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Trends and climatic sensitivities of vegetation phenology in semiarid and arid ecosystems in the US Great Basin during 1982–2011

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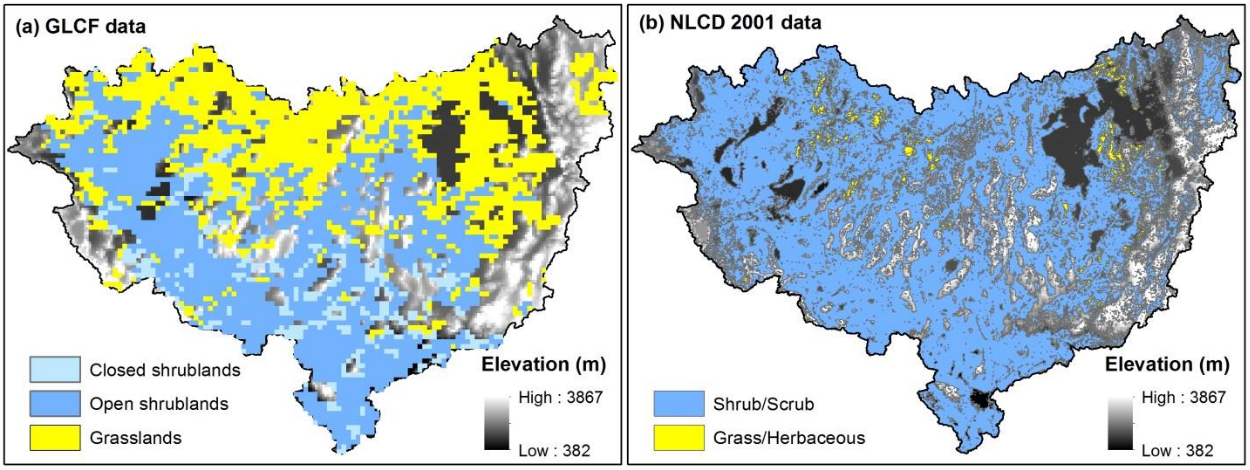

Figure S1. Distribution of shrublands and grasslands in the U.S. Great Basin defined by (a) GLCF data (Hansen *et al*., 2000) and (b) NLCD 2001 data (Homer *et al*., 2007)..

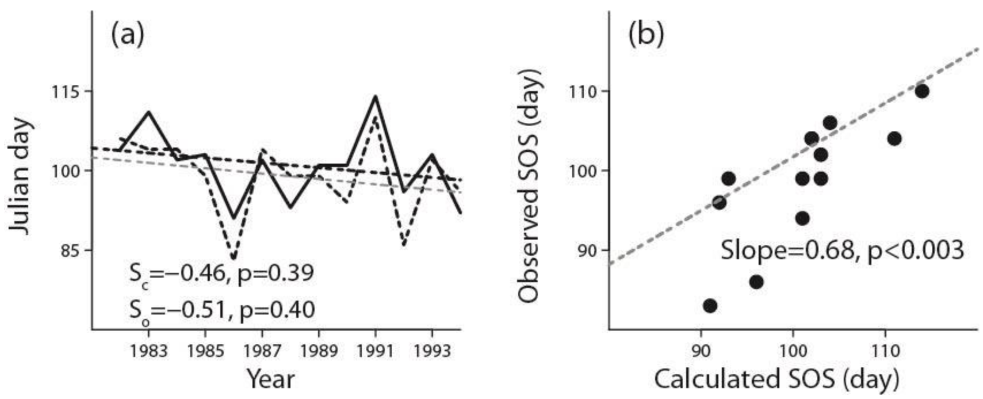

Figure S2. Comparison of the start of growing season (SOS) based on observed breaking leaf buds (OBLB, dashed black curve line, in Julian day) with calculated SOS (solid black curve line, in Julian day) based on the midpoint-pixel approach for the Great Basin. The OBLB data were from the USA National Phenology Network (http://www.usanpn.org/results/data) (Data source: USA National Phenology Network (USA-NPN), 20101015, Plant and Animal Phenology Data for the United States: None N/a, USA National Phenology Network, Tucson, Arizona, USA). The comparison suggests that (a) neither the calculated SOS nor that based on field observations (95% leaf buds are broken) have significant trend during 1982-1994, and (b) the calculated SOS was strongly and significantly correlated with that based on field observations during 1982-1994. In addition, the calculated SOS averages 101 Julian days during 1982-1994, which is only two days greater than that based on field observations (99 Julian days). These agreements justified the suitability of application of the midpoint-pixel approach in the dryland ecosystems of the U.S. Great Basin.

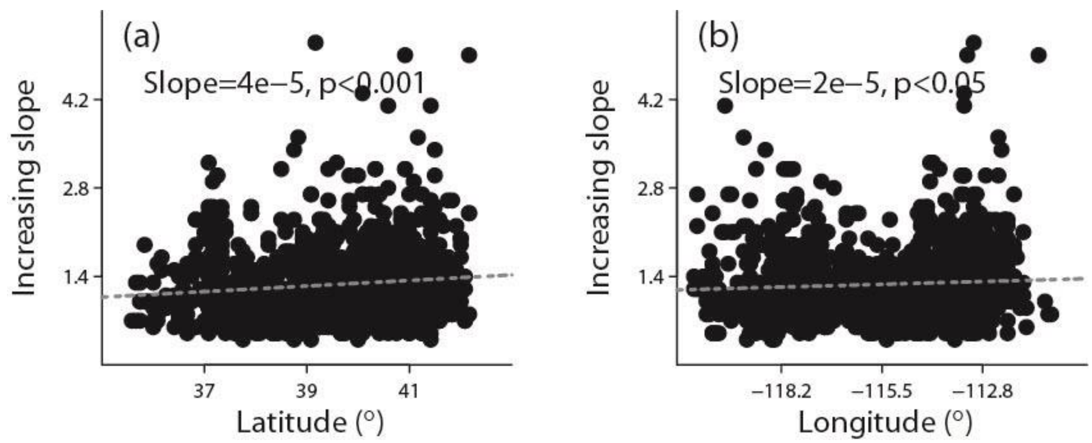

Figure S3. The relationships between the temporal positive trend in NDVI and latitude/longitude: the positive trend in mean NDVI amplifies as (a) latitude and (b) longitude increase. For plotting, the values in y-axis were multiplied by a factor of 1000.

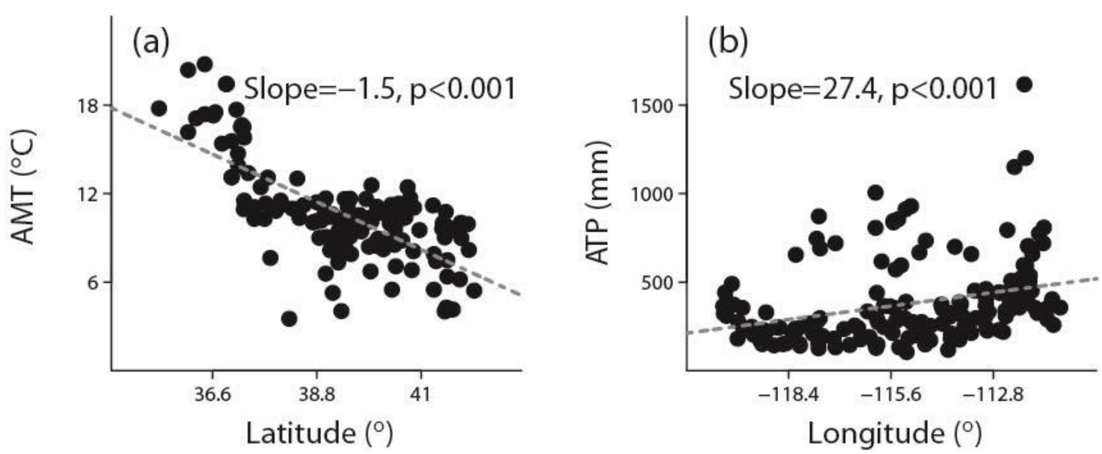

Figure S4. (a) The relationship between annual mean temperature (AMT, °C) and latitude: annual mean temperature decreases significantly as latitude increases in the Great Basin. (b) The relationship between annual total precipitation (ATP, mm) and longitude: annual total precipitation generally increases from west to east across the Great Basin. Data shown here are based on 126 selected weather stations (see Fig. 1a).

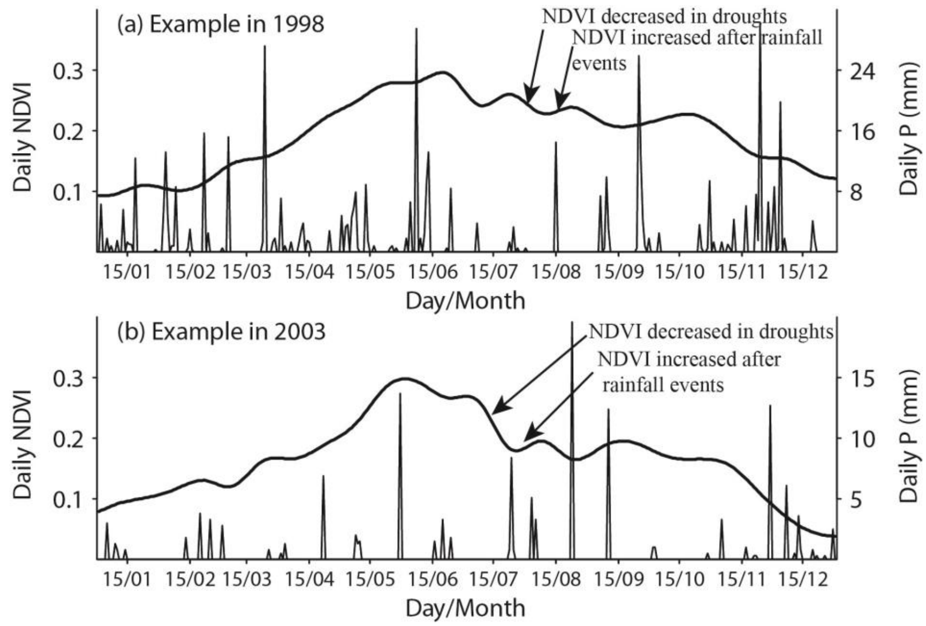

Figure S5. Example: the variation of daily NDVI values in a year. The data shown here suggest that vgetation greenness in the dryland ecosystems in the Great Basin was sensitive to synoptic rainfall events.