Institute of Atmospheric Physics, Chinese Academy of Sciences

Our Modeling Groups for CMIP6: Where are we now ?

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Outline

- Summary of where you are with CMIP6
- Ongoing engagement with CMIP Science
- Appetite for CMIP7

Summary of where you are with CMIP6: Model Names

Affiliation	ESM/CSM	AGCM	LSM	OGCM	SIM	Contact Person
Chinese Academy of Sciences (CAS)	CAS ESM	IAP AGCM5.0 + AACM	CoLM + IAP DGVM	LICOM2 + IAP OBGCM	CICE4.0	He Zhang (zhanghe@mail.iap.ac.cn)
	CAS FGOALS-g	GAMIL 3	CAS-LSM	LICOM3	CICE4.0	Lijuan Li (ljli@mail.iap.ac.cn)
	CAS FGOALS-f	FAMIL	CLM4.5	LICOM3	CICE4.0	Bian He (heb@lasg.iap.ac.cn) Yongqiang Yu (yyq@lasg.iap.ac.cn)
Universities	CICSM	Modified CAM5	CLM4.0	POP2	CICE4.1	Yanluan Lin (yanluan@tsinghua.edu.cn)
	NUIST-CSM	ECHAM –NUIST	JSBACH v3.1	NEMO 3.4	CICE 4.1	Jian Cao (esmc@nuist.edu.cn)
China Meteorology Administration (CMA)	BCC-ESM1 BCC-CSM2-MR BCC-CSM2-HR	BCC-AGCM3-Chem BCC-AGCM3-MR BCC-AGCM3-HR	BCC-AVIM2	MOM4_L40 MOM4_L40 MOM5_L50	SIS1 SIS1 SIS2	Tongwen Wu (twwu@cma.gov.cn)
	CAMS-CSM	ECHAM5.0	CoLM	MOM4	SIS	Xinyao Rong (rongxy@cma.gov.cn)
Ministry of Natural Resources (MNR)	FIO-ESM	CAM5	CLM4.0 + DGVM	POP2+Wave	CICE4.0	Zhenya Song (songroy@fio.org.cn)

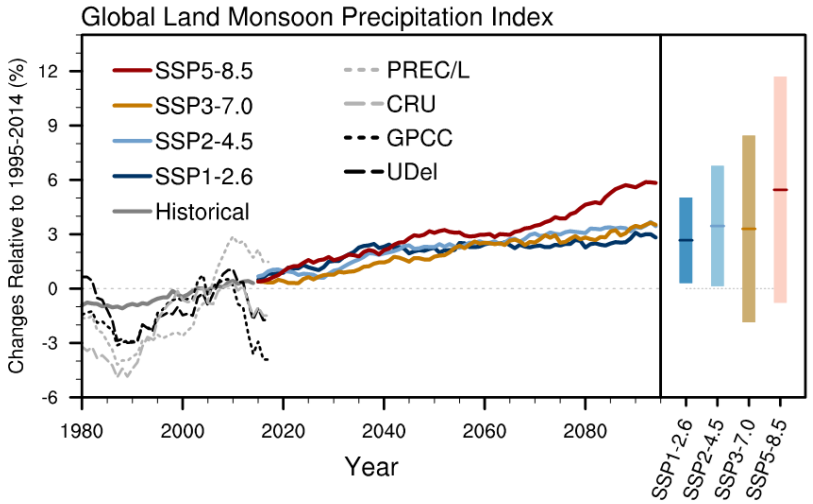
Summary of where you are with CMIP6: Data uploaded to ESG nodes

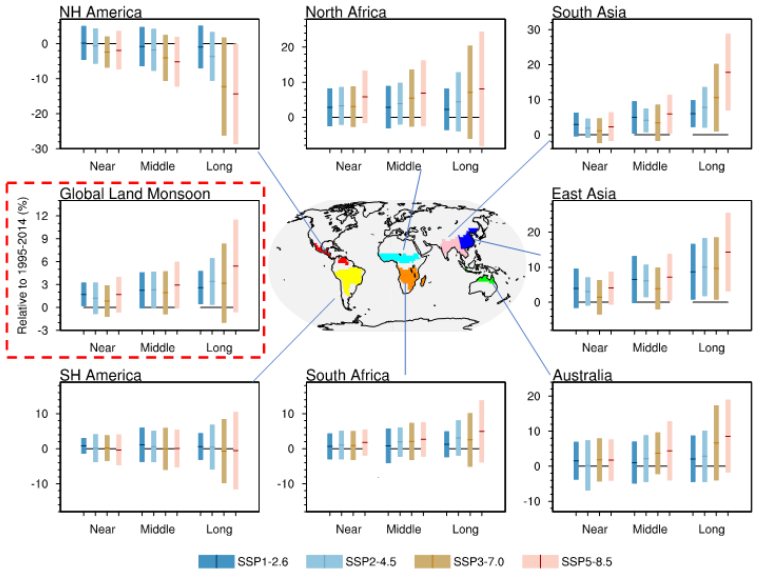
	MIPs	CAS			Universities		CMA		MNR	Total
		CAS ESM	FGOALS-g	FGOALS-f	THU	NUIST	BCC	CAMS	FIO	
0	DECK									8
1	AerChemMIP									3
2	C4MIP									2
3	CDRMIP									0
4	CFMIP									1
5	CMIP									8
6	DAMIP									2
7	DCPP									2
8	FAFMIP									2
9	GMMIP									6
10	GeoMIP									0
11	HighResMIP									3
12	ISMIP6									0
13	LS3MIP									2
14	LUMIP									2
15	OMIP									3
16	PAMIP									1
17	PMIP									3
18	RFMIP									0
19	ScenarioMIP									8
20	SIMIP									1
21	VolMIP									0
22	CORDEX									0

Done Ongoing Not Participating

Global Monsoon Model Inter-comparison Project (GMMIP)

Global land monsoon precipitation changes in CMIP6 projections



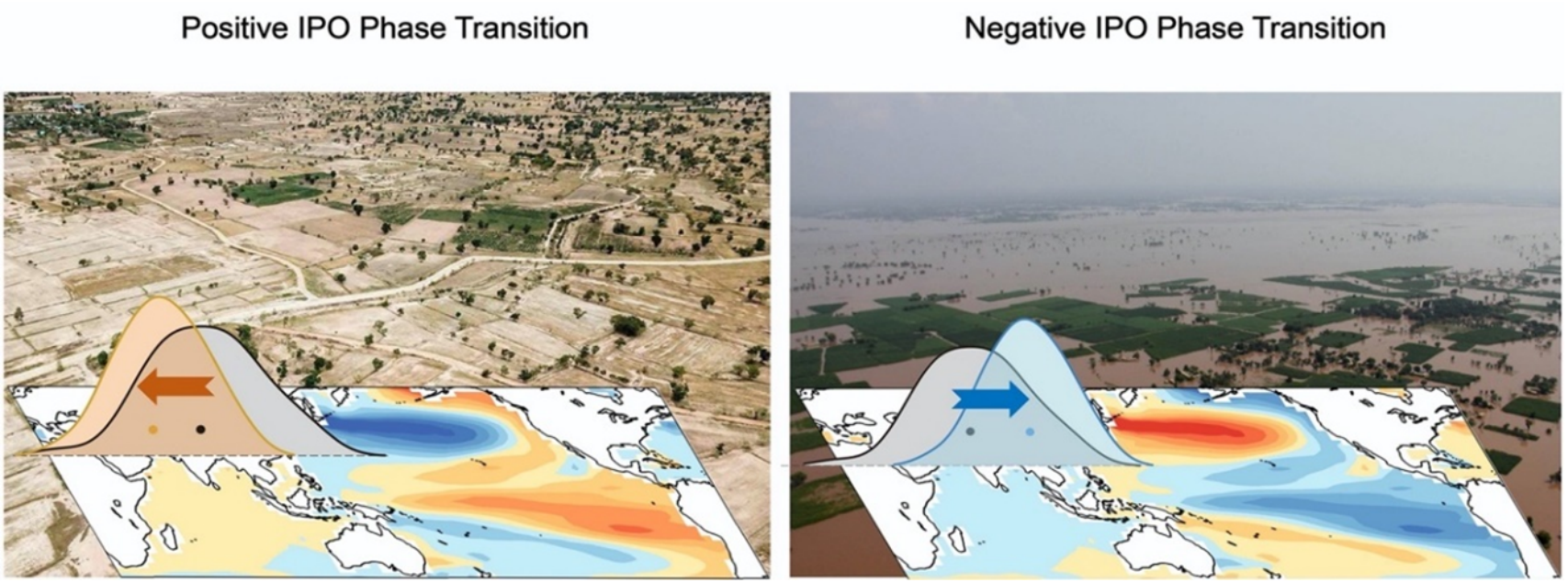


- The GLM summer precipitation is projected to increase by 1.76±1.57% (2.54±2.22%), 1.33±1.97% (3.52±3.05%), 0.96±2.04% (3.51±4.97%), 1.71±2.38% (5.75±5.92%) in the near-term (long-term) under Shared Socioeconomic Pathway (SSP) 1-2.6, SSP2-4.5, SSP3-7.0 and SSP5-8.5, respectively.
- The enhancement is caused by thermodynamic responses due to increased moisture, which is partly offset by dynamic responses due to weakened circulation.

Chen, Z., Zhou T.*, Zhang L., Chen X., Zhang W., Jiang J. (2020). Global land monsoon precipitation changes in CMIP6 projections. *Geophysical Research Letters*, 47, e2019GL086902

Ongoing engagement with CMIP Science: Global Monsoon Model Inter-comparison Project (GMMIP)

Constrain the near-term projection of Asian monsoon precipitation by IPO

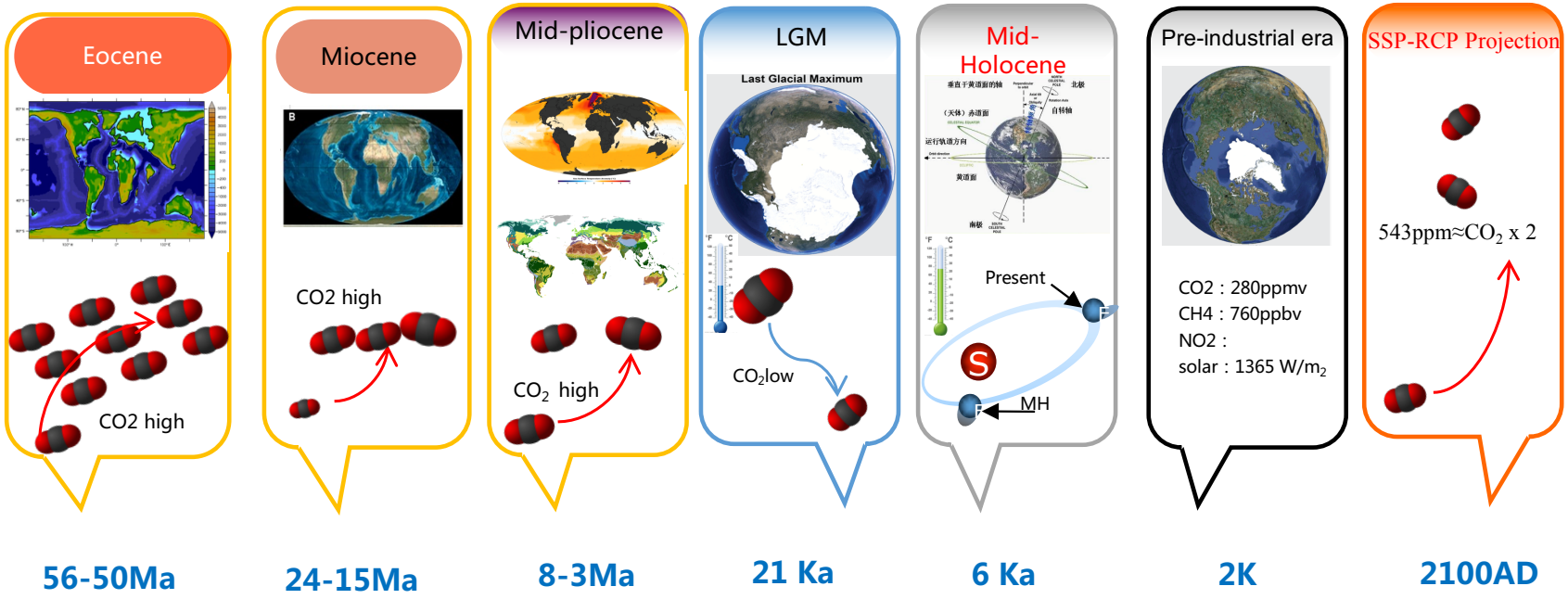


- Removing the IPO-related signal would reduce the uncertainties in the near-term projection of Asian summer monsoon rainfall by 13 to 15%
- Near-term (2016-2045) with IPO+: more chance of an extreme drying trend (increase from 10 to 32%)
- Near-term (2016-2045) with IPO-: more chance of a positive wetting trend (96%)

Huang X, T. Zhou* et al. 2020: South Asian summer monsoon projections constrained by the interdecadal Pacific oscillation. *Science Advances* 2020; 6 : eaay6546

GMMIP update in CMIP7:

Extend the time scale of GMMIP from 20th & 21st century to *paleoclimate* through cross-MIPs collaboration with PMIP



Appetite for CMIP7

Group name	Affiliation	Model name	Appetite for CMIP7
IAP/CAS	Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS)	CAS ESM	Yes
		CAS FGOALS-g	Yes
		CAS FGOALS-f	Yes
THU	Department for Earth System Science (CESS), Tsinghua University (THU)	CICSM	Yes
NUIST	Nanjing University of Information Science and Technology (NUIST)	NUIST-CSM	Yes
BCC	Beijing Climate Center (BCC) / China Meteorological Administration (CMA)	BCC-ESM2 BCC-CSM3	Yes
CAMS	Chinese Academy of Meteorological Science (CAMS) / CMA	CAMS-CSM	Yes
FIO	First Institute of Oceanography (FIO) / Ministry of Natural Resources (MNR)	FIO-ESM	Yes

FGOALS: Flexible Global Ocean-Atmosphere-Land System **CICSM:** Community Integrated CSM