Sensitivity of TM model results to various emission inventories used in PEGASOS and ECLIPSE

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Summary

- Different datasets used in simulations
- Totals of emission datasets
- Comparison of emissions
- Model used for simulations
- Comparison of model results
- Ongoing & future work
- Conclusions

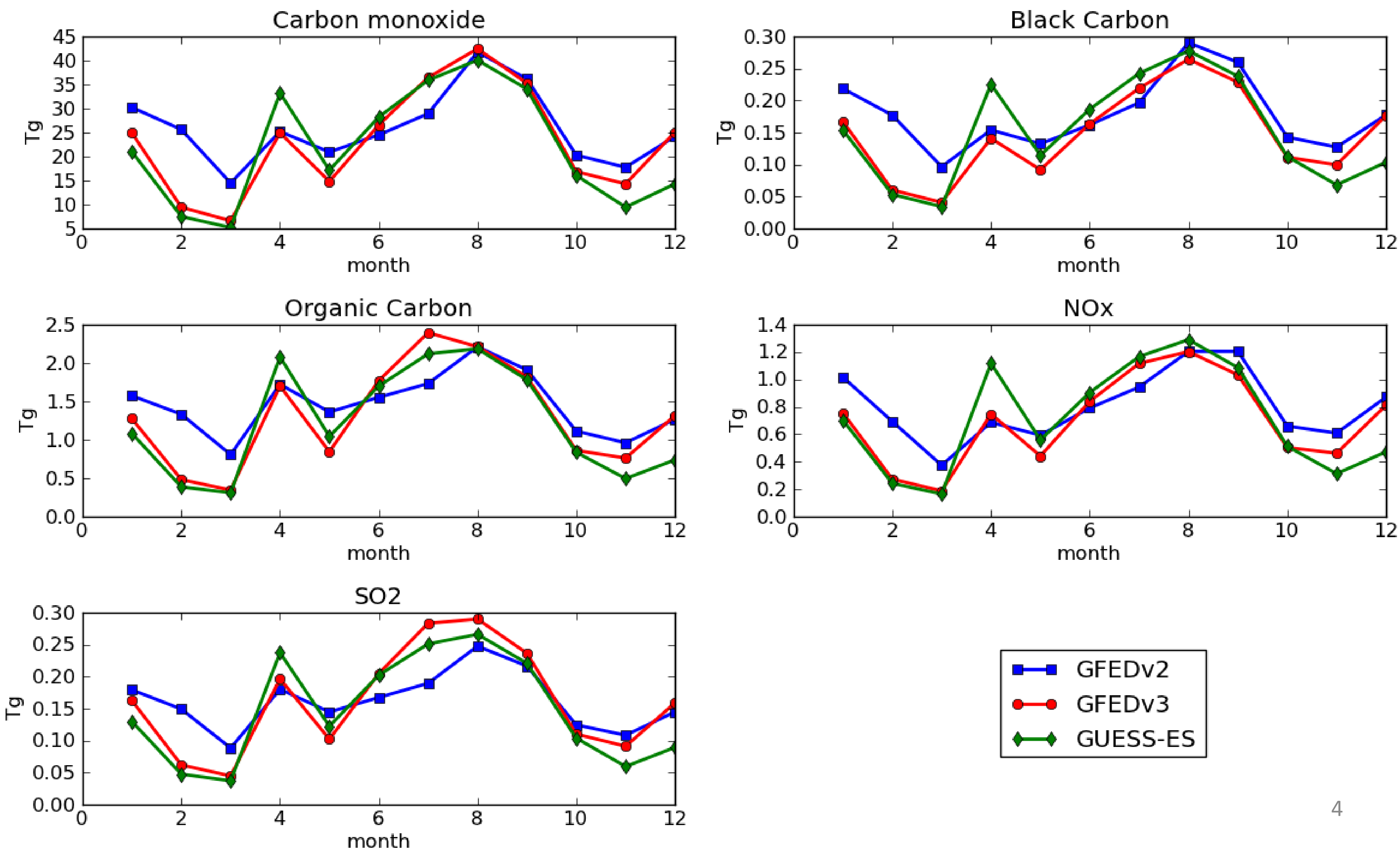
Different datasets used in simulations

- 3 different datasets
  - GFEDv2 (benchmark)(Wan der Werf et al., 2006)
  - GFEDv3.1 (Wan der Werf et al., 2010)
  - PEGASOS emissions (GUESS-ES, Knorr et al., 2012)

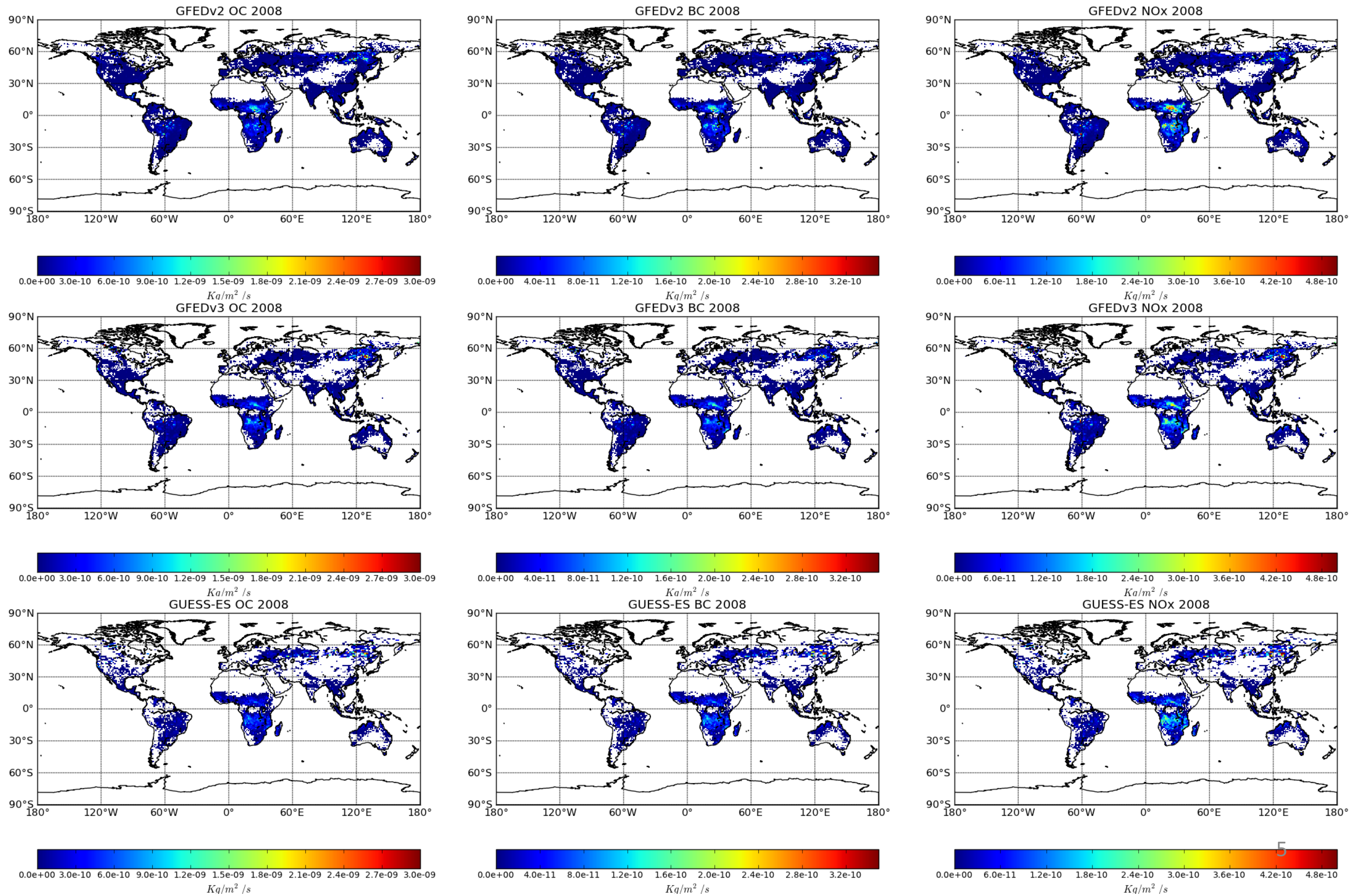
Totals of emissions for year 2008 in Tg/year

	GFEDv2	GFEDv3	GUESS-ES
CO	310.13	277.78	262.21
BC	2.14	1.76	1.81
OC	17.54	15.78	14.76
NOx (as NO)	9.65	8.38	8.53
SO_2	1.94	1.94	1.77

Monthly variation of emissions



2008 fire emissions

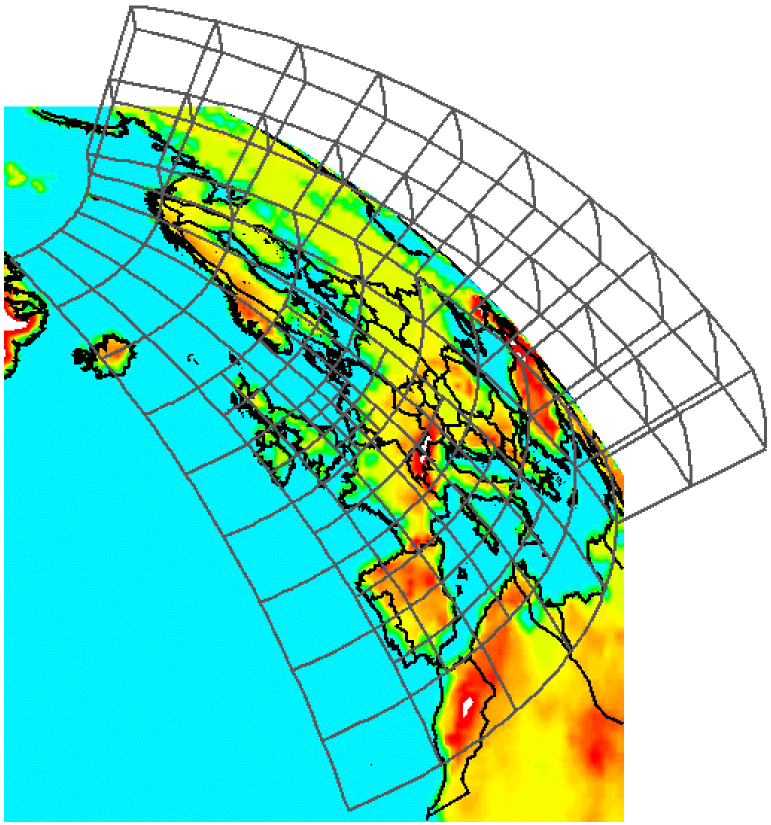


TM4-ECPL Description

- TM4-ECPL:
  - ***Low resolution***: 6^0x 4^0 and 34 vertical layers
  - ***High resolution***: 3^0x 2^0 and 34 vertical layers

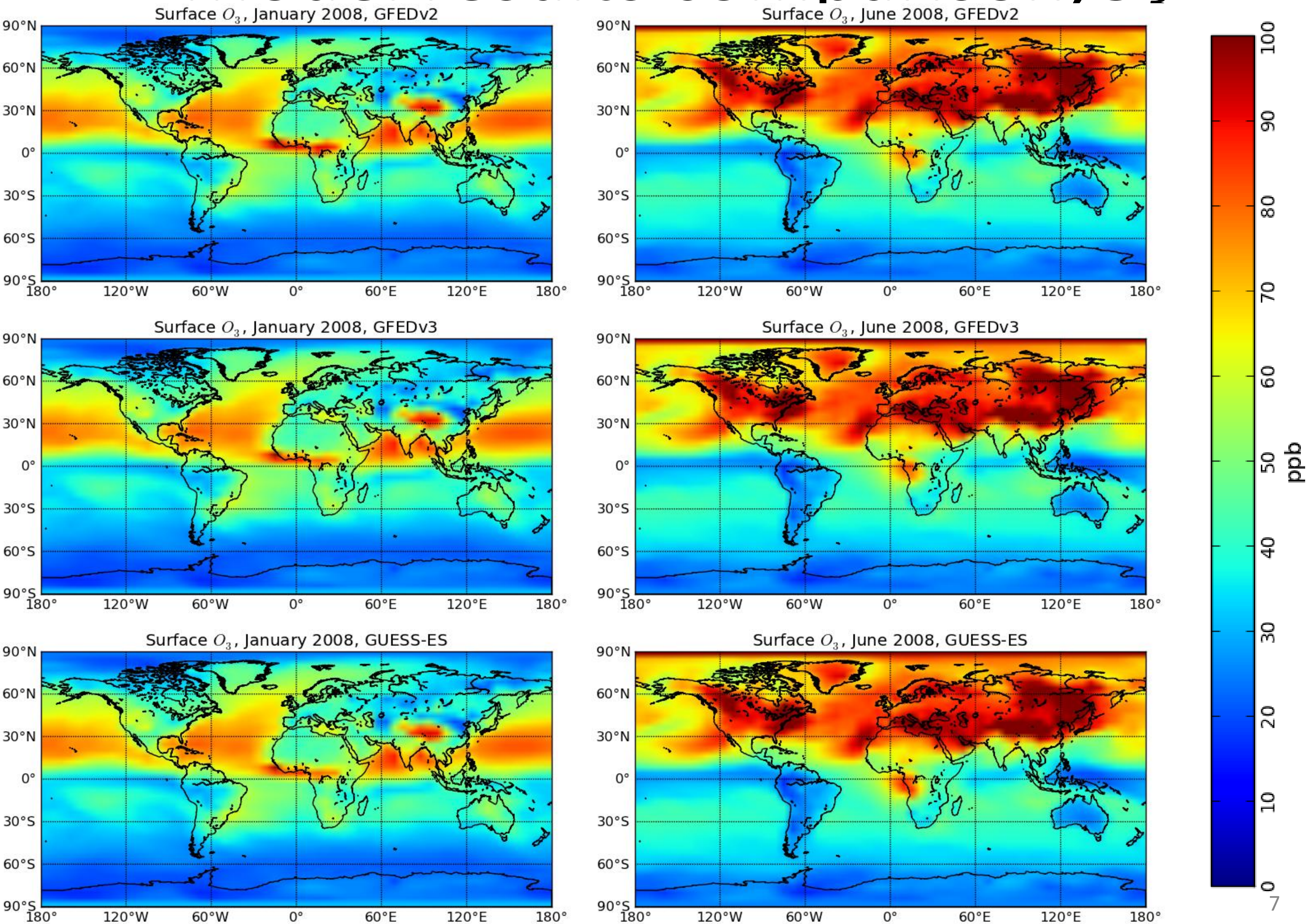
- Processes like
  - Emissions
    - CIRCE (anthropogenic, 2008)
    - POET(biogenic)(constant 2000)
    - Biomass burning
      - *GFEDv2 (2008)*
      - *GFEDv3 (2008)*
      - *GUESS-ES (2008)*
  - Chemistry
    - Analytical carbon chemistry
  - Deposition

  are calculated per box
- Then the air mass transport follows.
  - Advection
  - Convection

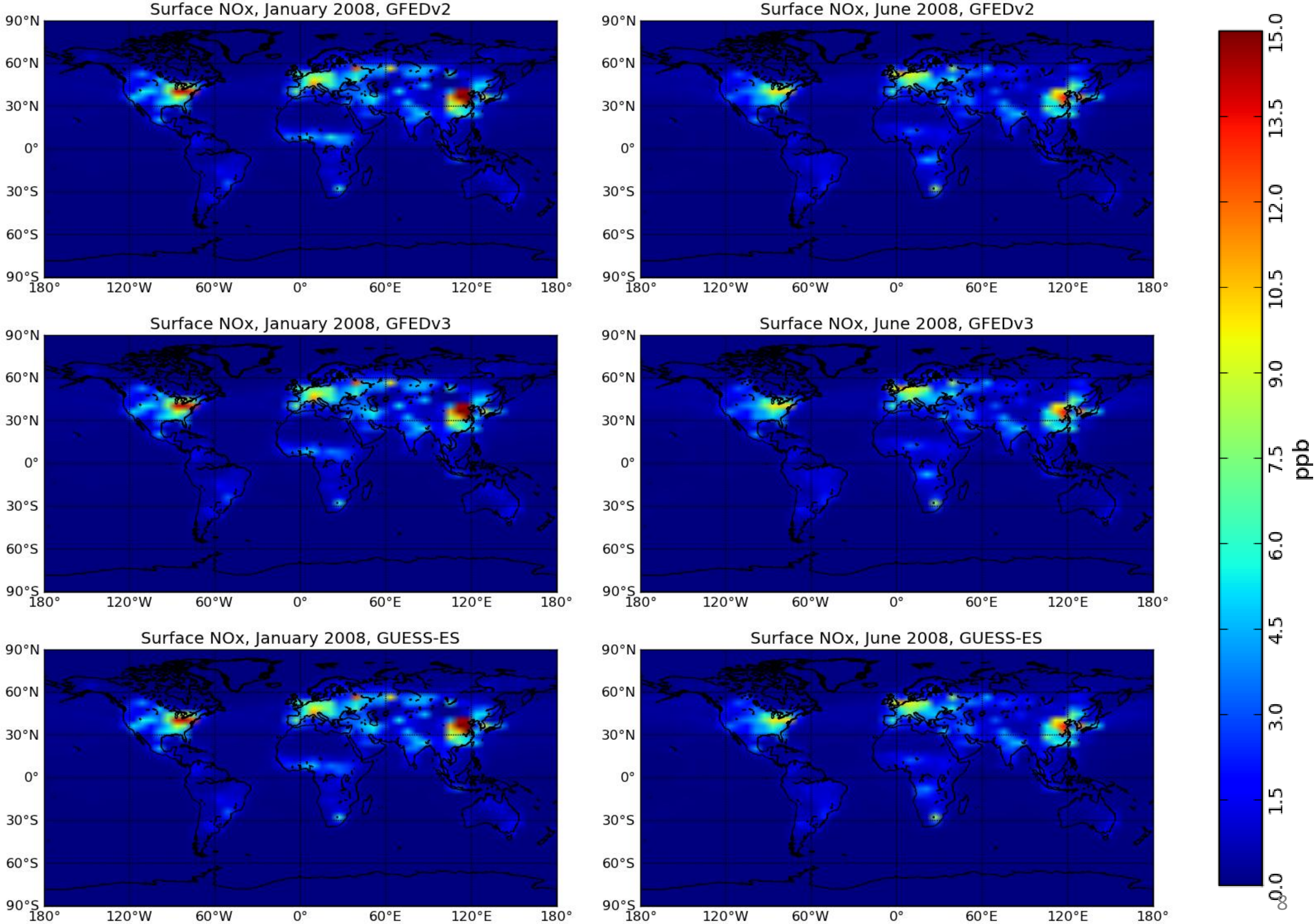


Myriokefalitakis et. Al., 2008, 2010, 2011

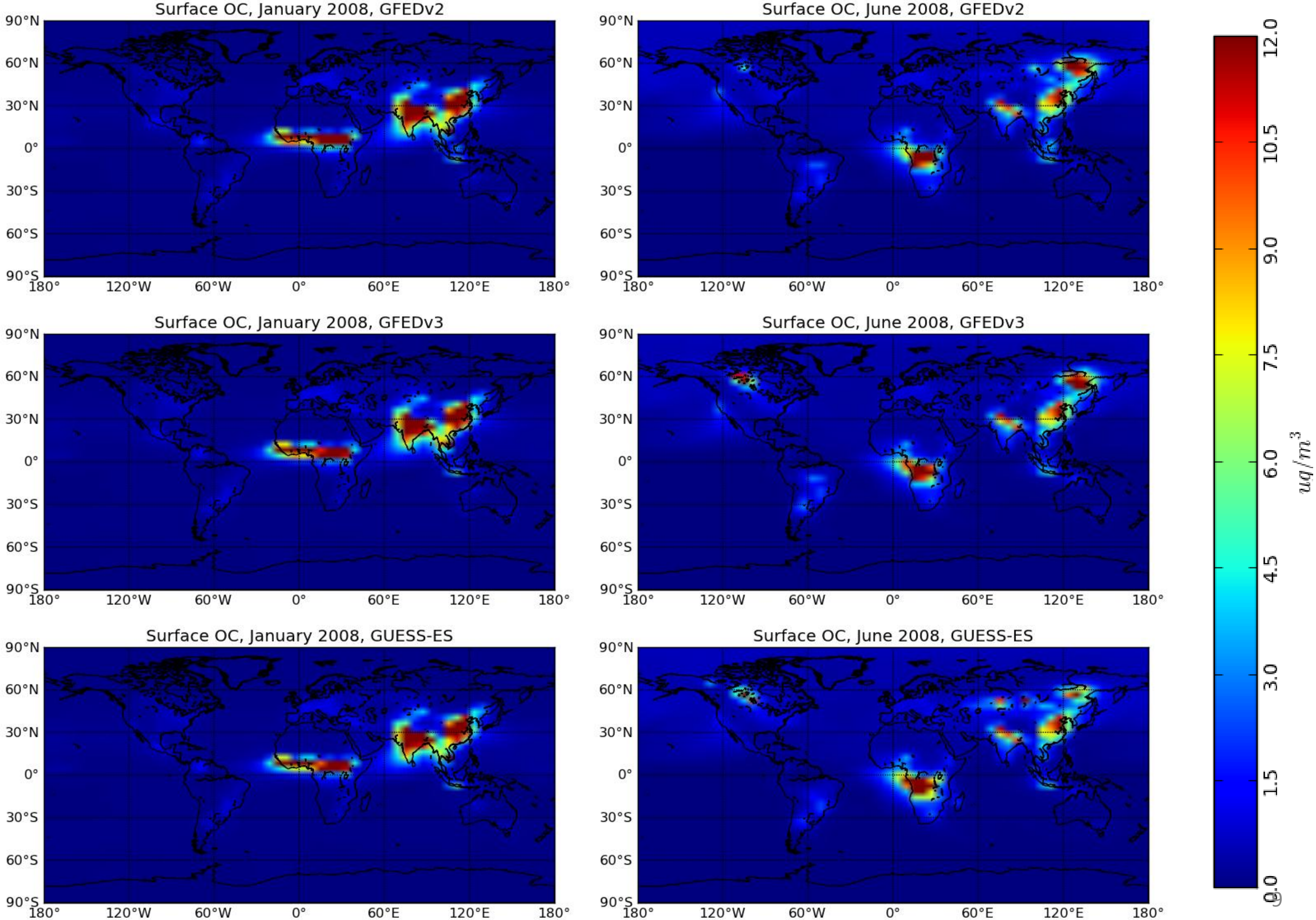
Model results comparison,O_3



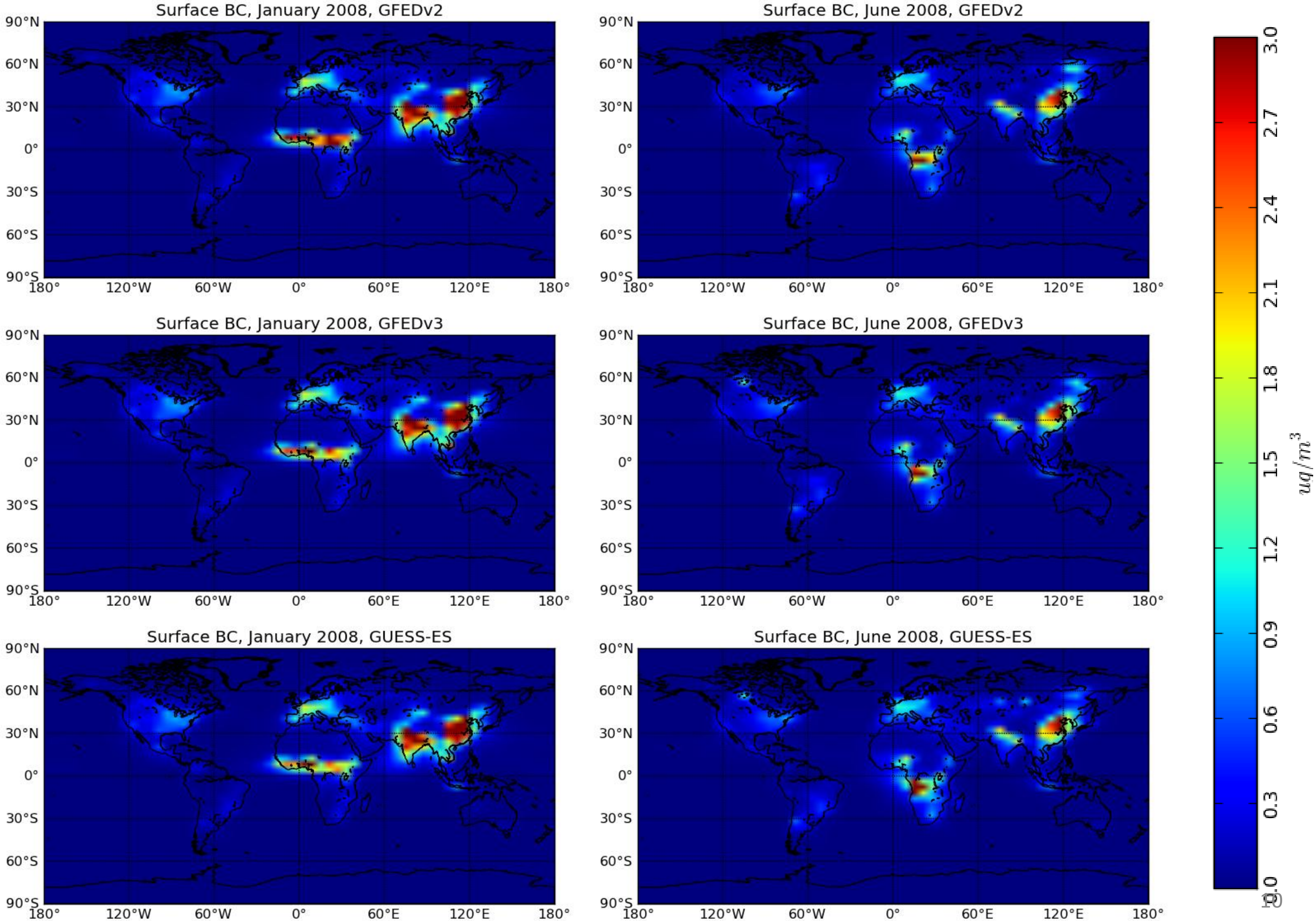
Model results comparison, NOx



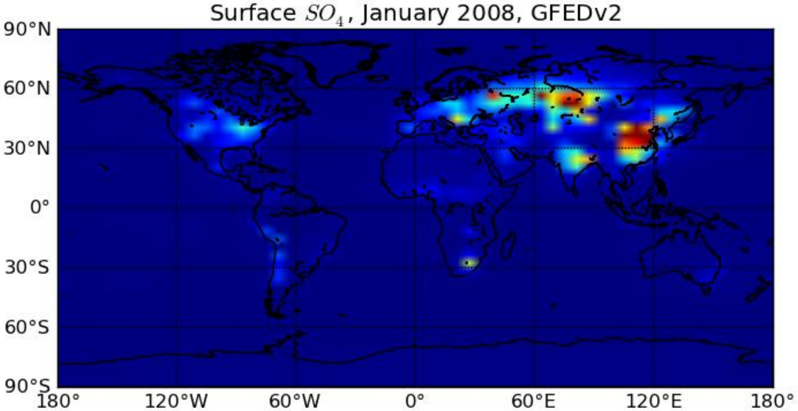
Model results comparison, OC

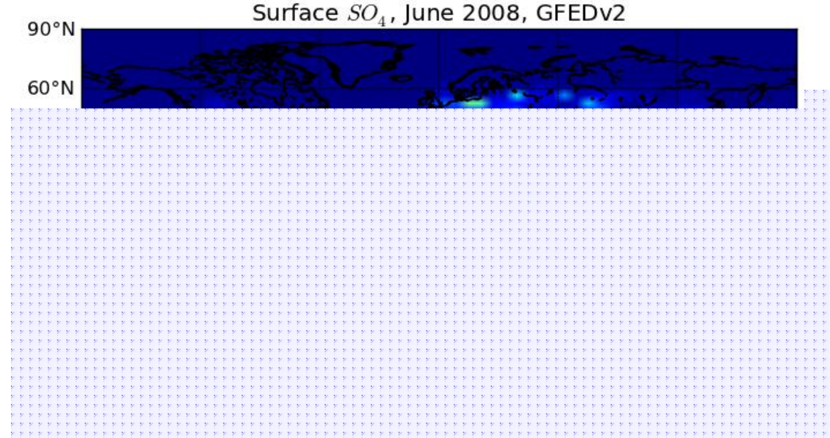


Model results comparison, BC

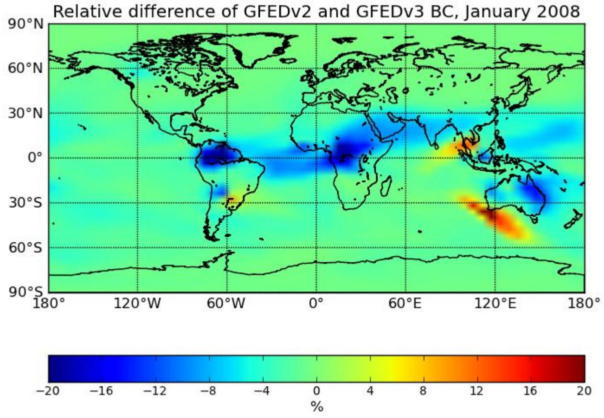


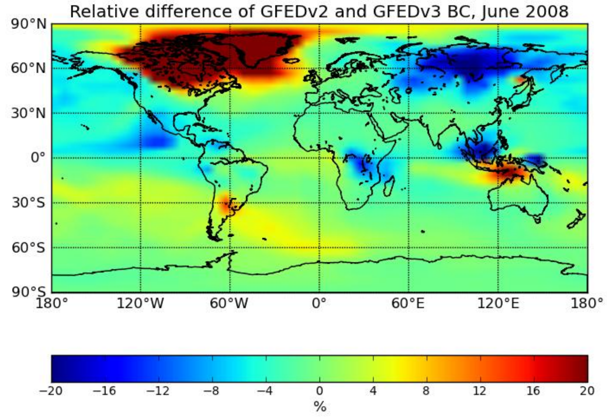
Model results comparison, SO_4

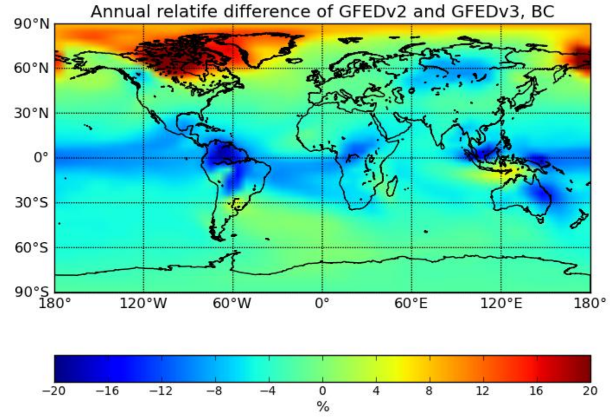


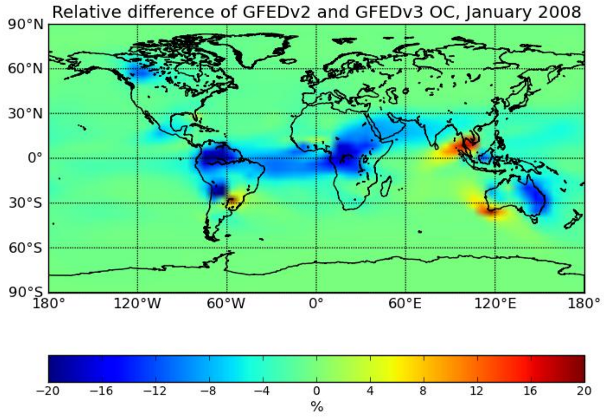


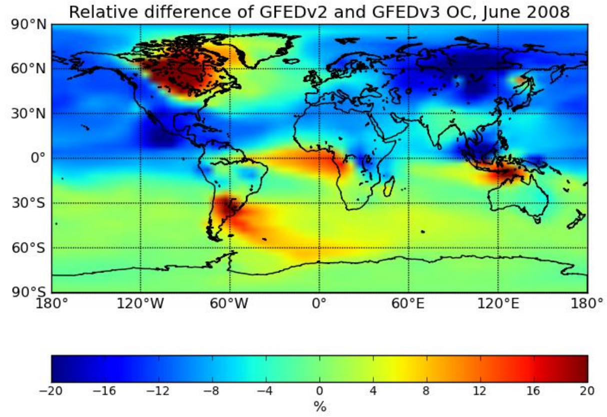
Relative difference of GFEDv2 and GFEDv3 for year 2008

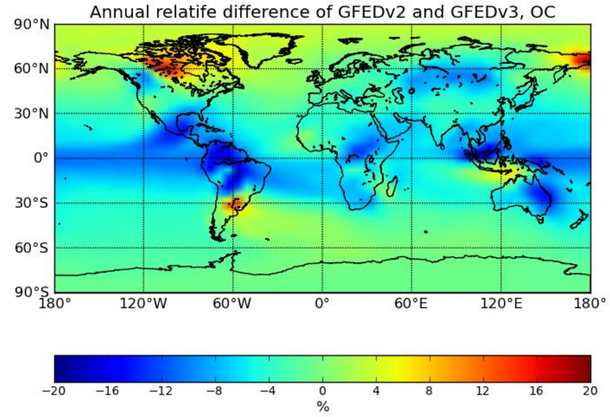




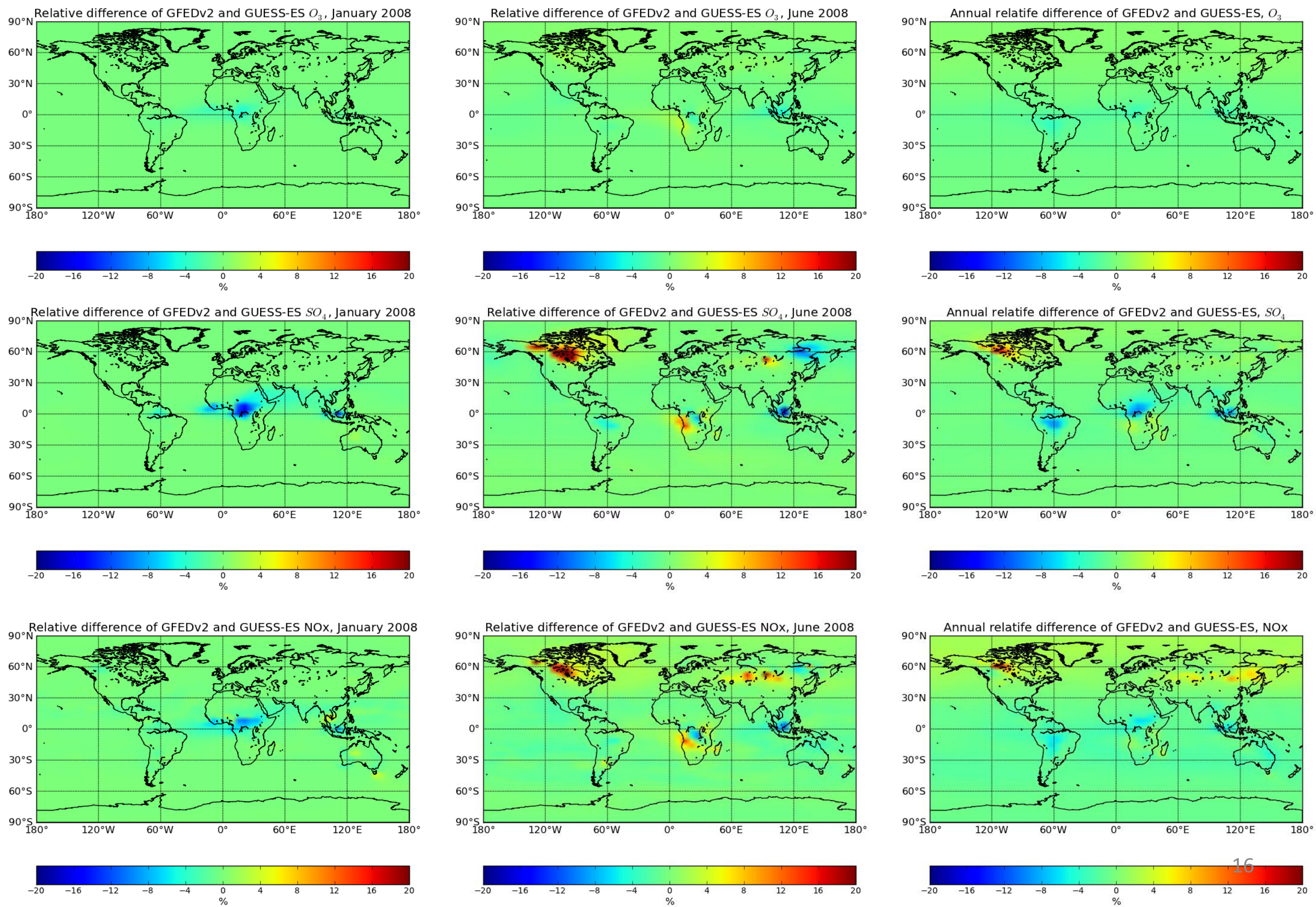




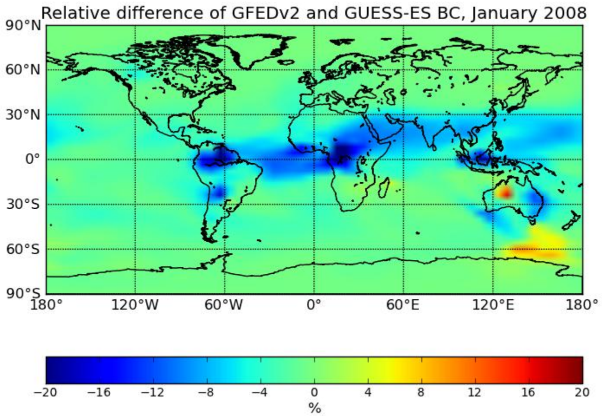


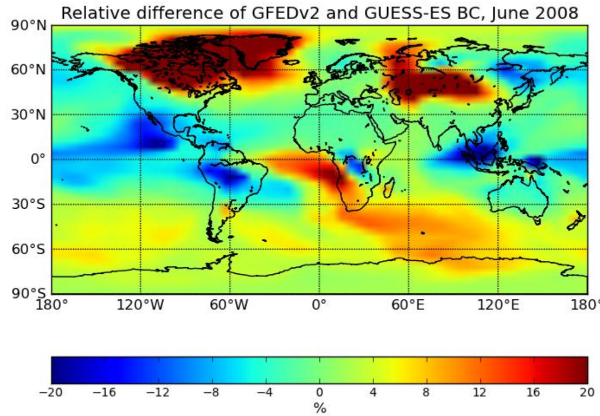


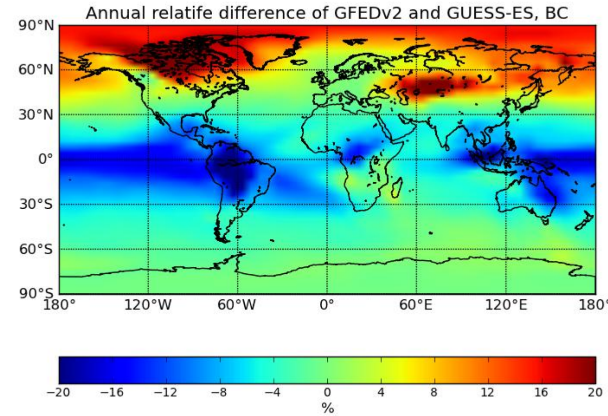
Relative difference of GFEDv2 and GUESS-ES for year 2008

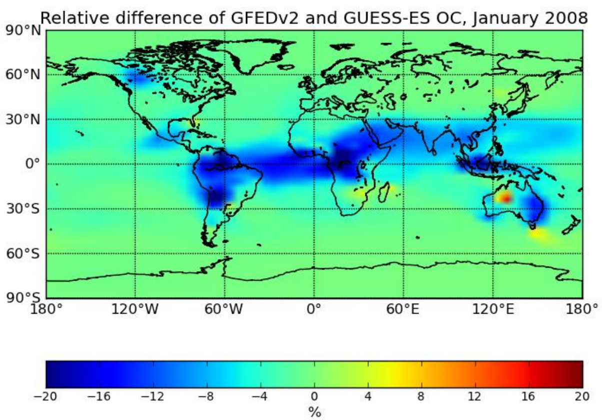


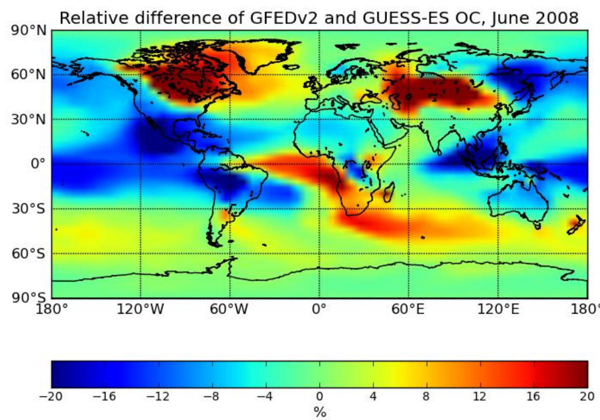
Relative difference of GFEDv2 and GUESS-ES for year 2008

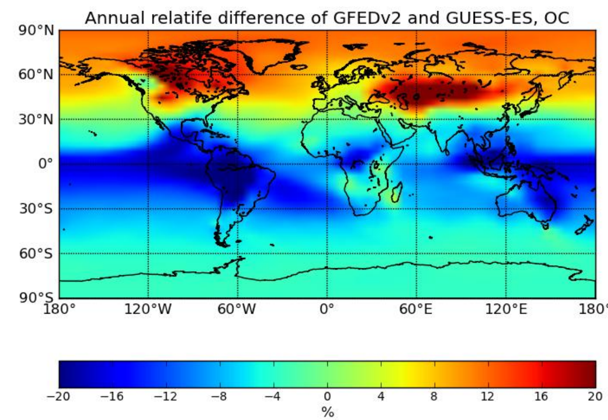












Conclusions

- GFEDv2 higher than GFEDv3 and GUESS-ES
- GUESS-ES similar with GFED3->similar model results

Ongoing and future work

- IIASA anthropogenic and fire emissions
- PEGASOS anthropogenic emissions