

CCSP 3.1 Public Review Draft Comments from Brian Flannery via email (with formatting changes, but no text changes)

Empirical Statement: Average of models better agrees with metric of comparison than any single model.

- I accept that this is the case but wonder why
- There is no a priori reason why the average of non-linear models should do better than any particular model.
- Is there an explanation why this is so, i.e. the discrepancy in match over the metric is dominated by a single very poor output in each model and this is lost in the average?
- In particular, it is even more unclear why projections using the average should do better.

Key Question:

To what extent can we rely on climate models to project future change?

- Major elements in calibration/validation:
- Natural variability
 - Do models reproduce natural variability over ~10-100s of years
 - Do we have adequate data on natural variability
 - Natural variability affects the confidence with which we can infer, e.g. climate sensitivity
- Climate sensitivity:
 - Clouds (and aerosols) now and in the future (and availability of data)
- Ocean heat uptake
- Ice: sea ice and continental scale glaciers

These processes interact and all of them affect temperature outcomes. Estimates for parameterization are not independent, rather have enormous covariance and so affect estimates of climate sensitivity.

Regards, Brian