Figure S1. Assessment of different precipitation intensities among the Chinese (a) and Russian (b) ATAs based on the POD and FAR.
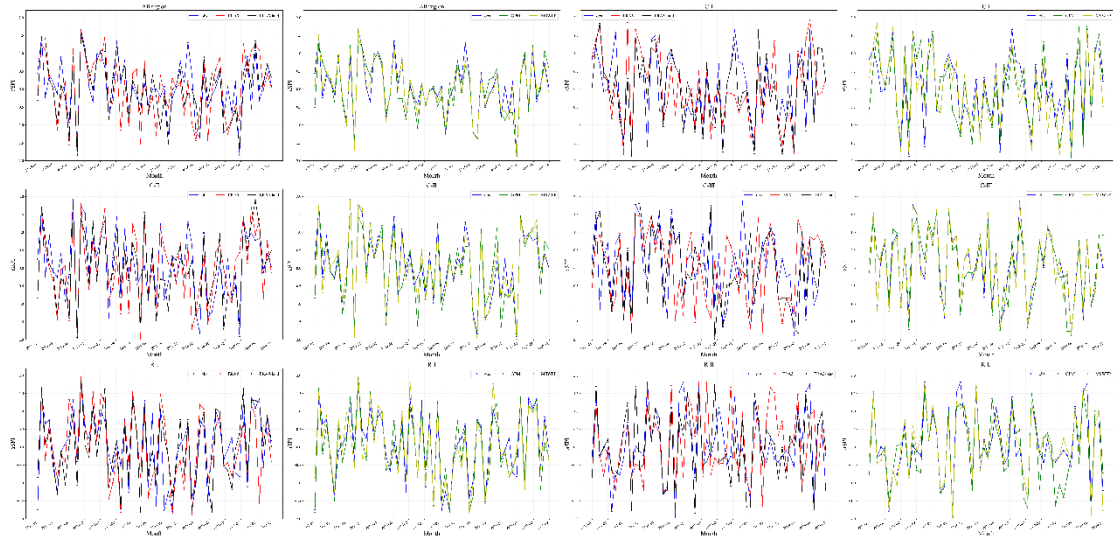

Figure S2. Spatial patterns of the aSPI-1 averaged by MP from 2015 to 2019 in the ATAs.

Table S1. The detailed information of selected station.

Part 1 the detailed information of selected station (Chinese part)				
Station index	**Latitude (°)**	**Longitude (°)**	**Farming region**	**National agrometeorological station**
50136	122.533	52.967	C-1	
50353	126.633	51.733	C-2	
50434	121.7	50.45	C-1	
50468	127.45	50.25	C-2	
50527	119.7	49.25	C-2	
50548	123.717	49.2	C-3	
50557	125.233	49.167	C-3	√
50564	127.35	49.433	C-2	√
50603	116.817	48.683	C-2	
50658	125.883	48.05	C-3	
50727	119.933	47.167	C-2	
50745	123.918	47.24	C-3	
50756	126.867	47.45	C-3	√
50774	128.833	47.7	C-2	
50788	131.983	47.233	C-4	√
50844	123.45	46.4	C-2	
50854	125.317	46.383	C-2	
50888	132.183	46.317	C-4	√
50949	124.867	45.083	C-3	
50953	126.567	45.933	C-3	
50963	128.733	45.967	C-3	√
50968	127.967	45.217	C-3	
50978	130.917	45.3	C-3	
50983	132.967	45.767	C-4	
54094	129.667	44.5	C-2	√
54161	125.681	43.996	C-3	√
54186	128.2	43.367	C-2	
54273	126.75	42.983	C-4	√
Part 2 the detailed information of selected station (Russian part)				
Station index	**Latitude (°)**	**Longitude (°)**	**Farming region**	**Deploy in perennial farmland and with fully data records**
30499	124.667	55.183	R-1	
30683	121.933	53.967	R-1	
31253	128.867	54.717	R-1	
31295	125.817	53.467	R-1	
31300	127.3	53.7	R-1	

31329	132.933	53.067	R-1	
31371	126	52.783	R-1	
31388	129.917	52.35	R-1	
31445	128.117	51.45	R-2	
31510	127.483	50.283	R-4	√
31527	129.467	50.117	R-3	
31587	128.65	49.617	R-3	
31594	130.083	49.417	R-3	√
31702	131.083	49	R-3	
31707	130.967	47.733	R-4	√
31713	132.95	48.733	R-3	
31725	133.833	48.617	R-3	
31845	135.317	46.533	R-3	
31873	133.733	45.867	R-4	√
31915	131.383	44.4	R-5	√
31921	132.067	44.717	R-4	
31981	133.067	43.967	R-5	