Climate change is expected to modify the timing of seasonal transitions this century, impacting wildlife migrations, ecosystem function, and agricultural activity. Tracking seasonal transitions in a consistent manner across space and through time requires indices that can be used for monitoring and managing biophysical and ecological systems during the coming decades. Here a new gridded dataset of spring indices is described and used to understand interannual, decadal, and secular trends across the coterminous US. This dataset is derived from daily interpolated meteorological data, and results are compared with historical station data to ensure the trends and variations are robust. Regional trends in the first leaf index range from $-0.8$ to $-1.6$ days per decade, while first bloom index trends are between $-0.4$ and $-1.2$ for most regions. However, these trends are modulated by interannual to multidecadal variations, which are substantial throughout the regions considered here. These findings emphasize the important role large-scale climate modes of variability play in modulating spring onset on interannual to multidecadal timescales. Finally, there is some potential for successful sub-seasonal forecasts of spring onset, as indices from most regions are significantly correlated with antecedent large-scale modes of variability.
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