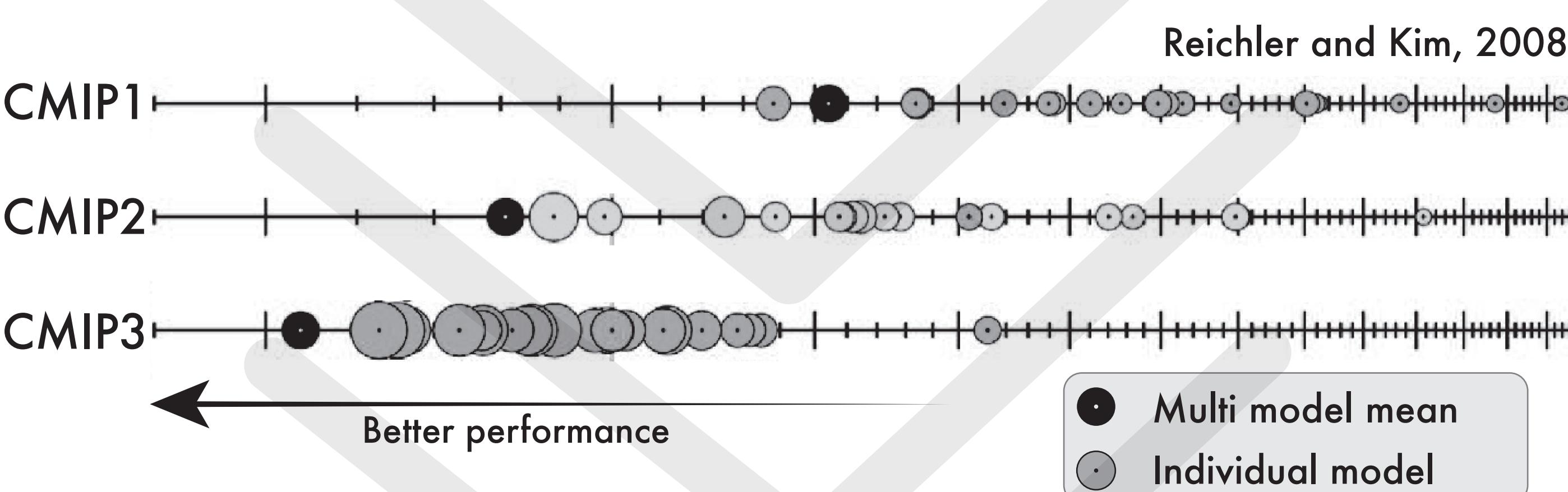


Using chemistry-climate model (CCM) ensembles

Matt Amos

An ensemble mean performs better than any single model



Typically, ensembles are processed by calculating a multi model mean

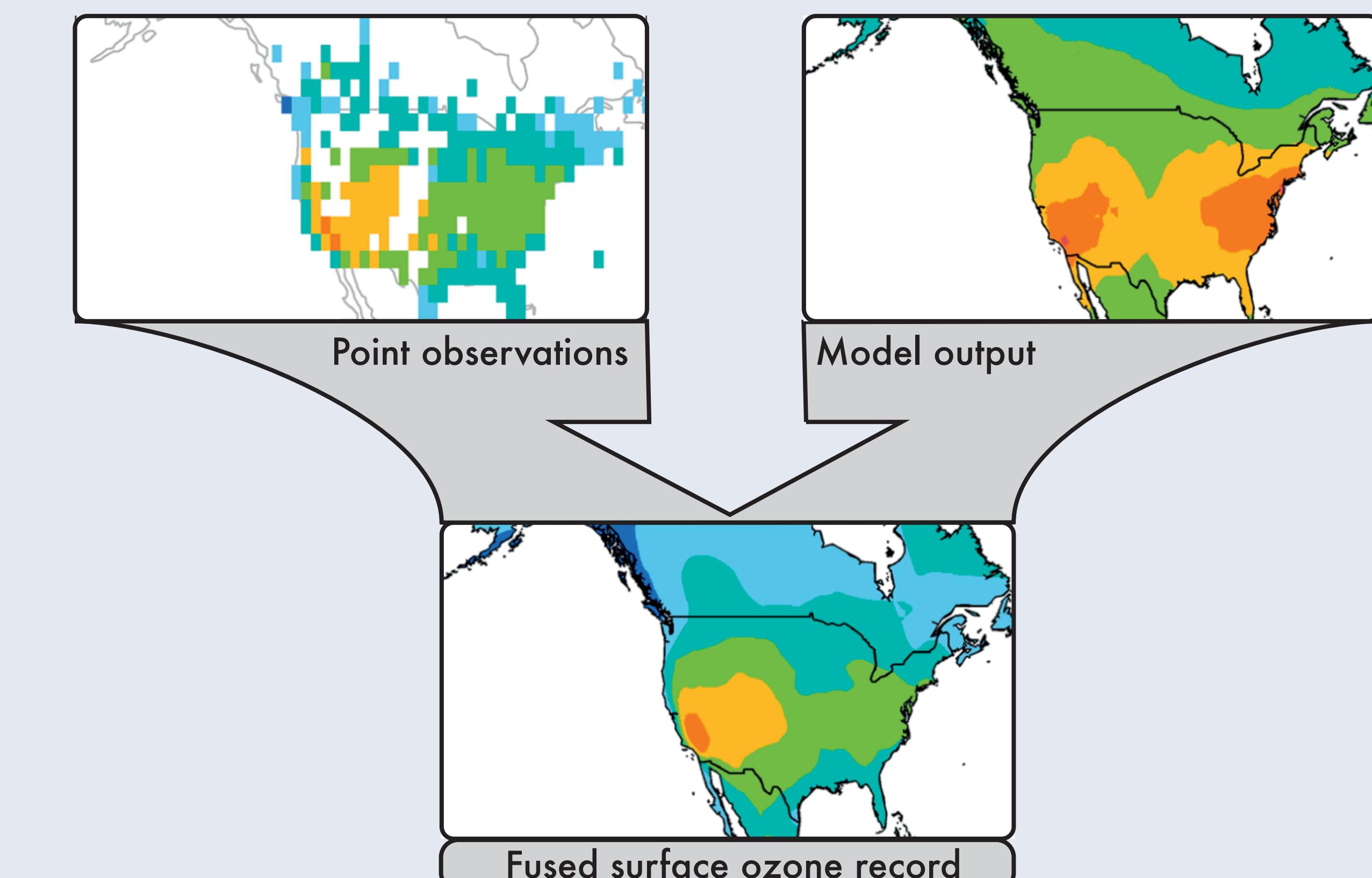
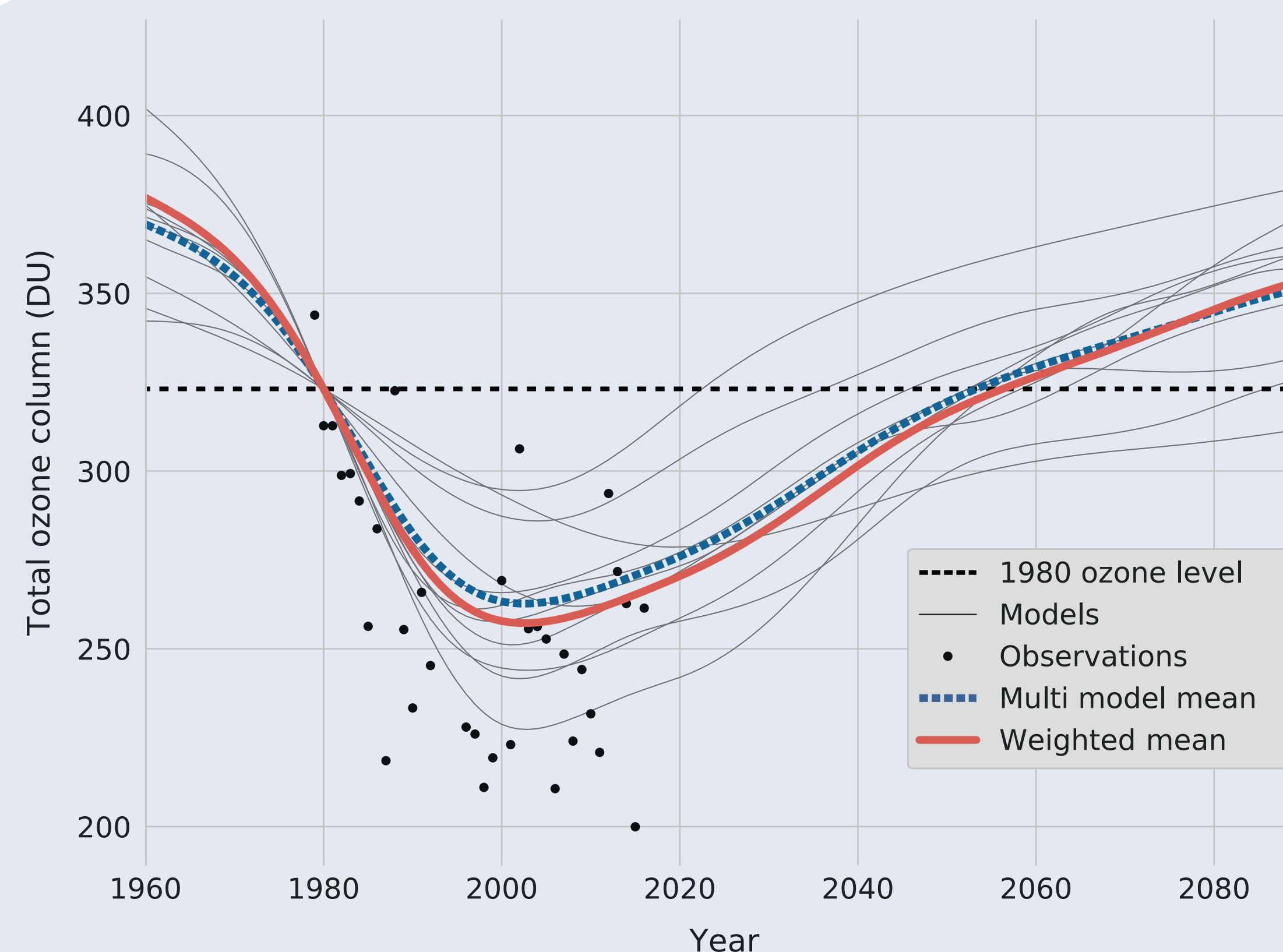
Models aren't independent

BUT...

Models don't perform equally

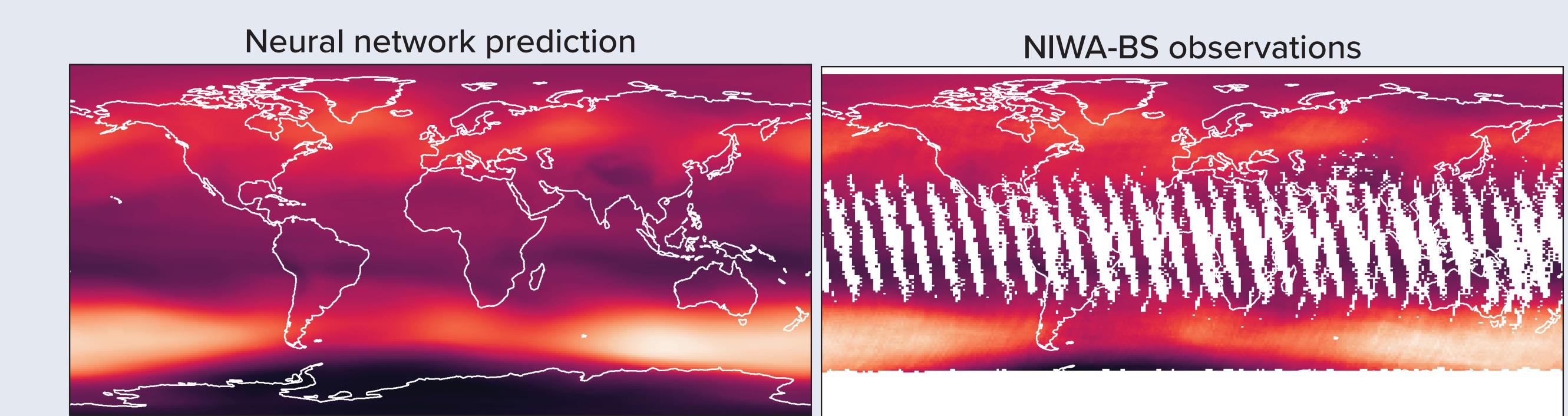
Weighted means

Weighted projection of Antarctic total ozone column from CCM1 model ensemble. (Soon to be submitted).

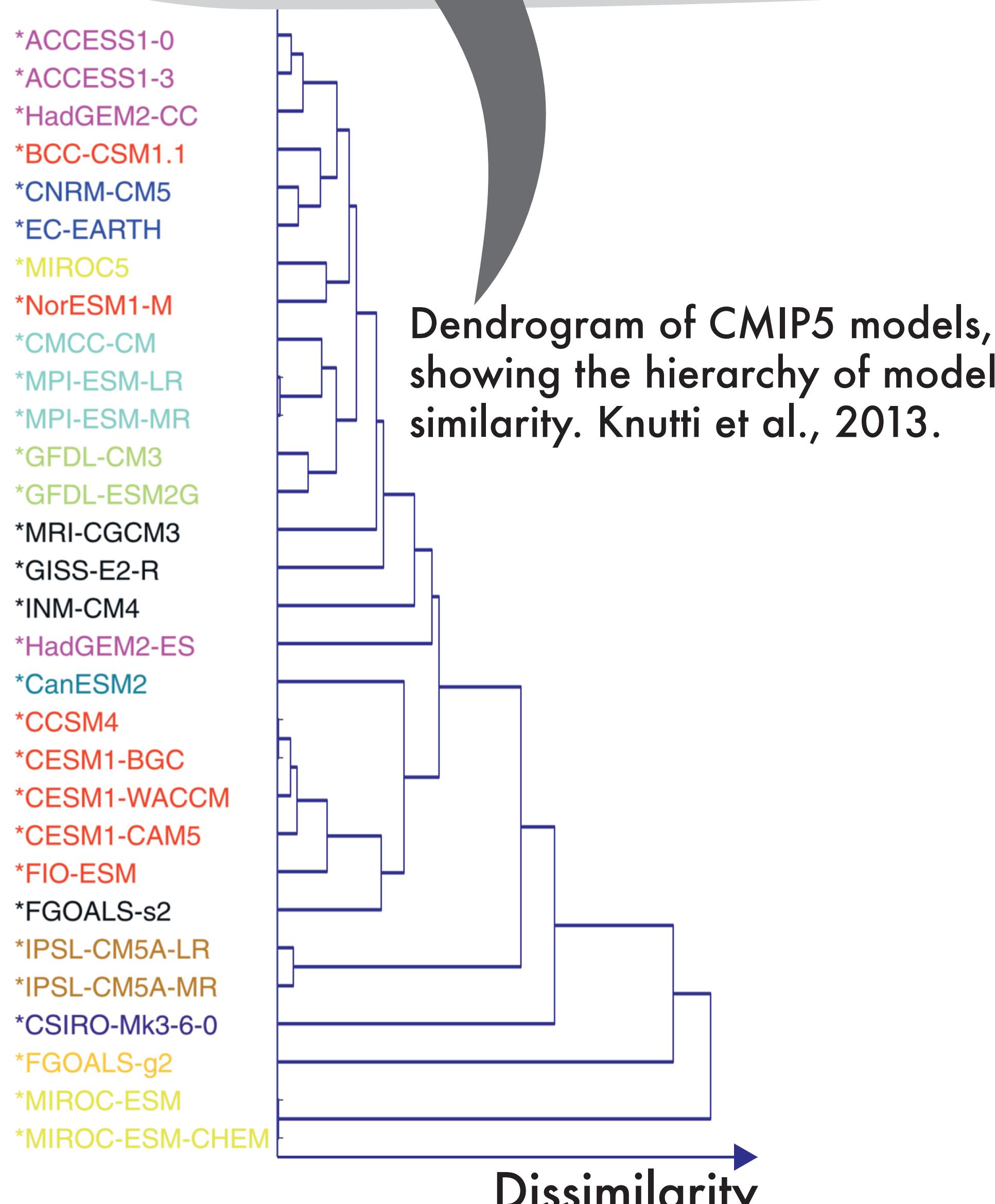


Fusing TOAR surface ozone with models - M³Fusion. Chang et al., 2019.

Fusing models and observations

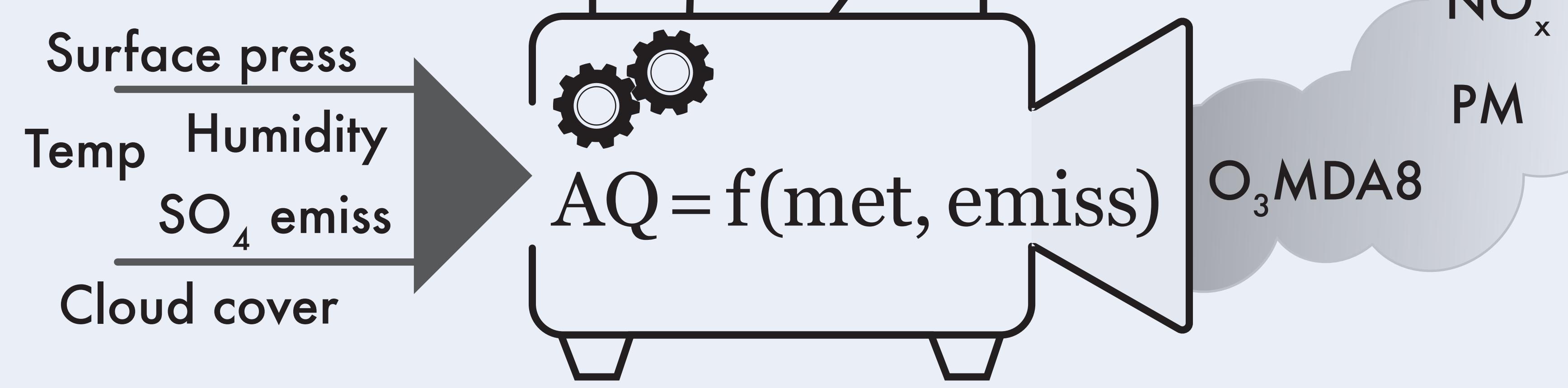


Total column ozone - CCM1 models fused with BDBP observations. (Work in progress).



Dendrogram of CMIP5 models, showing the hierarchy of model similarity. Knutti et al., 2013.

Creating pseudo models



Generating AQ projections for ensembles which don't simulate interactive chemistry. (Work in progress).

And what for the future?

- Only way of projecting atmos. future?
- CMIP6 will be the largest modelling ensemble yet. How to use ~PB of output?
- CESM Large ensemble findings: Large variance from small changes in initial conditions. Need wider ensembles?

