

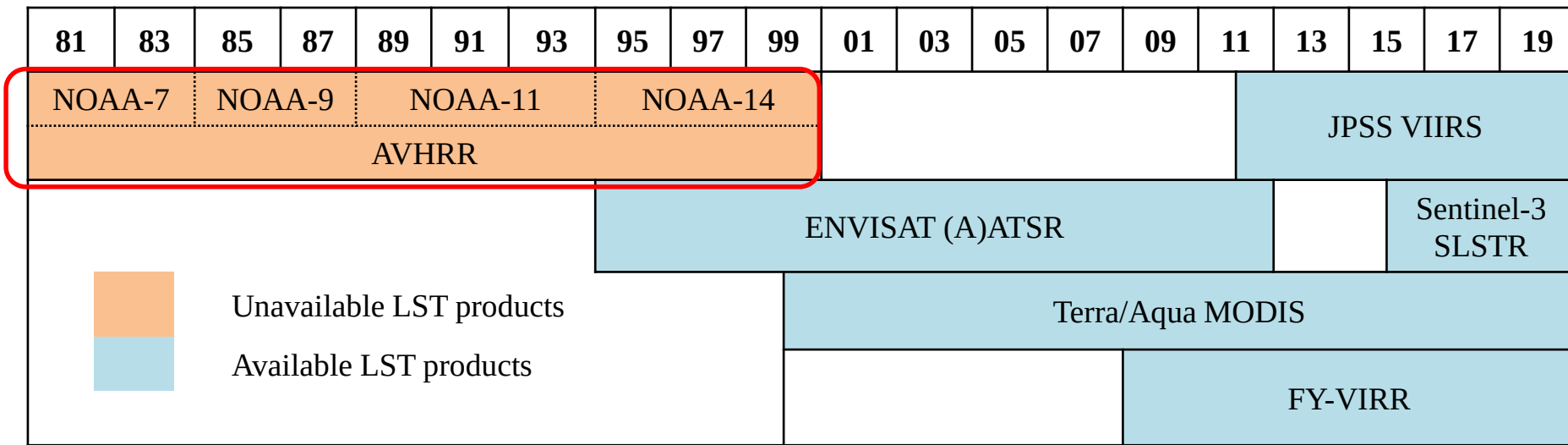
Global Land Surface Temperature from historical NOAA AVHRR datasets (1981-2000)

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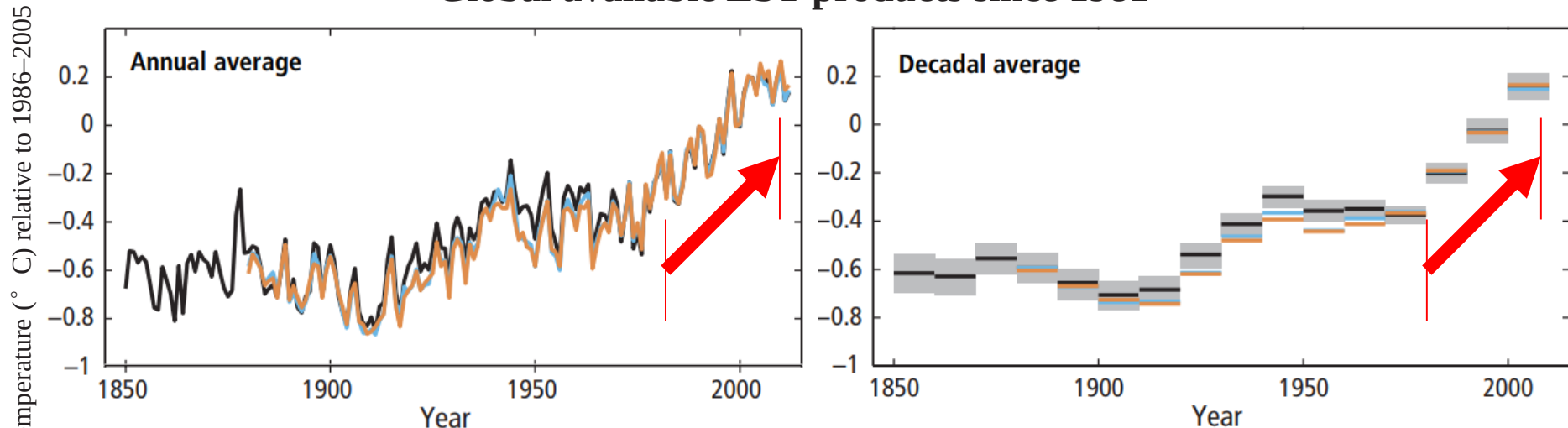
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Motivation



Global available LST products since 1981

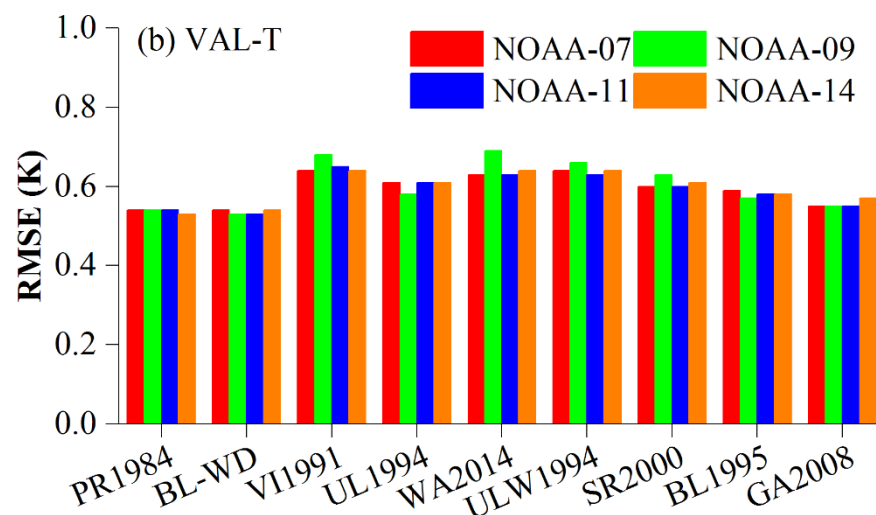
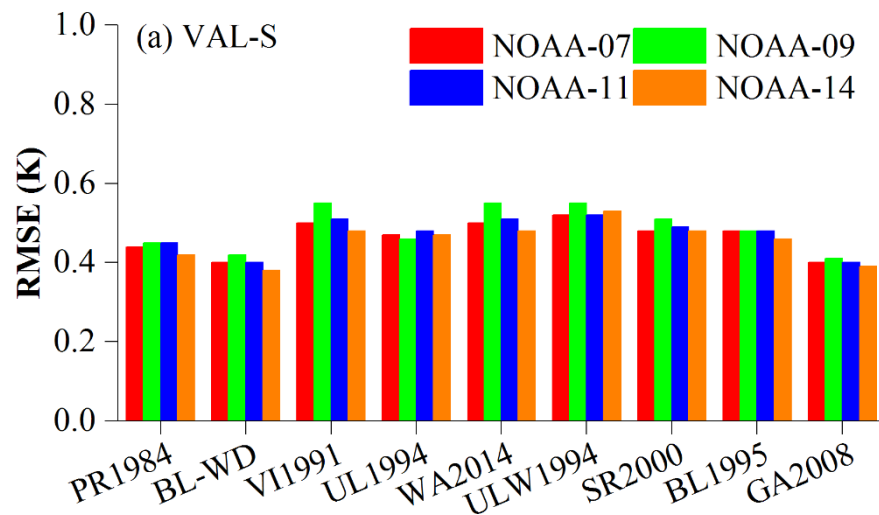


Observed globally averaged combined land and ocean surface temperature anomaly 1850–2012 (IPCC,2014)

SWAs training and Evaluating

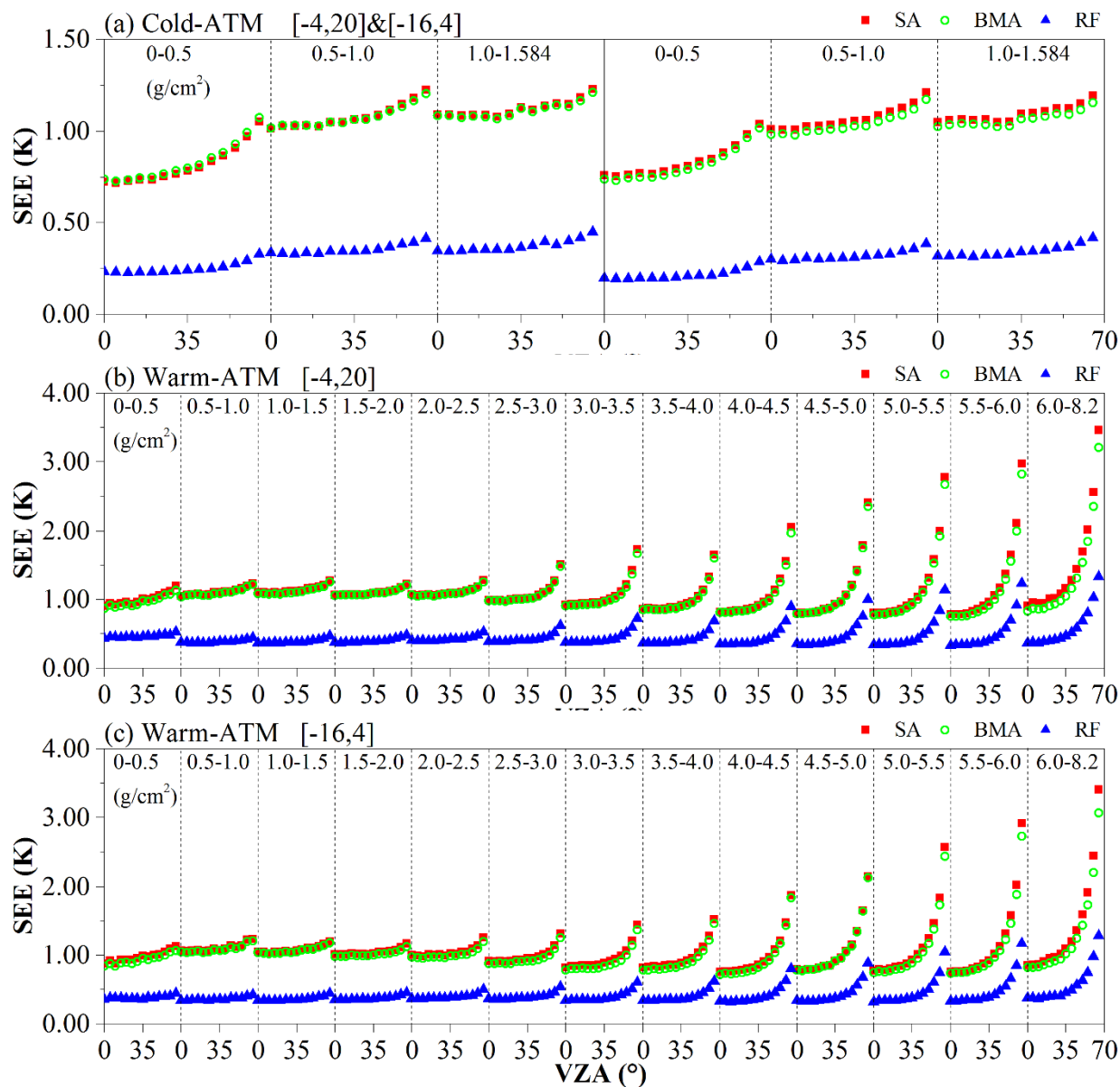
Summary of atmospheric profile datasets for algorithms training and evaluating

Sources	Name	CWV (g/cm ²)	NSAT (K)	Profiles	VZA	T_s	LSE	Sample size
SeeBor V5.0	TRA-G	0.014–7.939	224.25–309.05	549	15	10	48	3952800
	VAL-S	0.005–4.999	201.96–313.50	4761	10	1	1	47610
TIGR2000 V1.2	VAL-T	0.058–8.199	233.85–314.16	5060	1	1	1	5060



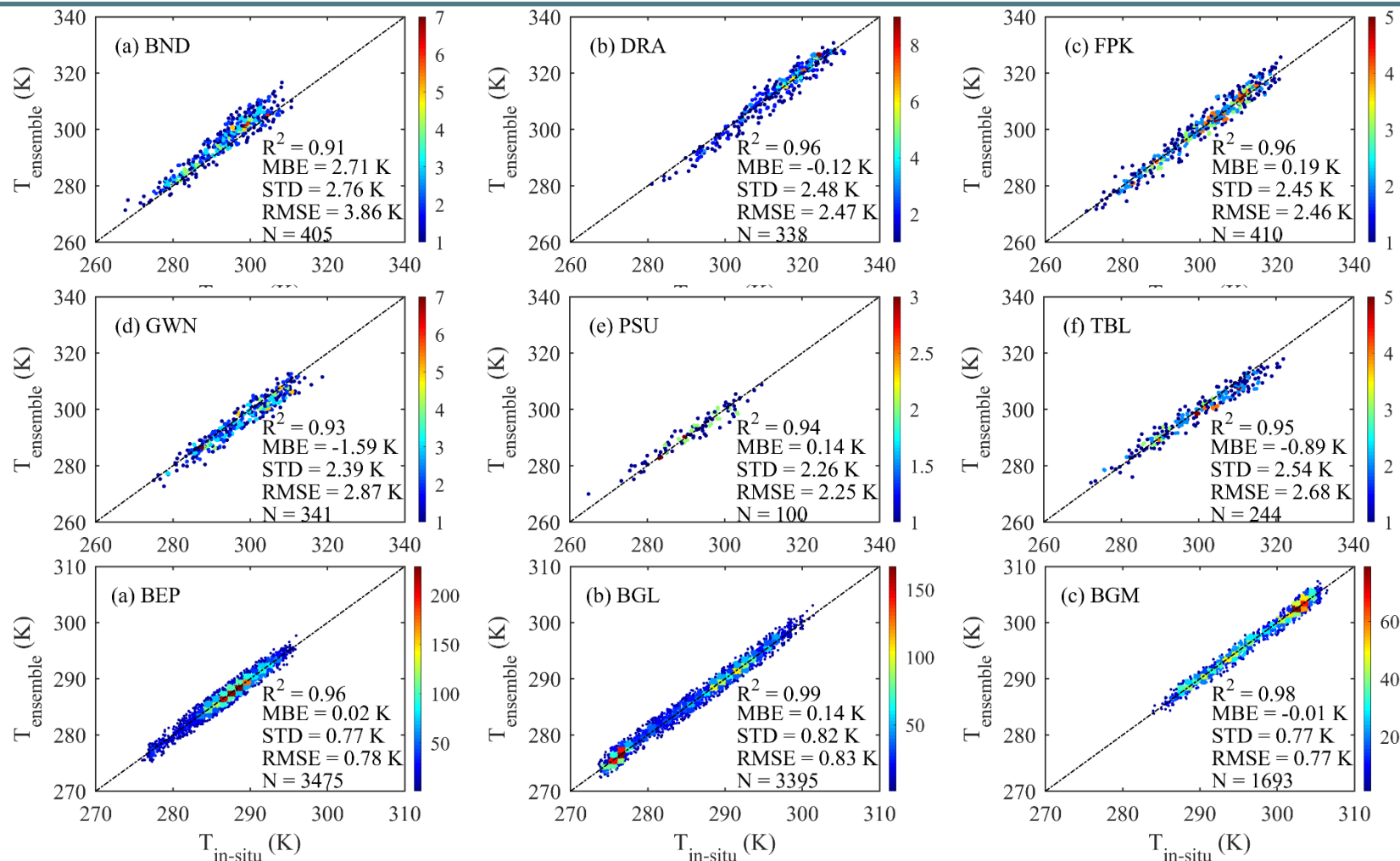
Performance of the nine selected SWAs for simulation datasets VAL-S and VAL-T

Ensemble method comparison



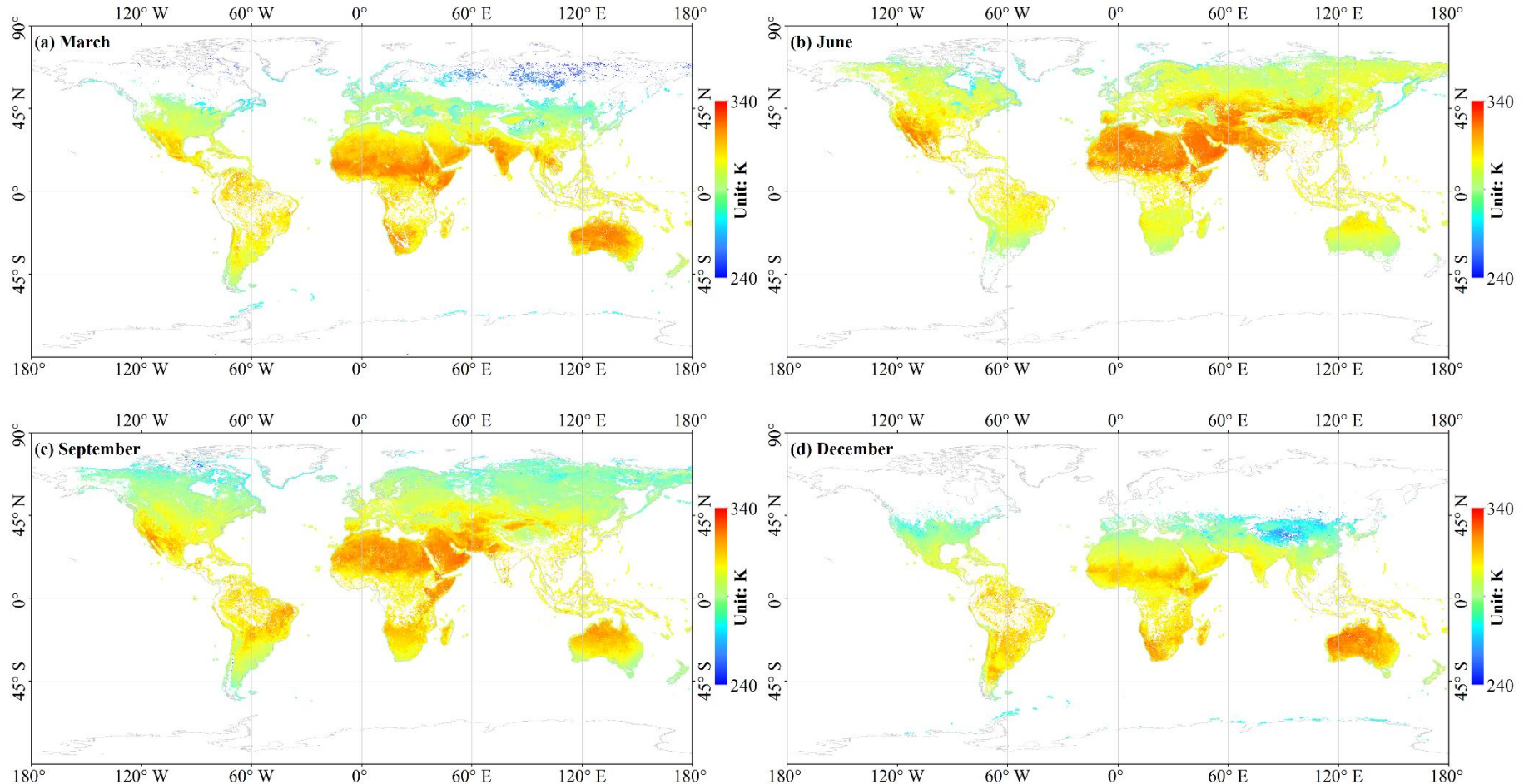
SEE values of the three ensemble methods for NOAA-14 AVHRR under different atmospheric conditions. (a) Cold-ATM, for $T_s - T_a$ within $[-4, 20]$ K (top) and $[-16, 4]$ K (centre); (b) Warm-ATM, for $T_s - T_a$ within $[-4, 20]$ K; (c) Warm-ATM, for $T_s - T_a$ within $[-16, 4]$ K (bottom).

LST validation against *in-situ* LST



RF-SWA LST plotted against in-situ LST from six SURFRAD sites and LSWT from three NDBC sites (buoy data) and corresponding statistics.

Global Monthly AVHRR LST



Monthly averaged ODC LST retrieved from NOAA 14 data for 1999 normalized to 14:30: (a) March; (c) June; (c) September; (d) December.

Data available online

Details of the three LST products available from NESSDC of China*

Name	Variable	Data type	Scale	Offset	Size	period
RF-SWA LST	Instantaneous LST	Int	0.02	-		
	View angle	Int	-	-	~20 GB	
	View time	Int	0.1	-		1981-
ODC LST	ODC LST	Int	0.02	-	~10 GB	2000
ODC monthly LST	LST	Int	0.02	-	~2 GB	

*The LST product will be freely available at the National Earth System Science Data Center of China (<http://www.geodata.cn/>)

Thank you!

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