California Climate Cycles through 2016

Jim Goodridge 6/14/17

The state has recently passed through the highest ever air temperatures and the lowest ever-annual rainfalls. This followed a submarine volcano on the Axial Seamount. It is located about 200 miles West of Brookings Oregon. The lava flow created a pool of heated water called the "Bloob".

California is blessed with 240 heritage rainfall records with over 100 years of record. Three of these date back to 1850. Old records form the main long-term index of inter-yearly rainfall variation. Seventy-three of these records have daily values since 1898. The 73 were stratified by storm duration and 9 year averages the extremes are plotted. The 119 years show 6 peaks reflected in all durations of maximum from one-day extremes to annual total rainfall.

San Francisco has the Worlds longest running tide gage since 1854. The tides show a nine–year running average resembling the States rainfall. The same Coriolis force acted on both rainfall and mean sea level. The tides are compared with the 9-year averages of the maximum daily rain and averages of the 365 day total rainfall.

The same pattern is reflected in average April 1 snow pack and surface water. Stream-flow reflects the variation as the extreme rainfall and San Francisco mean sea level. In previous studies the tree-ring pattern from Blue Oaks on the slopes of Mt Diablo varied as the tides.

There were 1038 monthly air temperature records that were summarized. Seventy eight of them had 100 years of record. The 100-year-old records were stratified by 2010 county population. The large counties show a plus 3° trend per century. Rural locations with no heated buildings or pavement in their view shed don't reflect this

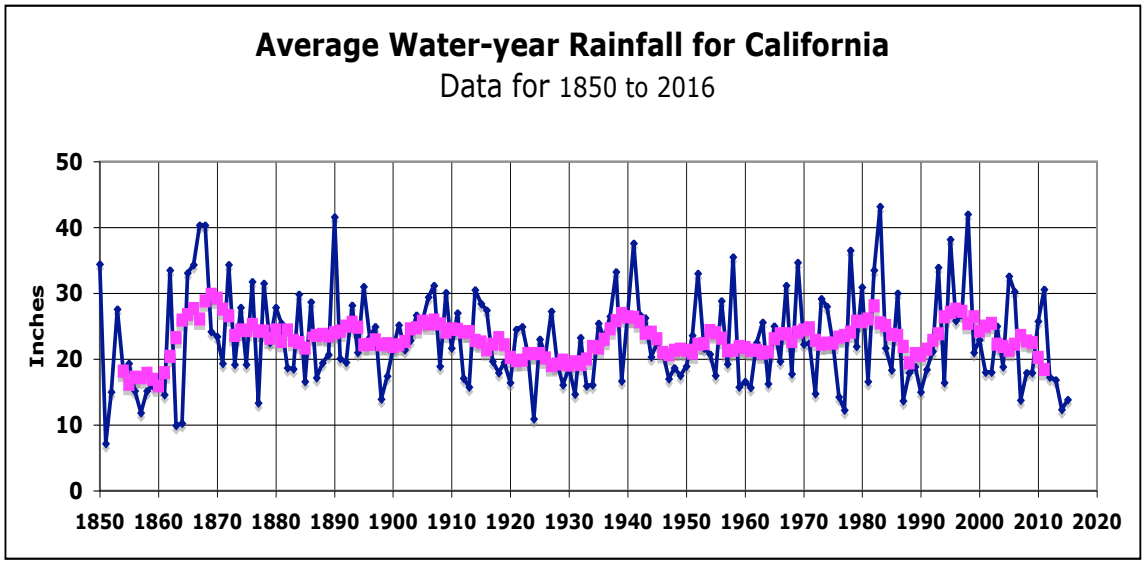
The Pacific Decadal Occlusion index shows sea water temperature difference on each side of the International Date line between 20° and 60° N. It has been a useful climate index.

The great 60-day storm of early 2017 was a fitting end to the States worst drought. Only one other historic storm had a large return period for 60 consecutive days. This resulted in saturated ground where nearly all the rainfall resulted in stream-flow. This gave substance to the old belief that droughts end with gully washers.

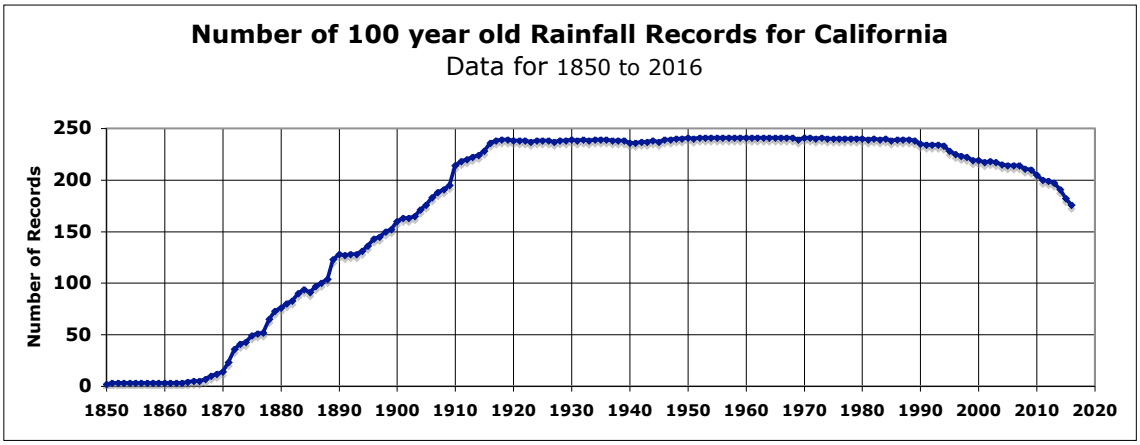
One Hundred Year Old California Rainfall Records

4/22/17

Planning storage for water supply calls for knowledge of inter-yearly water variation



This is an average of 240 easily available records with a nine-year average.
It represents a data availability summary rather than a homogeneous data set.
Note the apparent 18-year cyclic trend of recent 100 years ended with
high air temperatures associated with under sea lava flow from the Axial Seamount
This volcano is 200 miles West of Brookings, Oregon.

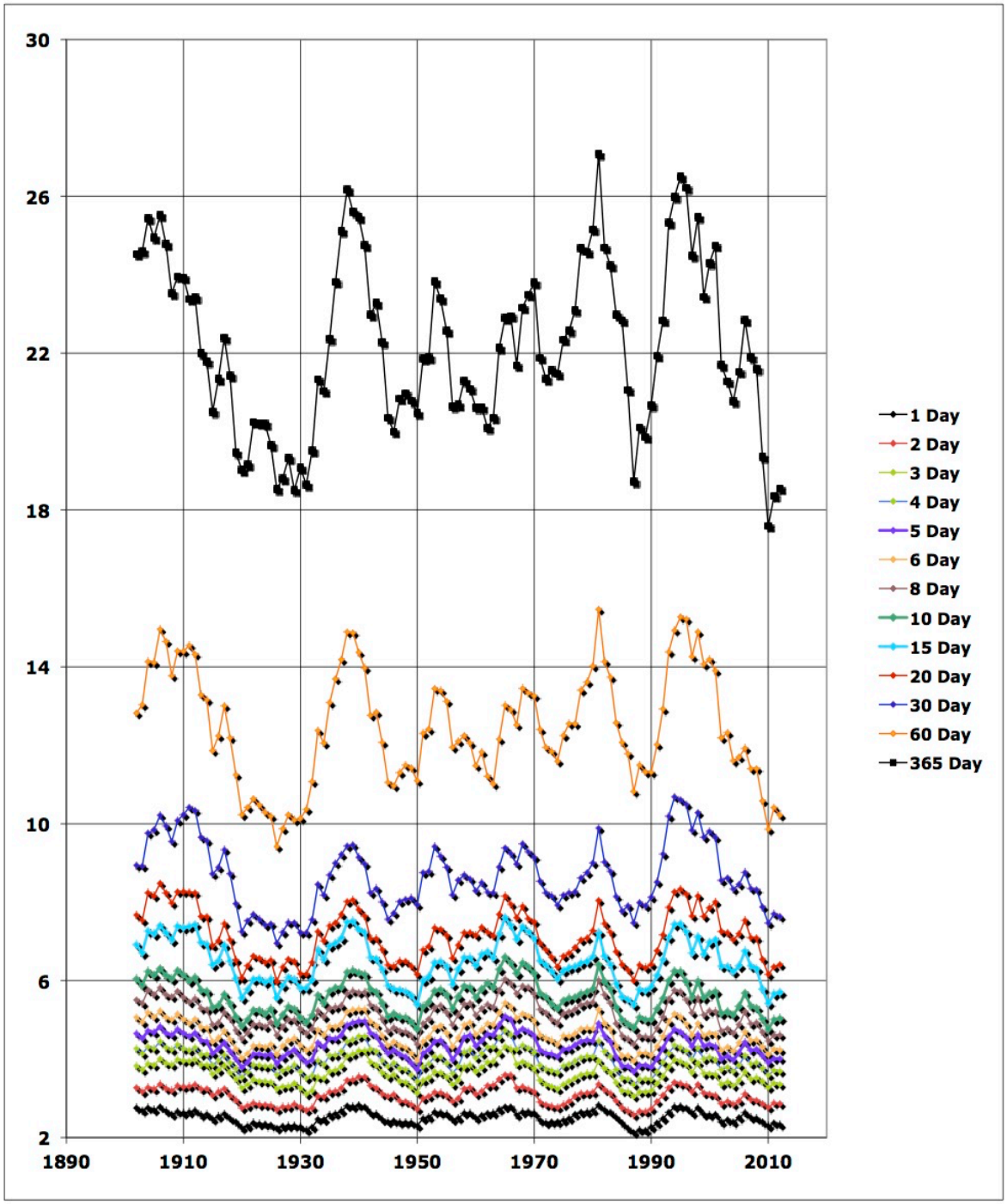


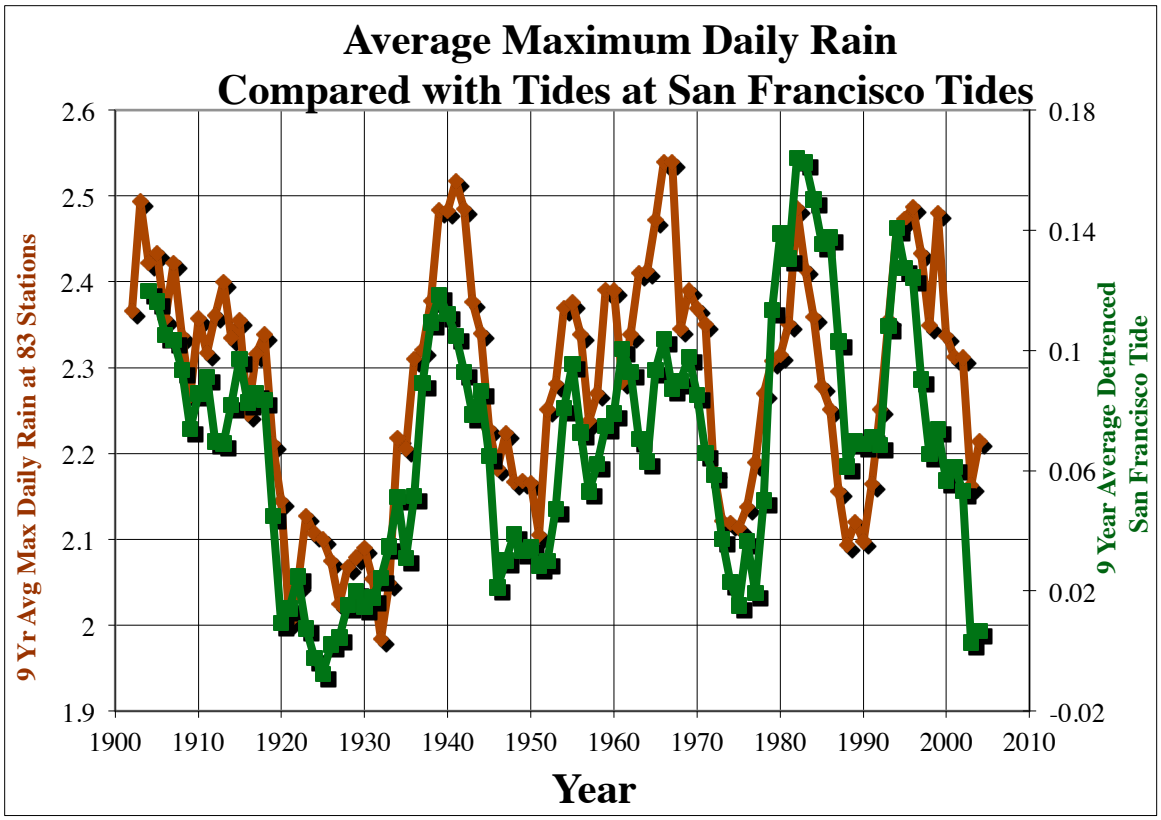
The rain data network of the National Weather Service is valued for long-term continuity. Other notable long-term rain gage networks include those of the San Francisco Water and the San Jose Water Works.

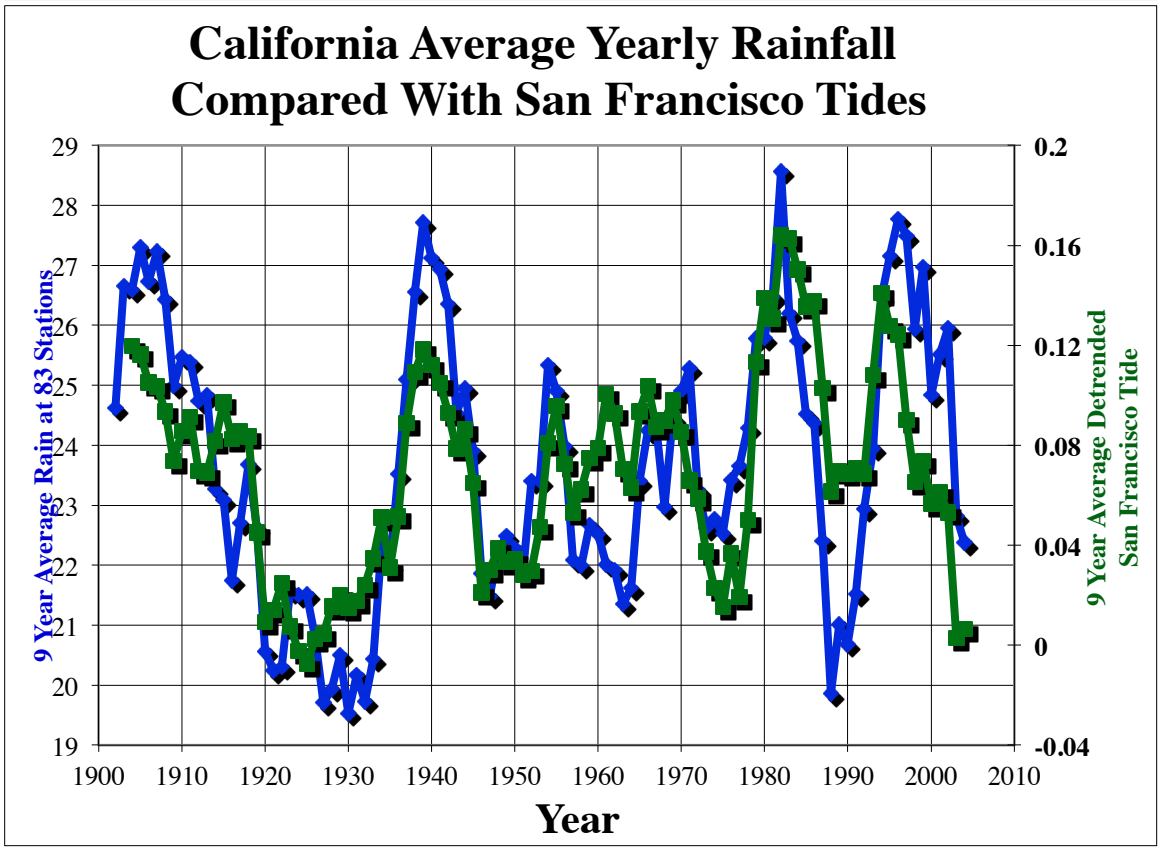
Nine Year Average Rainfall For Indicated Number Of Concecutive Days

Averages for all 73 California records with data for 1898 to 2016. Some data estimated
This is a 9 year running average of 73 California rain records that were nearly complete since 1898
These records were updated to evaluate the recent drought
It is apparent that the BLOB of high sea surface thmperatures brouht hignest ever air temperatures and drought.

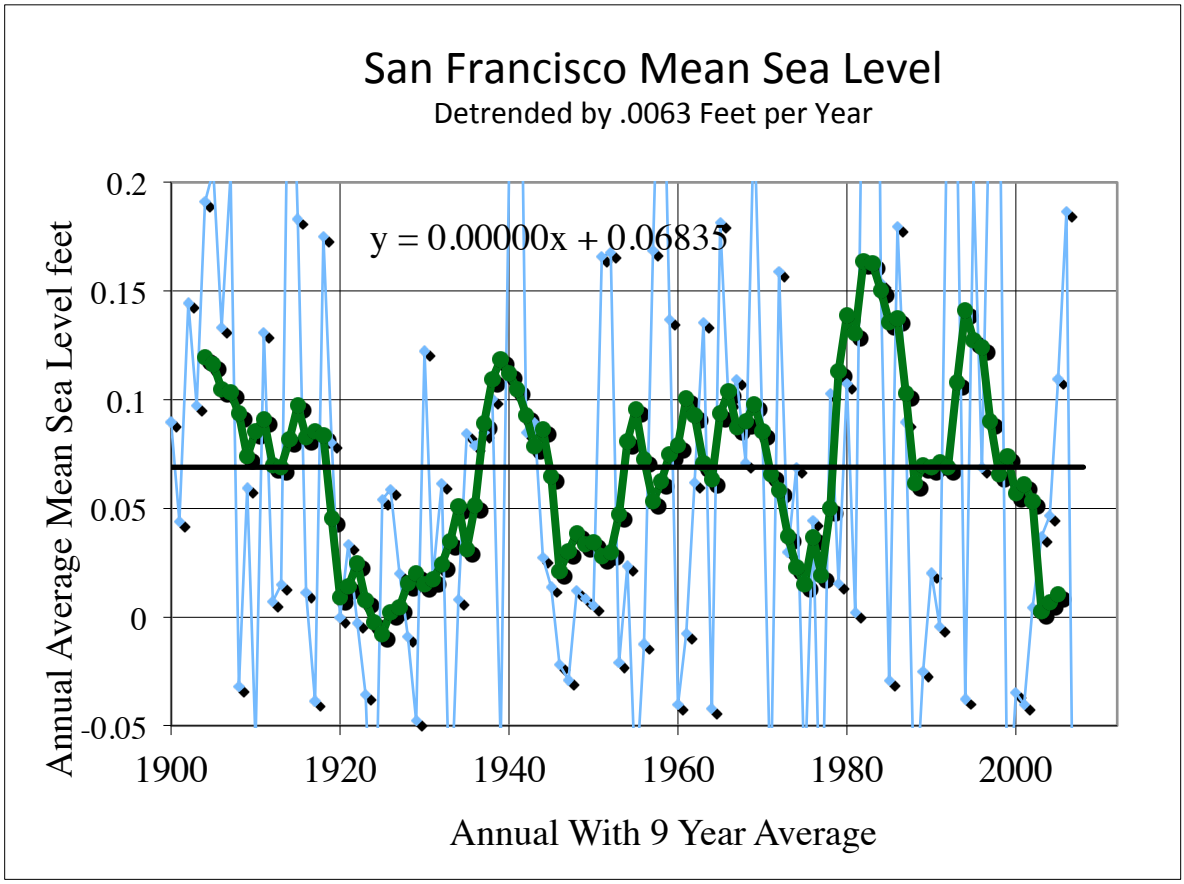
The great Flood of 2017 had 33 of the highest ever 60 consecutive days of rain.
It is planned that these graphs will be updated with the 2017 water year.




Average Maximum Daily Rain
Compared with Tides at San Francisco Tides
9 Yr Avg Max Daily Rain at 83 Stations
9 Year Average Detrenced
San Francisco Tide
Year
2.6
2.5
2.4
2.3
2.2
2.1
2
1.9
0.18
0.14
0.1
0.06
0.02
-0.02
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010


California Average Yearly Rainfall
Compared With San Francisco Tides
9 Year Average Rain at 83 Stations
9 Year Average Detrended
San Francisco Tide
Year
29
28
27
26
25
24
23
22
21
20
19
0.2
0.16
0.12
0.08
0.04
0
-0.04
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010

The similarity between the long-term variation extreme rainfall and San Francisco mean sea level is quite striking. The Earth rotates faster than the atmosphere. When moist South winds get lifted over coastal mountains, on shore winds generate high tides, they suppress upwelling seas and generate more rainfall. Dry North winds by contrast cause offshore winds that push water away from shore, inducing cold-water upwelling, low tides and reduced rainfalls.

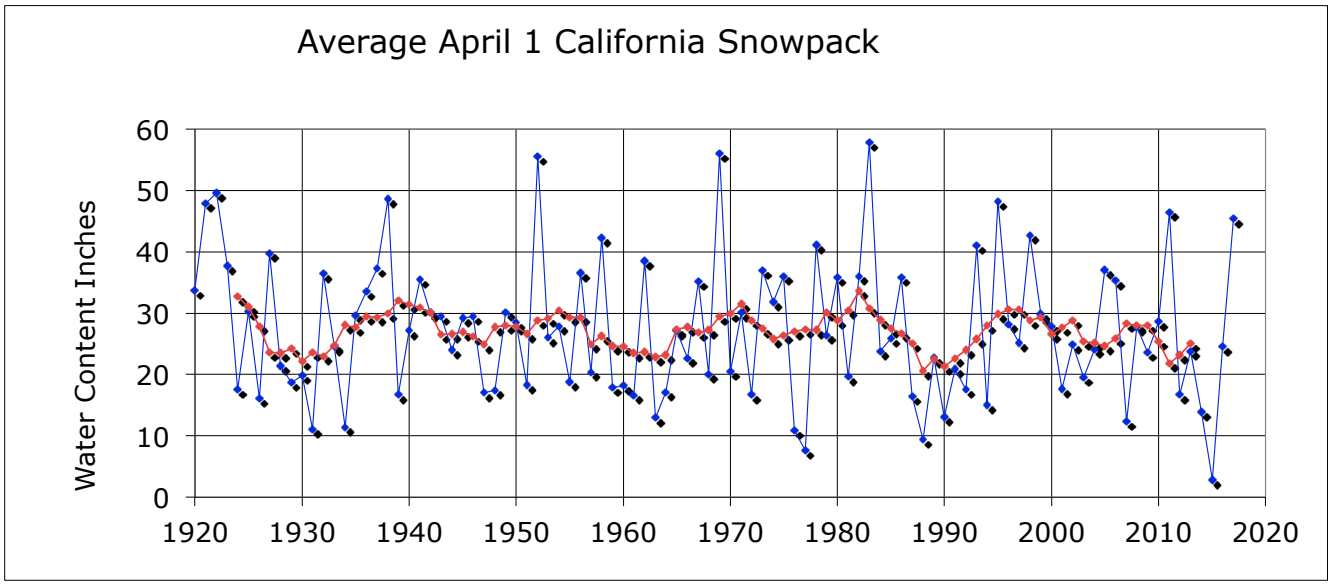


The tide gauge at San Francisco is the Worlds longest tide record from one location.

Average April 1 Water Content of California Snow Courses

4/24/17

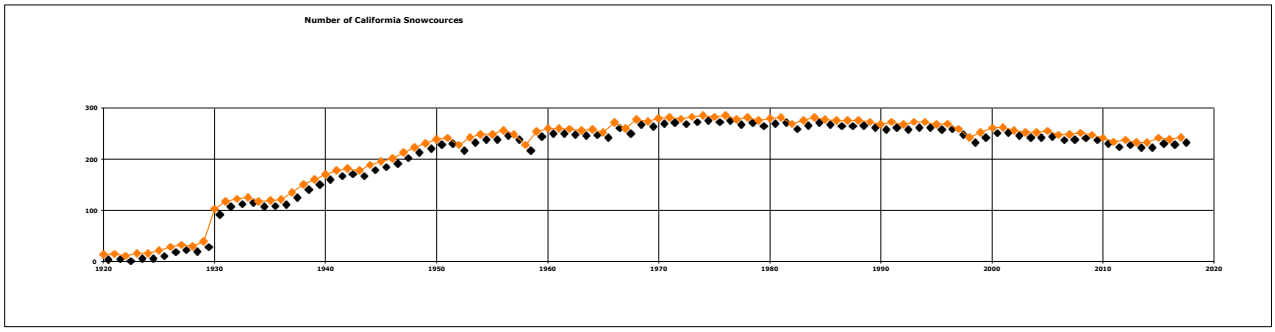
This was prepared to show the recovery from seawater heating from the Blob
The Bolb was from a sub surface volcano at 46°N, 130°W on the Axial seamount.



This graph is not a homogeneous data set but the average of all available records

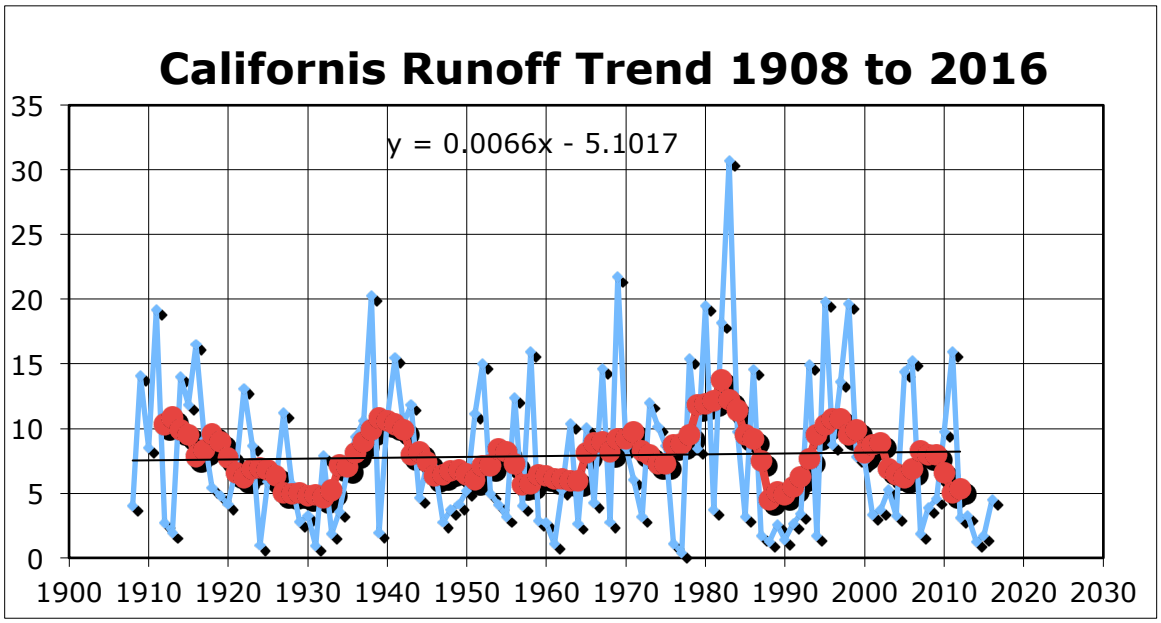
Hot lava apparently heated the North East Pacific Ocean and air temperatures in the Western US.

The apparent declining long-term trend in the April 1 water content reflects network changes.
Many of the high elevation snow courses were supplemented with low elevation stations accessible by car.



California Stream Flow

Natural stream flows are generally tainted by upstream diversion or storage.
Some times it is ground water underflow that modifies their flow.
Watershed ground cover has a great influence on flow rates.
Some of the watersheds have areas of glacier polished granite
and others deep rooted trees or shallow rooted grass.



Here is a graph of the average flow at 3 stations a subset of 327 that were selected
for few upstream diversion or minimum storage.
The size of these water sheds ranges from 9 to 900 square miles.
The trend would be different it this were expressed in percentages.

California Temperature Records

4/22/17

Average annual air temperature has been compiled for 1038 California records.
These started in 1850 and extend to through 2016.
These were compiled to check for influence of urban waste heat and volcanic effects.
These have 42,875 station years of data averaging 41 years per record.
The historic records were from Climatological Data of the National Weather Service.
One hundred eleven are from CD with 100 years of historic record.
Starting about 1980 remote data loggers are replacing daily manual observations.
The main networks consists of 512 Remote Automated System RAWS with fire weather data and the California Irrigation Management Information System CIMIS with 133 stations.
CIMIS is well quality controlled and RAWS is easily evaluated by near by records.

Averages of 1038 California Temperature Records

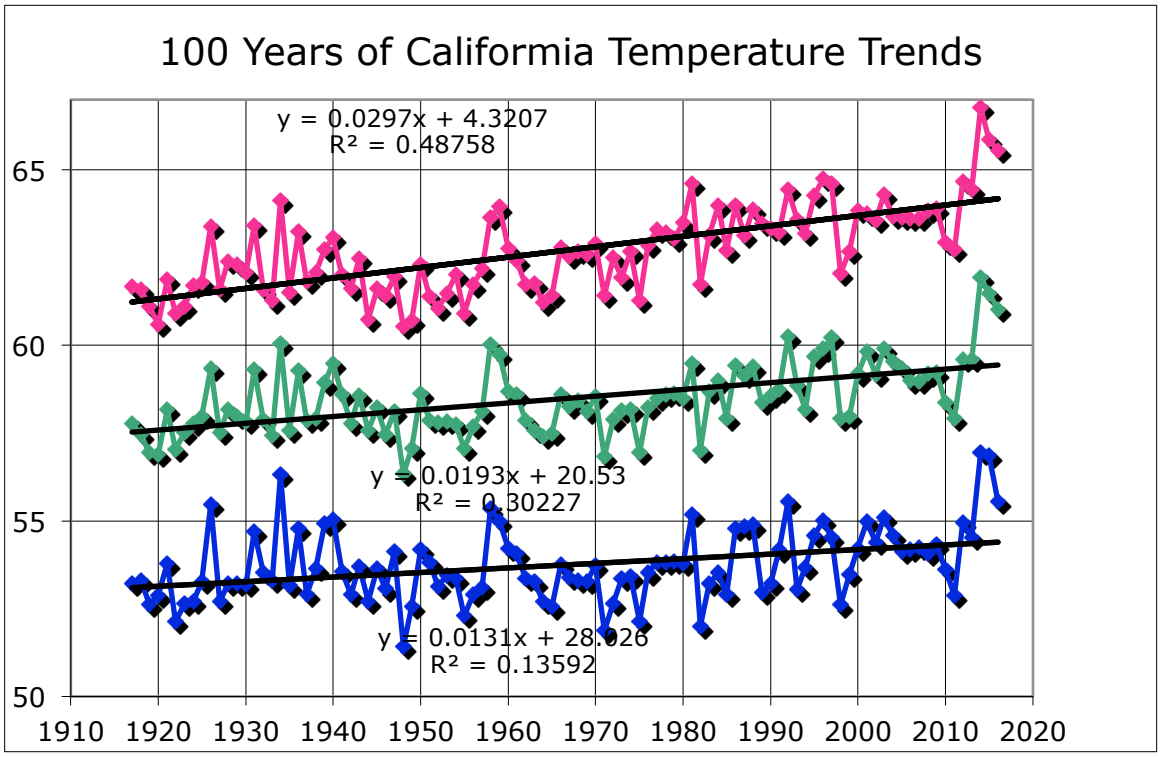
Based on 42875 station years of record as of 4/9/2017

	Warm Season May - Oct		For the year Jan - Dec		Cool Season Nov - Apr	
Avg Daily	Avg Max	Trend	Avg Daily	Trend	Avg Min	Trend
Maximum	80.99	0.056	66.94	0.032	53.03	0.138
Yearly	Avg Max	Trend	Avg Daily	Trend	Avg Min	Trend
Average	71.16	0.066	57.87	0.060	46.19	0.080
Avg Daily	Avg Max	Trend	Avg Daily	Trend	Avg Min	Trend
Minimum	60.76	0.069	49.24	0.066	38.76	0.866

California County Temperature Trend by Population

4/27/2017

2010 population data were used in this study.



25 large county records were averaged for a trend of 2.97°F per century.

34 records of medium sized counties have a trend of 1.93 ° F.

19 small sized counties averaged 1.31°F per 100 years.

Large counties were 840 to 10,441 K people.

Medium counties were from 99 to 531K. Small counties were from 3 to 63K people.

Higher trends in large counties reflect more land use modification with waste heat.

The influences of the Blob of high seawater temperature of 2014 to 2015 are noted.

This was associated with sub surface volcano on the Axial seamount at 41°N, 130°W.

Was the temperature spike of 1958-1959 also associated with a volcano?

Recent low rainfalls also coincide with the temperature spike.

There are places with no night-lights, heated buildings

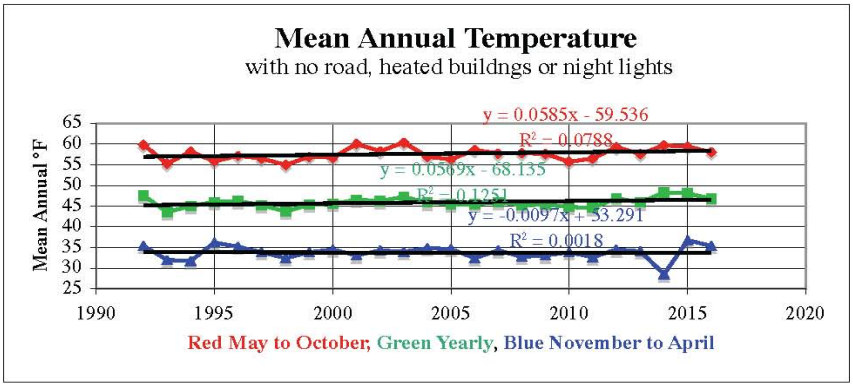
Or pavement or other causes of long term heating.
This is one of thousands of Remote Automated Weather Systems.
They report on the Internet via satellite every hour.

Mean Monthly Temperature °F

Ths illistrats temperature trends with no urban waste heat

Station	Statio No	County	Lat	Long.	Elev.	Source	Yrs Rec	Mean
Blue Door RAWS	A10 0899 22	Shasta	41.055	-120.338	5612	RAWS	25	45.9

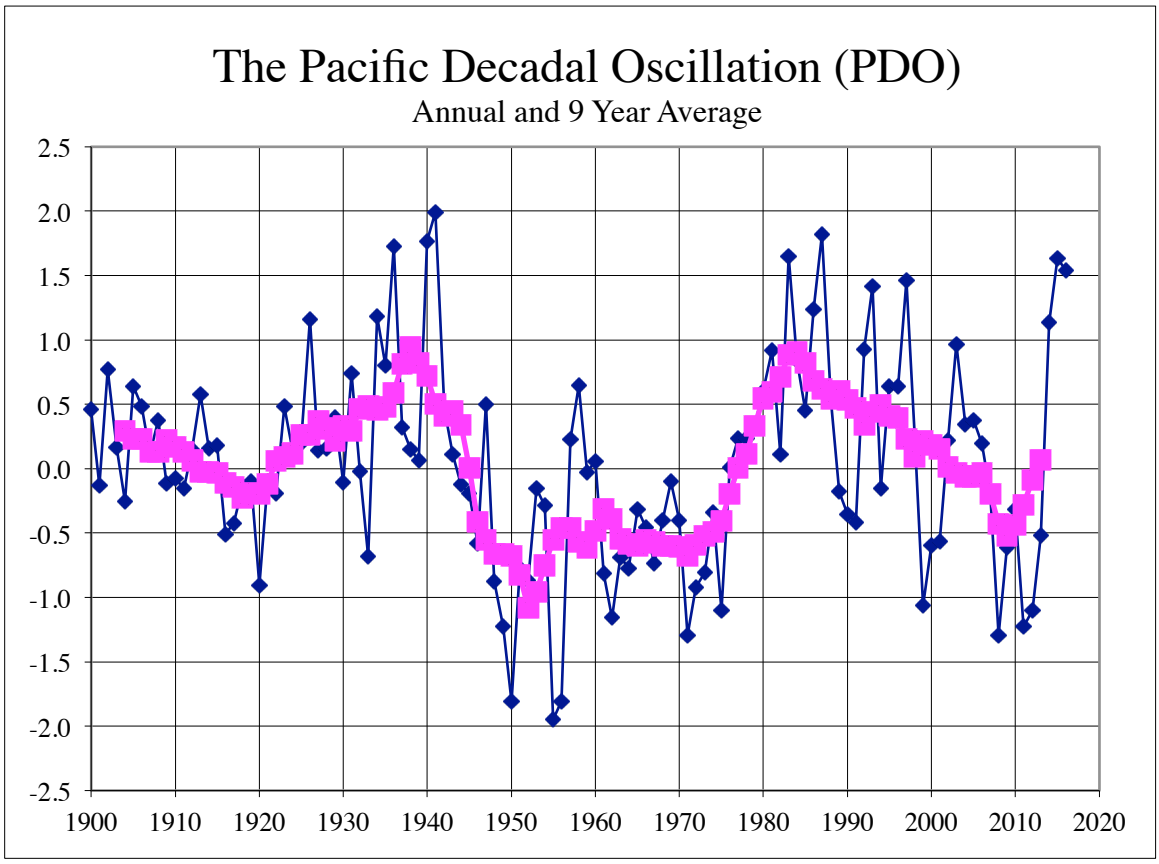
Year	Hot May-Oc	Ann	Cold Nov-Ap	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg	57.64	45.87	33.76	64.73	31.95	36.72	40.71	49.64	58.12	67.23	65.61	58.57	46.68	35.64	29.29
Max	60.41	48.36	36.76	38.50	39.04	44.70	45.63	58.12	64.98	71.24	69.27	63.23	51.88	42.54	32.55
Min	54.94	43.59	28.57	24.42	26.08	29.29	35.85	41.22	52.33	59.14	61.72	54.15	42.41	26.75	25.64
SD	1.53	1.18	1.67	3.60	3.20	3.35	2.79	3.99	3.27	3.01	1.86	2.44	2.91	3.63	2.37
Count	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25



JDG 3/4/17

The PDO Index

4/27/17



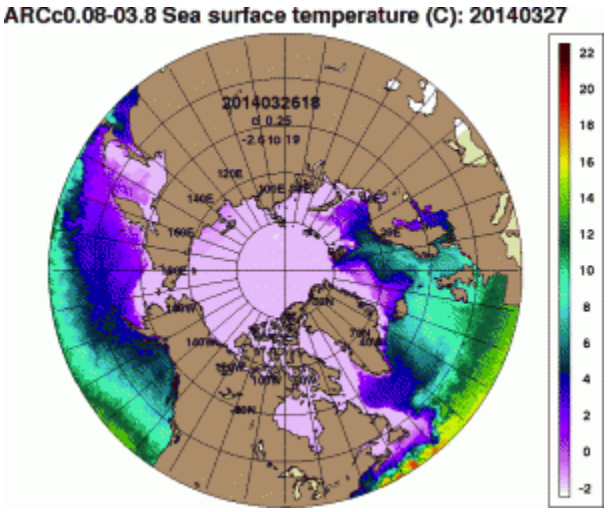
The PDO index express the sea surface temperature difference in the North Pacific. The North Pacific between 20° and 60°N, the PDO expresses the SST difference between the East and West sides of the International Date Line.
In general positive values are associated with south moist wind flow and high tides. Negative values with Northerly dry could winds with off shore flows and low tides.
"All generalizations are lies including these."

Global oceans upwell off the California or Japanese coastlines but not both at once. Apparently the sluggish change in upwelling is expressed by the PDO index. Shrinkage of the Artic Ocean apparently drives the World Ocean currents. The buoyant Gulf Stream water in Northern Europe keeps somewhat ice- free. Hydrostatic balance of the Artic sends cold water to bottom of the World Ocean. The North Pacific upwelling is a response to the Artic outflow.

Artic Influence on California Rainfall Cycles

Jim Goodridge 3/30/14

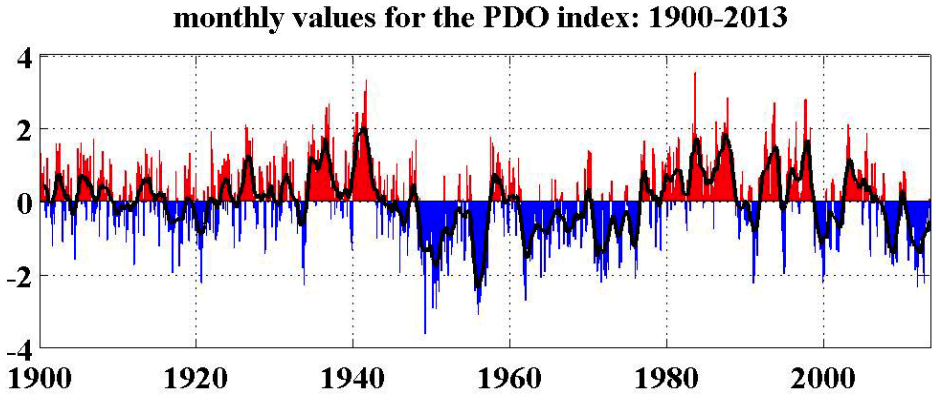
Why are there runs of wet and dry years in California rainfall records?



Seawater cooling causes several feet of shrinkage of the Artic Ocean.
The lower water levels draws the warm Gulf Steam into the Artic.
Outflow cascades at over the Straits of Denmark between Iceland and Greenland.
The cold dense water flows to the bottom of the world ocean.

The resulting hydrostatic forces must upwell somewhere to maintain balance.
The North Pacific Ocean is a site of much of the cold-water upwelling.
The Pacific Decadal Oscillation Index indicates it up-wells either in the East or West.
PDO is Sea Surface Temperature difference east or west of the international dateline.

With warm SST in Eastern Pacific moist tropical air is lifted by Coriolis effect.
This warm moist air being lifted over the mountain reduces water holding capacity
With cold SST north dry winds cause off shore winds and low tides.
This accounts for the similarity in California Rainfall and San Francisco tide trends



Volcano Weather - El Nino vs. The Blob

Jim Goodridge 4/8/16

The El Nino pattern occur in California
when a moist South wind patterns prevail.
This happens in the Eastern North Pacific Ocean.
Simultaneous high tides at San Francisco fluctuate
with the average rainfall in the State.

North flowing moist tropical air masses
are lifted over coastal mountains by the Coriolis effect.
Air Masses from the North are dry and cold with,
off shore winds that lower tides by the same Coriolis effect.
Coriolis effect results as Earth rotates under the atmosphere

A strange Blob of warn ocean water appeared
off the Oregon Coast during August 2014 to July 2015.
Warm water arrived without El Nino's South winds.
Thanks to WUWT and Dr. Tim Ball
we learned of a submarine volcano.

The volcano was on the Axial Seamount at 46°N and 130°W.
Energy from hot magma was calculated
to exceed the heat of the Blob.
A high dry temperature pattern with drought denied
the normal moist south winds of an El Nino pattern.

Geothermal contributions to weather became apparent.
Cut off from tropical moisture induced sever drought
Mysterious temperature spikes also occurred in 1958-59 and 1934.
Could these have been with volcanoes either surface or marine?

The year 1816 was known as the year-with-out-a-summer.
It followed the global dust clouds of the Mt. Tambora volcano
of April 1815 located in Indonesia at 8°S, 118°E.
Extended famine following histories worse eruption.

Sixty Day Storm of Jan 2 to March 2, 2017

Station	Grid	DWR Sta No.	County	Lat	Long	Elev	Max	Mean	Z	New RP	Rec	P max	Year	Sk	CV
Bucks Meadow BKM	F05	B40 1148 35	Calaveras	37.823	-120.098	3200	34.49	20.50	1.77	19	13	56.18	2005	0.64	0.385
Briceberg MBB	F06	B40 1070 45	Mariposa	37.599	-119.978	1150	34.08	15.25	2.91	131	16	50.08	2005	0.60	0.424
Tuolumne Meadows TUM	F06	B40 9063 00	Tuolumne	37.873	-119.340	8600	**30.48**	13.55	2.95	140	32	28.38	1997	0.60	0.424
Mariposa RS MRP	F06	B50 5352 00	Mariposa	37.501	-120.066	2250	**34.69**	15.25	3.01	156	15	21.69	2004	0.60	0.424
Marposa Grove RAWS	F06	B50 5354 00	Mariposa	37.513	-119.603	6400	**32.68**	13.84	3.21	228	26	26.42	1998	0.60	0.424
Wawona RAWS	F06	B50 9482 00	Mariposa	37.540	-119.652	4052	**53.37**	21.15	3.59	472	14	25.18	2008	0.60	0.424
Yosemite NP	F06	B50 9855 00	Mariposa	37.750	-119.582	3985	**43.20**	18.94	3.02	160	111	40.15	1956	0.60	0.424
Chilkoot Meadow CHM	F06	B70 1722 50	Madera	37.408	-119.480	7150	**58.68**	29.17	2.39	52	22	47.15	1997	0.60	0.424
Goat Mountian GTM	F06	B70 3479 00	Madera	37.270	-119.543	4520	**42.28**	16.22	3.79	694	27	32.14	1997	0.60	0.424
Graveyard Meadow GRV	F06	B70 3580 50	Madera	37.467	-119.283	6900	**48.84**	19.46	3.56	444	28	29.80	1998	0.60	0.424
Kiaser Point KSP	F06	B70 4444 20	Fresno	37.299	-119.000	9200	**54.12**	22.00	3.44	355	28	41.28	2011	0.60	0.424
Mountian Rest RAWS	F06	B70 5893 25	Fresno	37.054	-119.371	4100	**40.10**	18.50	2.75	99	18	28.04	2000	0.60	0.424
Peckenpah PCK	F06	B70 6775 20	Madera	37.350	-119.458	5150	**44.40**	19.93	2.90	128	28	35.20	1997	0.60	0.424
Poison Ridge PSR	F06	B70 7095 50	Madera	37.403	-119.520	6900	55.96	22.20	3.59	466	27	66.50	2005	0.60	0.424
Bald Mountain BDM	F06	C10 0451 00	Fresno	37.067	-119.400	4720	**41.25**	18.43	2.92	134	27	30.07	1997	0.60	0.424
Angwin PUC	G03	E30 0212 00	Napa	38.572	**-122.437**	1815	**48.08**	22.91	2.93	206	75	44.80	1986	0.36	0.375
Saint Helena 4SW SH4	G03	E30 7646 00	Napa	38.500	-122.533	1796	**41.00**	23.32	2.02	33	52	39.88	1955	0.36	0.375
Santa Rosa RAWS	G03	F90 7964 20	Sonoma	38.479	-122.712	560	**27.66**	15.12	2.21	47	26	24.03	1998	0.36	0.375
Hawkeye HKY	G04	F90 3835 20	Sonoma	38.782	-122.917	2000	**36.19**	21.70	1.80	21	24	34.95	1998	0.47	0.370
Georgetown GTW	G05	A50 3654 02	El Dorado	38.916	-120.760	3250	**46.42**	24.93	2.33	53	28	38.24	2000	0.47	0.370
Placerville IFG	G05	A70 6962 00	El Dorado	38.739	-120.742	2755	**42.49**	21.82	2.56	81	60	35.64	1956	0.47	0.370
Sly Park SLP	G05	B10 8274 40	El Dorado	38.717	-120.560	3530	45.88	23.98	2.47	69	36	52.44	1973	0.47	0.370
Black Springs BLS	G05	B20 0870 05	Calaveras	38.376	-120.190	6500	**56.75**	26.20	3.15	262	29	38.20	2006	0.47	0.370
Blood Creek BLD	G05	B20 0884 01	Alpine	38.450	-120.033	7200	**58.43**	25.90	3.39	436	28	38.13	2006	0.47	0.370
Tiger Creek PH TCP	G05	B20 8928 00	Amador	38.440	-120.491	2355	43.03	23.76	2.19	41	110	48.82	1911	0.47	0.370
Spring Gap Forebay SFB	G05	B30 8450 00	Tuolumne	38.168	-120.102	3000	**46.76**	20.85	3.36	404	70	36.30	1936	0.47	0.370
Sly Park SLP	G06	B10 8274 40	El Dorado	38.717	-120.560	3530	**87.28**	47.99	2.09	28	57	52.44	1975	0.84	0.392
Bucks Power House	H04	A50 1159 00	Plumas	39.911	-121.327	1760	52.06	34.15	1.52	14	87	63.02	1965	0.29	0.345
Bucks Lake BKL	H04	A50 1162 20	Plumas	39.850	-121.242	5750	**77.12**	42.25	2.34	67	29	72.76	1997	0.27	0.353
Forbestown FBS	H04	A50 3127 00	Butte	39.529	-121.281	2900	55.56	33.97	1.80	23	84	63.44	1956	0.27	0.353
Colgate PH CGT	H04	A60 1916 00	Yuba	39.331	-121.188	585	32.29	20.72	1.58	16	106	41.27	1912	0.27	0.353
Strawberry Valley	H04	A60 8606 00	Yuba	39.543	-121.109	3808	74.21	43.34	2.02	35	69	80.84	1956	0.27	0.353
Frenchman Dam FRD	H05	A50 3244 32	Plumas	39.883	-120.183	5517	**20.04**	7.77	3.73	547	29	12.60	2000	0.65	0.423
Lake Davis DAV	H05	A50 4678 82	Plumas	39.883	-120.477	5763	**23.35**	11.74	2.34	46	29	22.25	1993	0.65	0.423
La Porte LAP	H05	A50 4773 00	Plumas	39.682	-120.983	4975	65.15	38.44	1.64	16	67	89.07	1997	0.65	0.423
Quincy DWR QCY	H05	A50 7195 20	Plumas	39.935	-120.950	3408	**44.49**	20.93	2.66	80	28	29.11	2006	0.65	0.423
Allegany ALY	H05	A60 0119 20	Sierra	39.467	-120.967	4957	42.56	26.28	0.50	4	29	48.68	1997	0.65	0.423
Bear River at Rollins BRE	H05	A60 0865 20	Placer	39.133	-120.953	1845	**39.96**	33.39	0.47	3	20	33.89	2000	0.65	0.423
Gold Lakes GOL	H05	A60 3486 02	Sierra	39.667	-120.617	6750	**65.12**	33.39	2.25	40	30	64.72	2006	0.65	0.423
Grizzly Ridge	H05	A60 3486 02	Plumas	39.917	-120.645	6900	**51.02**	19.06	3.96	849	29	27.74	1993	0.65	0.423
Sierra City	H05	A60 8207 00	Plumas	39.935	-120.950	3408	57.46	33.38	1.71	17	46	61.87	1986	0.65	0.423
Blue Canyon BYM	H05	A70 0897 00	Placer	39.275	-120.709	5280	**69.22**	32.15	2.73	89	104	60.97	1997	0.65	0.423
Colfax	H05	A70 1912 00	Placer	39.099	-120.952	2418	36.37	24.51	1.14	8	17	44.20	1911	0.65	0.423
Hysink HYS	H05	A70 4195 00	Placer	39.282	-120.527	6600	**75.24**	37.48	2.38	50	29	63.63	1997	0.65	0.423
Sugar Pine SGP	H05	A70 8635 50	Placer	39.127	-120.750	3743	**57.40**	28.64	2.37	49	34	31.91	1993	0.65	0.423
Humbug HMB	I04	A50 4160 00	Plumas	40.113	-121.375	6500	53.64	31.72	2.06	35	30	78.88	1992	0.40	0.335
Antelope Lake	I05	A50 0219 01	Plumas	40.180	-120.607	4960	19.12	11.19	2.12	38	29	22.28	1997	0.40	0.335
Cashman RAWS	I05	A50 2231 20	Plumas	40.002	-120.915	4520	**22.37**	11.39	2.88	170	16	15.88	2006	0.40	0.335
Sierraville RS	I05	A50 8218 00	Sierra	39.583	-120.369	4975	28.76	13.36	3.44	584	106	53.08	1914	0.40	0.335

Columne Headings

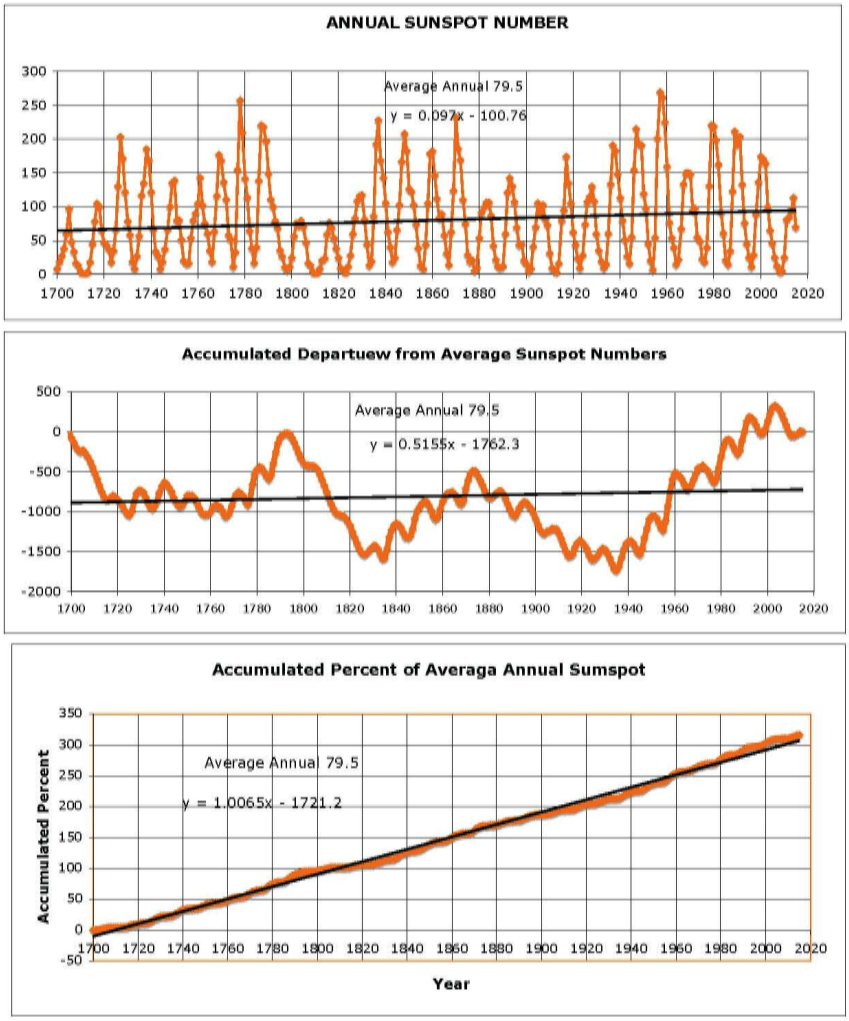
Station	Station name used in DWR Bulletin 195
GRID	This refers th the one degree quadrangles of latitude and lungitude
DWR St	Station number used in DWR Bulletin 195
County	County of station location
Lat	Latitude, degrees and thousandths
Long	Longitud,s degrees and thousandths
Elev	Elevation in feet
Max	Maximum 60 Consecutive Days Rain 2017
Mean	Average 60 consecutive Days Rain
Z	Normalized standard devation (standadr deviation / mean
New RP	Estimated return period
Rec	Years of record
P max	Prior year maximum water-year rainfall
Year	Year of prior water-year maximnm rain
Sk	Coeficient of skewness Eccel function, Grid cell average
CV	Ratio Standard deviation/Mean, Grid cell average

1000 Year Rain Storms of California

Station with High RP	DWR Station Number	n	Latitude	Longitude	Elevation in feet	Maximum inches	Mean Maximum	Maximum Std abv Mean	Maximum Return Period	Stations Reporting Highest	Stations with1000 Yr Rain	Year	Month	Day	Storm Duration Days	$ Damage Millions	10 Inch per Day Rainfalls
			36.817	-120.059	1383	11.68	3.10	6.78	34780	37	5	1961	7	14	3		13
			41.699	-114.513	7500	48.60	17.23	14.22	100000	338	50	2011	17	31	60		110
			32.628	-124.273	-100	3.15	0.69	4.12	1106	1	1	1866	1	1	0		1
75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	2	38
Oakland	E60 6335 00	F03	37.133	-122.200	3	7.76	2.56	5.00	1435	2	2	1866	12	18	3		
San Andreas L	E70 7704 00	F03	37.583	-122.400	377	27.16	5.28	10.06	100000	3	2	1871	12	18	3		2
Fort Ross	F80 3161 00	G02	38.517	-123.250	116	18.06	5.12	7.59	100000	1	1	1874	11	22	2		1
Sacramento	A00 7633 00	G04	38.583	-121.483	25	8.37	2.59	5.68	10255	1	1	1880	4	20	2		
Mt Hamilton	E50 5933 00	F04	37.333	-121.650	4206	33.32	6.13	10.85	100000	1	1	1884	12	17	10		
Mendota Dam	B00 5528 00	E05	36.788	-120.372	166	6.40	1.20	10.17	100000	1	1	1885	11	18	2		
Encinitas	Z04 2833 00	B08	33.050	-117.283	300	7.58	1.84	6.96	44336	1	1	1889	10	12	1		
Campo	Z11 1424 00	A08	32.628	-116.469	323	16.10	2.20	14.22	100000	1	1	1891	8	12	1		1
Tulare	C00 9051 00	E06	36.213	-119.331	293	3.89	1.14	5.66	1322	7	1	1898	9	26	1		
Camptonville	A60 1462 00	H04	39.451	-121.048	2755	48.60	17.23	5.16	33399	16	1	1911	1	10	6		
Ozema	T12 6576 00	C06	34.700	-119.317	3705	7.70	2.26	5.40	3504	2	1	1914	2	20	1		
China Flat	F40 1731 00	I02	40.865	-123.585	600	7.11	2.79	4.81	3639	2	1	1915	2	1	1		
Colusa	A00 1948 00	H03	39.200	-122.017	60	5.60	1.59	7.37	100000	3	2	1916	1	2	1		
Morena Res	Z11 5840 00	A09	32.686	-116.522	3075	26.18	5.96	6.76	12794	30	6	1916	1	14	15		8
Antioch	B80 0232 00	F04	37.984	-121.728	60	6.59	2.15	4.80	1106	11	1	1918	9	12	3		
Fancher Ranch	B00 2968 00	F05	37.318	-120.334	225	4.00	1.29	5.84	4920	1	1	1925	4	4	1		1
Belotta	B00 0637 01	F05	38.044	-121.058	108	6.37	1.88	6.62	15455	1	1	1925	17.17	0.37	0		
Table Bluff LH	F60 8740 00	I01	40.697	-124.273	160	15.10	5.46	5.18	21680	3	1	1926	11	27	6		
Palm Springs I	X19 6635 50	B09	33.827	-116.510	425	10.30	2.00	7.10	20655	34	7	1927	2	13	4		5
Griffith Pk Zoo	U05 3535 00	C07	34.134	-118.288	600	21.73	4.50	7.10	21388	27	5	1933	12	31	2		32
Alturas RS	A10 0161 00	J05	41.483	-120.533	4365	5.08	1.29	6.95	9889	39	9	1937	12	10	2		7
Brawley 2 SW	X23 1048 00	A10	32.954	-115.558	-100	6.33	0.96	7.28	4408	7	4	1939	9	5	2		
Indio	X19 4529 00	B09	33.713	-116.224	8	6.45	1.00	9.48	100000	5	1	1939	9	24	2		1
Cedar Springs	U05 1613 01	C08	34.356	-117.876	6780	27.53	6.18	6.73	23194	186	29	1943	1	22	2		110
Calaveras Dan	E50 1281 00	F04	37.487	-121.818	805	7.17	1.82	7.13	32716	49	5	1950	11	18	1		5
Lake McKenzie	E60 4688 00	F03	37.217	-122.067	1809	42.27	12.23	6.08	16114	178	15	1955	12	19	8		23
Oakdale Wood	B00 6305 00	F05	37.867	-120.867	220	5.72	1.34	8.88	100000	3	1	1958	4	3	1		2
Forest Lake	D40 3135 10	E04	36.592	-121.942	295	6.07	1.66	6.07	8741	8	1	1960	12	11	1		
Pattiway	C60 6754 00	C06	34.941	-119.381	3868	6.65	1.75	5.82	6764	8	1	1962	2	10	2		3
Beal AFB	A00 0584 00	H04	39.131	-121.427	120	10.90	3.15	6.89	20509	244	50	1962	10	10	3		
Sonora Junctic	G90 8355 00	G06	38.351	-119.448	6886	12.19	2.81	7.12	9376	67	5	1963	1	30	3		13
Gazelle	F20 3363 05	J03	41.575	-122.543	2690	8.09	2.11	6.99	59180	100	22	1964	12	19	6		33
Kern Intake 3	C50 4519 00	D07	35.945	-118.476	3642	23.57	4.40	8.96	72071	57	11	1966	12	3	4		22
Independence	W03 4232 00	E07	36.801	-118.185	3950	14.55	3.04	8.30	100000	338	9	1969	1	13	60		66
Lytle CR Intak	Y01 5212 30	C08	34.200	-117.450	2245	44.71	9.78	6.37	9520	158	33	1969	1	19	8		54
Harrison Gulch	A30 3791 00	I03	40.367	-122.967	2710	12.60	3.30	8.22	100000	1	1	1970	12	3	1		1
Yuma Valley	X27 9890 80	A11	32.717	-114.710	120	7.03	1.02	8.48	25343	20	2	1977	8	16	1		
Gurneville	F90 3685 00	G02	38.500	-123.000	55	12.40	4.15	6.11	100000	6	2	1977	11	21	1		14
Maricopa	C70 5338 00	D06	35.080	-119.383	680	4.15	1.03	6.62	5519	68	14	1978	2	10	1		14
Desert Hot Sp	X19 2405 00	B09	33.962	-116.510	1080	7.79	1.93	5.28	1631	235	1	1980	2	14	8		
Fergerson Ran	A00 3020 00	I03	40.350	-122.450	800	12.00	2.90	9.15	100000	3	1	1980	12	3	1		1
La Quinta	X19 4782 11	B09	33.674	-116.291	85	4.06	1.03	5.37	1533	5	1	1980	12	3	1		
Point Reyes Li	E10 7027 00	G03	38.183	-122.850	490	5.96	1.73	6.35	40528	102	8	1982	1	4	1		11
Phelan CDF	W28 6848 01	C07	34.422	-117.572	4160	11.51	2.61	5.58	3553	28	1	1983	2	26	6		7
Park Moari Re	X13 6697 80	A11	32.728	-114.513	540	6.20	1.25	5.70	1261	2	1	1983	7	21	1		
Park Moari Re	X13 6697 80	A11	32.728	-114.513	540	6.20	1.25	5.70	1261	2	1	1984	8	15	1		
Atlas Peak	E30 0372 20	G03	38.422	-122.248	1660	41.08	11.92	6.38	100000	234	19	1986	2	11	10		11
Newman	B00 9418 00	G05	38.182	-120.962	214	4.10	1.22	6.67	16554	1	1	1988	1	17	1		
Fawn Lodge F	F40 2972 20	I03	40.625	-122.905	2800	3.56	0.69	12.13	100000	1	1	1991	6	28	0.04		
Yermo Insp St	W28 9836 75	C09	34.914	-116.792	1912	3.50	0.79	5.87	3835	1	1	1992	12	25	1		
Table Mtn 82	W26 8748 00	C08	34.382	-117.685	7500	24.26	6.10	5.13	1292	158	9	1993	1	5	15		3
San Francisco	E70 7772 00	F03	37.783	-122.417	52	6.76	2.29	4.89	1258	2	1	1994	11	5	1		
Chester	A50 1700 00	I04	40.306	-121.228	4525	14.87	5.73	4.12	2918	51	3	1995	1	7	6		11
Roseville Filter	A00 7565 30	G04	38.723	-121.186	298	7.56	2.35	5.96	6471	1	6	1995	1	10	1	741	2
Morrow Bay FI	T10 5866 00	D05	35.367	-120.850	115	13.50	2.48	9.81	100000	11	1	1995	3	10	2		2
Morrow Bay FI	T10 5866 00	D05	35.367	-120.850	115	8.82	1.96	7.75	82031	72	8	1995	3	10	1	741	2
Pajaro CIMIS :	D10 6548 11	F02	36.900	-121.733	65	5.91	2.11	4.91	1393	35	1	1995	12	12	1		11
Kneeland 1.0 I	F60 4587 00	I02	40.667	-123.917	2660	11.03	3.90	5.18	17188	7	1	1995	12	30	1		1
Stratford 15	C00 8595 00	F06	36.158	-119.850	193	4.37	1.29	5.60	6263	1	1	1996	2	3	1		
Camp Pardee	B20 1428 00	G05	38.250	-120.844	658	5.33	1.78	5.63	3675	1	1	1996	5	16	1		
Pilot Peak	A50 6867 00	H05	39.787	-120.872	6300	11.36	6.64	6.64	31251	29	1	1997	1	1	1		15
Tustine MCAF	Y01 9087 40	B08	33.700	-117.833	120	7.18	1.74	6.85	45508	2	6	1997	12	6	1		
Los Banos CIM	B00 5117 56	F05	37.092	-120.760	95	3.15	1.10	5.06	1875	31	2	1998	2	3	1		
Escalon	B00 2860 00	F04	37.783	-121.000	125	6.00	1.29	10.31	100000	4	3	1998	5	6	1		
Del Norte RWS	F00 2360 05	J01	41.699	-124.104	720	14.29	5.11	5.20	2283	1	1	1998	11	21	1		1
Buelton FS 23	T14 1167 60	C06	34.613	-120.197	360	9.55	2.59	5.95	8399	14	4	2001	3	5	1		3
Barstow CIMIS	W28 0519 50	C09	34.884	-116.983	2080	8.23	1.29	9.64	100000	1	1	2002	9	12	2		
Green Valley F	D10 3612 05	E04	36.941	-121.767	110	11.42	3.47	5.55	1844	9	1	2002	12	13	1		4
Eureka NWS	F60 2910 00	I01	40.800	-124.167	43	6.79	2.50	5.20	2882	8	1	2002	12	27	1		2
Puddingstone	U05 7160 01	B08	34.092	-117.806	1030	9.40	2.68	5.50	4957	5	1	2003	2	14	1		
Oceanside	Z03 6277 49	B08	33.220	-117.320	50	6.46	1.92	5.18	2998	1	1	2003	12	25	1		
Kern Canyon F	D07	D07	35.441	-118.795	700	4.91	1.11	7.64	100000	1	1	2004	12	29	1		
Placerville	A70 6960 00	G05	38.729	-120.798	1890	8.27	2.88	5.17	3199	10	2	2005	12	31	1		
Huron Ranch	C00 4188 00	E05	36.267	-120.100	335	3.28	1.04	5.01	3993	2	1	2006	1	2	1		
New Hogan Da	B20 6165 05	G05	38.150	-120.800	554	6.26	1.99	5.24	7423	1	1	2011	1	25	1		
Grizzly Ridge	A60 3486 02	H05	39.917	-120.645	6900	51.02	19.06	3.96	849	79	0	2017	1		60		

Sunspot Number

Hidden in the sunspot numbers are long-term trends.
Orbiting observatories since 1978 show solar irradiance and sunspot number are associated.



"Source: WDC-SILSO, Royal Observatory of Belgium, Brussels". http://www.sidc.be/silso/datafiles

Sunspots have increased by 1 percent per year since 1700.
This suggests recovery from the Little Ice Age of 1660 to 1710.
A major increase in sunspot trend was from 1940 to 2002.
This coinciding with the atmospheric CO2 increase.
The temperature-CO2 correlation is spurious rather than causal.
Thanks to Dr. Leif Svalgaard for help in revising sunspot numbers.

The main lesson

7/30/2008

The main lesson is to let the physical data determine public policy.
One of the biggest problems arises when we depend on the opinion of experts.
Opinions may be useful in the absence of facts but do they reflect basic reality?
Even when the correlation is high is it associated with reasonable causality?

Temperature measurement is a prime example of an historical misreading.
Temperature reflects the environment in which the observations are made.
In an urban environment the rising trends reflect environmental modifications.
It may appear that air temperatures are increasing because of rising atmospheric CO2.

A definite causal connection with a joint rise in temperatures and CO2 is not evident.
CO2 release from a cold Coke is a function of increasing temperature as well as lower pressure.
When opened and warms to room temperature the Coke loses most of its CO2 and tastes flat.
Our Planet's oceans may be going flat also as increasing heat is driving out the dissolved CO2.

The real questions now relate to the solubility of CO2 and the origin of the heat source.
There are a few assumptions that we must make in order to function as informed people.
Evaluation of the "Solar Constant" was a goal of the Smithsonian Institution in about 1900.
Their accuracy was about one percent, which was masked by the atmospheric water content.

"Solar Constant" measurement had to be made from above the Earth's atmosphere.
This task fell on Richard Willson of the Jet Propulsion Laboratory with results from 1978.
It was found that the "Solar Constant" was not constant but varied with the sunspot numbers.
The Royal Belgium Observatory has counted sunspots fairly accurately since 1900.

Their accuracy was .2 or .3 % back to 1750. Estimates of sunspot numbers date back to 1500.
From these we learn of the Maunder Minimum with the Little Ice Age of 1660 to 1710.
The same force creating the Little Ice Age has brought us increased Solar heating since 1935.
The oceans absorb 98 percent of the in falling solar energy.

The solubility of CO2 in water decreases rapidly with increasing temperature.
The temperature increase clearly preceded the increase in atmospheric CO2.
Makers of dry climate models say the temperatures increase was caused by the CO2 increase.
Many people would like us to think it was CO2 that caused the temperature increase.

This concept contradicts the reality that temperature increase preceded the CO2 increase.
CO2 is only a minor atmospheric constituent. Water is Earth's controlling Greenhouse Gas.