October 21, 2012

Dear Colleagues,

Due to feedback on our IVI2 datasets, we have reviewed and revised them. The automatic algorithm we used to align different ice core time series and produce the latitude and altitude distribution failed when the ice-core signal and the assigned time (year+month) of the eruption were out of alignment, and failed to add the 1167, 1227, and 1783 Laki eruptions to that file. So that file has been corrected. We thank Robert A. Rohde and Ivan Pechenezhskiy for pointing out this discrepancy to us and apologize for this error. But this correction is also part of the scientific process and shows once again that it is the best scientific practice to make your data freely available for others to use and to report back errors they find.

The revised data can be found at http://climate.envsci.rutgers.edu/IVI2/#Version2 The data sets are described on page 2.

For the annual average time series, file IVI2 Total loading_501-2000Version2.txt has also been revised due to our review of our procedures: (NH = Northern Hemisphere, SH = Southern Hemisphere)

1. Data are only reported to two decimal places. Any more precision is illusory
2. The following changes, indicated by *** in the rightmost column are:
   a. Year 933: Moved data for NH injection (and hence global injection) from year 939.
   b. Year 991: SH signal moved to 992 so that it appears in the same year as the NH signal.
   c. Year 993: NH signal moved to 992 so that it appears in the same year as the SH signal.
   d. Year 1125: Very minor SH eruption removed.
   e. Year 1194: SH signal moved to 1195 so that it appears in the same year as the NH signal.
   f. Year 1196: NH signal moved to 1195 so that it appears in the same year as the SH signal.
   g. Year 1963: The Agung loading has been reduced by about 20%, to be consistent with Gao et al. (2007).
   h. Year 1982: We added El Chichón using data from Sato et al. (1993), updated at http://data.giss.nasa.gov/modelforce/strataer/. Many of the ice cores we used stopped before this year, and we did not have enough ice core data to evaluate this eruption. Nevertheless, we know what the loading was from other data. We previously indicated this in the readme file, but want to put it in here to make it easier for others to use the time series, keeping in mind that these are not ice core data.

Sincerely,
Alan Robock (robock@envsci.rutgers.edu) and Chaochao Gao (gaocc@zju.edu.cn)

Reference: Gao, Chaochao, Luke Oman, Alan Robock, and Georgiy L. Stenchikov, 2007: Atmospheric volcanic loading derived from bipolar ice cores accounting for the spatial distribution of volcanic deposition. *J. Geophys. Res.*, **112**, D09109, doi:10.1029/2006JD007461. http://climate.envsci.rutgers.edu/pdf/GaoIceCores2006JD007461.pdf

Volcanic Forcing of Climate over the Past 1500 Years:
An Improved Ice-Core-Based Index for Climate Models

These data are described in the paper:

Gao, Chaochao, Alan Robock, and Caspar Ammann, 2008: Volcanic forcing of climate over the past 1500 years: An improved ice-core-based index for climate models. *J. Geophys. Res.*, **113**, D23111, doi:10.1029/2008JD010239. PDF file

DATA SET DESCRIPTION. There are two data files available for downloading:

1) The first file contains the global and hemispheric annual stratospheric volcanic sulfate aerosol **injections** for the period from 501 to 2000 AD. Units are **Tg sulfate aerosol.**

2) The second file contains the monthly, latitudinally, and height dependent aerosol **loading** for the same period. Units are **kg sulfate aerosol/km^2**.

Please use the parameters of your choice to convert the data to optical depth or radiative forcing if necessary.

The first dataset has 5 columns: (1) time; (2) NH sulfate aerosol injection; (3) SH sulfate aerosol injection; (4) global total sulfate aerosol injection; (5) *** when different from original version.

The second dataset has 775 columns: the first column gives the time, and the rest of the 774 (18*43) columns give the loading from 9 km to 30 km at 0.5 km resolution for each 10° latitude belt (from 90°S to 90°N) for individual months. The data are provided in both text and binary formats. You can read the data in with a simple MATLAB program like the following:

```
**********************************************
...
TIME = D(:,1);
DATA = D(:, 2:end);
for t = 1:18000
   for lat = 1:18
      for alti = 1:43
            LOAD(t, lat, alti) = DATA(t, 43*(lat-1)+alti);
         end
   end
end
...

**********************************************
```