CMIP5 Simulations

- Last Millennium simulation: 850 – 2005 AD
- Mid-Holocene (6000 yrs BP): 500 years
- Last Glacial Maximum (21,000 yrs BP) simulation: 1000 years

All with CCSM4 1-degree model; CMOR-ized & available from PCMDI and/or ESG
CMIP5 Simulations

Last Millennium simulation:
CCSM4 – 1 degree
850 – 2005 AD
Forcings: Solar, Volcanic, GHGs, Land use, and Orbital

Landrum et al., CCSM4 Special Issue, Journal of Climate, submitted.
Paleoclimate Working Group
Highlights for the Last Year

CMIP5 Simulations
- Last Glacial Maximum (21,000 yrs BP) simulation: 1000 years
- Mid-Holocene (6000 yrs BP): 500 years
- Last Millennium simulation: 850 – 2005 AD
All with CCSM4 1-degree model; CMOR-ized & available from PCMDI and/or ESG

Additional PMIP3 and Paleo simulations with CCSM4
- LGM CO$_2$ sensitivity simulation: 1100 years
- Permian-Triassic (251 million yrs ago) simulation: 1000+ years
- Mid-Pliocene (3 million yrs ago): 500 years
PMIP3/PlioMIP with CCSM4 1-degree model
Mid-Pliocene (3 million yrs ago): 500 years

Pliocene MAT change from 1850 Pre-Industrial control (proxy record: PRISM3 Validation Data Set)

Rosenbloom and Otto-Bliesner, Geoscientific Model Development, in prep.
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Future Community Simulations

- PMIP3 Simulations
  - PlioMIP: Mid-Pliocene (3 million yrs ago): CESM (CAM5)-2 deg

- Joint with BGC WG
  - PCMIP: Coupled carbon-climate for past epochs: CESM-BGC-1 deg
    - 6000 yrs BP (Mid-Holocene) and 21,000 yrs BP (LGM)

- Joint with LIWG
  - PMIP3 Last Interglacial Transient (130,000-110,000 yrs BP):
    - CESM(CAM5)-CISM-1 deg
  - Glacial Inception: CAM5,SOM-¼ deg; CAM5-CISM-1deg

- Cross WG Community Ensembles
  - Transient Last Millennium: Full and Single Forcings:
    - CESM(CAM5)-2deg + WACCM5-2deg
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Developments: Highlights for the Last Year

- Paleoclimate User’s Guides
- Isotope-enabling CESM: water and carbon isotopes
  - Atmosphere-land: CU group (Noone, Nussberger, Wong), NCAR (Gettelman, Bardeen), DOE Berkeley (Riley), Bern (Joos, Bozbiyik)
  - Ocean: NCAR-UWisc (Brady, Zhang, Lindsay)

CLM4 $\delta^{13}$C: signature of GPP

Figure of preliminary results courtesy of Joos and Bozbiyik
Paleoclimate Working Group
Developments: Highlights for the Last Year

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  - Ocean: NCAR-UWisc (Brady, Zhang, Lindsay, Jahn)

Figure of preliminary results courtesy of Zhang and Brady
Isotope-enabling CESM:CAM5: CSL proposal

- Water isotopes
  - PI and LGM controls + N. Atlantic and Southern Ocean meltwater perturbations on these controls: CESM(CAM5)-water isotopes-2 deg
  - Dependence on atmospheric resolution, CAM5-water isotopes-FV 2 deg, 1 deg, ½ deg, ¼ deg

- Carbon isotopes
  - Land and atmosphere spinups
  - Ocean implementation and spinup: BGC WG
  - PI and LGM controls: CESM(CAM5)-BGC-carbon isotopes-1 deg