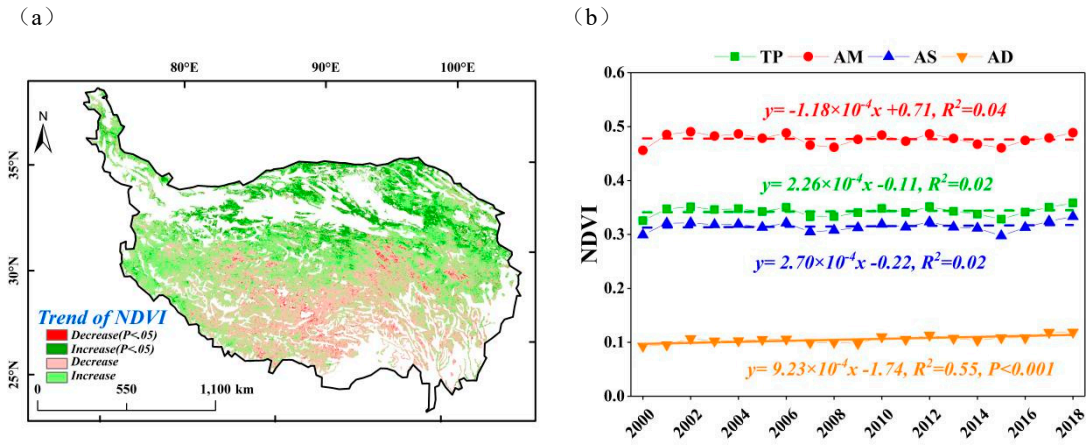

Figure S1. Spatial and temporal dynamics of NDVI in grassland on the Qinghai-Tibet Plateau from 2000 to 2018（Fig.S1a Spatial dynamics of NDVI on the Qinghai-Tibet Plateau during 2000-2018 and its temporal dynamics in Fig.S1b,TP: total grassland of the QTP; AM, alpine meadow; AS, alpine steppe; AD, alpine desert）

The trend distribution of grassland NDVI showed that the increasing trend was 63.2% (14.2%, $P<0.05$) in the northern part of the Qinghai-Tibet Plateau. The decreasing trend was 36.8% (1.9%, $P<0.05$), mainly in the central and southern parts of the Plateau (Fig S1a). The multi-year dynamics of different grassland types showed that there was a significant increasing trend only in alpine desert, but there was no significant result in other grassland types, although there was a positive trend (Fig S1b).

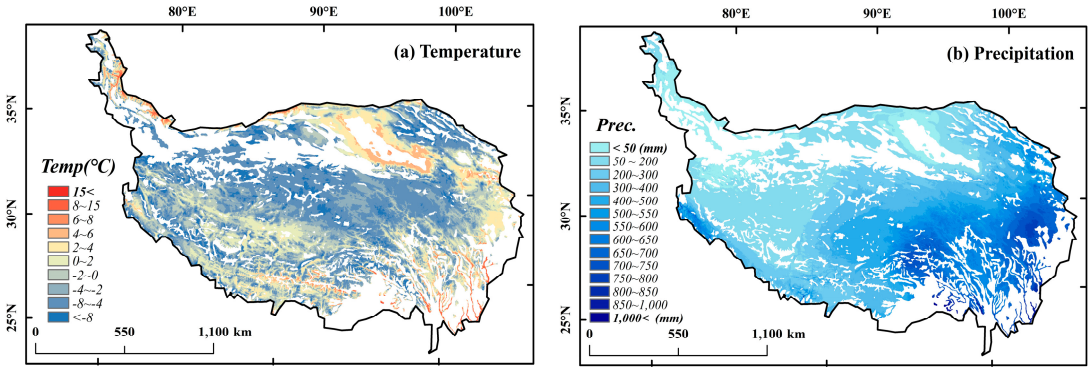

Figure S2. Spatial distribution of annual mean temperature (a) and mean precipitation (b) in the grasslands of the Tibetan Plateau from 2000 to 2018

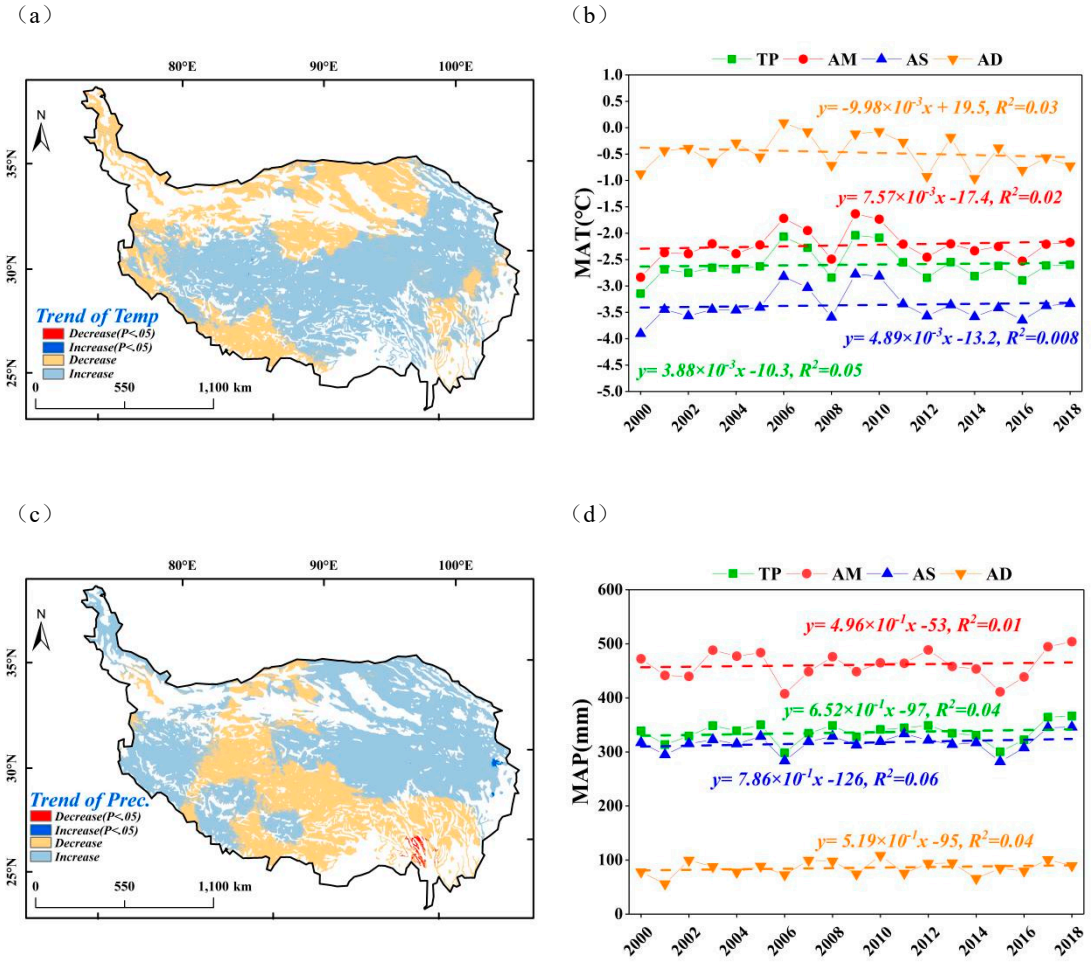

Figure S3. Temporal and spatial dynamics of grassland temperature and precipitation on the Qinghai-Tibet Plateau from 2000 to 2018 (Fig.S3a the spatial dynamics of temperature and Fig.S3b the temporal dynamics of grassland on the Qinghai-Tibet Plateau; Fig.S3c the spatial dynamics of precipitation and Fig.S3d the temporal dynamics of grassland on the Qinghai-Tibet Plateau; TP: total grassland of the QTP; AM, alpine meadow; AS, alpine steppe; AD, alpine desert)