. Corno, Thesis, Univ. of Tasmania, 170 pp., 2001).

In addition to the intermittent sampling at Couta Rocks, we have several other programs at the Cape Grim Baseline Air Pollution Station that assess halogenated species from the gas-phase instruments (Advanced Global Atmospheric Gases Experiment (AGAGE)) to aerosol iodine analyses (Commonwealth Scientific and Industrial Research Organization (CSIRO)).