

CEOP-based Diagnosis of Prediction Skill of Four Operational GCMs and One Land Data Assimilation System

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Abstract

This study evaluated prediction skill of four operational GCMs (**BMRC, JMA, NCEP, and UKMO**) and NASA global land data assimilation system (**GLDAS**) through comparisons between in situ data and model output of CEOP/EOP 3 (2002/10/1~2003/9/30).

This evaluation not only contributes to improving forecast skill but also provides guidance for data users to choose appropriate data from these model products for their applications.

Data: In situ and model output at 27 sites

CSE	Reference Site Name	Code	Lat. (N)	Lon. (E)	Ele. (m)	Data availability					References/PI	Vegetation Type				
						Ta&qa	Tsfc	Radiation	Flux	Rain		In-situ	JVA	NCEP	UKMD	GLDAS
BALTEX	Lindenberg	LIN	52.2	14.1	112						Beyrich & Adam(2004)	Grassland	Savanna	Cultivations	Grass	Openland
	Cabauw	CAB	52.0	4.9	-1						Isemer (2002)	Short grass	Savanna	Groundcover only	Grass	Openland
	Sodankylä	SOD	67.4	26.7	179					O	Isemer (2002)	Needleleaf evergreen trees	Needleleaf evergreen trees	needleleaf evergreen trees	Needleleaf trees	Bareground
GAPP	ARM Southern Great Plains	SGP	36.6	-97.5	313						Raymond McCord	Grassland	Med forest	Cultivations	Grass	Openland
	Bondville	BON	40.0	-88.3	300						Tilden P. Meyers	Openland	savanna	Cultivations	Grass	Openland
	Fort Peck	FPE	48.3	-105.1	800						Tilden P. Meyers	Grassland	Grasslands	Groundcover only	Grass	Grassland
	Oak Ridge	ORI	36.0	-84.3	275						Tilden P. Meyers	Med forest	Med forest	Med forest	Broadleaf trees	Wooded Grassland
CAMP	Eastern Siberian Tundra	ES1	71.6	128.8	38						Ohata et al. (1999)	Open Shrubland	Ocean	Tundra	Bare Soil	Open Shrubland
	Eastern Siberian Tiaga	ES2	62.3	129.6	220						Ohia et al. (2001)	Needleleaf deciduous trees	Needleleaf deciduous trees	Needleleaf deciduous trees	Needleleaf trees	Wooded Grassland
	Mongolia	MCN	45.7	106.3	1393						Kaihotsu et al. (2003)	Grassland	Grasslands	Bare soil	Bare Soil	Grassland
	Tongyu	TON	44.4	122.9	184						Wenjie Dong & Huizhi Liu	Openland	Grasslands	Cultivations	Grass	Openland
	Tibet	TIB	31.4	91.9	4580						Ishikawa et al. (2001)	Grassland	Grasslands	Bare soil	Grass	Grassland
	West Tibet	GAI	32.5	84.1	4416						Ishikawa et al. (2001)	Grassland	Bare soil	Bare soil	Shrubs	Bareground
	Himalayas	HIM	28.0	86.8	5050						Bollasina et al. (2002)	Grassland	Grasslands	Med forest	Grass	Bareground
	North South China Sea	NSC	25.0	121.2	8	O		O			Chen et al. (2004)	NA	Ocean	groundcover only	Grass	Shrubs
	Korean Haenam	KHA	34.6	126.6	14						Kim et al. (2002)	groundcover only	Savanna	Groundcover only	Grass	Wooded Grassland
	Korean Peninsula	KPE	37.4	127.9	330						Kim et al. (2002)	Broadleaf deciduous trees	Broadleaf deciduous trees	Cultivations	Grass	Openland
	Chao-Phraya River - Lampang	CPL	18.4	99.5	241						Masatoshi AOKI	Deciduous Forest	Savanna	Cultivations	Broadleaf trees	NA
	North-East Thailand	NET	14.5	102.4	311						Masatoshi AOKI	Broadleaf deciduous trees	Savanna	Broadleaf deciduous trees	Broadleaf trees	Openland
	Western Pacific Ocean	WPO	7.1	134.3	40	O		O			Kubota et al. (2002)	NA	Ocean	Ocean	Ocean	Ocean
Equatorial Island	EIS	-0.2	100.3	699						Mori et al. (2004)	NA	Tropical forest	Cultivations	Broadleaf trees	Grassland	
LBA	Manaus	MAN	-2.6	-60.2	130			O	O		Marengo et al. (2003)	tropical forest	Tropical forest	Tropical forest	Tropical forest	Tropical forest
	Santarem	SAN	-3.0	-55.0	N/A						Marengo et al. (2003)	tropical forest	Tropical forest	Tropical forest	Tropical forest	Tropical forest
	Pantanal	PAN	-19.6	-57.0	N/A						Marengo et al. (2003)	Savanna	Savanna	Savanna	Grass	Wooded Grassland
ARM	ARM NSA-Barrow	NSA	71.3	-156.6	8						Tilden P. Meyers	Open Shrubland	Tundra	Tundra	Bare Soil	Open Shrubland
	ARM TWP-Manus	MNS	-2.1	147.4	4	O		O			Raymond McCord	NA	Ocean	Ocean	Ocean	Ocean
	ARM TWP-Darwin	DAR	-12.4	130.9	29.9						Raymond McCord	Savanna	Savanna	Savanna	Broadleaf trees	Wooded Grassland

GCMs

- Models
 - BMRC, Australia
 - JMA, Japan
 - NCEP, USA
 - UKMO, UK
- Evaluation
 - Radiation schemes
 - Cumulus schemes
 - Land surface schemes
 - Precipitation diurnal cycle

GLDAS

- Model operators
 - Mosaic
 - CLM
 - Noah
- Evaluation
 - Surface temperature
 - Surface energy budget

Poster

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