Details on CAM3.5 Aerosol dataset conversion.

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Constants:

-SHR_CONST_AVOGAD = 6.02214e26_R8 ! Avogadro's number ~ molecules/kmole
-DMS molecular weight: 62.13 g/mol (see http://en.wikipedia.org/wiki/Dimethyl_sulfide)
-Black Carbon – 12.0109997 g/mol
-Organic Carbon – 12.0109997_r8 grams/mole g/mol
-S = 32.06, O=15.9994
-SO2 = 64.0588 g/mol
-SO4 = 96.0576 g/mol
trop_mozart chemistry uses SHR_CONST_AVOGAD for Avogadro's number
Molecular weights are defined in:
~/branches/trop_mozart_aero_cam3_4_03/models/atm/cam/src/chemistry/trop_mozart_aero/mo_sim_dat.F90

- DMS : 62.1324005_r8 grams/mole
- SO2 : 64.0647964_r8 grams/mole
- SO4 : 96.0635986_r8 grams/mole
- Carbon Aerosols : 12.0109997_r8 grams/mole

Location of conversion codes:

- /project/cseg/erik/cam3.5_aerosol/
- http://www.cgd.ucar.edu/cms/bundy/Projects/cam_cases/cam_prognostic_aerosol_runs

DMS data-set

- Copy climatology to each year from 1870 to 2000.
- Change DMS name to total
- Convert units to molecules/cm2/s (multiply by SHR_CONST_AVOGAD/(1x10^4 x 62.1324005))
- Add scale_factor=1.f, long_name="dms total emissions", _FillValue=-999.f, Species, Grid, Conventions, institution, and authors
  Use Yorick script that does interpolation to do above changes.
  Annual average global area-weighted sum = 37.1266 Tg/year (Total DMS, not just S)

SOx data-set

- Rename "date" dimension to "time"
- Change name of "SOx" to "total"
- Create 4-files: SO2-surface, SO4-surface, SO2-100m, SO4-100m
  (98% is SO2, 2% is SO4)
- Convert units to molecules/cm2/s (multiply by 0.02 x SHR_CONST_AVOGAD/(1x10^4 x 32.06) for SO4)
  (multiply by 0.98 x SHR_CONST_AVOGAD/(1x10^4 x 32.06) for SO2)
  (multiply by 0.02 x SHR_CONST_AVOGAD/(1x10^4 x 32.06) for SO4)
- Add scale_factor=1.f, long_name="SOx total emissions", _FillValue=-999.f, Species, Grid, Conventions, institution, and authors
  Use Yorick script that does interpolation to do above changes.
  Annual average global area-weighted sum = 56.96 Tg/year

Carbon data-set

- Create 2-files: Organic-C, Black-C
- Output: FFBCSF_BBBCSF+BFBCSF for output hydrophobic Black Carbon
- Output: FFOCSF+BBOCSF+BFOCSF+NOCSF for output hydrophobic Organic Carbon
- Convert units to molecules/cm2/s from kg/m2/year
  (multiply by SHR_CONST_AVOGAD/(1x10^4 x 12.0109997) for BC)
  (multiply by SHR_CONST_AVOGAD/(1x10^4 x 12.0109997) for OC)
- Add scale_factor=1.f, long_name="black carbon total emissions", _FillValue=-999.f, Species, Grid, Conventions, institution, and authors, Label species as "CB1" and "OC1"
  for hydrophobic black and organic carbon. "CB2" and "OC2" are hydrophillic carbon and I'm assuming will be set to zero emission.

Use Yorick script that does interpolation to do above changes.
Create script to convert 10-year monthly climatology to 130 year monthly dataset.
Annual average global area-weighted sum = 6.51 Tg/year OC and 2.747 Tg/year BC