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UCRL-ID-108511

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Trace Gas Emission Data Bases for Atmospheric Chemistry Studies

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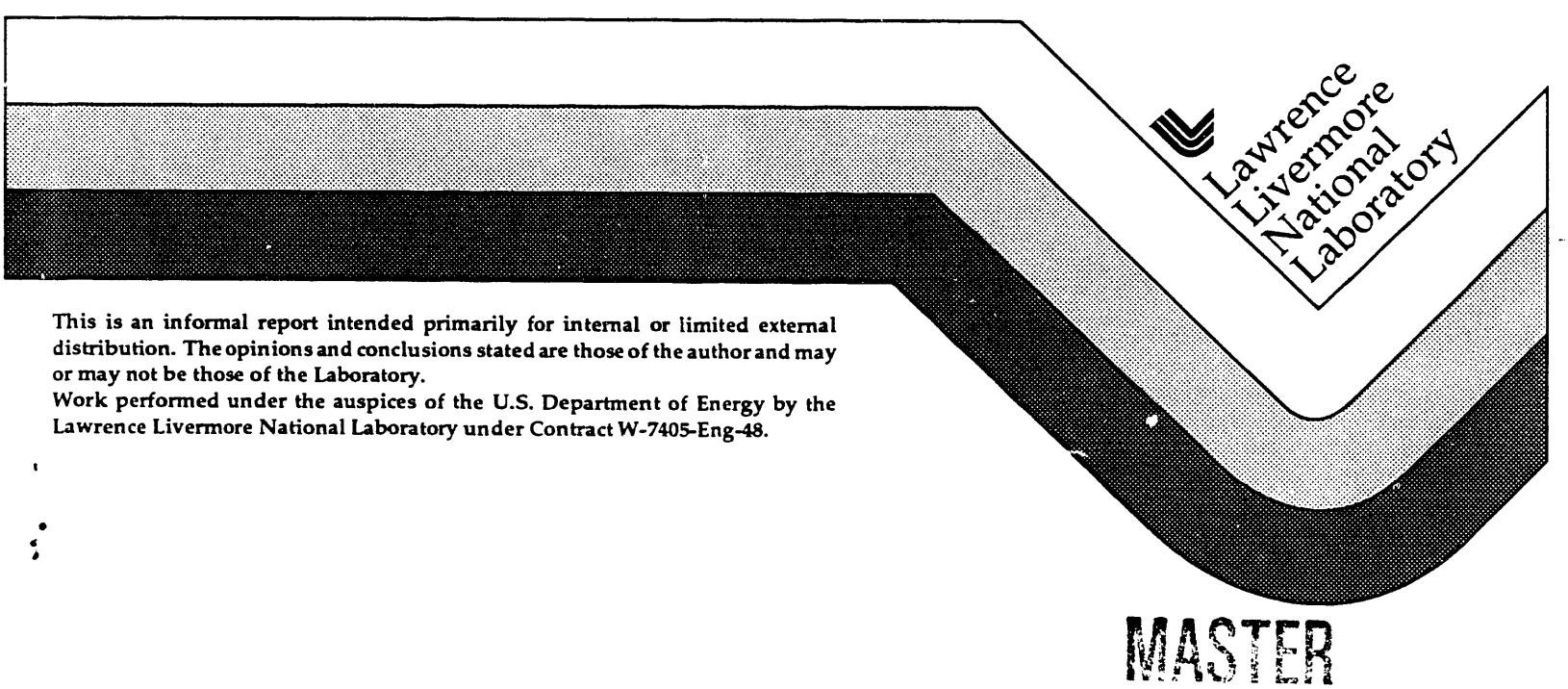
October 7, 1991



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Trace Gas Emission Data Bases for Atmospheric Chemistry Studies

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UCRL-ID--108511
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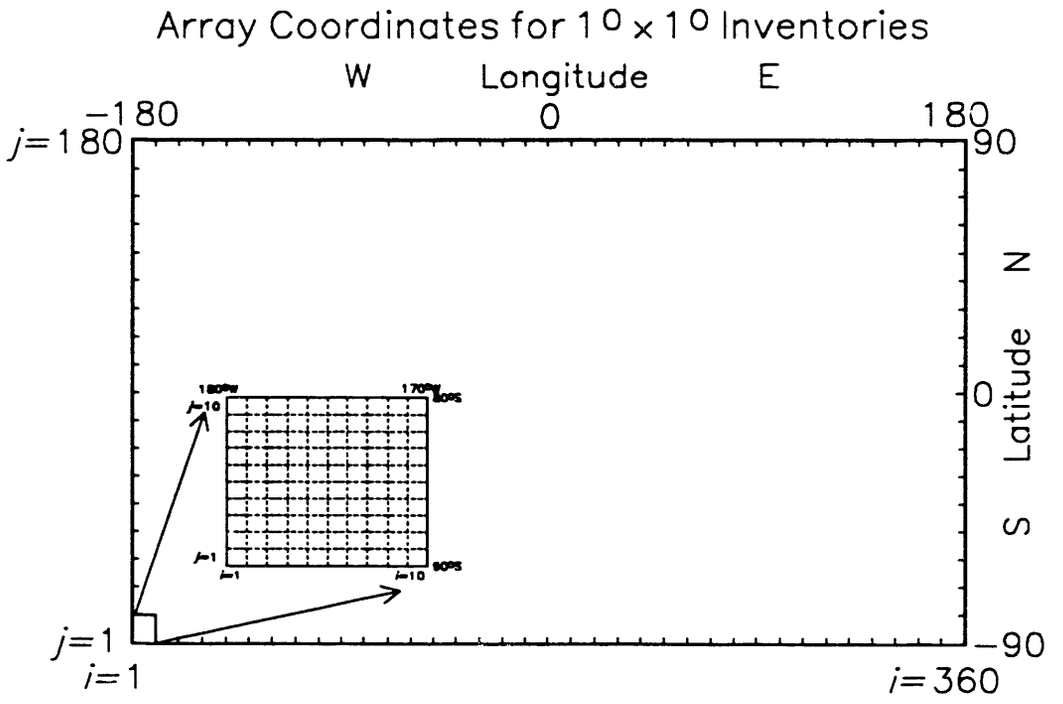
Description

Global data bases of trace gas emissions to the atmosphere have been compiled for the use in atmospheric chemistry studies. The resolution provided is a 1° latitude by 1° longitude based on previous work by Matthews (1983) and Matthews and Fung (1987). A series of 3 data bases has been provided. The first is an inventory of emissions of NO_x from fossil fuel combustion, while the second is an inventory of SO_2 emissions from the same anthropogenic source. An extensive description of these 2 data bases can be found in Dignon (1991). The third database includes a global inventory of the emissions of NO_x from terrestrial biomass burning and is given seasonally for the globe (Dignon and Penner, 1991; Dignon et al., 1991).

The units of emission for the inventories are given as the mass in metric tons of N for the NO_x inventories and metric tons of S for the SO_2 inventory for each 1° × 1° grid. The emissions are expected to represent the emissions for the year 1980. The biomass burning source is given for 2 seasons where *XXXX*jul represents an ascii file containing the cumulated emissions for the months from April to September, and *XXXX*jan represents October to March (Bates et al., 1991).

The grid for these data bases, (i,j) arrays, is (360,180), which represents 1 degree (lon,lat) resolution. Here, j=1,180 and j=1 represents the latitude band 90 degrees south to 89 degrees, i.e. centered at 89.5 degrees south; j=180 represents the band from 89 degrees north to 90 degrees north, i.e. centered at 89.5 degrees north. Longitude is represented as i=1,360, where i=1 represents the band from 180 degrees (international date line) to 179 degrees west, i.e. centered at 179.5 degrees west; i=360 is the band from 179 degrees east to 180 degrees (date line), i.e. centered at 179.5 degrees east. The

Figure. Data base array structure.



accompanying Figure illustrates the structure of the arrays.

The Table shows a description of each data base and provides FORTRAN code, documentaion, and data format for reading each array. Complete description of the emission inventory data bases can be obtained in the references listed below.

Acknowledgements: Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

References

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Dignon, J., C.S. Atherton, J.E. Penner, and J.J. Walton, 1991. NO_x pollution from biomass burning, submitted to the *Proceedings of the 11th COnference on Fire and Forest Meteorology*, Missoula, MT, April 16-19, 1991. LLNL Report UCRL-JC-104735.

Matthews, E., 1983. Global vegetation and land use: New high-resolution data bases for climate studies, *Journal of Climate and Applied Meteorology*, **22**, 474-487.

Table. Trace gass emission data bases: Description, format and structure.

FILE NAME	TYPE	ARRAY SIZE/FORMAT	DESCRIPTION
noxfos80	Real	dimension noxfos(360,180) read (lunit,1000) noxfos 1000 format(6e12.3)	emissions of NO_x for each grid in metric tons of N
so2fos80	Real	dimension so2fos(360,180) read(lunit,1000) so2fos 1000 format (6e12.3)	emissions of SO_2 for each grid in metric tons of S
nbiojul nbiojan	Real	dimension nbio(360,180,2) do 100 j=1,180 read (lunit1,1000) (nbio(i,j,1),i=1,360) read (lunit2,1000) (nbio(i,j,2),i=1,360) 100 continue 1000 format (6e12.3)	emissions on NO_x from biomass burning divided into 2 files representing summer and winter seasons

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