Layout of LS3MIP

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Recently published

Geosci. Model Dev., 9, 2809–2832, 2016
www.geosci-model-dev.net/9/2809/2016/
doi:10.5194/gmd-9-2809-2016

Geoscientific Model Development
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EGU

LS3MIP (v1.0) contribution to CMIP6: the Land Surface, Snow and Soil moisture Model Intercomparison Project – aims, setup and expected outcome

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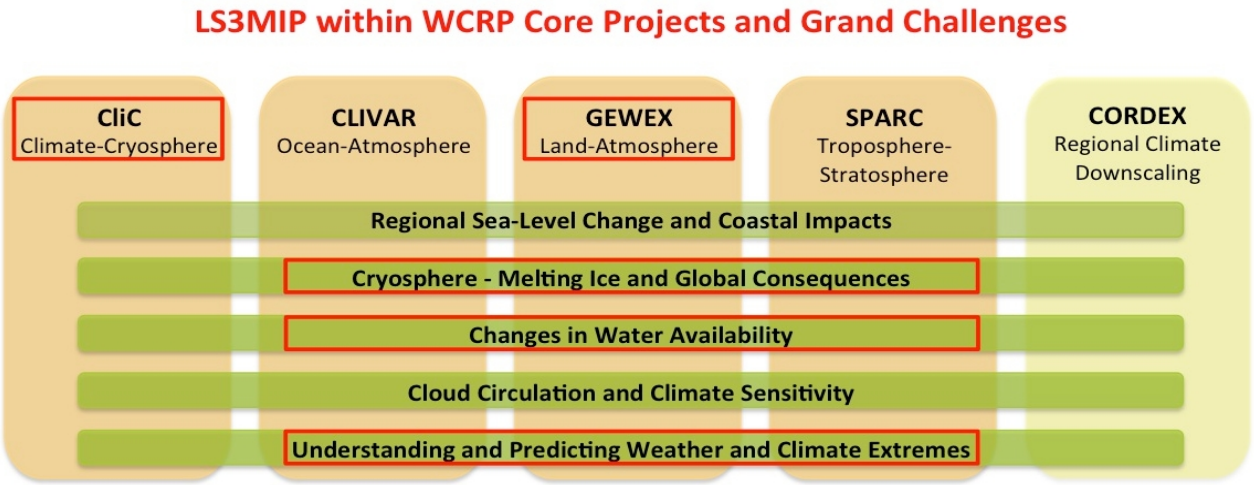
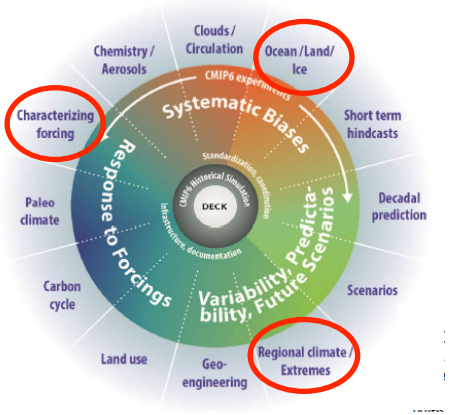
Overview and scientific goal

- Multi-model based reconstruction of land surface (from early 20th century)
- Explore land-atmosphere coupling and its impacts (for climate trends, water resources, predictability)
- Link patterns and trends of ECVs to model properties and biases

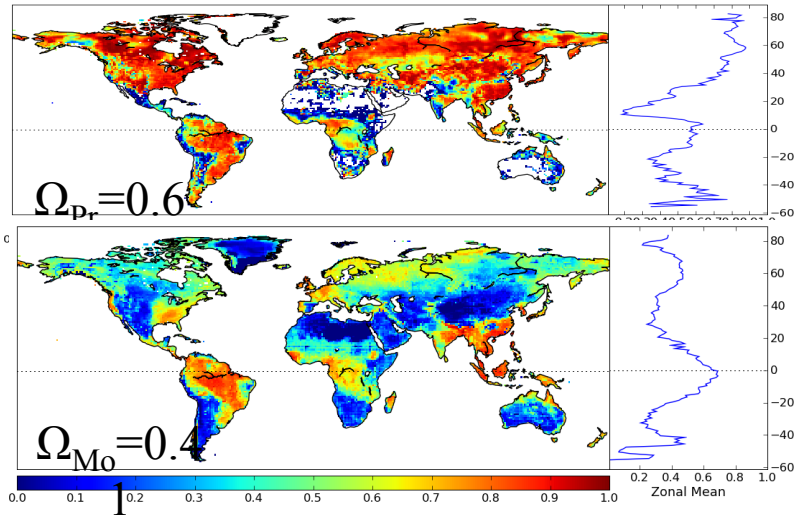




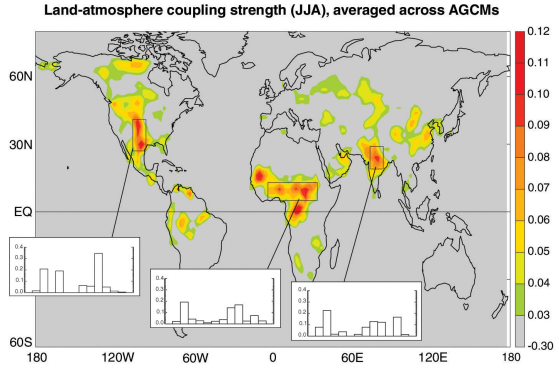
Gap filled by LS3MIP (1)

- Map (uncertainty of) water resources over the 20th century (and beyond)

Kim et al (2015) showing that disparity in GSWP2 runoff from uncertainty in precipitation is much less than model uncertainty



- Explore model-dependent land-atmospheric coupling

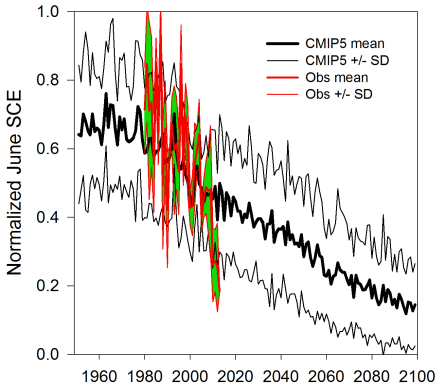


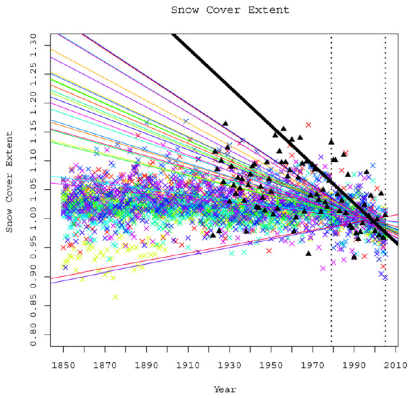
Koster et al (2006): GLACE result showing model-specific land-atmospheric coupling strength

Land Surface, Soil moisture and Snow Model Intercomparison Project

Gap filled by LS3MIP (2)

- Ability of climate models to capture observed rates of spring snow cover

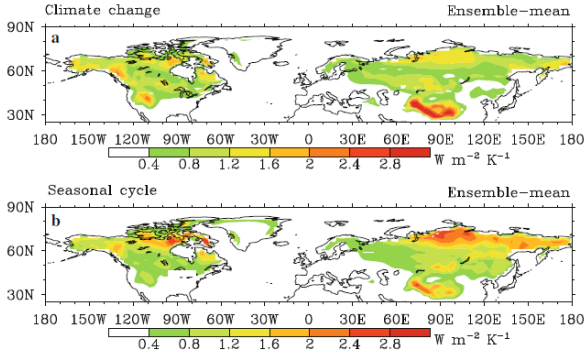


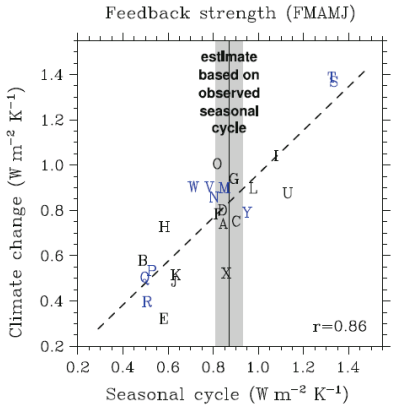


Brutel-Vuilmet et al. (2012); Derksen and Brown (2012): CMIP5 models underestimate the significant reductions in spring snow cover extent observed during the satellite era

- Linkage between snow-albedo feedback and 21st century warming

Qu and Hall (2013): The spread in snow albedo feedback accounts for much of the CMIP5 spread in the 21st century warming of Northern Hemisphere land masses





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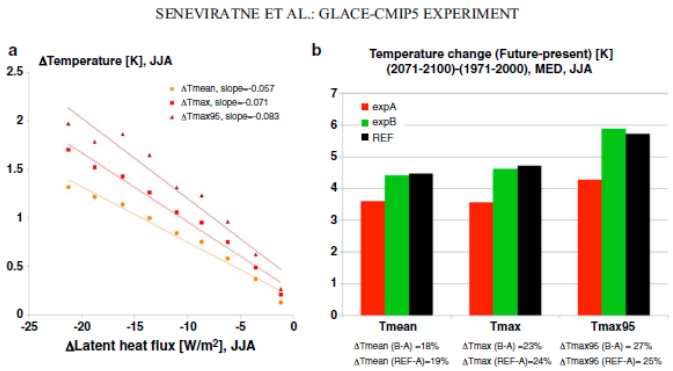
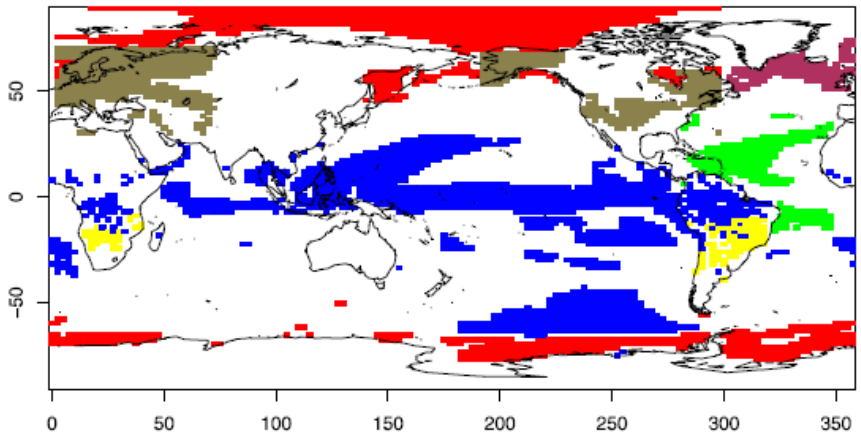
Gap filled by LS3MIP (3)

- Soil moisture affecting the climate change signal



Seneviratne et al (2014): GLACE-CMIP5 result showing effect of prescribing 20th century soil moisture climatology

- (Seasonal) Predictability can alter in a warmer climate



Del Sole et al (2014): Changes in seasonal predictability as a result of a trade-off between more signal and more noise in a warmer world

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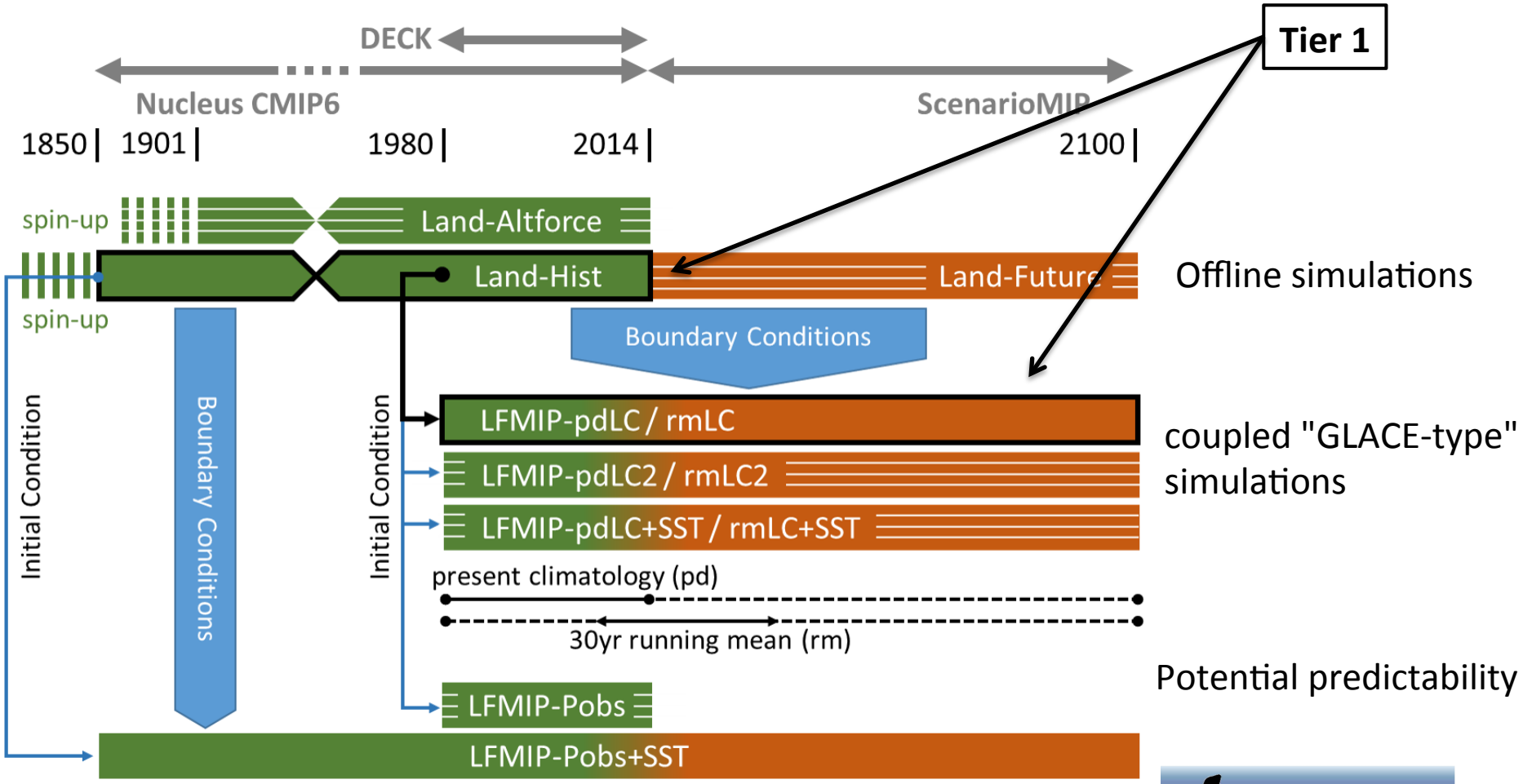
Experimental overview



Participants

- ACCESS
- BCC-CSM2-MR
- CanESM
- CESM
- CMCC
- CNRM-CM
- EC-Earth
- FGOALS
- GFDL
- GISS
- IPSL-CM6
- MIROC6-CGCM
- MPI-ESM
- MRI-ESM1.x
- NorESM
- UKESM

Discussion items on LS3MIP-affairs

- LMIP
  - status of forcing/documentation/testing
  - …
- LS3MIP
  - prescribing soil m and snow together
  - early experiments for tests?
  - …

Land Surface, Soil moisture and Snow Model Intercomparison Project