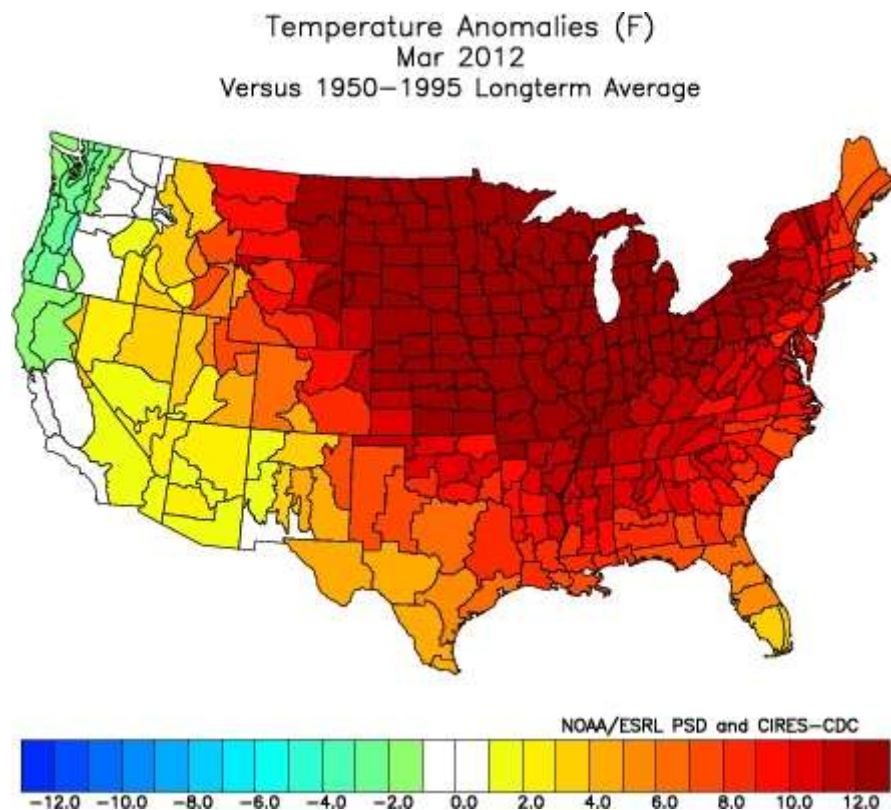


Records and Extremes

Following the super La Nina of 2010/11, we had a period of extremes - snow and cold to start, then floods and drought, tornadoes and heat and a landfalling hurricane.

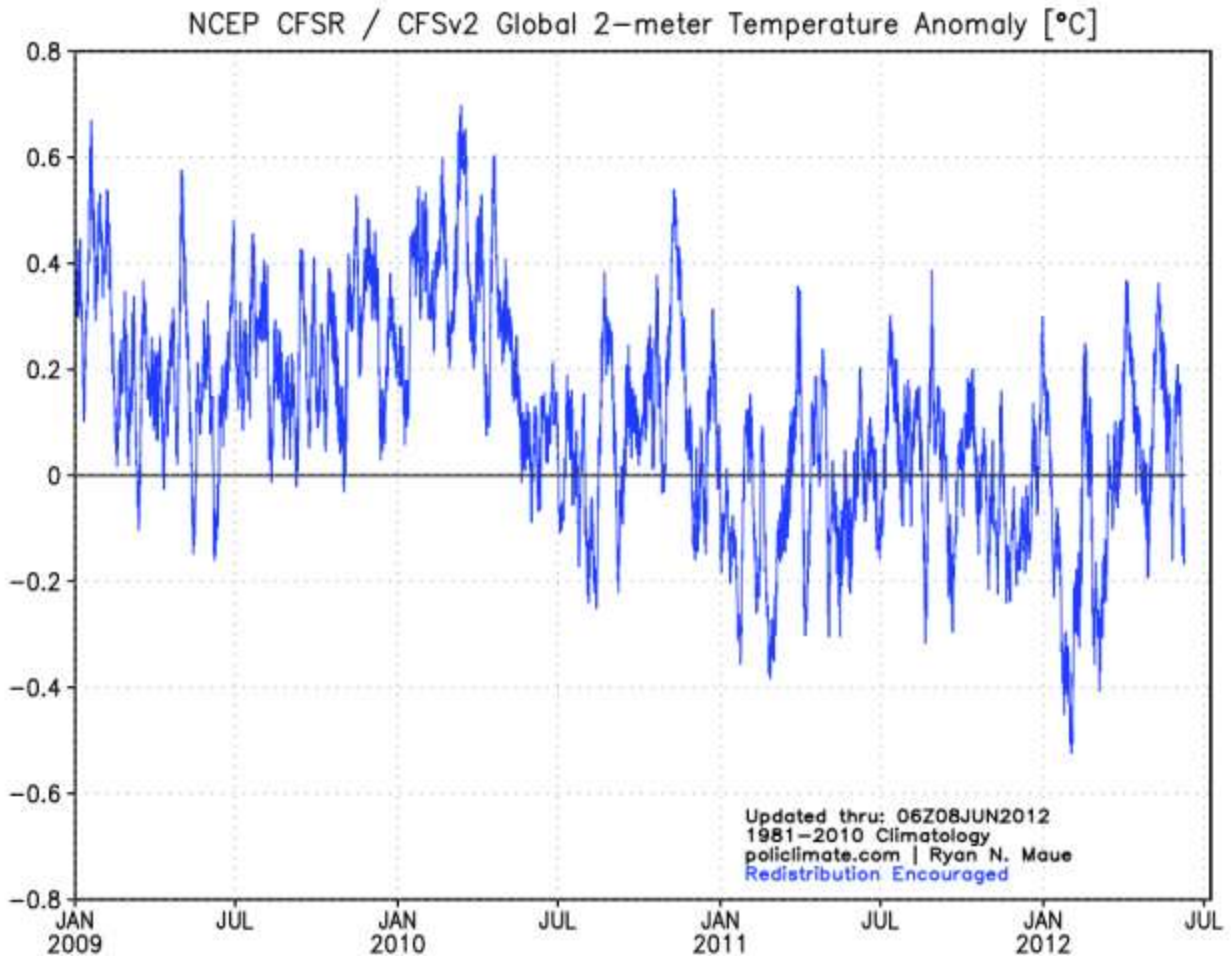
As the La Nina faded but the eastern and northern Pacific water remained cold, a warm and dry winter followed in 2011/12 much as the warm winter of 1918/19 followed the super La Nina of 1917/18 which was the only colder, snowier La Nina this century.

The warmth peaked in March. With the exception of the Pacific Northwest, most of the nation was well above normal with many daily record highs. Warmest March in the record books for the lower 48.

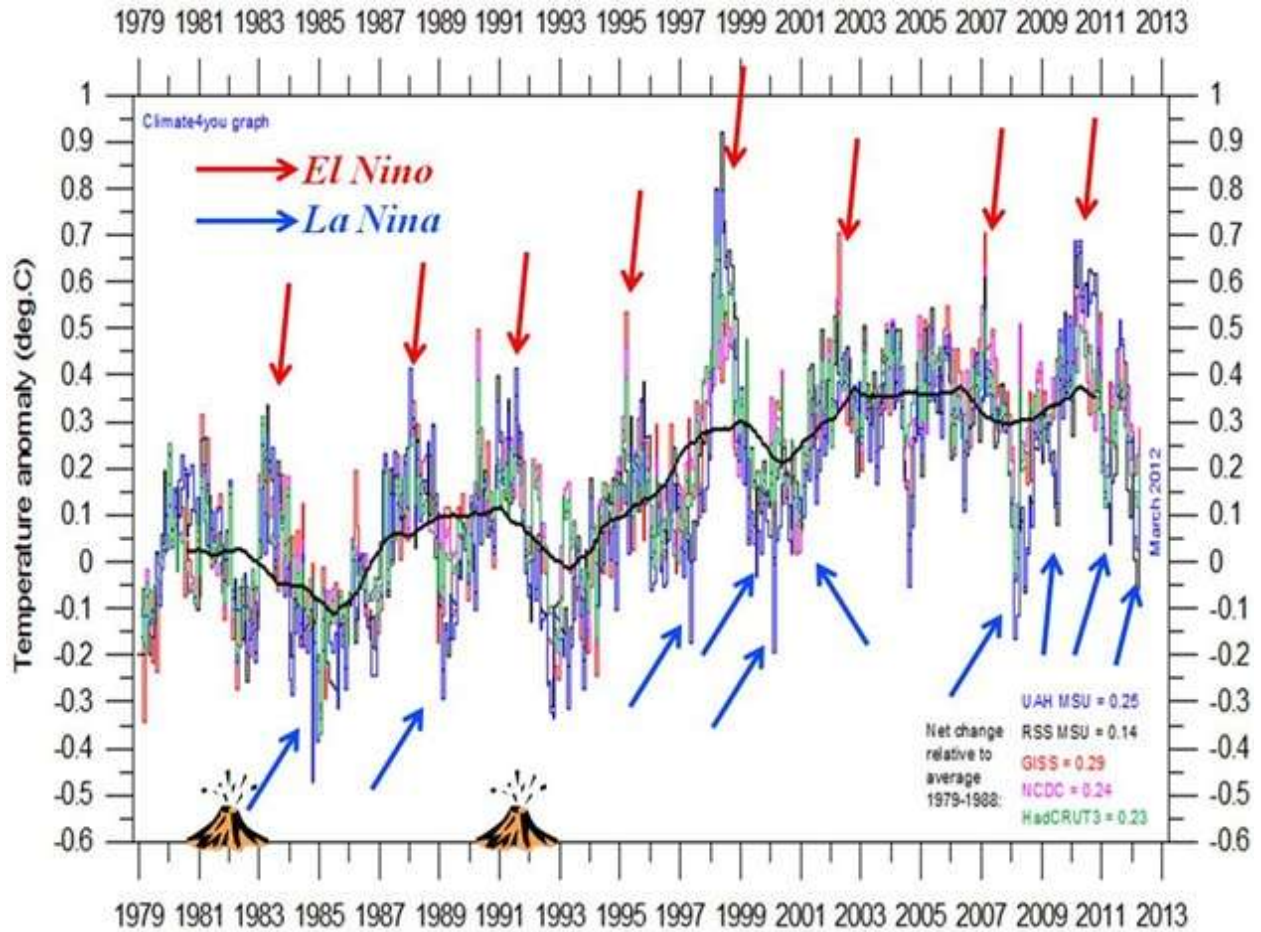


The warmth has continued but gradually subsided since then.

Despite the high number of record daily highs, this is a US centric warm event. The NCEP CFSv2 global anomalies from the winter through early June have been much of the time below the 1981-2010 average. The deep Eurasian cold wave shows in late January.



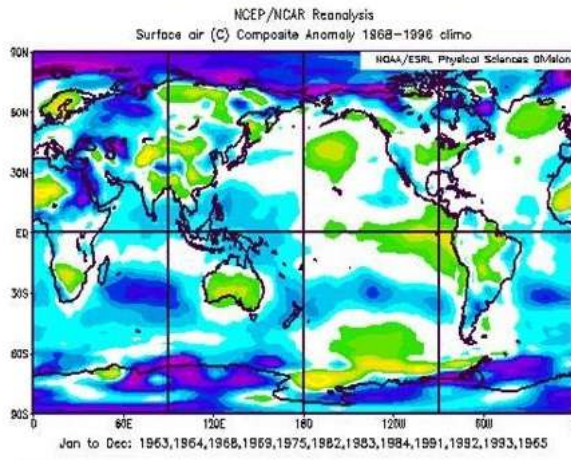
Looking back over the last century, you can explain global temperatures by ENSO and volcanism and the ocean multidecadal cycles that favor a particular ENSO state. Here is the plot since 1979 of all data sets with ENSO and volcanism indicated.



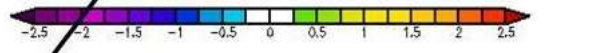
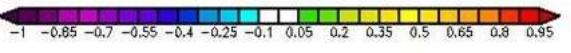
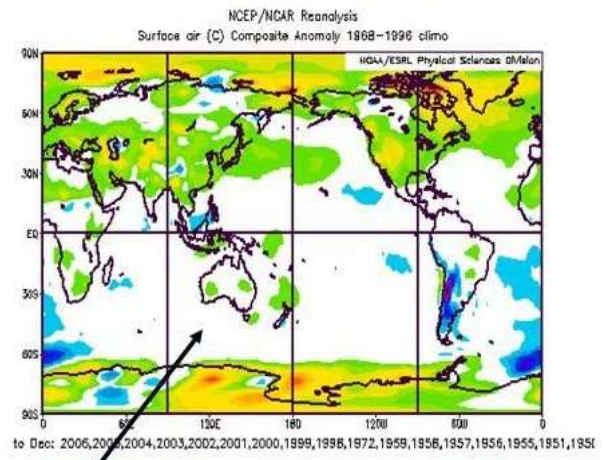
El Ninos bring a short term warming, La Ninas a dip in global temperatures. The warmn mode of the Pacific from 1977 to 1998, led to a net warming. Major volcanoes produce a cooling as we saw in the early 1980s and early 1990s, lack of volcanism (like we have seen since the middle 1990s) means more solar radiation at the surface and enhanced warming.

Years with more than 1/2 STD departures stratospheric aerosols

More than 1/2 STD Above



More than 1/2 STD Below

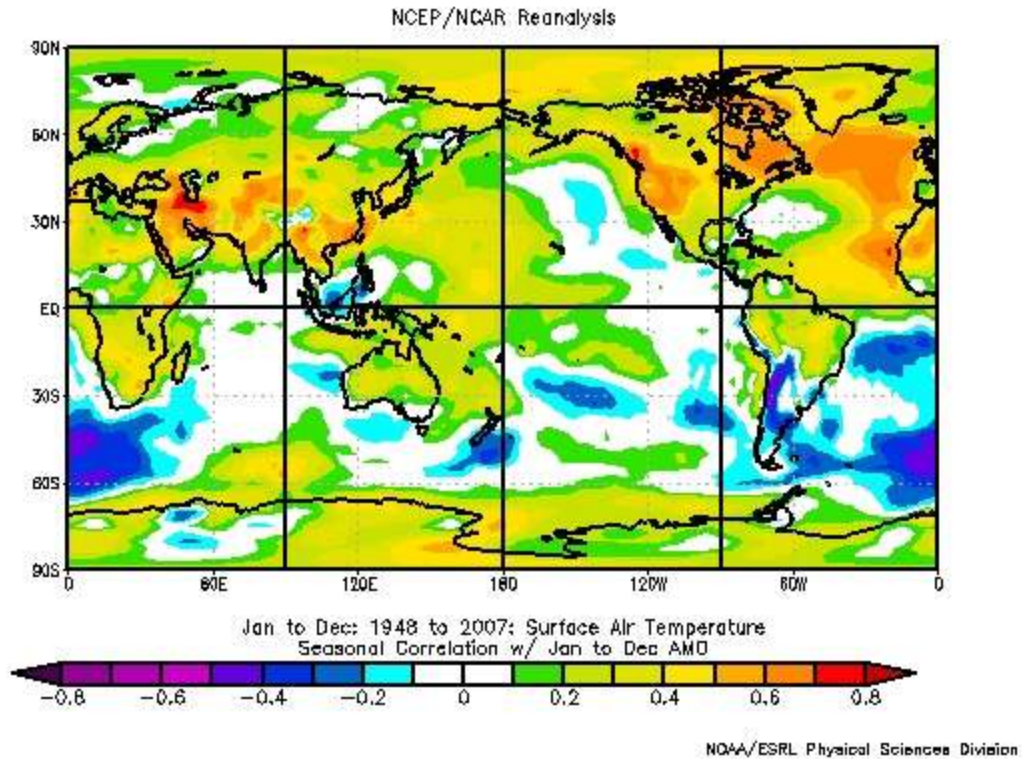


January to December Annual Temperature Anomalies

Data NASA GISS, CDC

1998-2006

In 1995, the Atlantic went into its warm mode, which means a warmer annual temperature in the Northern Hemisphere.



May for the US was warm again making the last year in the US allegedly the warmest in the record, but as John Christy of UAH noted from the satellite perspective, it was notable only in the lower 48.

"Here are the sectors from MSU TLT in deg C. Max12mo is highest 12-month average value beginning with Dec78-Nov79 and going forward month by month. Right column is latest 12-month running mean (Jun2011-May2012).

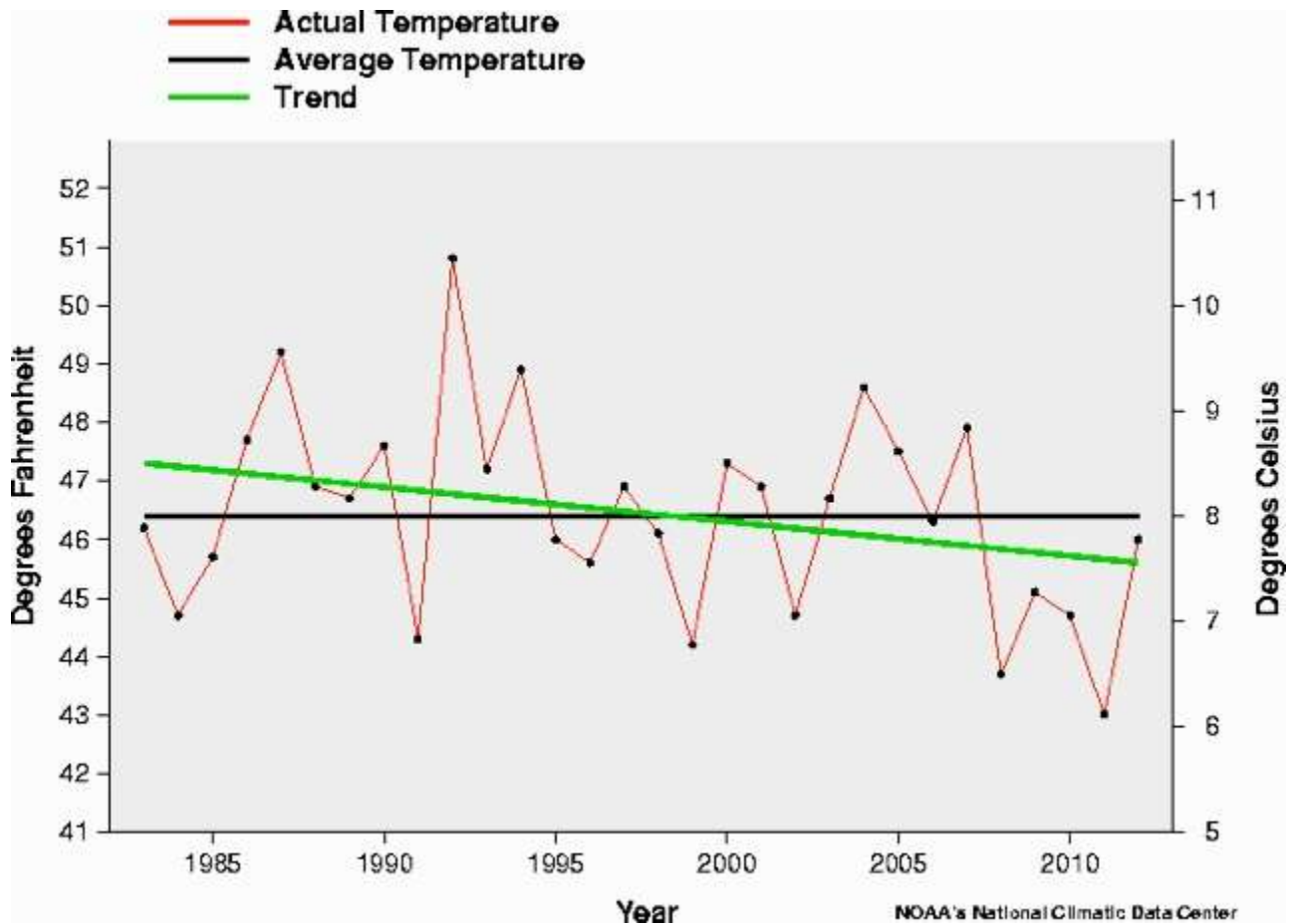
Latest USA48 is essentially tied with the value from Oct1999-Sep2000. The USA48 is the interesting story because other sectors (larger) are less than half of hottest value.

Sectors:Trpcs 20S-20N;NoExt 20N-85N;SoExt 85S-20S;Pol 60 to 85

Region	Maximum	2011/12
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Globe	0.429	0.184
Land	0.492	0.259
Ocean	0.403	0.141
NH	0.505	0.228
Land	0.628	0.286
Ocean	0.479	0.173
SH	0.395	0.138
Land	0.516	0.208
Ocean	0.363	0.118
Trpcs	0.695	0.016
Land	0.681	0.099
Ocean	0.703	-0.027
NoExt	0.565	0.343
Land	0.669	0.340
Ocean	0.453	0.349
SoExt	0.335	0.200
Land	0.645	0.310
Ocean	0.384	0.170
NoPol	1.237	0.725
Land	1.118	0.651
Ocean	1.487	0.843
SoPol	0.968	0.428
Land	1.408	0.638
Ocean	0.663	0.259
USA48	0.902	0.894
AK	1.348	-0.928

Again in the Pacific Northwest, it actually was colder than the 30 year mean for the fifth straight year.

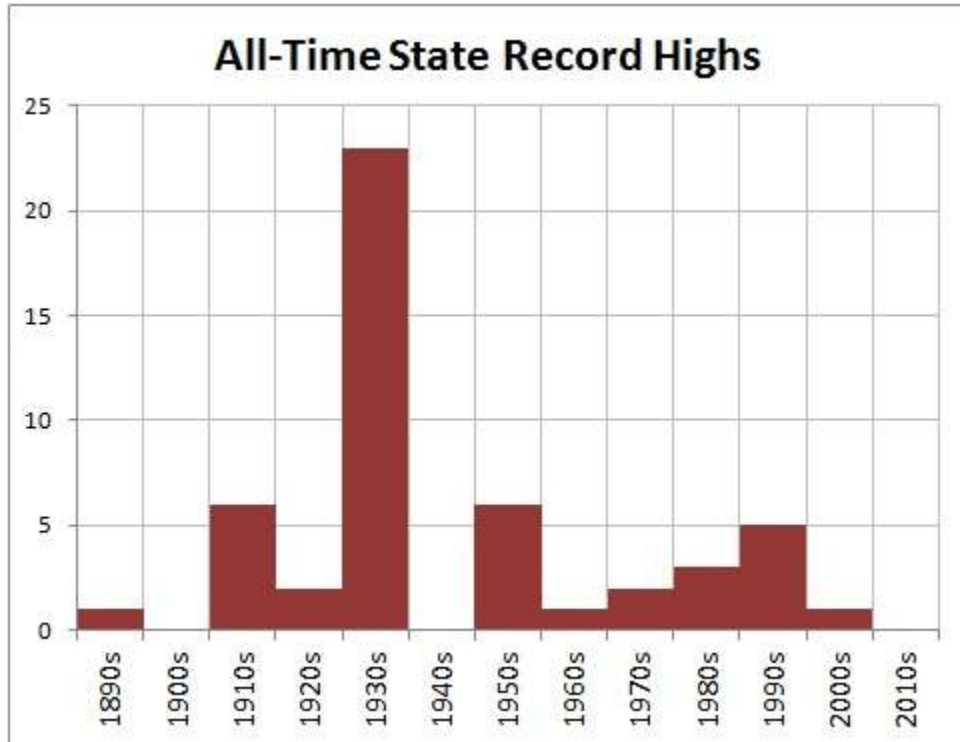


·Spring temperatures across the Northwest Region have been trending downward at a rate of 0.59 degrees F per decade during the 30 years since 1983.

·Spring temperatures across the Northwest Region have been trending downward at a rate of 4.10 degrees F per decade during the 10 years since 2003.

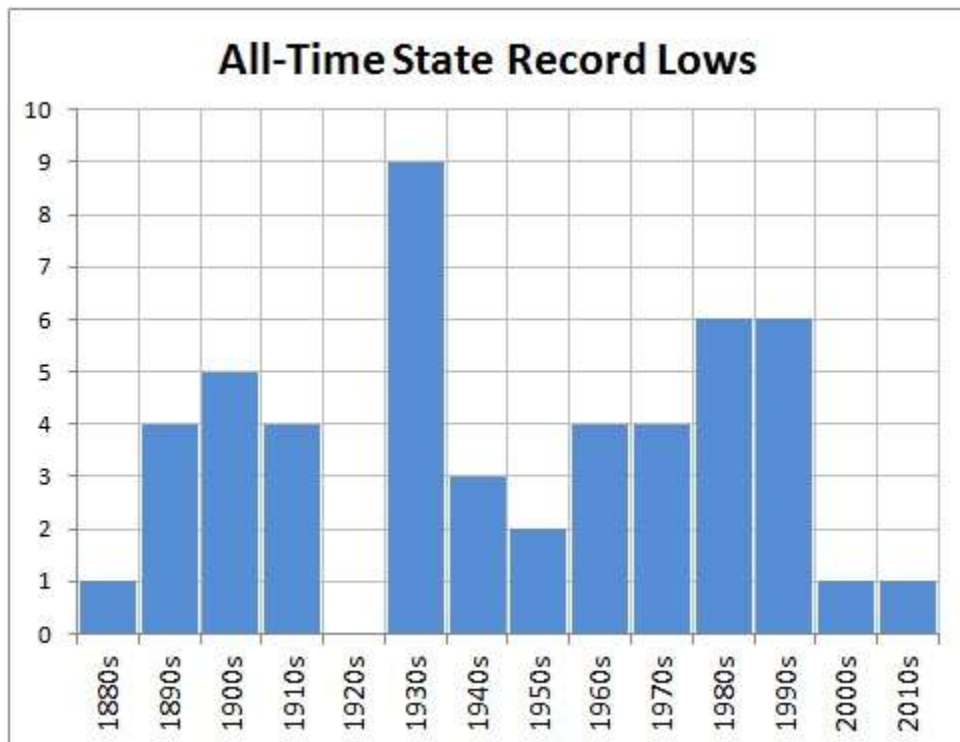
A Cold west usually translates to warmth further east as we saw in the 2010 and 2011 summers.

As hot as it has been the past two summers, the heat is not cracking all-time levels. Here is the latest decadal plot of all-time records for the 50 states. When multiple years are tied, the latest year/decade is used.

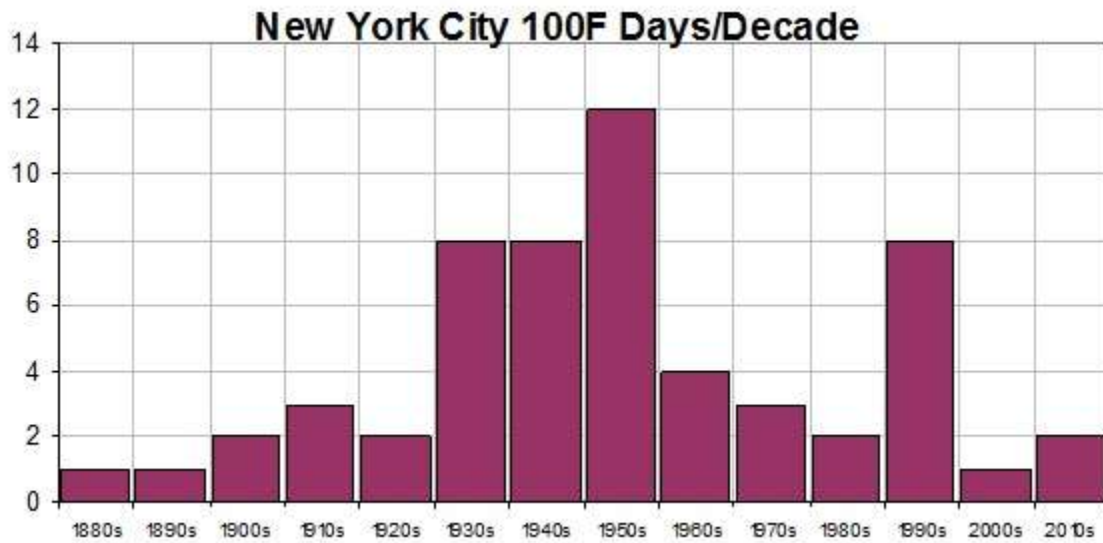


The 1930s stands out as the hottest decade, the 1910s and 1950s were second, 1990s third and 1980s fourth. This decade doesn't rank although it is early.

All time cold records look like this.



New York City reached 100F last summer, but that was common from the 1930s to 1950s.



The state monthly records through the end of the 2009.. This depicts the 12 monthly records for the 50 states (600 data points). There were likely March heat records set in some states and perhaps some other months so the 2010s will show and take away from some prior years.

U.S. State Maximum and Minimum Monthly Records by Decade

