Earth's Future

Supporting Information for

Cropland and Population Exposure to Extreme Precipitation Events in Central Asia Under Future Climate Change

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Introduction

This document contains supplementary tables and figures. Providing additional information on the details of three future Climate Scenarios used in this study (Table S1), Analysis of contributing factors to cropland (Table S2) and population exposure (Table S3). Taylor diagram of model data and observations (Figure S1), Spatial and temporal distribution of observational and model data (Figure S2) and Spatial distribution of multi-model averaged data (MME) and observations (OBS) (Figure S3).

Table S1: Combination of Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs) and the Characteristics of Different RCP-SSP Scenarios

Representative concentration pathways (RCPs)	Shared socioeconomic pathways (SSPs)		
	SSP1 (sustainability)	SSP3 (regional rivalry)	SSP5 (fossil-fueled development)
RCP2.6	√Low challenge for adaptation, High challenge for mitigation		
RCP7.0		√Medium challenge for adaptation and mitigation	
RCP8.5			√ High challenge for adaptation Low challenge for mitigation

Table S2: Analysis of the driving forces of changes in cropland exposure to EPEF across CA (%)

Change of cropland exposure	Cropland factor			Climatic factor			Interactive effect between climate and cropland		
	SSP1-2.6	SSP3-7.0	SSP5-8.5	SSP1-2.6	SSP3-7.0	SSP5-8.5	SSP1-2.6	SSP3-7.0	SSP5-8.5
Between 2041 and 2060 relative to 2021–2040	15.78	21.24	13.38	82.6	76.69	84.28	1.61	2.07	2.34
Between 2061 and 2080 relative to 2021–2040	23.33	16.59	13.22	74.02	79.71	82.96	2.65	3.70	3.81
Between 2081 and 2100 relative to 2021–2040	26.35	15.34	13.42	70.73	80.20	80.54	2.91	4.46	13.42

Table S3: Analysis of the driving forces of changes in population exposure to EPEF across CA (%)

Change of population exposure	Population factor			Climatic factor			Interactive effect between climate and population		
	SSP1-2.6	SSP3-7.0	SSP5-8.5	SSP1-2.6	SSP3-7.0	SSP5-8.5	SSP1-2.6	SSP3-7.0	SSP5-8.5
Between 2041 and 2060 relative to 2021–2040	46.02	49.77	33.70	49.61	44.75	60.68	4.37	5.48	5.63
Between 2061 and 2080 relative to 2021–2040	61.55	42.75	37.06	31.72	47.70	51.19	6.73	9.55	11.74
Between 2081 and 2100 relative to 2021–2040	71.78	41.43	34.58	21.09	46.66	48.16	7.13	11.91	17.25

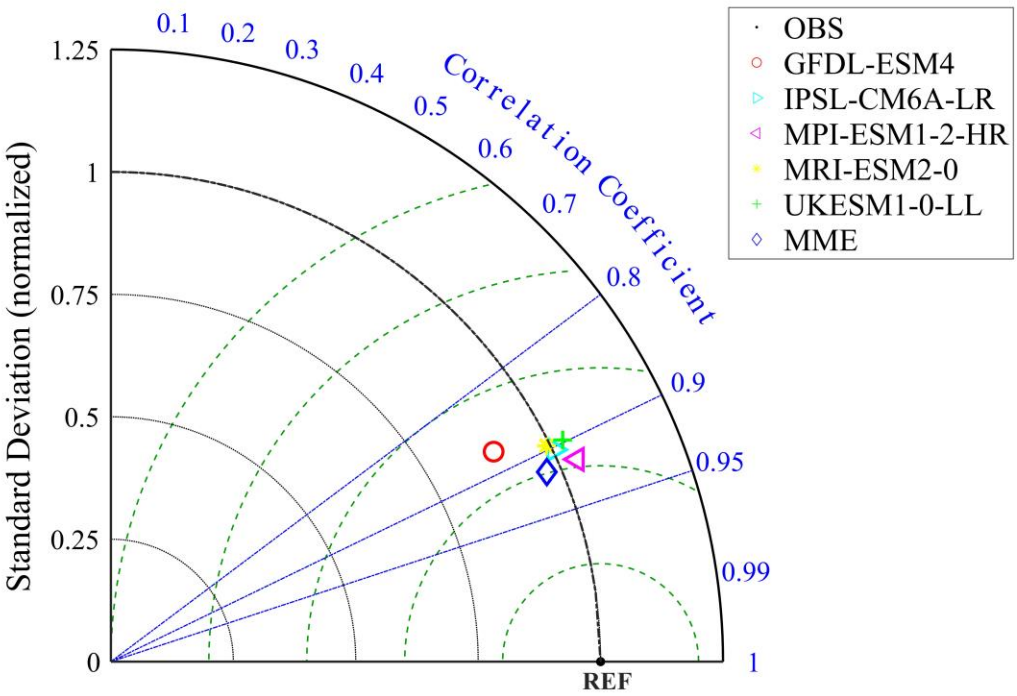

Figure S1. Taylor diagrams of the simulated precipitation by GCMs across the world for the period of 1995-2014 with the CRU observed data. (The Observation data is marked by REF and GCMs are marked as different color shapes.)

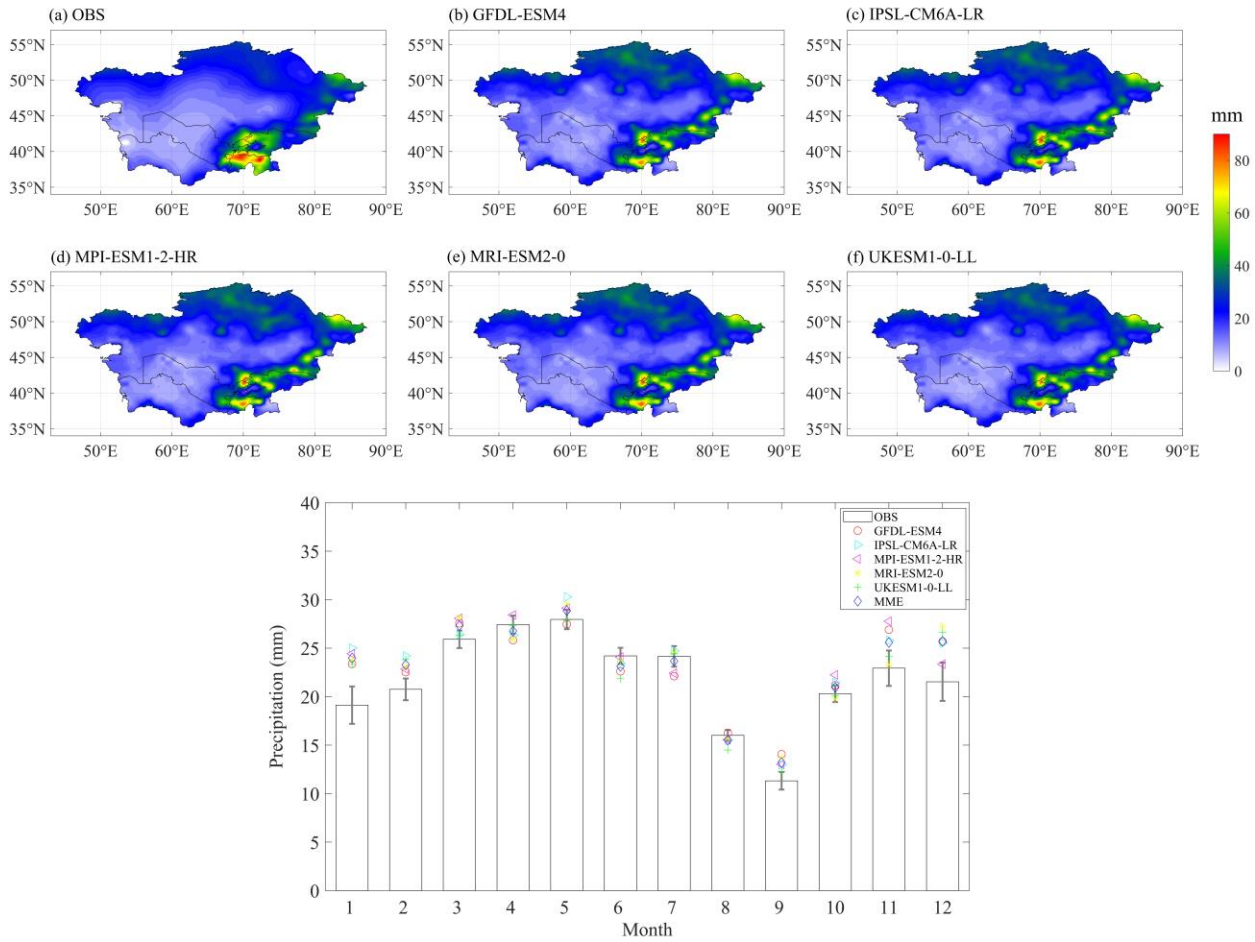

Figure S2. Spatial distributions of precipitation amount for (a) the observation dataset, (b–f) the GCMs of 1995–2014, and the bar graph depicts the Mean monthly precipitation in CA from 1995 to 2014.

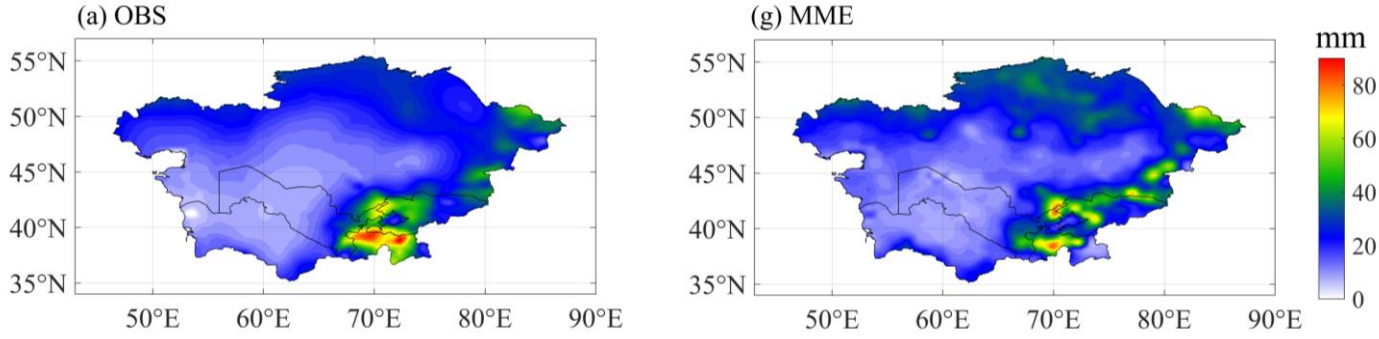

Figure S3: Spatial distributions of observation data (CRU) and multi-modal ensemble averaged data (1995-2014).