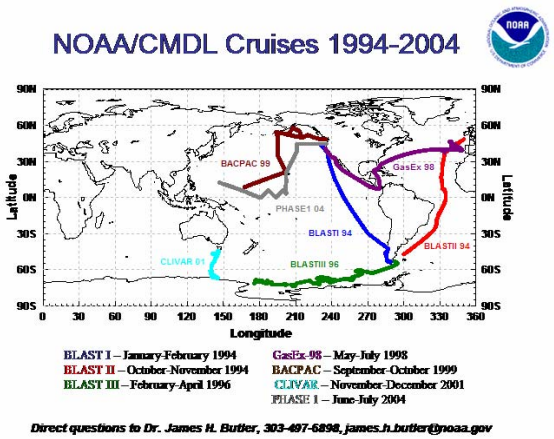
31 August 2005

NOAA/CMDL Cruises 1994-2004
GCMS Data
(ftp://ftp.cmdl.noaa.gov/hats/ocean/Ocean%20GCMS%20Data%201994-2004/)

Message to potential users of these data:

These research expeditions were conducted over a 10-year period with the primary objective of understanding more about the exchange of halocarbons across the air-sea interface and the role of the ocean in regulating the atmospheric composition of these gases. Questions regarding methyl bromide were the driver for the earlier cruises but, in later years, interest also began to focus on other methyl halides and polyhalogenated methanes. Although most of the very short lived (VSL) halocarbons analyzed were captured and referenced on all cruises, the lack of adequate and consistent scales precluded reporting these values as mixing ratios, partial pressures, or concentrations. However, we recently were able to develop scales for $CHBr_3$, CH_2Br_2, and CH_3I and have applied the new scales to their measurements on all of the cruises. Other VSL halocarbons, such as CH_2BrCl, $CHBr_2Cl$, CH_3ClI and CH_2I_2 were detected on some of the cruises, but they were below our detection limits on other cruises. At all times they were near our limit of detection in the air. Although we have standards for some of the latter gases, their concentrations are not included in these tables at this time. We continue to work on developing reliable, consistent scales and values and will report them when completed.



Measurements of all gases in all of these tables are referenced to long-term calibration scales maintained at NOAA/CMDL (http://www.cmdl.noaa.gov/hats/standard/standard.html). Extraordinary care goes into maintaining these scales and assuring their consistency over time. Stability in tanks is a serious concern, especially for the low concentration, reactive gases. For information regarding calibrations of individual gases, please contact Dr. Bradley Hall (303-497-7011 or 7061), bradley.hall@noaa.gov. A final note regarding $CHBr_3$, CH_2Br_2, and CH_3I is that these values in the atmosphere are very low and maintaining scales at those levels requires accepting a greater relative uncertainty in the absolute values and in the comparability of one reference gas to another. Comparability is difficult to trace back to 1994 because few cylinders were referenced to one another at that time for these gases, but one could expect agreement among reference gases for the cruises to be of the order of ~0.1 ppt for these short-lived gases; actual mixing ratios in the reference cylinders range from 0.2 to 0.8 ppt.

These data are freely available to all. If you plan on publishing them in any way, we appreciate it if you contact us beforehand. Calibration scales can shift periodically by small amounts and we continue to publish results based upon these data. However, in no way do we want to limit their access to all who are interested, and we are willing to work with others who wish to analyze them.

Project Leader: Dr. James H. Butler (303-497-6898); james.h.butler@noaa.gov
Project Advisor: Dr. Stephen A. Montzka (303-497-6290) stephen.a.montzka@noaa.gov
Calibrations: Dr. Bradley D. Hall (303-497-7011) bradley.hall@noaa.gov
Halocarbon Group Chief: Dr. James W. Elkins (303-497-6224) james.w.elkins@noaa.gov

This research would not have been possible without the exceptionally dedicated, skilled, and focused efforts of the post docs and Research Associates who built the instrumentation, conducted the measurements at sea, at times led the expeditions, and processed and analyzed the data. These individuals, all of whom continued involvement in the effort to make the data available, are

- Dr. Jurgen M. Lobert (BLAST I, II, and III); now at Mykrolis Corporation, Billerica, MD, USA 01821
- Dr. Shari Yvon-Lewis (BLAST III, GasEx-98, BACPac, CLIVAR-01, PHASE I -04); now at Department of Oceanography, Texas A&M University, College Station, TX, USA 77843
- Dr. Daniel King (GasEx-98, BACPac, CLIVAR-01, PHASE I-04); now at Department of Chemistry, Drexel University, Philadelphia, PA, USA 19104

Additional contributors to these data sets include Richard Myers (NOAA), Dr. Laurie Geller (University of Colorado/CIRES), Andrew Clarke (University of Colorado/CIRES) and Debbie Mondeel (University of Colorado/CIRES), as well as colleagues and associates on these seven expeditions, who have provided assistance in a variety of ways to keep sampling systems and instruments running at virtually all times while underway.

James H. Butler
Project Leader

Publications to Date Using these Data

Yvon-Lewis, S. A., D. B. King, R. Tokarczyk, K. D. Goodwin, E. S. Saltzman, and J. H. Butler (2004), Methyl bromide and methyl chloride in the Southern Ocean, *Journal of Geophysical Research*, 109, C02008, doi:10.1029/2003JC001809.

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Other Related Publications by this Research Team

Montzka, S.A., J.H. Butler, B.D. Hall, D.J. Mondeel, and J.W. Elkins (2003), A decline in tropospheric organic bromine, *Geophysical Research Letters*, *30* (15), doi:10.1029/2003GL017745.

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