**Questions regarding data:**

- Can I combine NOAA and AGAGE data? Different scales right?

- How to select stations (or: how did Montzka/Schaefer/Schwietzke select stations?)

- Why the weird latitudinal band weights in Montzka (2011)

- What is the difference between NOAA GCMS and NOAA OTTO data?

- How do I calculate yearly averages if the measurement frequency is not constant? (GCMS MCF data)

**Examples in papers:**

**Montzka (2011):**

- 9 stations (3 SH, 6 NH):

- SH: South Pole (SPO, high), Cape Grim (CGO, mid), Cape Matatula (SMO, low)

- NH: Low: Cape Kumukahi (KUM), Mauna Loa (MLO)

Mid: Niwot Ridge (NWR), Wisonsin (LEF)

High: Barrow (BRW), Alert (ALT)

- 6 boxes: 3 latitudinal bands per hemisphere. He took 1 station per band in the SH and 2 per band in NH.

- Weight per band: [0.97, 0.76, 0.40]:[low, mid, high] (but changing this had no strong effect)

**Schaefer (2016)**

- 17 measurement stations (10 NH, 7 SH) (See table S2 of supplements)

1. Monthly values were averaged for each year (missing months filled by interpolation from adjacent years)

2. They calculated yearly averages for 5 latitudinal bands

(90-60N (2), 60-30N (5), 30N-30S (4), 30-60S (2), 60-90S (3))

3. The area-weighted average of each latitudinal band was taken as the global mean

4. They calculated a spline fit through historical data

1700 - 1987: They use the historical spline

1988 - 1996: They splice the station data with the historical spline

1996 - 2014: Only the station data is included

**Schwietzke (2016)**

- Very many stations

**NOAA data:**

1. **CH3CCL:** 
   * **Location:** <ftp://ftp.cmdl.noaa.gov/hats/solvents/CH3CCl3/flasks/GCMS/>
   * **Data format:** Event-wise
   * **Stations:**
     1. **THD: 2002.2 – 2016.8**
     2. **SUM: 2004.5 – 2016.5**
     3. **SPO: 1992.5 – 2015.6**
     4. **SMO: 1991.9 – 2016.8**
     5. **PSA: 1998 - 2013.8 & 2016.2 – 2016.5**
     6. **NWR: 1992 - 2016.8**
     7. **MLO: 1992.0 - 2016.7**
     8. **MHD: 1998.8 – 2016.7**
     9. **LEF: 1996.8 - 2016.8**
     10. **KUM: 1995.9 - 2016.8**
     11. **HFM: 1995.9 - 2016.8**
     12. **CGO: 1991.9 - 2016.7**
     13. **BRW: 1992.3 - 2016.7**
     14. **ALT: 1991.9 – 2016.7**

The period from this data would be 1992 – 2015.

To deal with the infrequent measurements:

* First compute yearly averages per station, then global averages using latitudinal bands.
* Yearly averaging by interpolating between subsequent measurements and taking the interpolated value as representative for that period. The weight of the value is the length of the period.
  + At a transition between years I do a double interpolation: First I interpolate to find the concentration at the transition. Then I interpolate between that concentration and the start/end concentration, to find separate values of the period before and after the transition.

1. **CH4**

* **Location:** <ftp://ftp.cmdl.noaa.gov/data/greenhouse_gases/ch4/flask/>
* **Data format:** Monthly or event-wise
* **Stations:** Very many, but the ones with an interesting measurement period are: