

CMIP7: Overview (including specification of emission forcing)

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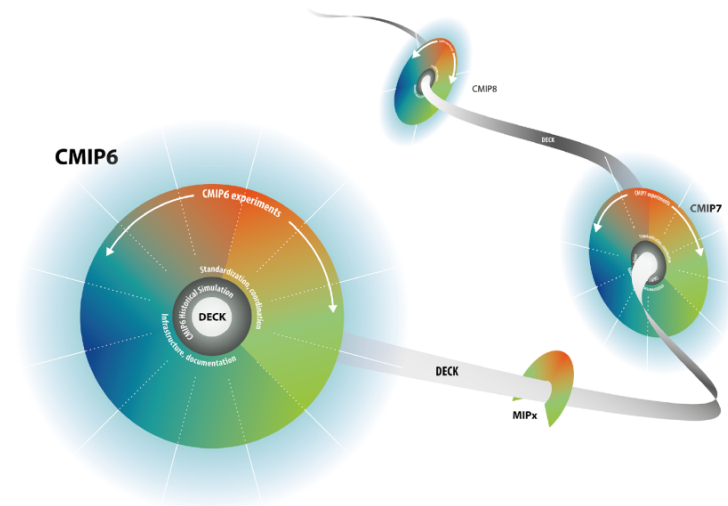
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Background on CMIP

- The objective of the Coupled Model Intercomparison Project (CMIP) is to better understand past, present and future climate changes arising from natural, unforced variability or in response to changes in radiative forcing in a multi-model context.
- Started in 1995 -> first set **common** experiments: comparing the model response to an **idealized** forcing - a constant rate of increase which was accomplished using a CO₂ increase of 1% per year compounded.
- Strong emphasis on specified data format (CMOR) and distribution (ESGF)
- CMIP schedule has been tied to IPCC Assessment Reports, as results/papers from CMIP simulations have been used extensively in the ARs.
- All CMIP activities are overseen by a coordinated pair of subcommittees: the [CMIP Panel](#) and the [WGCM Infrastructure Panel](#) (WIP).

Diagnostic, Evaluation, and Characterization of Klima (DECK)

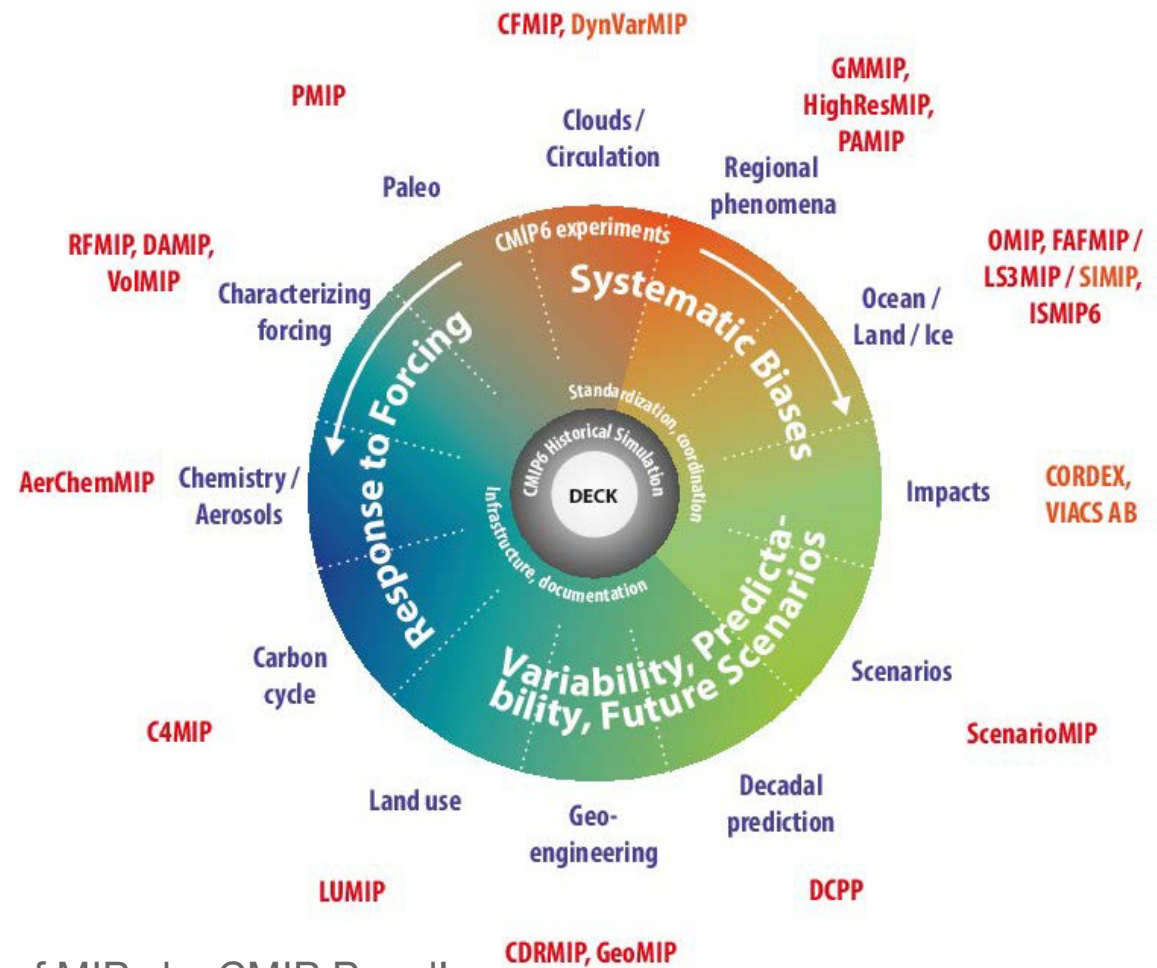


- Pre-industrial control
- 1%CO₂
- 4xCO₂
- AMIP

Eyring et al. (GMD, 2016)

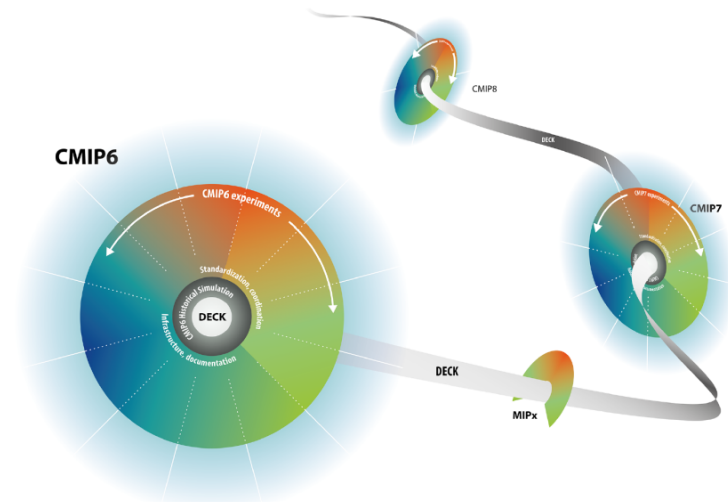
NCAR
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CMIP6



Process for approval of MIPs by CMIP Panel!

Diagnostic, Evaluation, and Characterization of Klima (DECK)

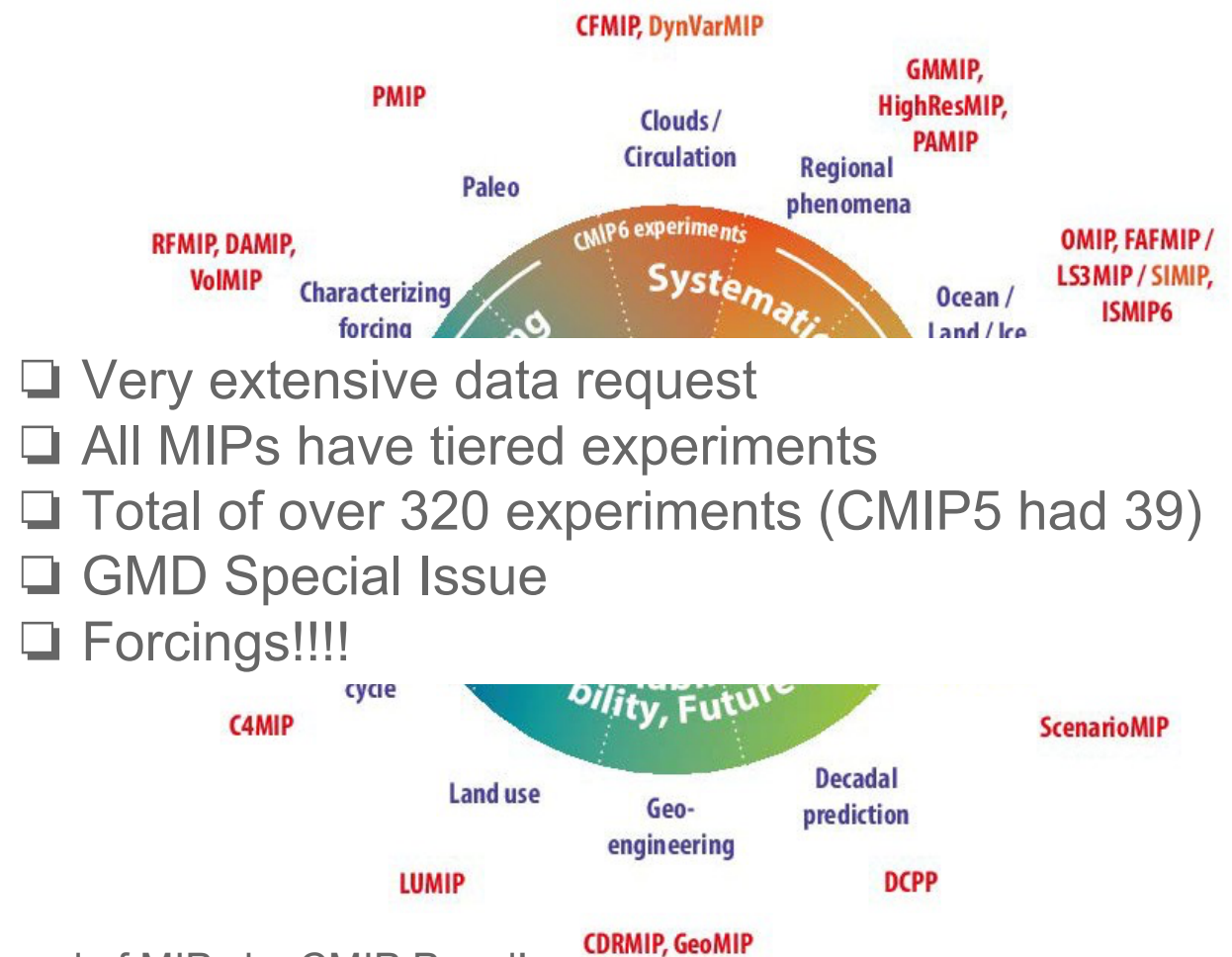


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CMIP6



- ❑ Very extensive data request
- ❑ All MIPs have tiered experiments
- ❑ Total of over 320 experiments (CMIP5 had 39)
- ❑ GMD Special Issue
- ❑ Forcings!!!!

Process for approval of MIPs by CMIP Panel!

Current status of CMIP6

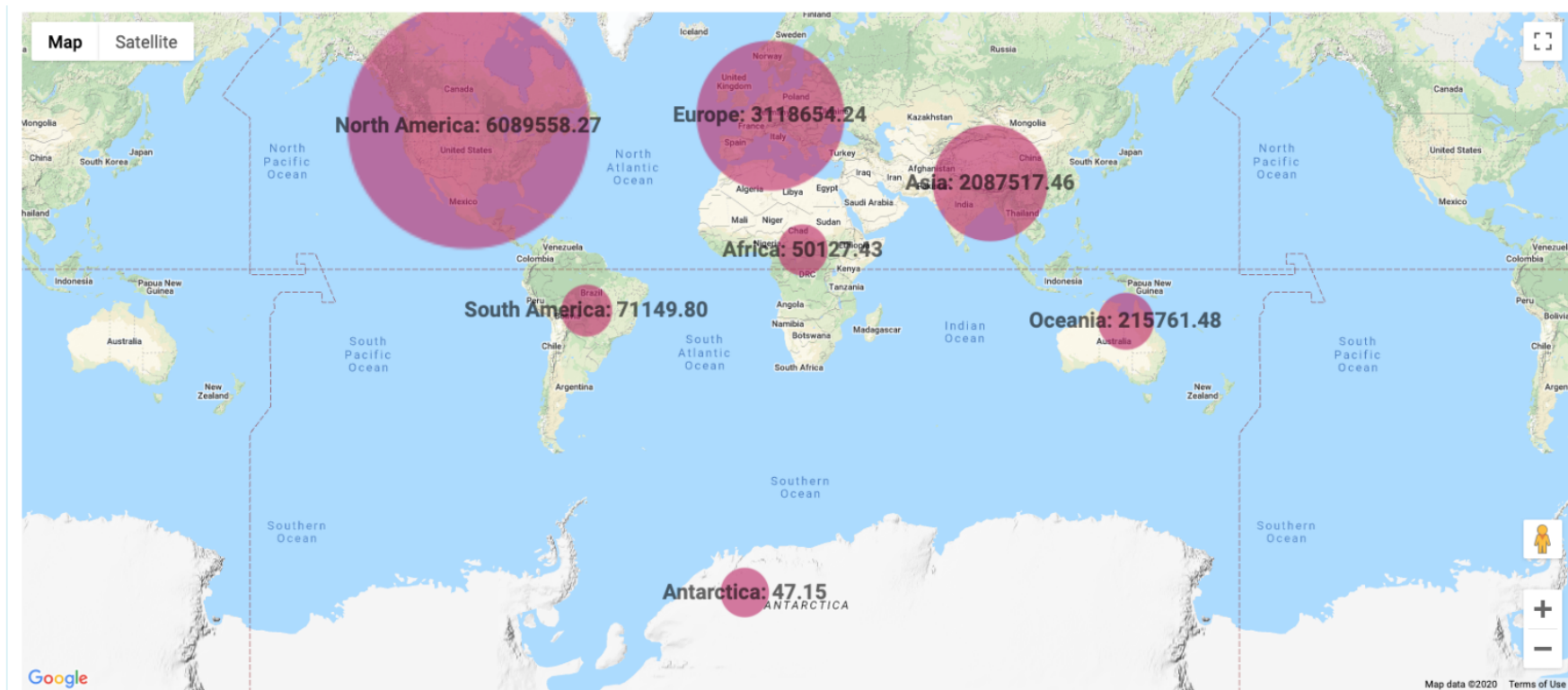
- **CMIP6/AR6:** delay in acceptance deadline gives modeling group the opportunity to perform additional simulations (or fixing issues in existing ones)
- **“Hallway” conversations:**
 - CMIP6 too complex (number of experiments, data requirements, ...)
 - Some MIPs have (very) few participants
 - Issues with forcings
 - Is this the best/most useful science/kW or science/FTE?
 - ...

Current status of CMIP6

- **CMIP6/AR6:** delay in acceptance deadline gives modeling group the opportunity to perform additional simulations (or fixing issues in existing ones)
- **“Hallway” conversations:**
- **Number of participating models/model versions: 136 (53 centers)**
- **Generated data: ~ 9 PB**

Are we reaching out the interested communities?

CMIP6 downloaded data volume by continent



Forcings

- **Which forcings do we need for CMIP?**
 - LLGHGs concentrations (and emissions)
 - SLCF emissions (anthro, **biomass burning**, **natural**)
 - Volcanic emissions/concentrations
 - Aerosol/ozone concentrations
 - Land use-land cover change
 - Deposition (nitrogen,...)
 - Solar forcing
 - ?

Forcings

- Which forcings do we need for CMIP?
- How frequently should we update them?
 - > obvious case with COVID
 - > updated forcings need to be very explicitly identified to avoid analysis issues (forcing is part of the experiment design!)
- Broader questions of how to support/coordinate/fund teams generating forcings

CMIP7?

- Should there be a CMIP7 and if so what would it look like? What should be the timeline?
- Continuum between synchronized monolith (like CMIP6) and nimble but less organized one-offs as an issue/choice for CMIP7
- CMIP5 survey (Stouffer et al., BAMS, 2017) was critical in identifying the path from CMIP5 to CMIP6 -> expecting many discussions after survey results
- CMIP Panel composition will be re-visited after decision on CMIP7 to ensure the best match with plan