What is GMMIP?

- **GMMIP:**

  Global Monsoons Modeling Inter-comparison Project

- **One of the 18 MIPs for WCRP CMIP6**

- **Proposed by former CLIVAR AAMP, now CLIVAR/GEWEX Monsoons Panel & CLIVAR/C20C+**

- **Co-chairs: Tianjun Zhou, Andy Turner, James Kinter III**

- **Secretariat: LASG/IAP**

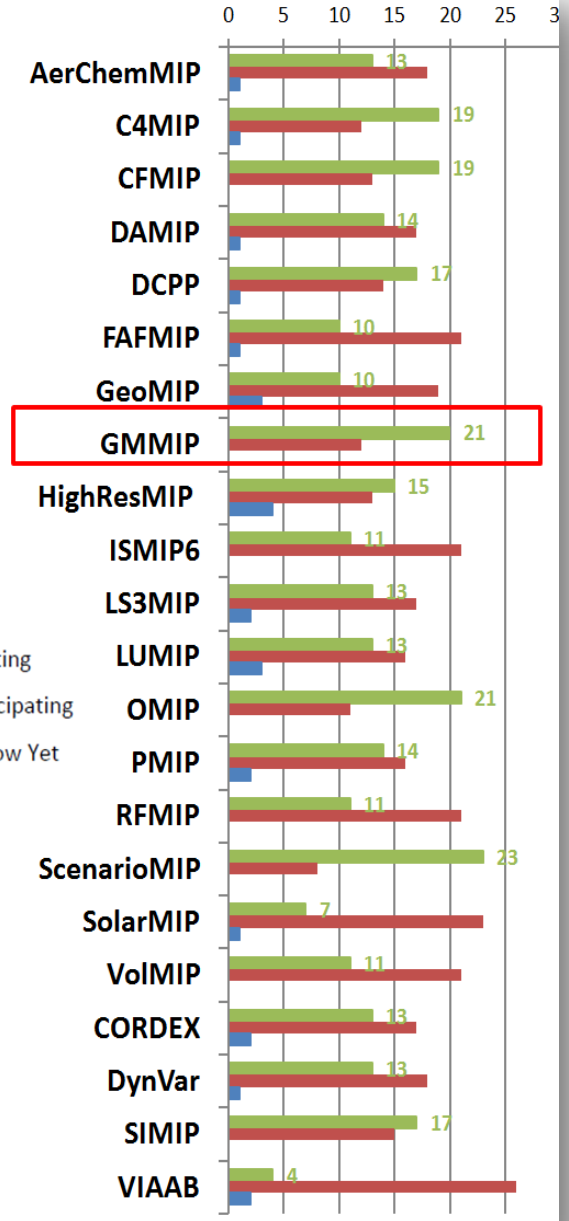
WCRP World Climate Research Programme

cmip Coupled Model Intercomparison Project

Proposals from CMIP6-Endorsed MIPs

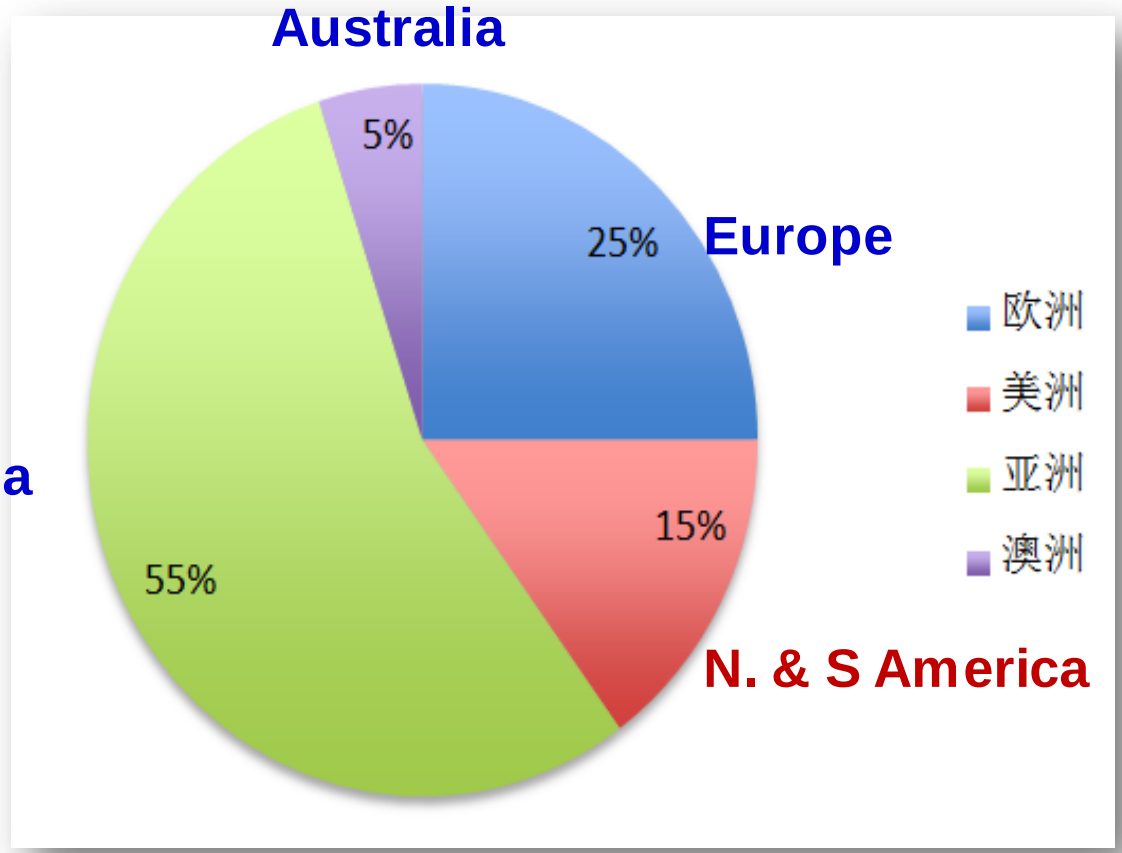
Proposals from CMIP6-Endorsed MIPs & Model Groups' Commitments to Participate in each MIP

	Long Name of MIP (Short Name of MIP)
1	Aerosols and Chemistry Model Intercomparison Project (AerChemMIP)
2	Coupled Climate Carbon Cycle Model Intercomparison Project (C4MIP)
3	Cloud Feedback Model Intercomparison Project (CFMIP)
4	Detection and Attribution Model Intercomparison Project (DAMIP)
5	Decadal Climate Prediction Project (DCPP)
6	Flux-Anomaly-Forced Model Intercomparison Project (FAFMIP)
7	Geoengineering Model Intercomparison Project (GeoMIP)
8	Global Monsoons Model Intercomparison Project (GMMIP)
9	High Resolution Model Intercomparison Project (HighResMIP)
10	Ice Sheet Model Intercomparison Project for CMIP6 (ISMIP6)
11	Land Surface, Snow and Soil Moisture MIP (LS3MIP)
12	Land-Use Model Intercomparison Project (LUMIP)
13	Ocean Model Intercomparison Project (OMIP)
14	Palaeoclimate Modelling Intercomparison Project (PMIP)
15	Radiative Forcing Model Intercomparison Project (RFMIP)
16	Scenario Model Intercomparison Project (ScenarioMIP)
17	Solar Model Intercomparison Project (SolarMIP)
18	Volcanic Forcings Model Intercomparison Project (VolMIP)
19	*Coordinated Regional Climate Downscaling Experiment (CORDEX)*
20	*Dynamics and Variability of the Stratosphere-Troposphere System (DynVar)*
21	*Sea-Ice Model Intercomparison Project (SIMIP)*
22	*Vulnerability, Impacts, and Adaptation Advisory Board for CMIP6 (VIA AB)*



CMIP
The World Climate Research Programme's Coupled Model Intercomparison Project

Model groups' commitment to participate in GMMIP



21 model groups from 14 countries

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Primary Scientific Questions of GMMIP

1. What are the relative contributions of internal processes and external forcings that have driven the 20th century historical evolution of global monsoons?
2. To what extent and how does the ocean-atmosphere interaction affect the interannual variability and predictability of monsoons?
3. How well can developing high-resolution models and improving model dynamics and physics help to reliably simulate monsoon precipitation and its variability and change?
4. What are the effects of Eurasian orography, in particular the Himalaya/Tibetan Plateau, on the regional/global monsoons?

GOALS of GMMIP

- To deepen our understanding of models' capability in reproducing the monsoon mean state and its natural variability, as well as the forced response to natural and anthropogenic forcing.
- Help to reduce model uncertainty and improve the credibility of models in projecting future changes in the monsoon.
- The coordinated experiments will also advance our physical understanding and prediction of monsoon changes.

WCRP Grand Challenges

Rank the WCRP GCs and GMMIP theme of collaboration :

(1)Clouds, circulation and climate sensitivity *(Rank-2)*,

(2)Changes in cryosphere,

(3) Climate extremes *(Rank-2)*,

(4) Regional climate information *(Rank-1)*,

(5) Regional sea-level rise, and

(6) Water availability *(Rank-2)*,

plus an additional theme on “Biogeochemical forcings and feedbacks”

Main Experiments

All the GMMIP partners are encouraged to conduct both the Tier-1 and Tier-2 experiments.

	EXP name	Integration time	Description	Model type	Motivation
Tier-1	AMIP 20C	1870-2014	Extended AMIP run that covers 1870-2014.	AGCM run, min realization 3	understand the roles of SST forcing and external forcings
Tier-2	HIST-IPO	1870-2014	Pacemaker 20th century historical run that includes all forcing as used in CMIP6 Historical Simulation, and the observational historical SST is restored in the tropical lobe of the IPO domain (20° S-20° N, 175° E-75° W)	CGCM min realization 3	understand the forcing of IPO-related tropical SST to global monsoon changes.
	HIST-AMO	1870-2014	Same as HIST-IPO, but the observational historical SST is restored in the AMO domain (0° -70° N, 70° W-0°)	CGCM min realization 3	understand the forcing of AMO-related SST to global monsoon changes

Tiered Experiments

	EXP name	Integration time	Description	Model type	Motivation
Tier-3	DTIP	1979-2014	The topography of the TIP is modified by setting surface elevations to 500m	AGCM run, min realization 1	Understanding the combined thermal and mechanical forcing of the TIP.
	DTIP-DSH	1979-2014	Surface sensible heat released at the elevation above 500m over the TIP is not allowed to heat the atmosphere	AGCM run, min realization 1	Understanding the thermal forcing of the TIP
	DHLD	1979-2014	The topography of the highlands in Africa, N. America and S. America TP is modified by setting surface elevations to a certain height (500m),	AGCM run min realization 1	Understanding the combined thermal and mechanical forcing of other plateaus except the TIP.