



Figure S1: Monthly total precipitation and mean, minimum and maximum temperature at (a) Chuguevka (1936-2004), (b) Melnichnoe (1941-2009), and (c) Krasniy Yar (1940-2013) meteorological stations; (d) annual precipitation distribution in percent for all three meteorological stations.

Table S1. Correlation between instrumental precipitation data and monthly climate indexes. April-June and July-September are the durations of the first and second stages of the summer monsoon, respectively; April-September is entire summer monsoon period. Significant correlations ($p < 0.05$) are marked in bold.

Index	Chuguevka			Melnichoye			Krasny Yar		
	Apr-Jun	Jul-Sep	Apr-Sep	Apr-Jun	Jul-Sep	Apr-Sep	Apr-Jun	Jul-Sep	Apr-Sep
SOI	0.151	0.199	0.351	0.037	0.107	0.140	-0.035	-0.072	-0.02
NINO3	0.021	-0.195	-0.194	0.080	0.033	0.030	0.130	-0.034	-0.012
NINO4	-0.055	-0.137	-0.185	-0.004	-0.013	-0.113	0.121	0.026	0.062
NINO3.4	-0.046	-0.184	-0.399	0.076	0.037	-0.034	0.130	0.030	0.043
PDO	-0.075	-0.158	-0.331	-0.037	-0.211	-0.419	-0.011	-0.188	-0.123
AO	0.188	-0.108	0.099	-0.009	0.002	0.062	0.175	0.114	0.267