Feedback from input4MIPs meeting and update of forcings

Jean-François Lamarque
Climate and Global Dynamics Laboratory
NCAR, USA
Purpose of meeting (held prior AGU 2018)

- Combination of dataset developers and users
- Take stock on CMIP6
- What do to for CMIP7?
- Focus on SLCF emissions, land-use, concentrations (including stratospheric aerosols) and deposition datasets
  - Approximately 20 attendees

Will focus my presentation on forcings, not on the very good support input4MIPs has provided!
Key points on CMIP6

• It takes a long time to generate and coordinate datasets -> original timeline was overly optimistic
CMIP6 Forcing Timeline

PI/Historical SLCF emissions (S. Smith)
Historical GHG emissions to 2014 (B. Andres)
Gridded GDP and population maps etc. (HYDE & IIASA website)
Historical land use (G. Hurtt, D. Lawrence)
Historical GHG concentrations (M. Meinshausen?)
Historical ozone concentrations (M. Hegglin, J.-F. Lamarque)
Historical aerosol concentrations (M. Schulz, G. Myhre)
Solar past and future (K. Matthes)
Volcanoes (L. Thomason et al.)

Future emissions (IAMs)
Gridding & Harmonization past to future (IAMs)
Future GHG concentrations (IAMs)
Future ozone and aerosol concentrations (M. Hegglin, J.-F. Lamarque, M. Schulz, G. Myhre)
Future harmonized land use dataset (G. Hurtt, D. Lawrence)

PI control and idealized model experiments: DECK
Global model historical runs: DECK+
ScenarioMIP global model runs

Nominal Period of CMIP6 (2015-2020)
Key points on CMIP6

• It takes a long time to generate and coordinate datasets -> original timeline was overly optimistic
• Single point-of-failures present in several forcing areas
• Quality control and early testing is essential, and this was not done enough (last minute changes on SO2 emissions or volcanic datasets)

The volc v3 vs v4 differences are also something that will require a number of additional slides, at this stage the AMIP simulations that have been run show that the differences between these are small, and so are unlikely to be a major show-stopper for CMIP6/AR6 assessments
Key points on CMIP6

- It takes a long time to generate and coordinate datasets -> original timeline was overly optimistic
- Single point-of-failures present in several forcing areas
- Quality control and early testing is essential, and this was not done enough (last minute changes on SO2 emissions or volcanic datasets)
- CMIP6 funding was (slightly) better than for CMIP5, but most efforts still rely on mostly unfunded participation, limiting ability to put pressure on developers
- Some datasets are actually a mix of CMIP5/CMIP6 (ozone and Ndep)
- Globally/annually the SLCF emissions didn’t change much from CMIP5 but large differences at regional/seasonal scales
Key points on CMIP6

- It takes a long time to generate and coordinate datasets -> original timeline was overly optimistic
- Single point-of-failures present in several forcing areas
- Quality control and early testing is essential, and this was not done enough (last minute changes on SO2 emissions or volcanic datasets)
- CMIP6 funding was (slightly) better than for CMIP5, but most efforts still rely on mostly unfunded participation, limiting ability to put pressure on developers
- Some datasets are actually a mix of CMIP5/CMIP6 (ozone and Ndep)
- Globally/annually the SLCF emissions didn’t change much from CMIP5 but large differences at regional/seasonal scales
Moving forward

• Communication is critical: should we create a private forum to discuss identified issues within a trusted group? Early automated tests should help!
• Is continual update/evolution of forcing necessary?
• We need to remove bottlenecks -> funding/TSU-like group?
• How do we move away from a single/central estimate forcing -> should that be another MIP/community activity?
• What constitutes an experiment, i.e. can forcings change/get updated?
• Does it really matter that we have “consistency” between forcings?
• Needs and capabilities of modeling groups are changing: are we addressing the new ones? Are we doing un-necessary ones?
  ➢ should ozone be set at PI in a 4xCO2 run?
  ➢ volcanic emissions
  ➢ fire/biogenic emissions/deposition are becoming online calculations in many ESMs