Figure 1. Photographs of the two diurnally active tree squirrels that are present in Southern California: (A) the native Western Gray Squirrel, *Sciurus griseus* and (B) the non-native Fox Squirrel, *Sciurus niger*. The Fox Squirrel has replaced the Western Gray Squirrel in some habitats while the two species coexist in other habitats. Photographs by Alan Muchlinski.

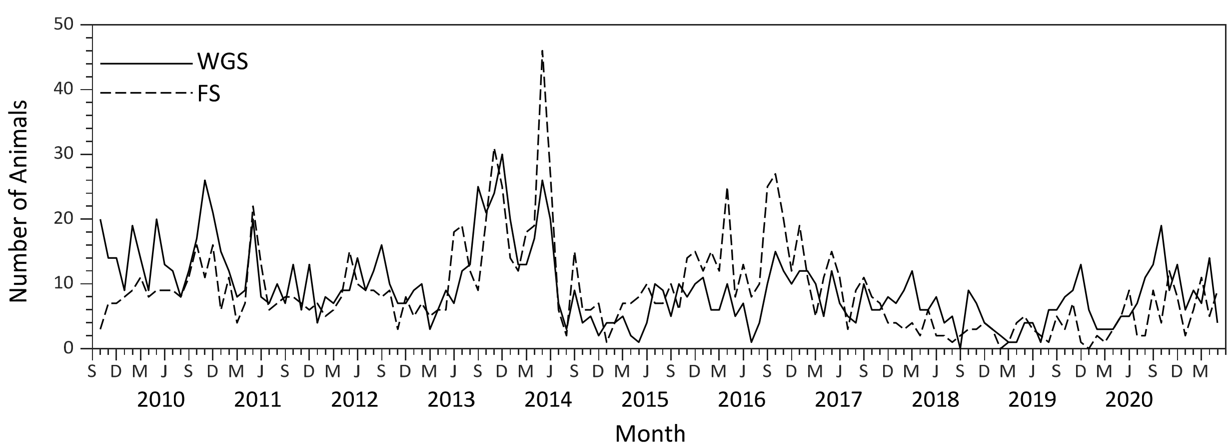

Figure 2. Monthly time series for numbers of WGS and FS at our study site from October 2009 through May 2021.

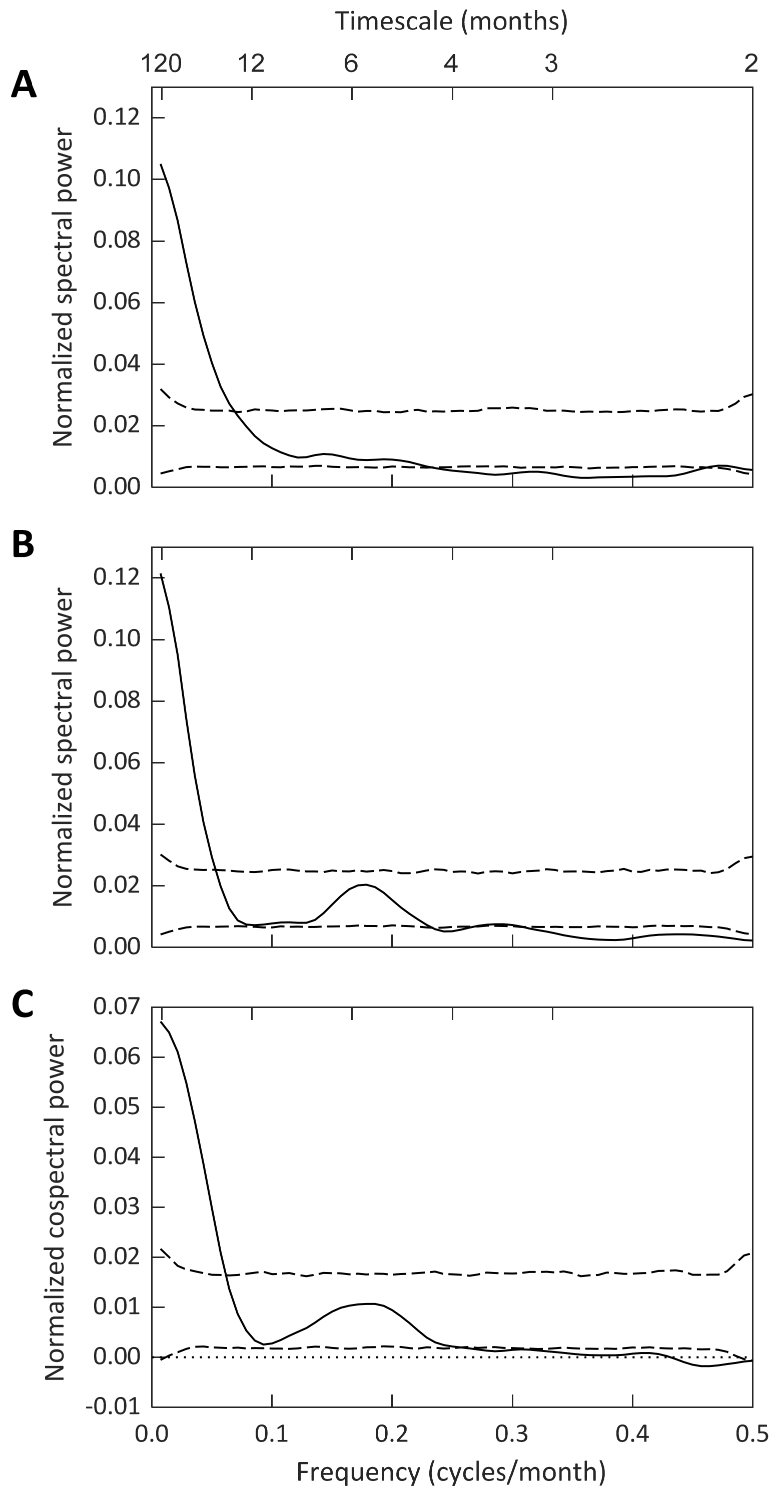

Figure 3: Smoothed normalized spectra for (A) the WGS and (B) the FS and the (C) smoothed normalized cospectrum between the two species. Dashed lines are 95% significance thresholds for the null hypothesis of no timescale dependence of the WGS-FS paired observations.

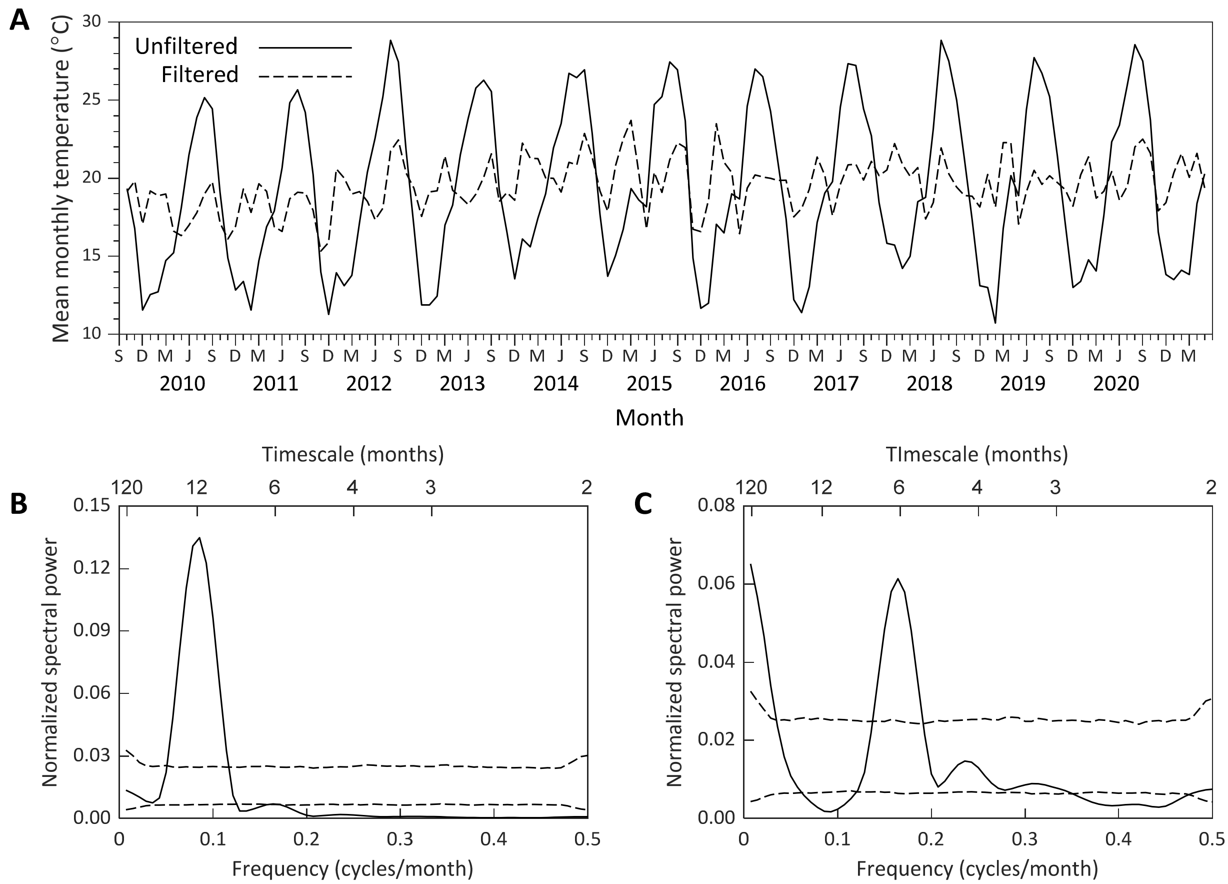

Figure 4: (A) Mean monthly temperature for the Ontario Airport (ONT) time series from October 2009 through May 2021. The solid line is for the recorded temperatures and the dashed line is the time series obtained after filtering out the annual cycle. Smoothed normalized spectra are shown for the (B) unfiltered and (C) filtered ONT temperature time series. Dashed lines in (B) and (C) are 95% significance thresholds for the null hypothesis of no timescale dependence in the ordering of the filtered and unfiltered data.

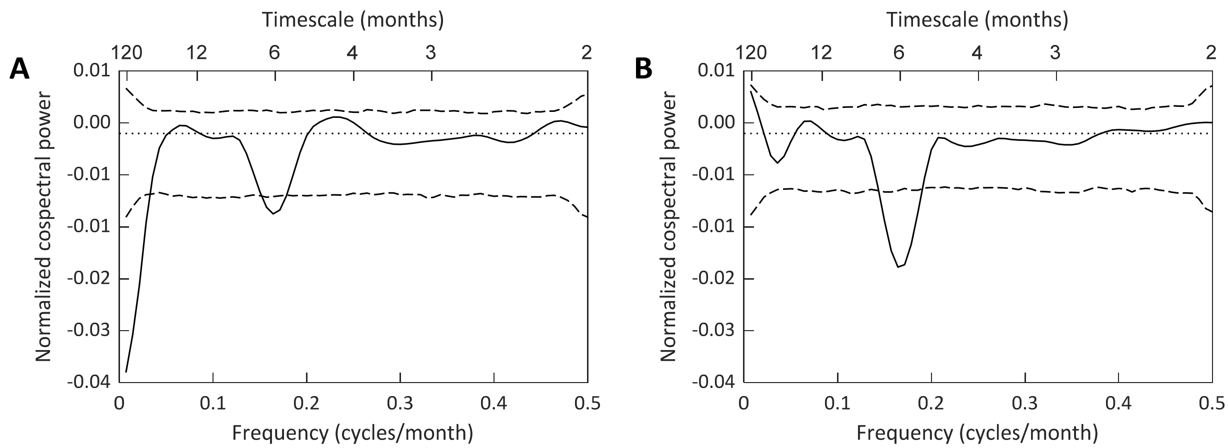

Figure 5: Smoothed normalized cospectra between the filtered Ontario Airport temperature time series and the census numbers for (A) the WGS and (B) the FS. Dashed lines in (A) and (B) are 95% significance thresholds for the null hypothesis of no timescale dependence in the ordering of the temperature, WGS, and FS data triplets.

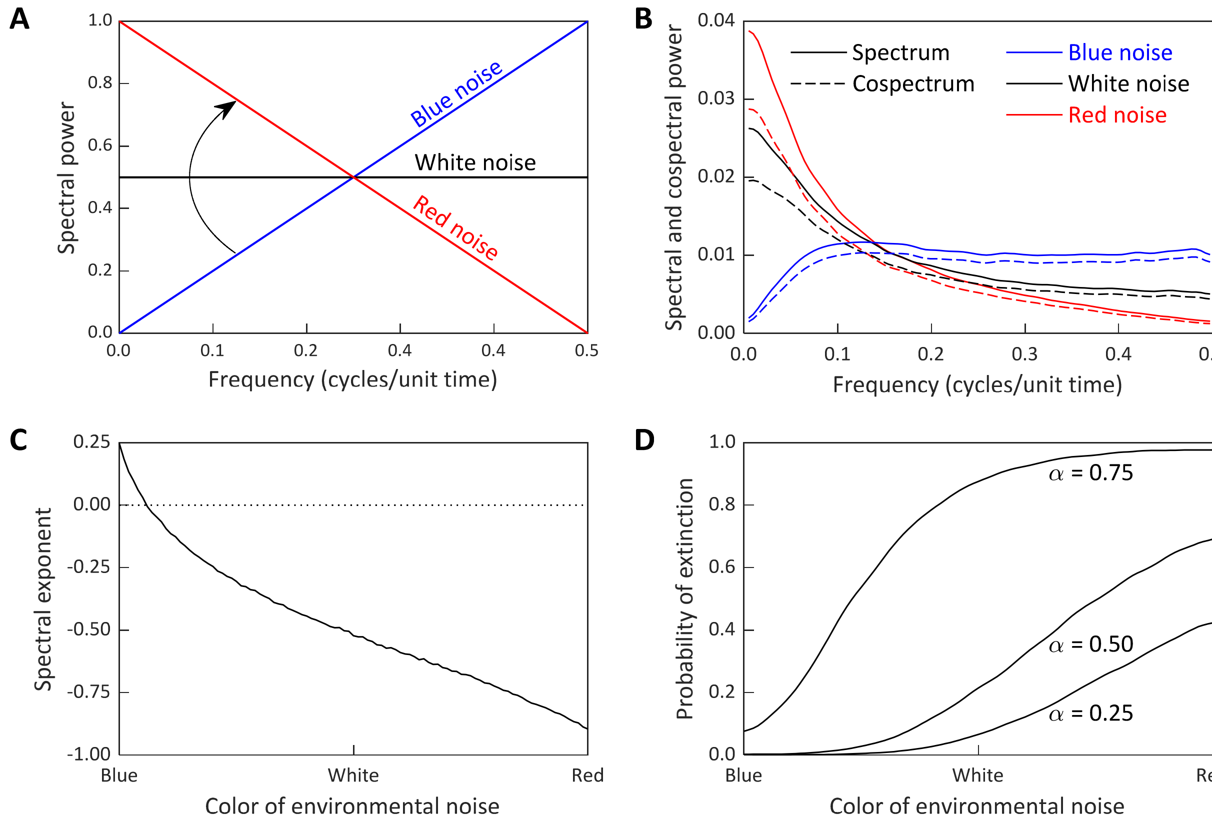

Figure 6: (A) Linear environmental spectra used for the model simulations. Each spectrum has the same variance, but a different distribution of variation over time scales. The arrow indicates how the spectra were gradually changed from blue noise, to white noise, to red noise for the simulations in panels C and D. (B) Mean smoothed normalized spectra and cospectra for the populations with the blue, red, and white environmental noise shown in panel A. Both competing populations had the same parameter values, so their spectra were identical. (C) Mean spectral exponents for the populations with environmental noise color varied continuously from blue to white to red as shown in panel A. More negative slopes indicate longer time scale fluctuations in population numbers. (D) Probabilities of extinction for the native species for 2000 simulations of the model with environmental noise color varied continuously from blue to white to red as shown in panel A. Larger values of α represent higher intensities of competition from the invading species.

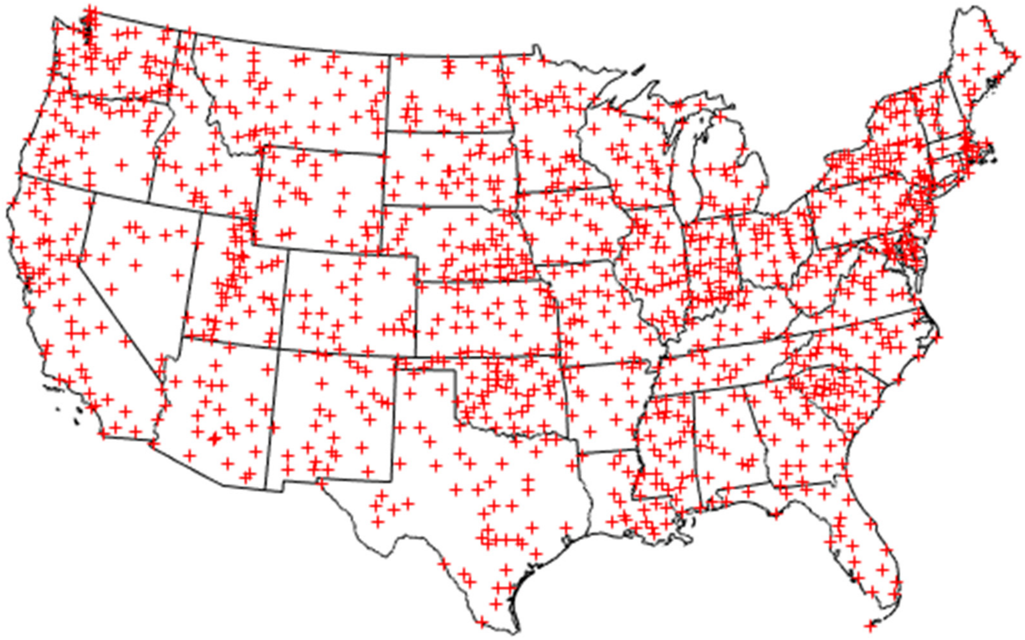

Figure 7: Geographic locations of the 1218 weather stations from which a 100-year record (1915-2014) of mean annual temperatures were obtained. Data are from the U.S. Historical Climatology Network.

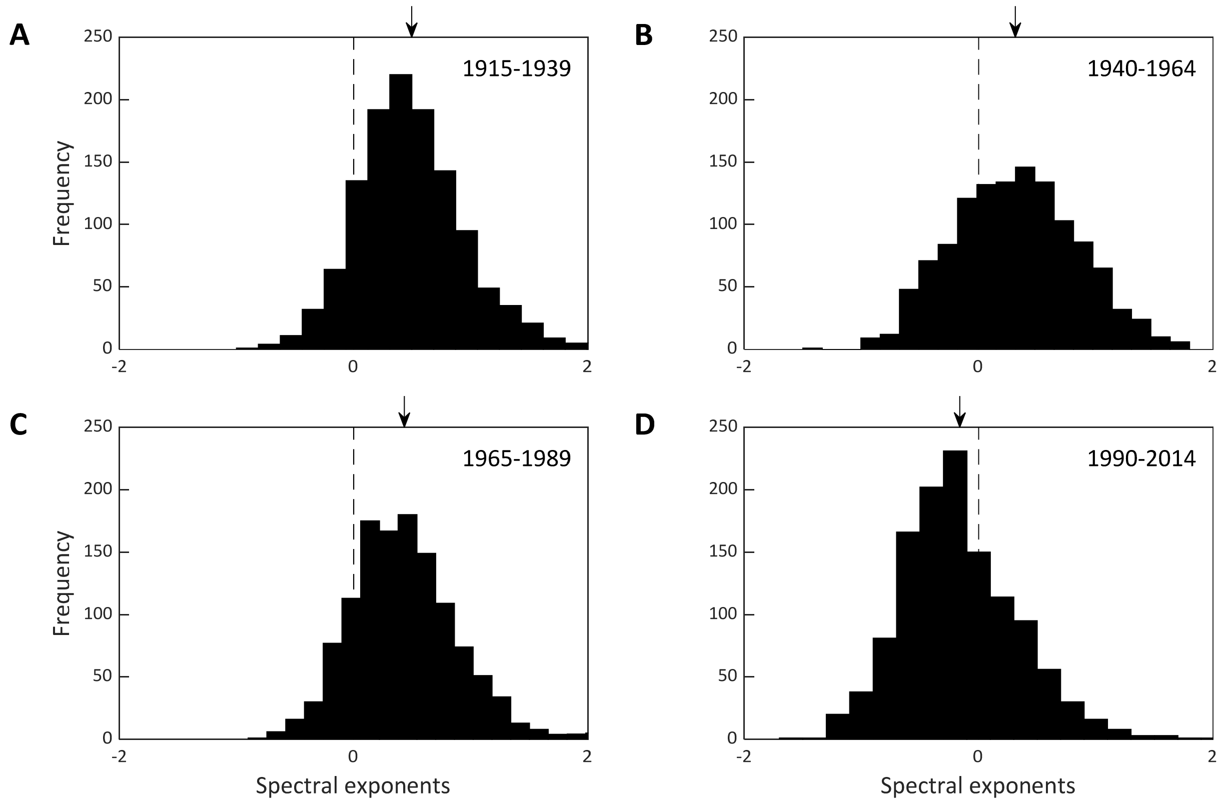

Figure 8: Spectral exponents for the 1218 time series of mean annual temperatures. Each 100-year record was broken into four 25-year intervals (A-D). The arrows indicate the locations of the mean values. The dashed lines represent a spectral exponent of zero. Positive spectral exponents indicate spectra biased towards short timescales (blue-tinged noise) and negative values indicate a bias towards long timescales (red-tinged noise).

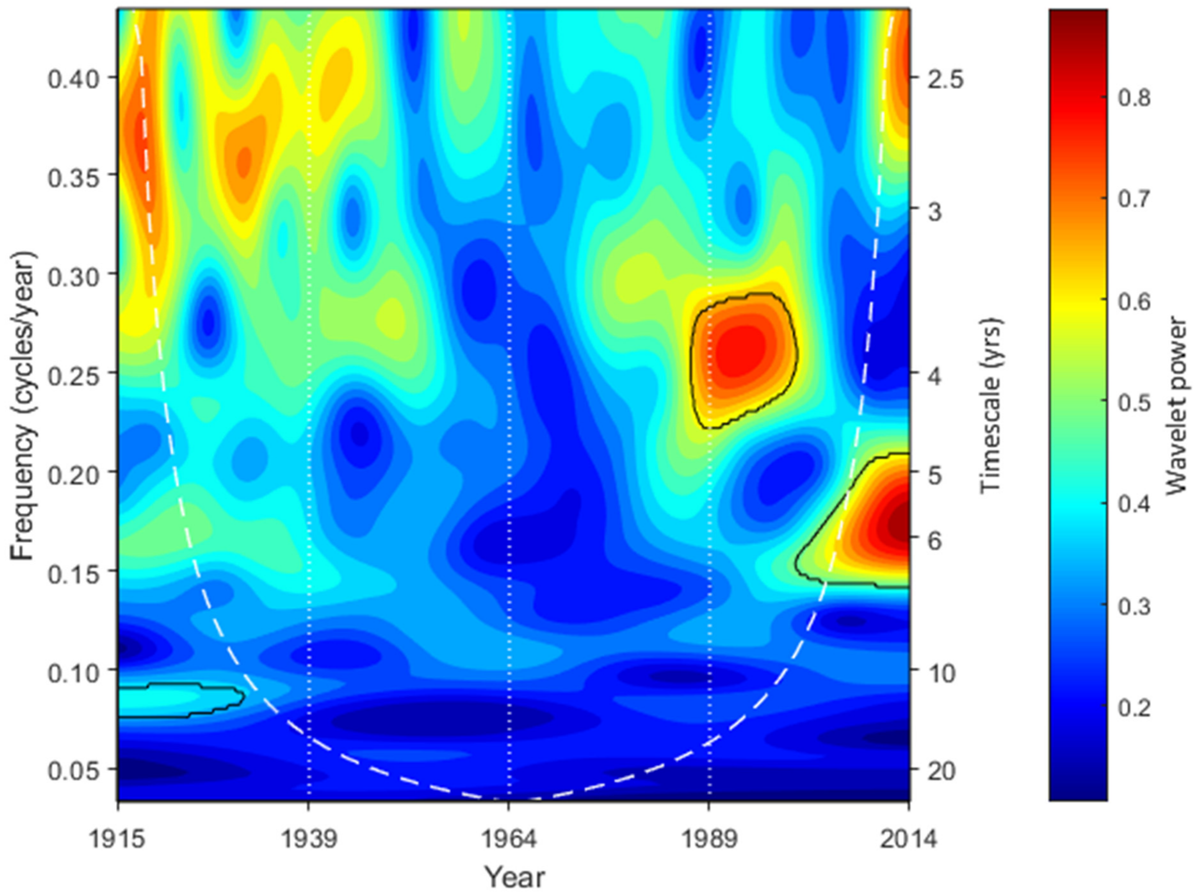

Figure 9: Mean field wavelet for 100-year time series of mean annual temperatures. The wavelet is a visualization of how the time scale distribution of variation in mean annual temperatures has varied from 1915 to 2014. Each 100-year time series was quadratically detrended and a Morse wavelet was obtained using the MATLAB default values of 3 and 60 for the symmetry and time-bandwidth product, respectively. The wavelets for the 1218 stations were then averaged. The white dashed curve is the cone of influence where edge effects can affect the wavelet power. The dark curves indicate areas where the wavelet power is statistically significant at the 5% level, based on the upper 95th percentiles of 2000 surrogate data sets where the time series for all stations were reordered randomly in tandem. A change to longer timescale fluctuations is indicated by the significant shift in wavelet power to lower frequencies.