



Arizona Climate Summary

January 2013

Summary of conditions for December 2012

December 2012 Temperature and Precipitation Summary

December 1st – 16th: During the first week of December, high pressure dominated the southwest elevating daytime temperatures and preventing any precipitation from occurring over Arizona. Average daily temperatures were 10+ degrees above normal at many locations statewide including Flagstaff, Phoenix, Yuma, and Tucson from the 1st-7th. During the 9th-16th a trough of low pressure in the upper atmosphere deepened southward extending over Arizona. The trough helped to suppress daytime high temperatures and daily average temperatures remained at or below normal for most locations. On the 14th, a strong surface low pressure system moved from California into Arizona causing the first major winter storm of the season. Precipitation amounts on the 14th totaled 0.93” in Nogales, 0.85” in Flagstaff, 0.49” at Phoenix Sky Harbor and, 0.31” in Casa Grande. The storm lingered through the 15th where another 0.55” occurred in Flagstaff, 0.19” occurred at Kingman AP, and 0.15” occurred in St. Johns. After the storm system moved out of the state, daily temperatures across Arizona dropped well below normal throughout the 15th-16th.

December 17th – 30th: A surface low pressure system moved inland from the Pacific on the 18th-19th bringing another round of precipitation to the state. The heaviest amounts occurred on the 19th at the Grand Canyon AP (0.85”), Payson (0.48”), Bellemont (0.45”), Show Low (0.45”), Heber-Overgaard (0.40”), and Prescott (0.40”). After the surface system passed out of the state, temperatures once again plummeted below average. Daily average temperatures on the 20th were 14°F below normal in Flagstaff, 8°F below normal in Blythe, and 7°F below normal in Yuma. High pressure returned to the southwest from the 21st-23rd and daily average temperatures returned close to normal. On the 24th-25th, a surface frontal system moved across northern Arizona helping to suppress temperatures statewide and bring trace amounts of precipitation to higher elevations including Payson (0.14”), Window Rock (0.09”), Winslow (0.07”), and Cottonwood (0.06”). A trough of low pressure in the upper atmosphere remained over the western U.S. throughout the last week of December and below average daily temperatures persisted across the state. On the 31st a cut-off low moved over the state producing precipitation totals of 0.75” in Douglas, 0.65” in Bisbee, 0.24” in Bowie, and 0.21” in East Mesa.

In This Issue: Overview of December and the monsoon, graphs of the December daily maximum and minimum temperatures, precipitation, mean daily dew points for Flagstaff, Phoenix, and Tucson; December climate statistics, maps of mean monthly maximum and minimum temperatures, precipitation, dew points, wind speeds for December; and graphs of the mean December temperature and precipitation for the period of record for Tucson, Phoenix, and Flagstaff, graphs of the cumulative precipitation for the calendar year for Flagstaff, Phoenix, and Tucson. Climate calendars for Flagstaff, Phoenix, Tucson, Prescott, Winslow and Yuma, including daily and monthly normals and extremes, for each month of the year, can be downloaded directly from the State Climate website. See p. 19 of this report for calendar abbreviations.

Data are preliminary and are from the National Weather Service Forecast Offices in Flagstaff, Phoenix and Tucson.

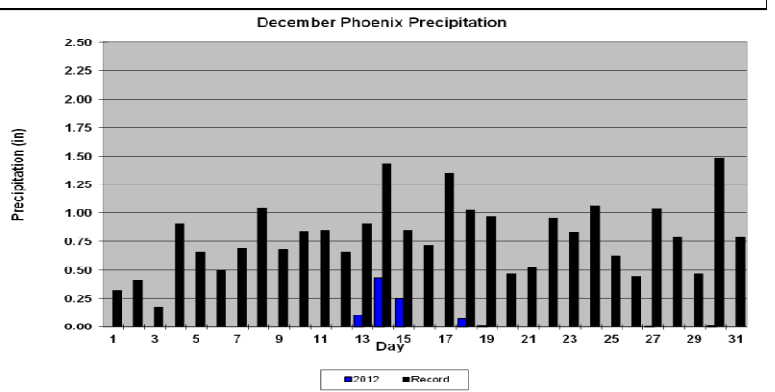
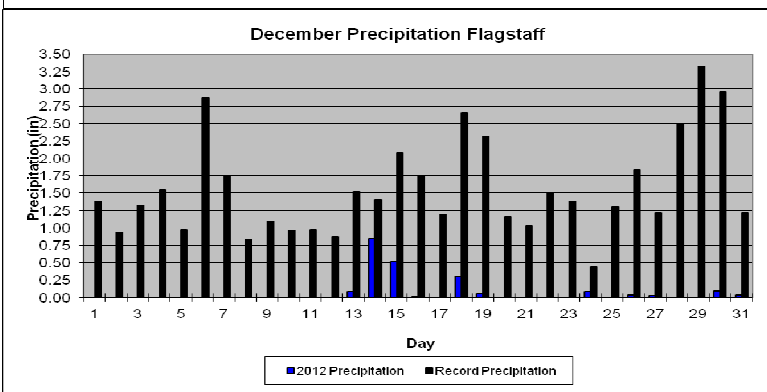
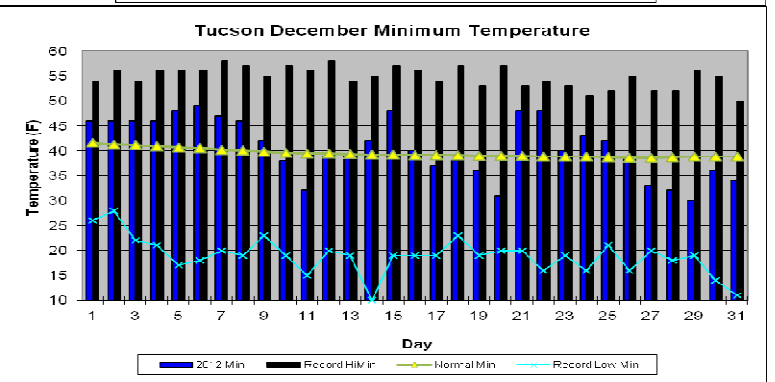
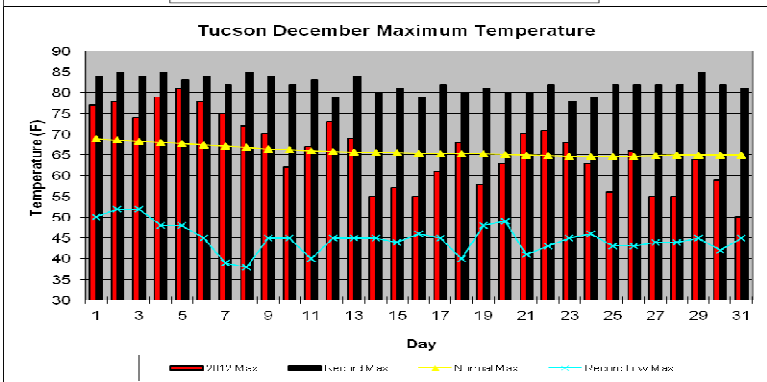
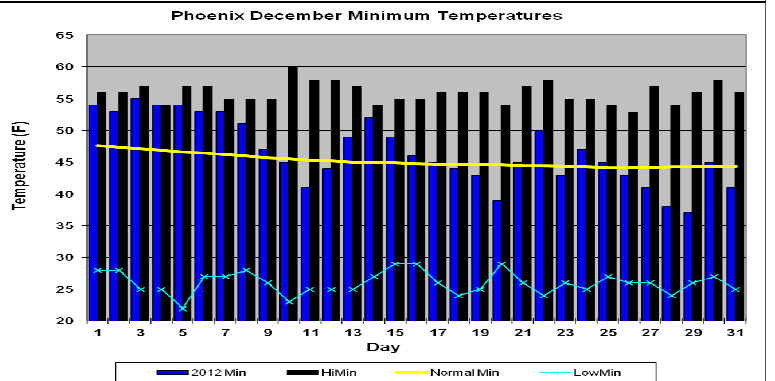
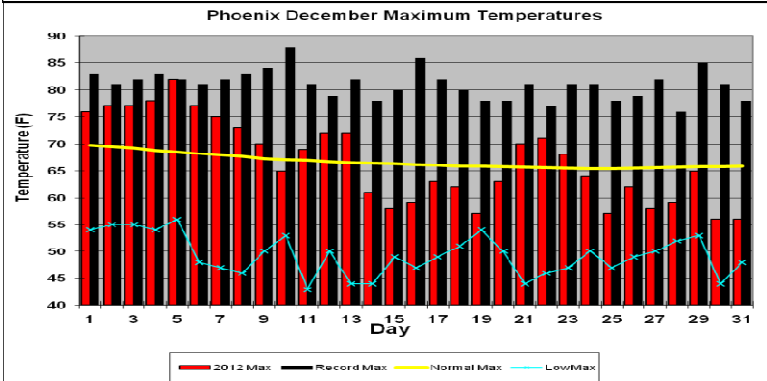
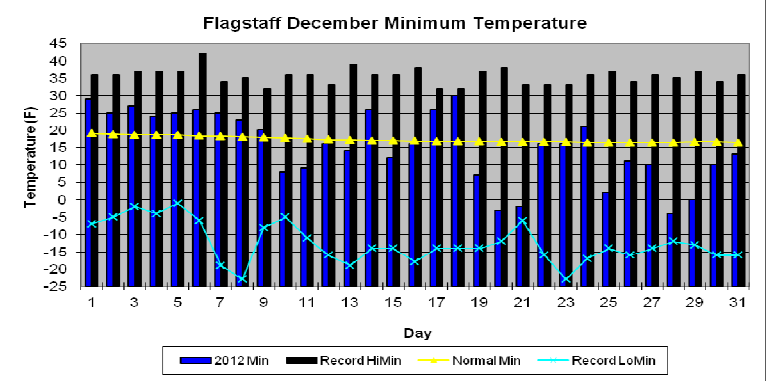
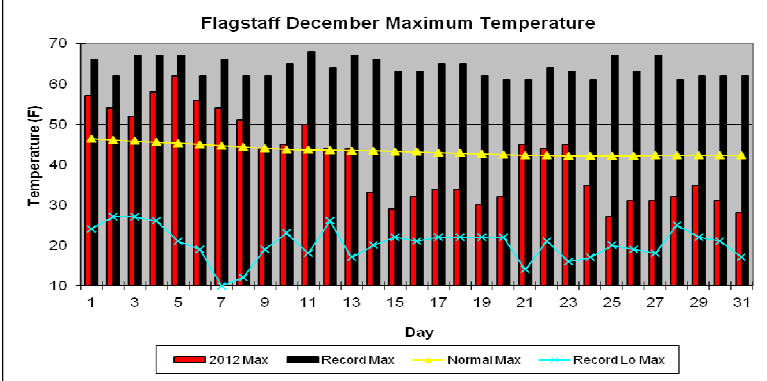
****Note:** The discrepancy between the Statewide Temperature and Precipitation values for Phoenix, Flagstaff and Tucson and the daily values in their graphs are due to the reporting times. Statewide Temperature and Precipitation values are taken at 5pm, while official daily records at the airports are taken from Midnight to Midnight.

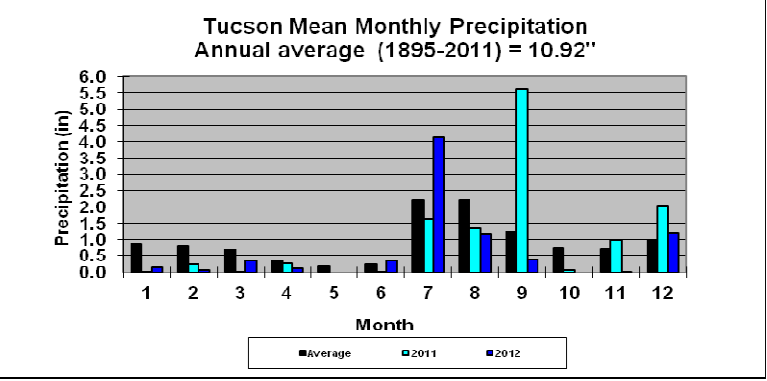
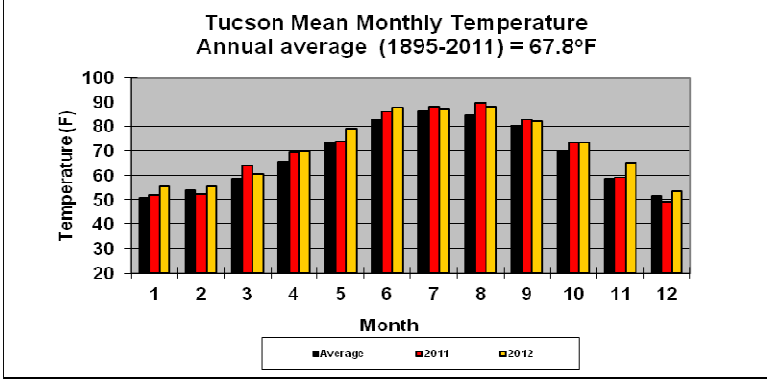
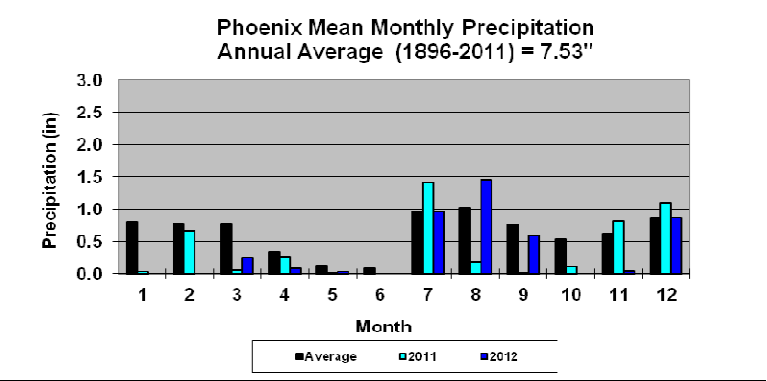
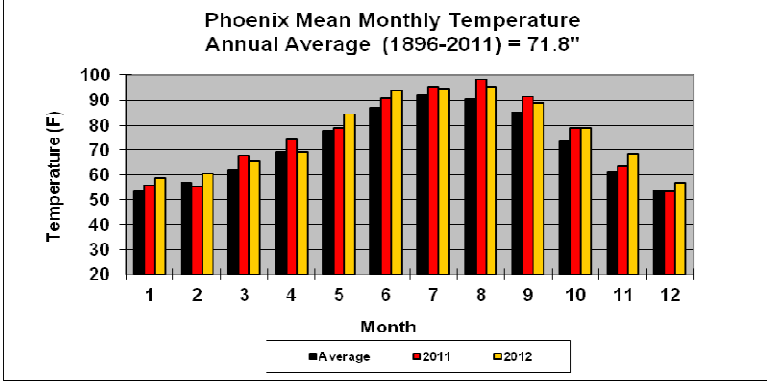
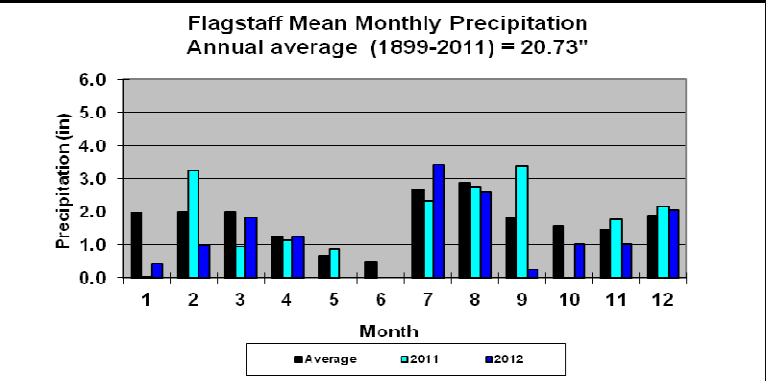
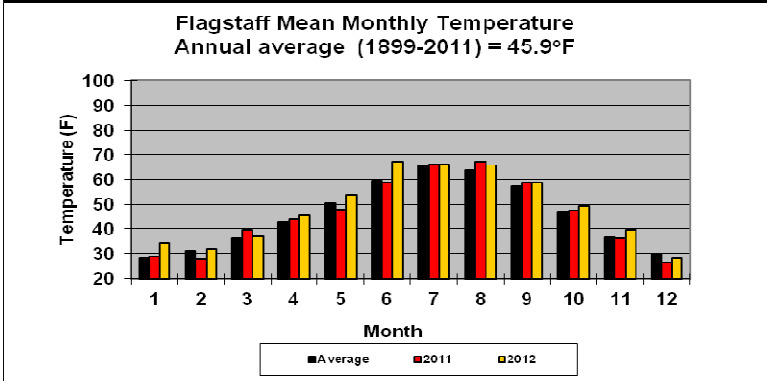
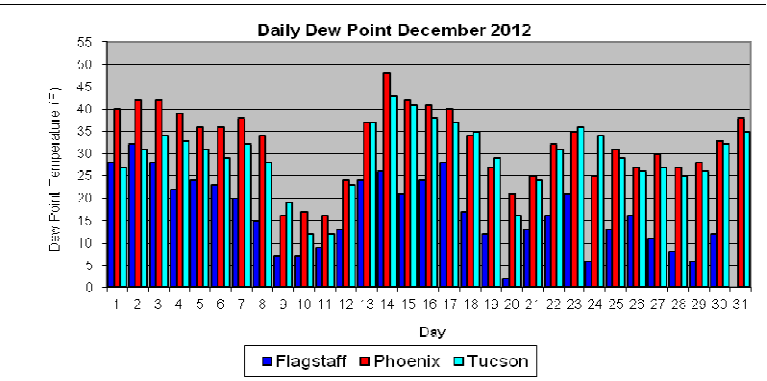
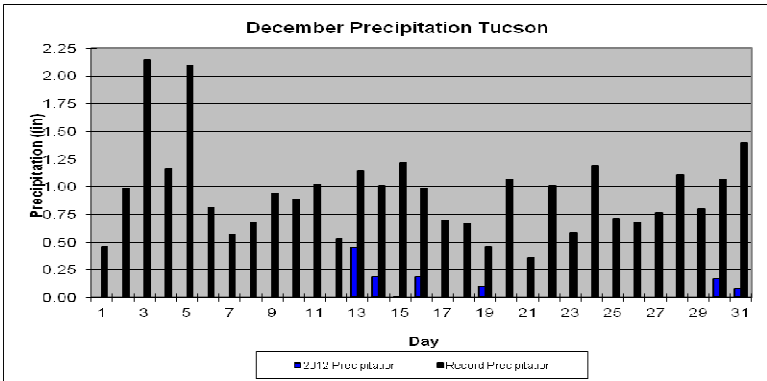
State Climate Office
Dr. Nancy J. Selover, State Climatologist
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December 2012 Daily Temperature, Precipitation, & Dew Point for Flagstaff, Phoenix, and Tucson





FLAGSTAFF CLIMATE STATISTICS

December 2012

This December had no significant ranking for temperature or precipitation records.

Avg Max Temp (F)	41.3	Normal	42.5
Avg Min Temp (F)	15.4	Normal	16.8
Avg Mean Temp (F)	28.3	Normal	29.6
Departure from Normal (F)	-1.3		

Highest Monthly Avg Temp (F)	39.8 in 1980
Lowest Monthly Avg Temp (F)	21.9 in 1932, 1972

Highest Temp this month (F):	62 on 5 th
Lowest Temp this month (F):	-4 on 28 th

Record High (F):	68 on 12/11/1950
Record Low (F):	-23 on 12/23/1990 12/08/1978

No temperature or precipitation records this month:

Flagstaff Number of Days of:

Minimum Temp 20° or higher	13
Minimum Temp 0° or lower	4
Maximum Temp 50° or higher	9
Maximum Temp 30° or lower	4

Heating Degree Days	1128	Normal	1096
Cooling Degree Days	0	Normal	0
Degree base 65°F			

Total December Precipitation	2.08"
Normal December Precipitation	1.87"
Departure from normal	+0.21"
Greatest 24-Hr Precipitation	0.89" on 12/13-14
Total Precipitation Year-to-Date	14.89"
Departure from Normal	-6.97"

Number of Days:

Clear	21
Partly Cloudy	6
Cloudy	4

Greatest December Precipitation	7.30" in 1967
Least December Precipitation	0.00" in 1917, 1958, 1999

Average Wind Speed	6.4 mph
Highest Peak Gust	37 mph from 210° on 18 th

PHOENIX CLIMATE STATISTICS

December 2012

This December was the 16th warmest on record and had no significant ranking for precipitation.

Avg Max Temp(F)	66.8	Normal	66.0
Avg Min Temp(F)	46.6	Normal	44.8
Avg Mean Temp (F)	56.7	Normal	55.4
Departure from Normal (F)	+1.3		

Highest Monthly Avg Temp (F)	61.3 in 1980
Lowest Monthly Avg Temp (F)	46.6 in 1911

Highest Temp this month (F):	82 on 5 th
Lowest Temp this month (F):	37 on 29 th

Record High (F):	87 on 12/10/1950
Record Low (F):	22 on 12/26/1911 12/31/1900

Temperature or precipitation records this month:
4th HiMin tied 54, first set in 1942
5th HiMax tied 82, first set in 1965

Phoenix Number of Days of:

Minimum Temp 40° or lower	3
Minimum Temp 50° or higher	10
Maximum Temp 60° or lower	8
Maximum Temp 70° or higher	13

Heating Degree Days	254	Normal	298
Cooling Degree Days	5	Normal	1
Degree base 65°F			

Total December Precipitation	0.87"
Normal December Precipitation	0.88"

Departure from normal -0.01"
 Greatest 24-Hr Precipitation 0.50" on 13th-14th
 Total Precipitation Year-to-Date 4.28"
 Departure from Normal -3.75"

Greatest December Precipitation 3.98" in 1967
 Least December Precipitation 0.00" in 1896,
 1900, 1901, 1907, 1920, 1922, 1929, 1930, 1933,
 1939, 1958, 1963, 1973, 1981, 1995, 2000, 2005

Number of Days:

Clear 8
 Partly Cloudy 21
 Cloudy 2

Average Wind Speed 4.8 mph
 Highest Peak Gust 33 mph from 260° on 19th

TUCSON CLIMATE STATISTICS
 December 2012

This December tied for 29th warmest on record and
 had no significant ranking for precipitation

Heating Degree Days 354 Normal 405
 Cooling Degree Days 0 Normal 0
 Degree base 65°F

Avg Max Temp(F) 66.1 Normal 64.8
 Avg Min Temp(F) 40.7 Normal 39.1
 Avg Mean Temp(F) 53.4 Normal 51.9
 Departure from Normal (F) +1.5

Total December Precipitation 1.18"
 Normal December Precipitation 0.93"
 Departure from normal +0.25"
 Greatest 24-Hr Precipitation 0.64" on 12/13-14
 Total Precipitation Year-to-Date 7.91"
 Departure from Normal -3.68"

Highest Monthly Avg Temp (F) 58.1 in 1980
 Lowest Monthly Avg Temp (F) 41.3 in 1915

Highest Temp this month (F): 81 on 5th
 Lowest Temp this month (F): 30 on 29th

Greatest December Precipitation 5.85" in 1914
 Least December Precipitation 0.00" in 1894,
 1897, 1898, 1899, 1900, 1901, 1907, 1958, 1981,
 1996, 2000

Record High (F): 85 on 12/08/1939
 12/29/1921
 12/02/1911

Number of Days:

Clear 25
 Partly Cloudy 5
 Cloudy 1

Record Low (F): 10 on 12/14/1901

No temperature or precipitation records this month:

Tucson Number of Days of:

Minimum Temp 35° or lower 6
 Minimum Temp 45° or higher 11
 Maximum Temp 60° or lower 9
 Maximum Temp 70° or higher 12

Average Wind Speed 6.2 mph
 Highest Peak Gust 39 mph from 210° on 13th

Data are from the National Weather Service and the
 National Climatic Data Center and are **preliminary**.

Winds for December:

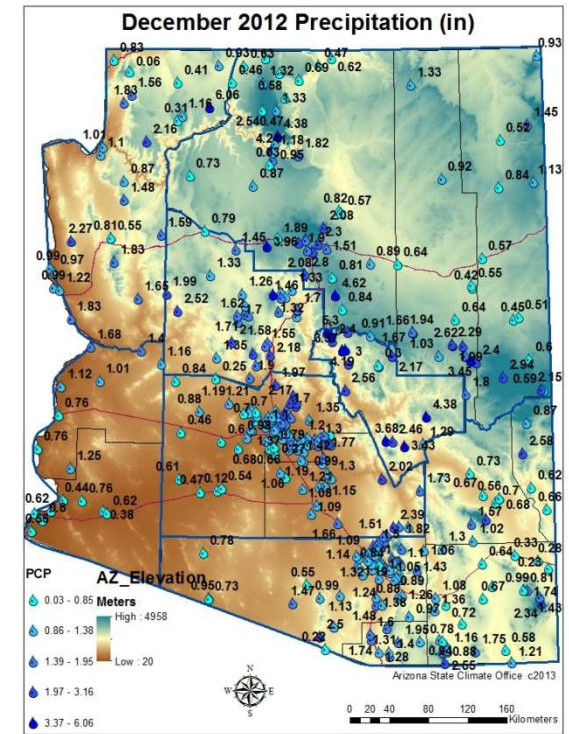
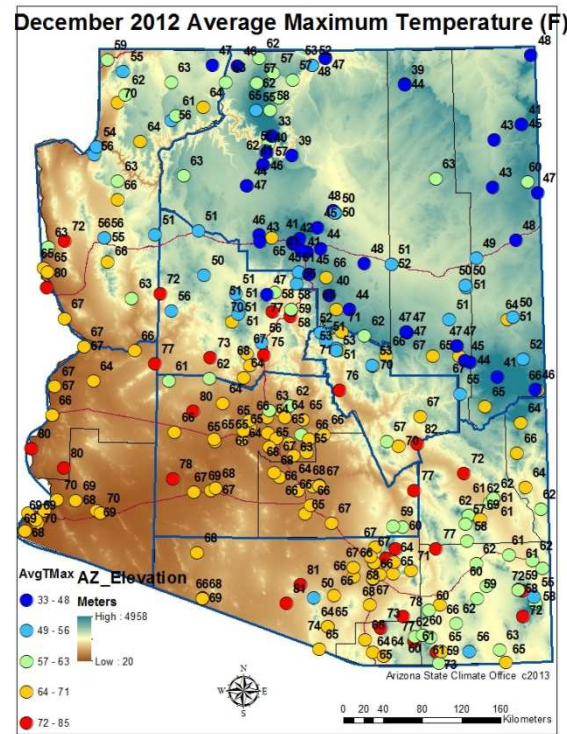
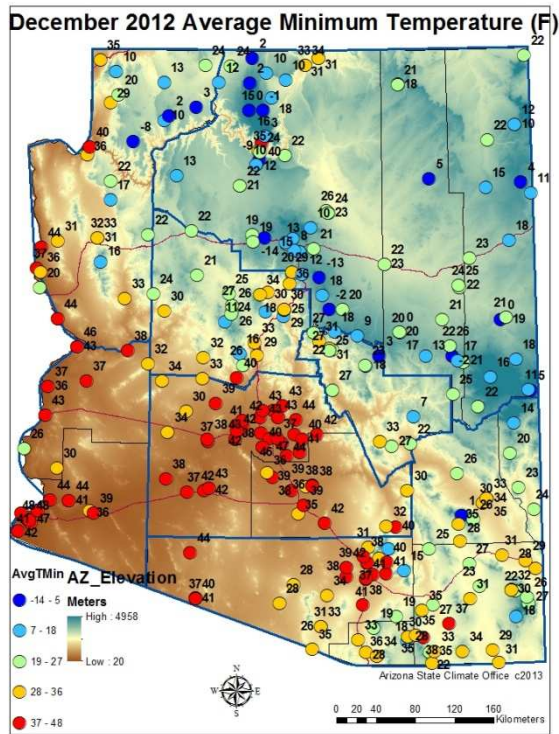
Day	Phoenix		Flagstaff		Tucson		
	(mph)	Avg	Max	Avg	Max	Avg	Max
1		4.4	10	5.6	30	5.2	20
2		3.4	12	9.1	26	5.8	15
3		4.4	15	4.1	23	4.9	18
4		2.3	12	2.4	16	5.3	15
5		2.1	10	4.8	22	5.2	16
6		3.9	14	4	24	5.8	16
7		3.4	13	3.6	22	5.2	16
8		4.3	13	5.6	25	5.3	16
9		7.2	25	10	35	6.8	23
10		4	17	3.2	30	4.1	15
11		4.2	14	2.5	20	4.9	15
12		5.1	13	6.3	30	7.2	18
13		7.8	31	9.2	40	9	39
14		7.9	26	15.8	40	9.7	29
15		6.6	22	10.2	30	9.4	29
16		3.2	13	7.4	17	5.1	17
17		2.8	12	8.5	21	4	15
18		4.3	23	16.3	46	6.8	26
19		11	33	9.8	35	8	36
20		7.9	21	3.9	16	12.1	33
21		5.1	23	1.6	18	13.4	36
22		4.2	15	4.6	23	5.8	20
23		3.4	10	5.5	21	3.8	38
24		5.1	20	10.3	37	5.7	24
25		5	20	4.4	15	4.6	17
26		3.2	12	7.1	29	4.2	15
27		5.1	23	5.6	23	5.7	32
28		3.2	12	2.6	16	4.2	20
29		4.2	16	2.6	16	6.8	20
30		4.5	18	5.3	29	5.5	28
31		4.9	18	5.6	18	3.9	28

Dew Points for December:

Daily Average Dew Point (°F):

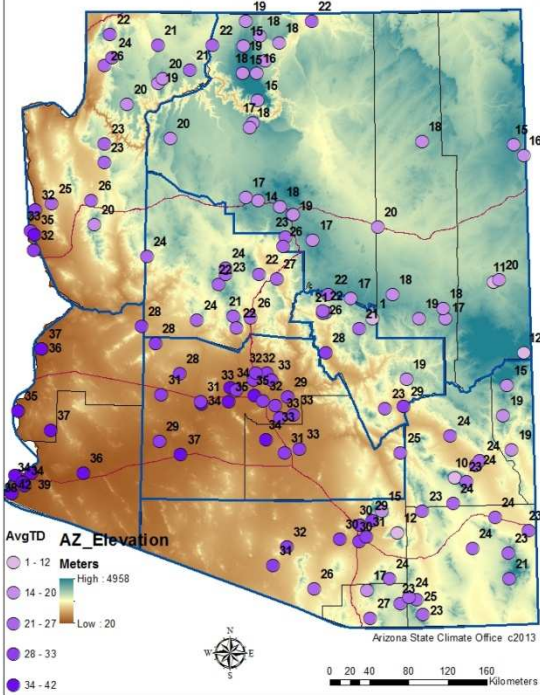
Day	Phx	Tuc	Flg
1	40	27	28
2	42	31	32
3	42	34	28
4	39	33	22
5	36	31	24
6	36	29	23
7	38	32	20
8	34	28	15
9	16	19	7
10	17	12	7
11	16	12	9
12	24	23	13
13	37	37	24
14	48	43	26
15	42	41	21
16	41	38	24
17	40	37	28
18	34	35	17
19	27	29	12
20	21	16	2
21	25	24	13
22	32	31	16
23	35	36	21
24	25	34	6
25	31	29	13
26	27	26	16
27	30	27	11
28	27	25	8
29	28	26	6
30	33	32	12
31	38	35	

December 2012 Temperature, Dew Point, Wind Speed, and Precipitation Maps are based on **preliminary data** from the National Weather Service, the Arizona Meteorological Network (AZMet), operated by the University of Arizona College of Agriculture Cooperative Extension and the RAWS (Remote Automated Weather Station) network operated by the Bureau of Land Management and Forest Service, and the CoCoRaHS (Community Collaborative Rain, Hail and Snow) Network.

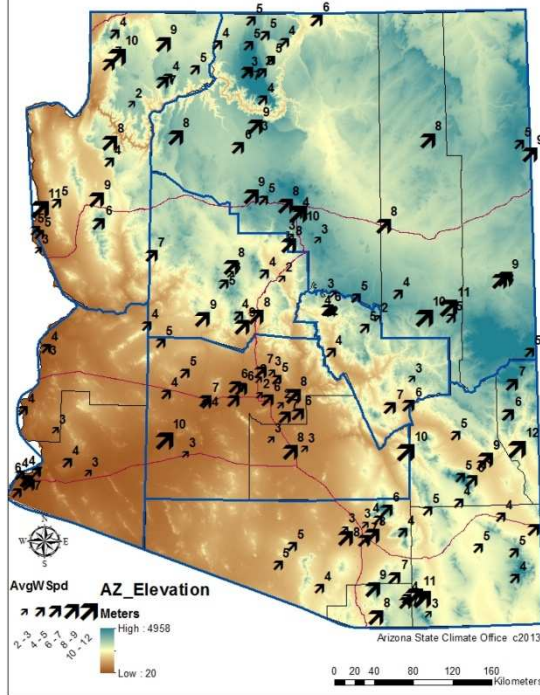


Average nighttime temperatures ranged from -14°F at Tusayan, to 48°F at Yuma. Average daytime temperatures ranged from 33°F at Bright Angel Ranger Station, to 85°F at San Carlos. Precipitation values ranged from less than an inch at many locations in the southwest to 6.06” at Robinson Tank.

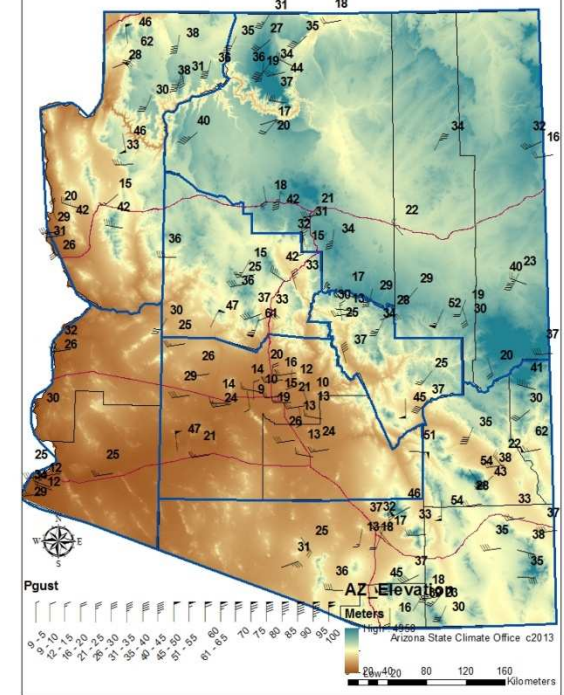
December 2012 Average Dew Point Temperature (F)



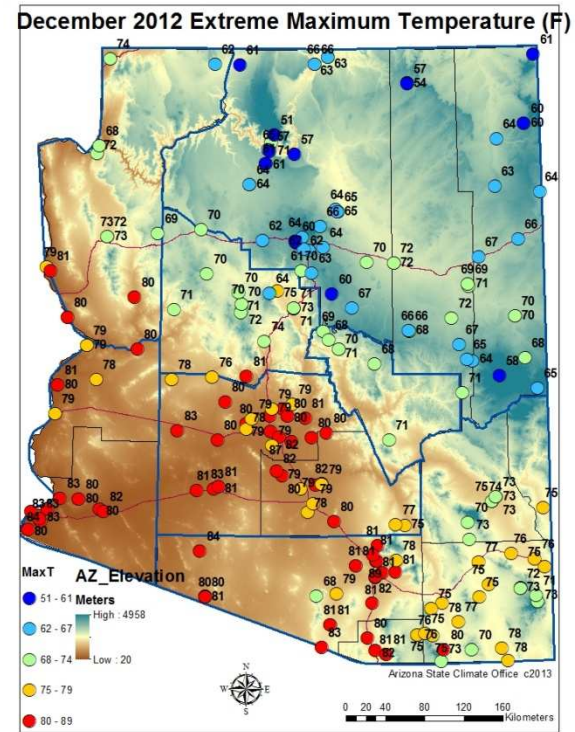
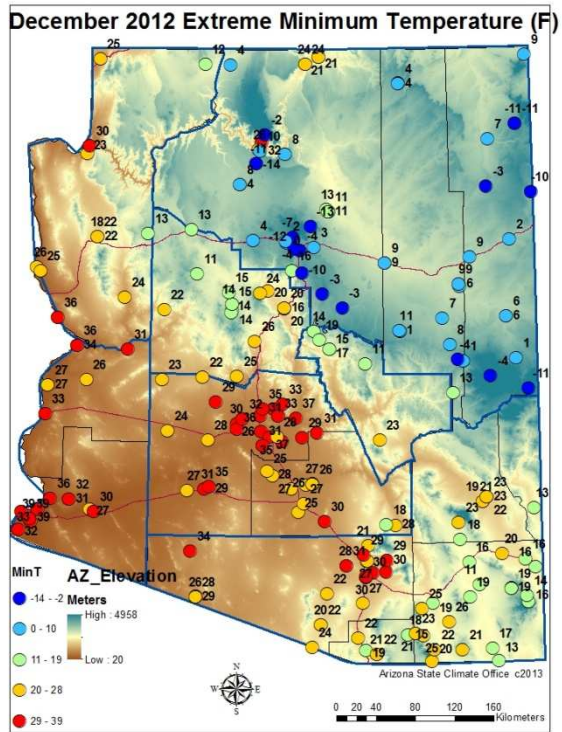
December 2012 Average Wind Speed (mph)



December 2012 Peak Wind Gust (mph)

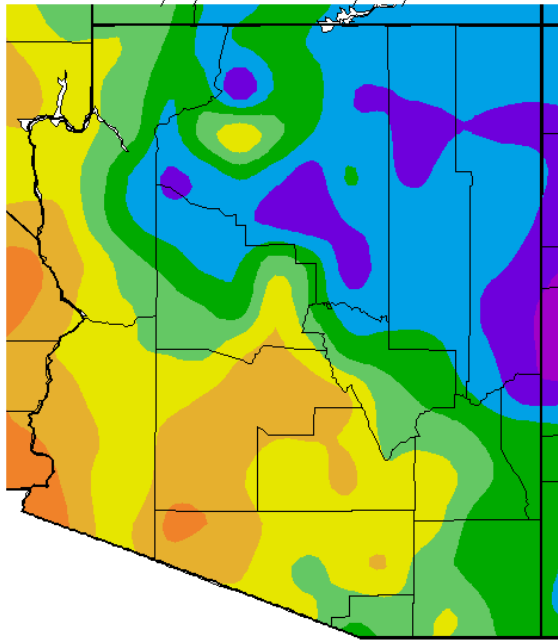


Average monthly dew points ranged from 1°F at Red Lake, to 42°F at Yuma South. As in most months, average winds were light, with 12 mph as the highest average at Guthrie. The highest peak wind gust was 62 mph at Tweed's Point and Guthrie. Peak wind gusts blew in all different directions, which is typical as the high winds are generally attributed to thunderstorm outflows, which have no dominant direction. The arrows point to the direction the winds blow from.

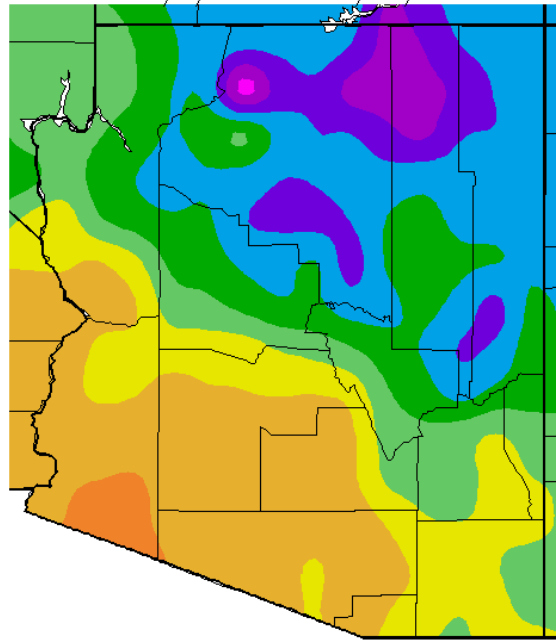


Lowest temperature in December was -10°F recorded at Grand Canyon National Park. The highest daytime temperature of the month was 89°F recorded at Tucson Campbell Avenue.

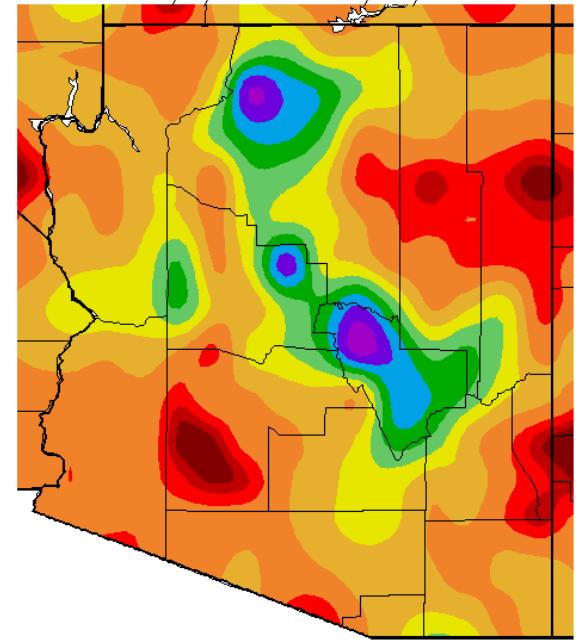
Av. Min. Temperature (deg. F)
12/1/2012 – 12/31/2012



Av. Max. Temperature (deg. F)
12/1/2012 – 12/31/2012



Total Precipitation (in.)
12/1/2012 – 12/31/2012

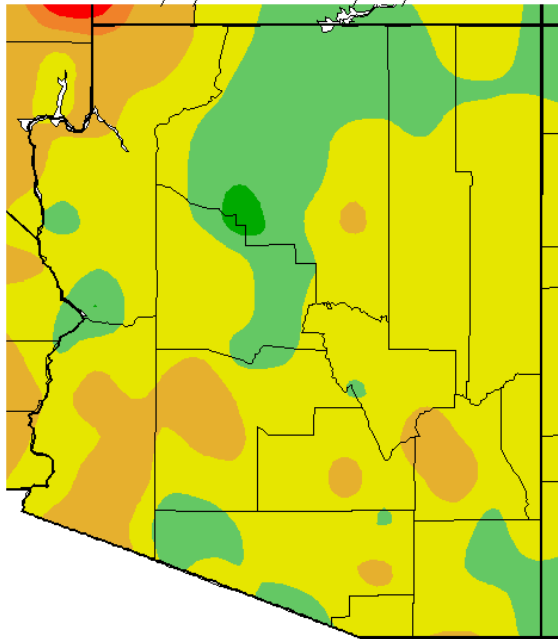


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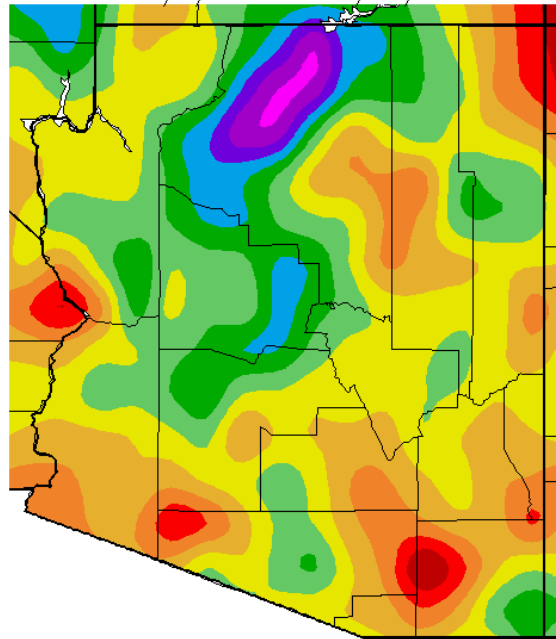
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Av. Min. Temperature dep from Ave (deg. F)
12/1/2012 – 12/31/2012



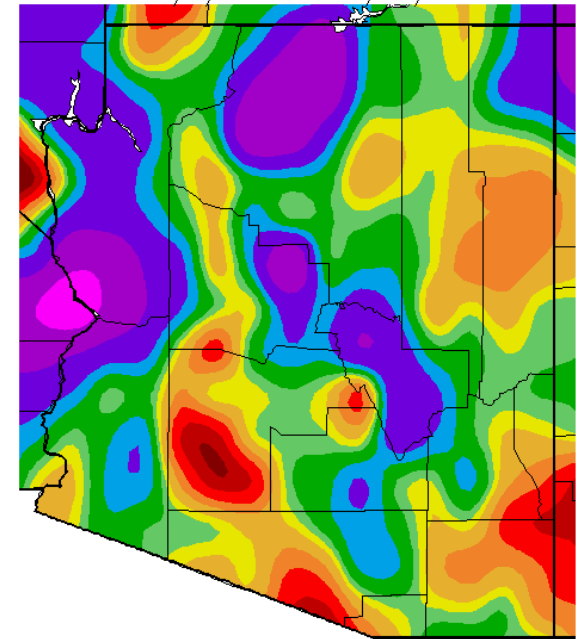
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Av. Max. Temperature dep from Ave (deg F)
12/1/2012 – 12/31/2012



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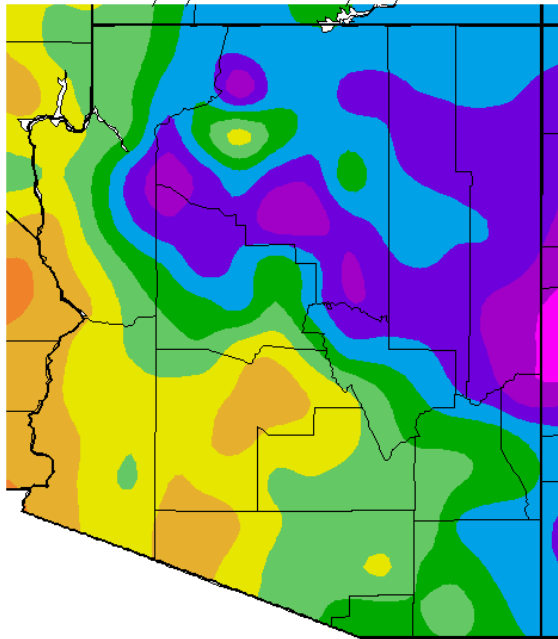
Percent of Average Precipitation (%)
12/1/2012 – 12/31/2012



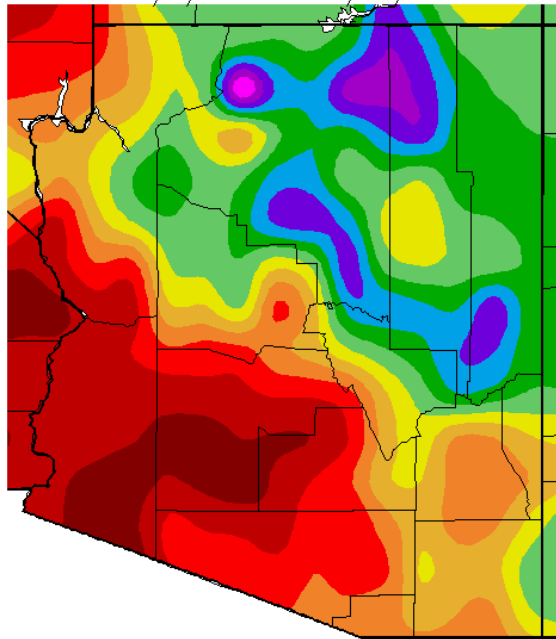
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December minimum temperatures were within 2 degrees of normal statewide. Daytime temperatures tended to be 2-4°F warmer than normal in southern Arizona and 2-4°F colder than normal in central and north central Arizona. Rainfall was spotty across the state with some locations in central and northern Arizona receiving 110 to 300% of normal and other locations in southern Arizona receiving 5 to 70% of normal precipitation. Four storms moved through the state, leaving above snowpack to end the calendar year.

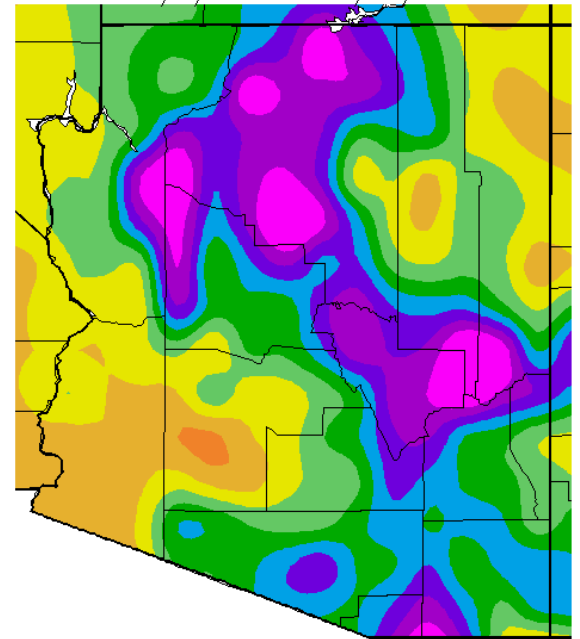
Av. Min. Temperature (deg. F)
1/1/2013 - 12/31/2012



Av. Max. Temperature (deg. F)
1/1/2013 - 12/31/2012



Total Precipitation (in.)
1/1/2013 - 12/31/2012

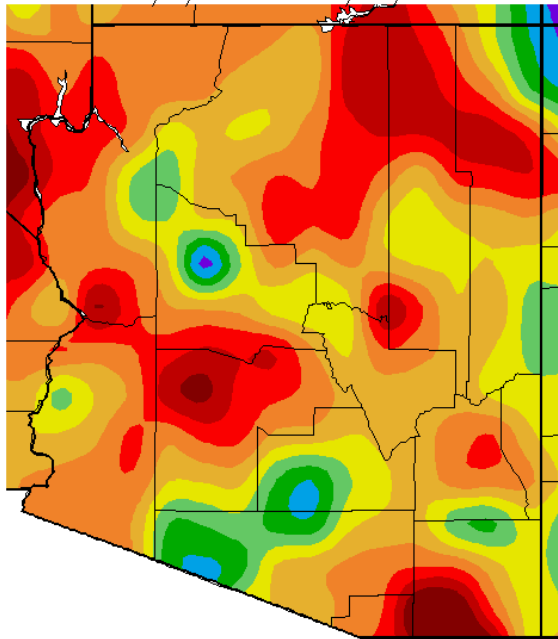


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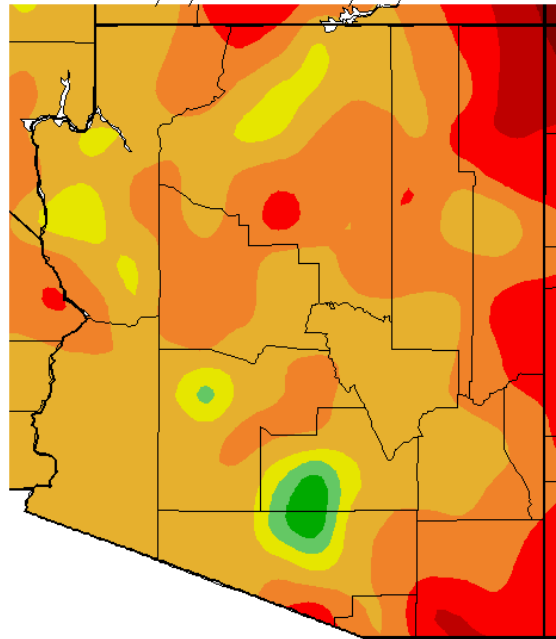
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Av. Min. Temperature dep from Ave (deg. F)
1/1/2013 – 12/31/2012



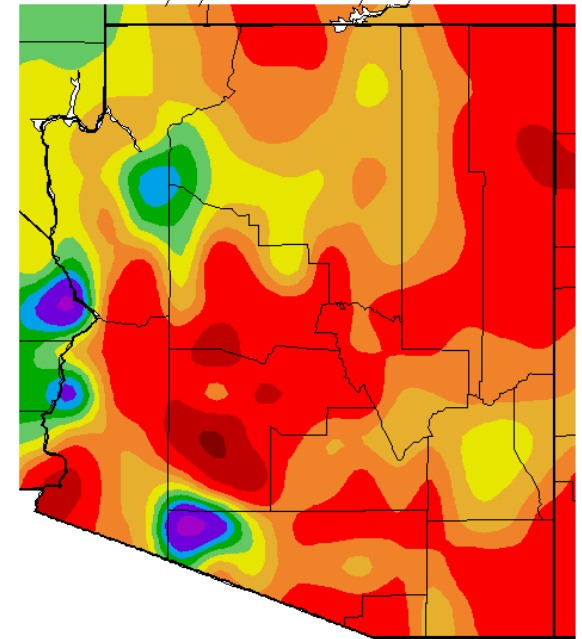
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Av. Max. Temperature dep from Ave (deg F)
1/1/2013 – 12/31/2012



Generated 1/01/2013 at WRCC using provisional data.
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Percent of Average Precipitation (%)
1/1/2013 – 12/31/2012

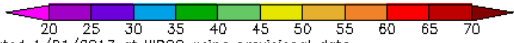
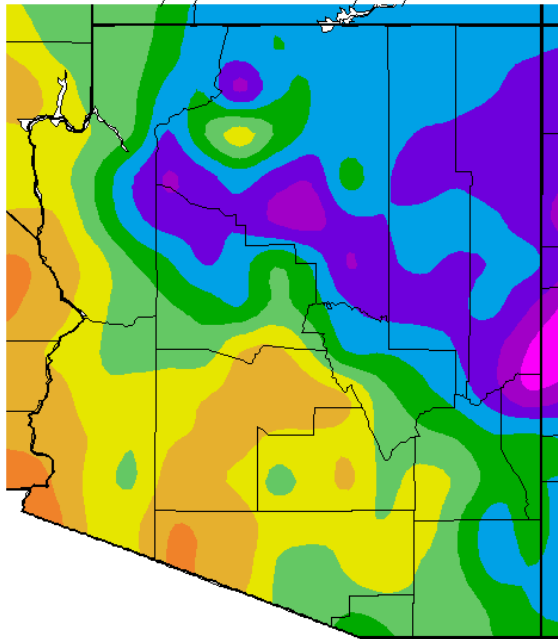


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NOAA Regional Climate Centers

Calendar Year 2012

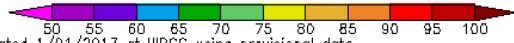
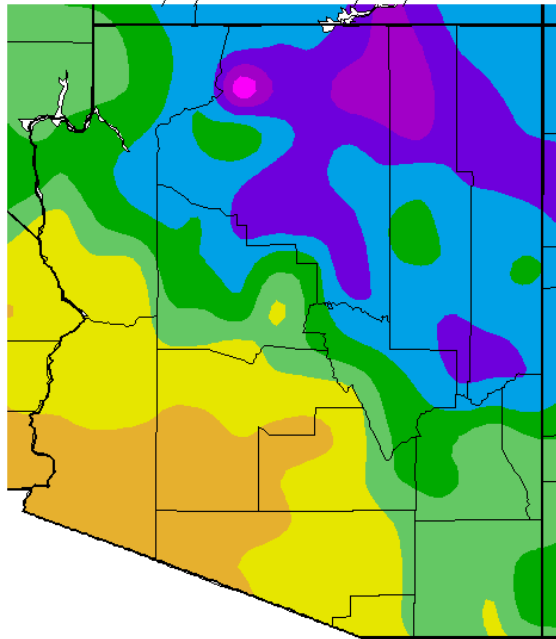
Since January 1st, nighttime temperatures have been 0-2°F warmer than normal statewide, with western Pima and Pinal counties slightly cooler than normal. Daytime temperatures have been 1-3°F warmer than normal statewide, with a small area of southern Pinal and northern Pima counties cooler than normal. Precipitation for the calendar year was less than 70% of average in central, northeastern, and southeastern Arizona. East central Mohave County, the western quarter of Pima County, and the lower Colorado River valley received above average precipitation. Overall, 2012 was a dry year, continuing the drought that has persisted for more than 15 years.

Av. Min. Temperature (deg. F)
10/1/2012 - 12/31/2012



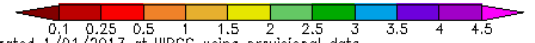
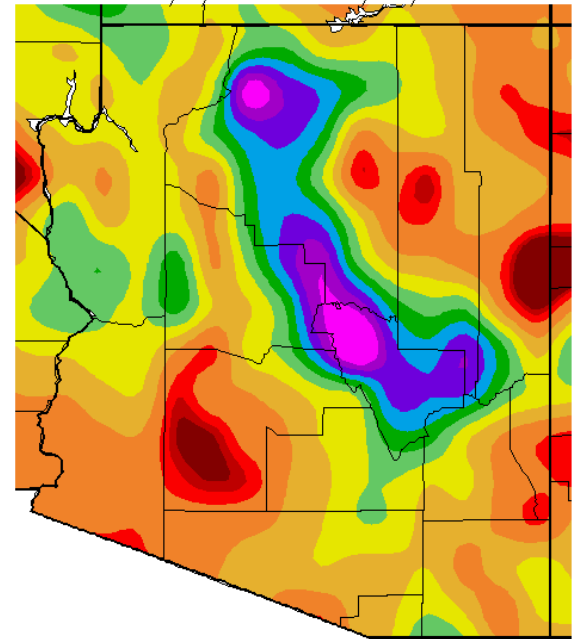
Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

Av. Max. Temperature (deg. F)
10/1/2012 - 12/31/2012



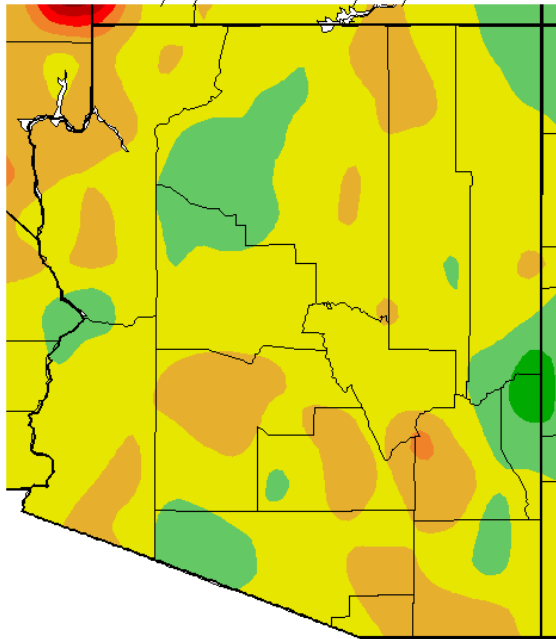
Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

Total Precipitation (in.)
10/1/2012 - 12/31/2012



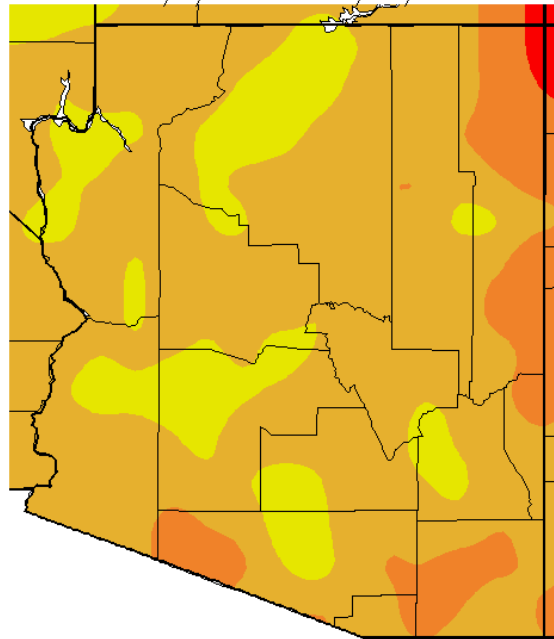
Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

Av. Min. Temperature dep from Ave (deg. F)
10/1/2012 – 12/31/2012



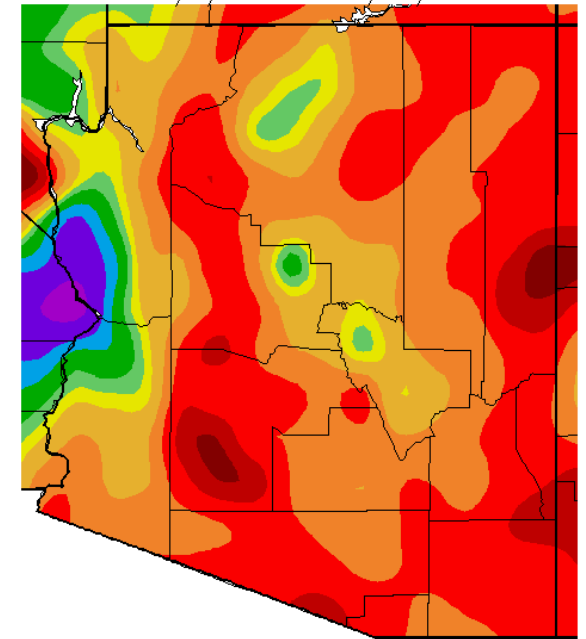
Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

Av. Max. Temperature dep from Ave (deg F)
10/1/2012 – 12/31/2012



Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

Percent of Average Precipitation (%)
10/1/2012 – 12/31/2012

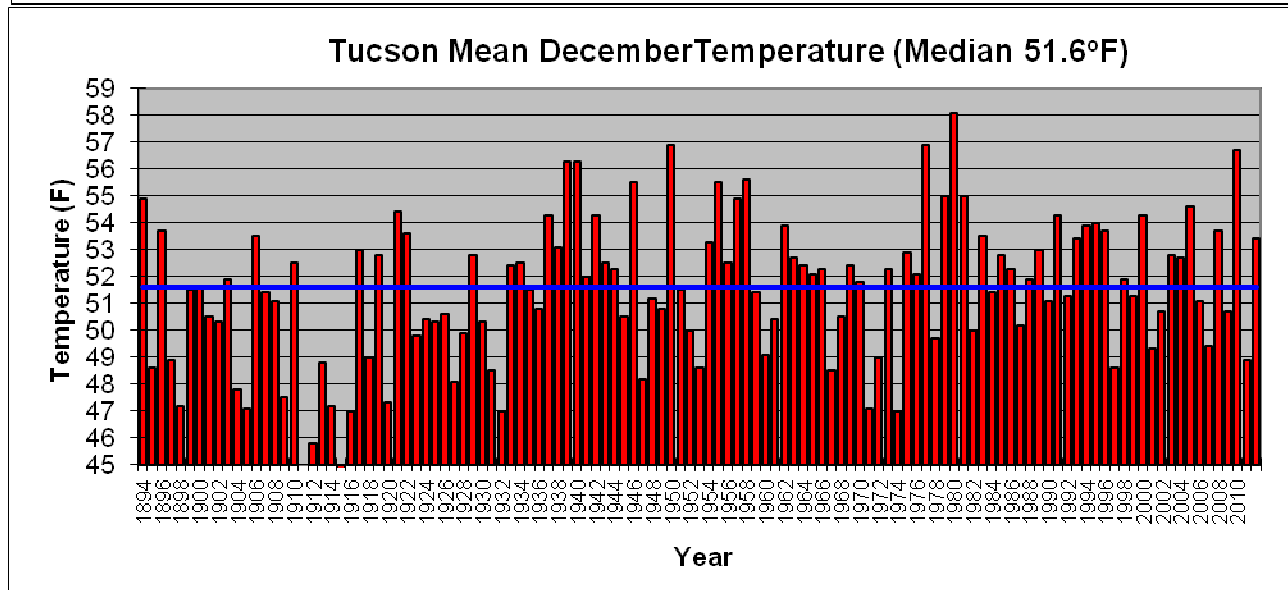
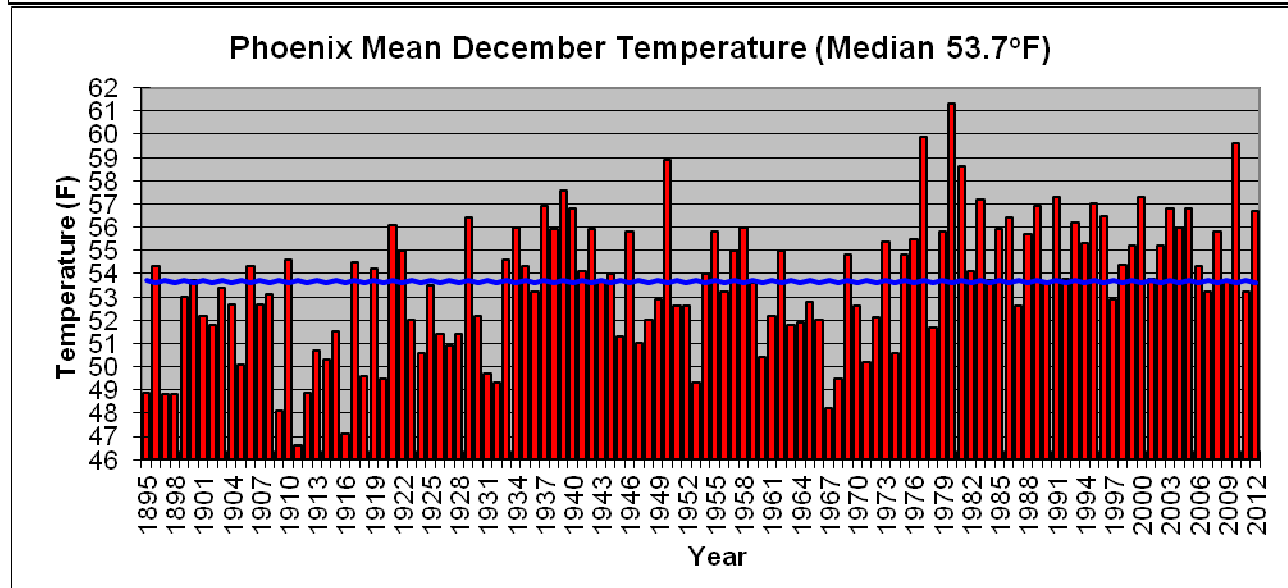
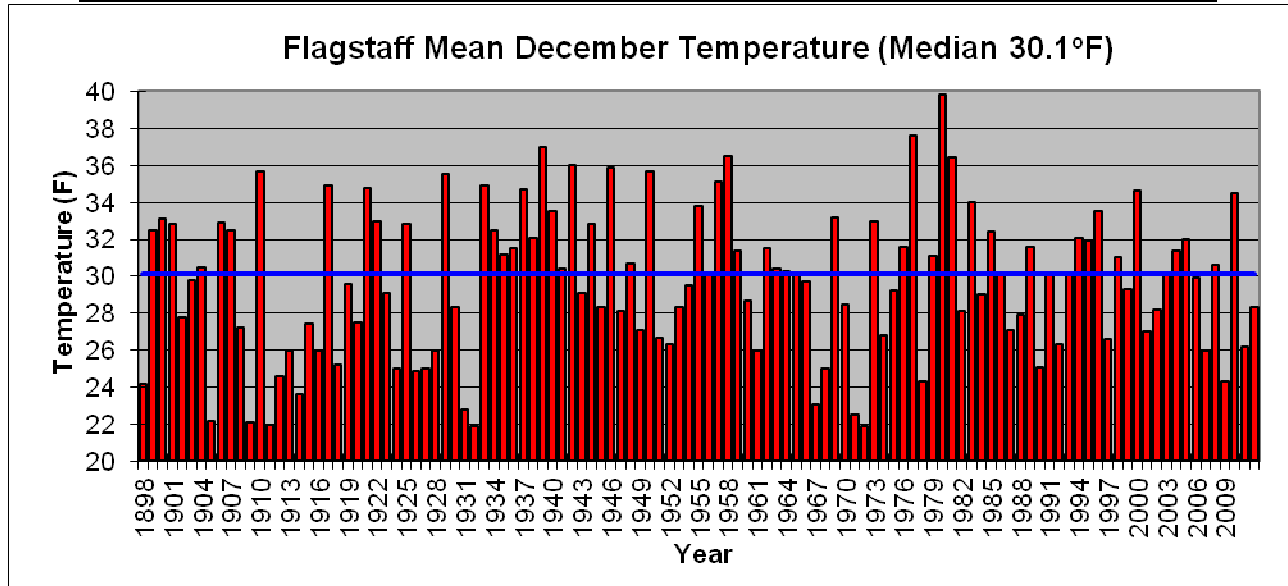


Generated 1/01/2013 at WRCC using provisional data.
NOAA Regional Climate Centers

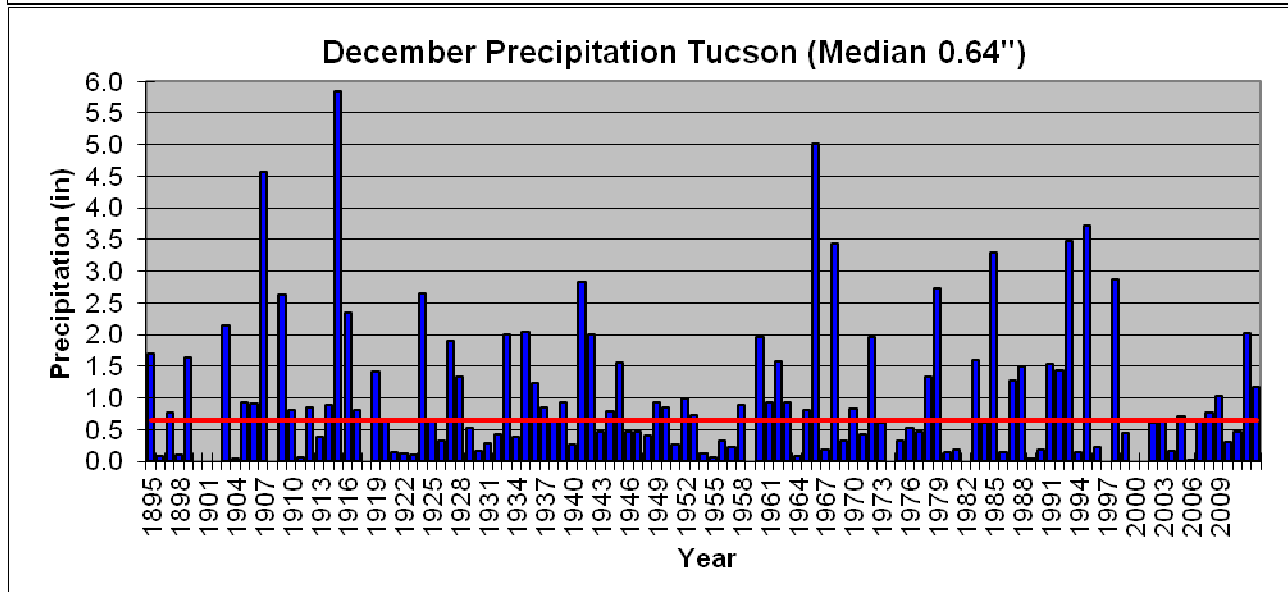
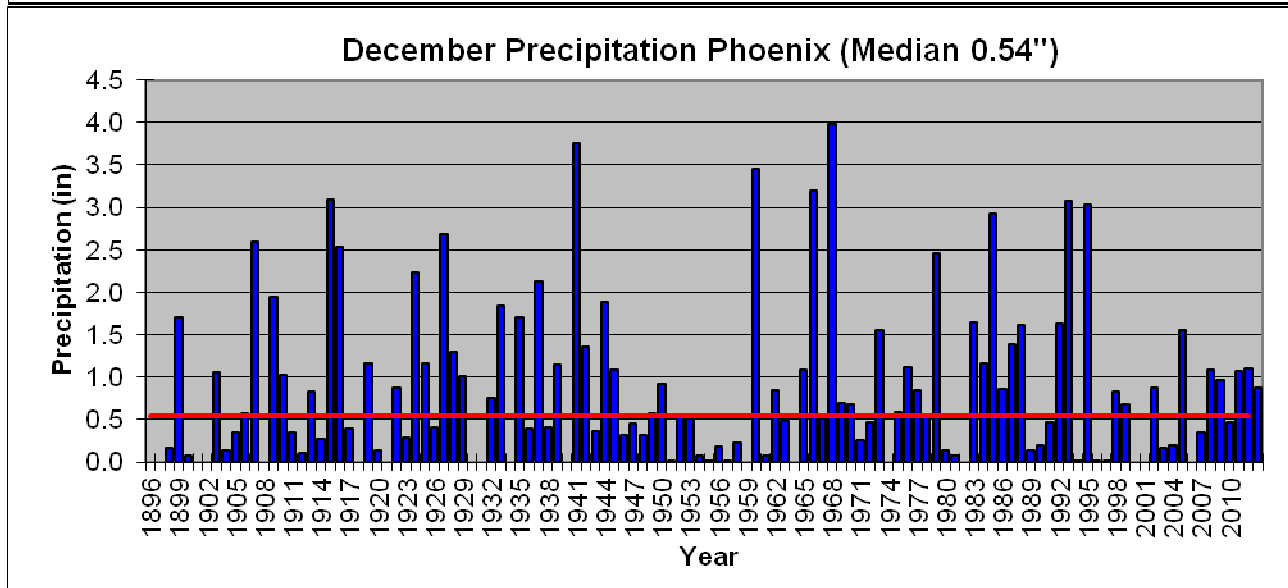
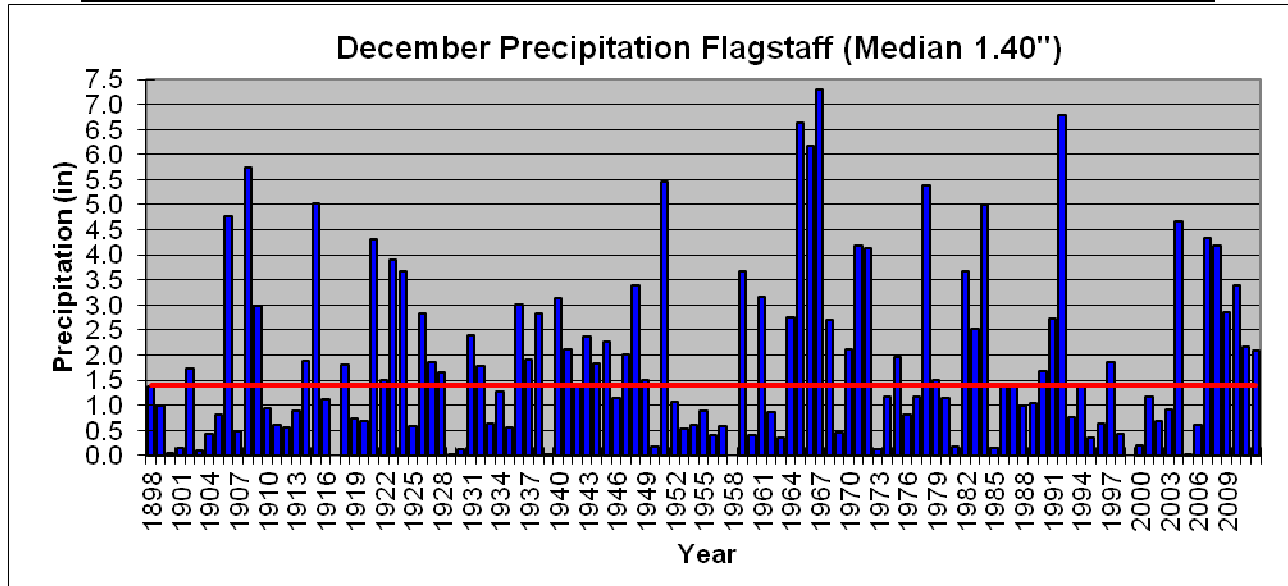
2013 Water Year

Minimum temperatures have been 0 to 2°F warmer than average for most of the state. Only a few isolated pockets have been cooler than average. Likewise, maximum temperatures have been 0-4°F warmer than average statewide. Through the end of December, the water year has started out much drier than normal, less than 70% of average in central Arizona and less than 50% of average in west central and eastern Arizona. The only wet areas are the lower Colorado River valley in Mohave and La Paz counties and isolated spots in Gila, Yavapai and Coconino counties.

December Mean Temperature Graphs – Flagstaff, Phoenix, and Tucson 1895-2012:

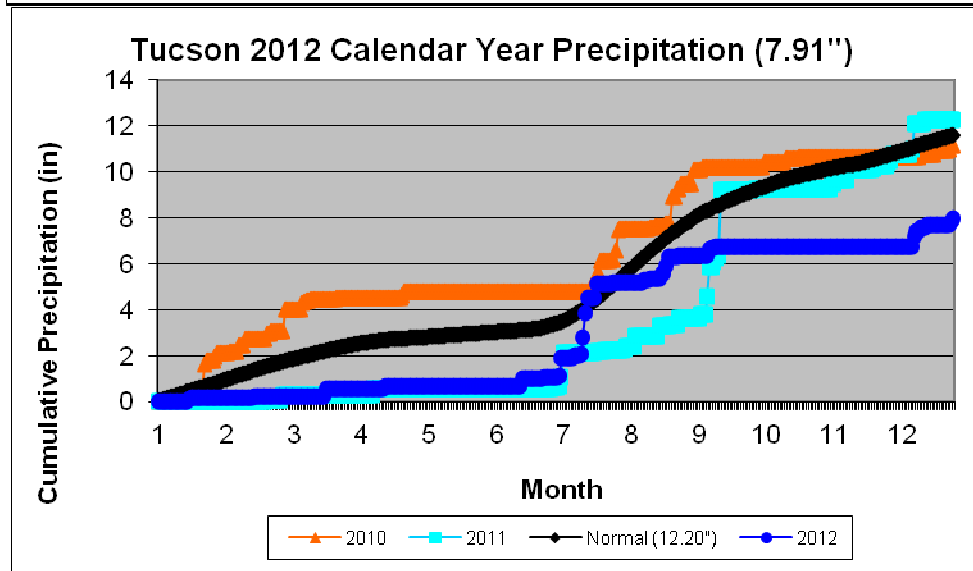
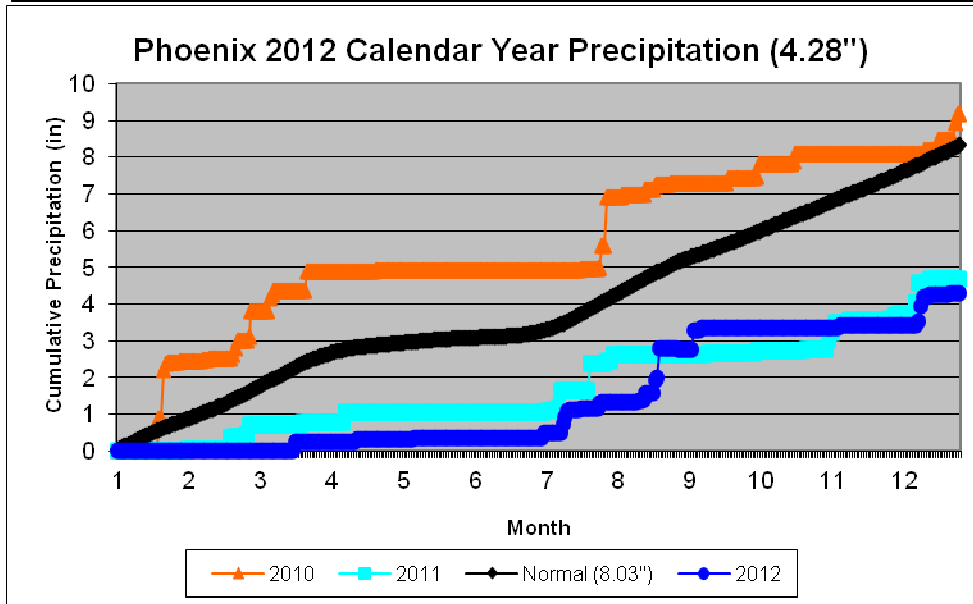
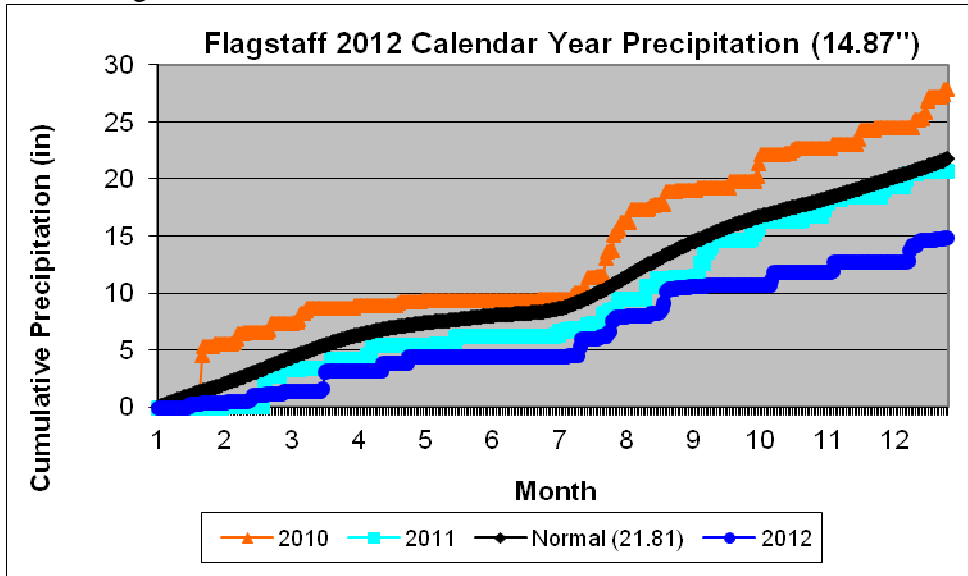


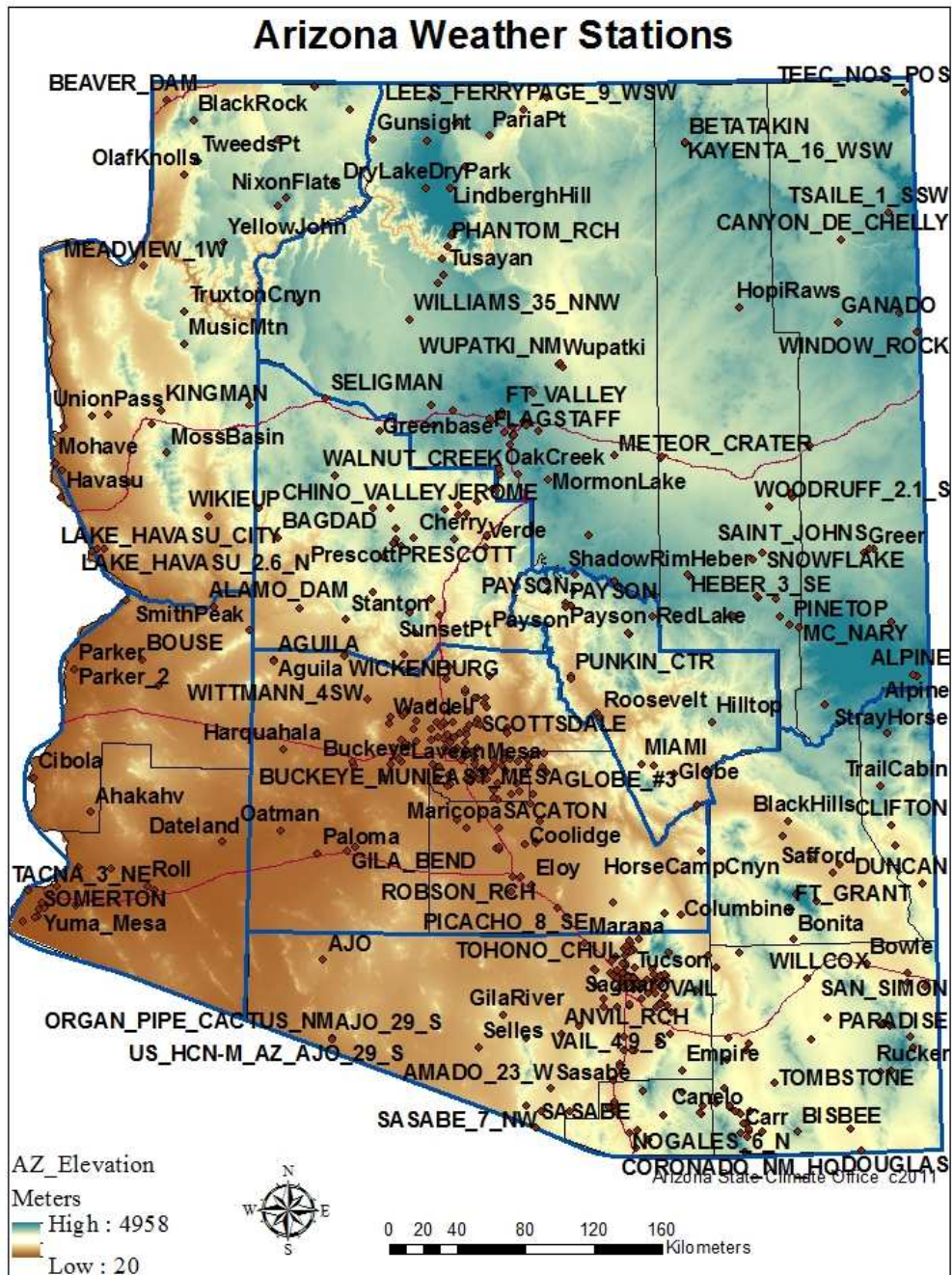
December Mean Precipitation Graphs – Flagstaff, Phoenix, and Tucson 1895-2012:



2012 Cumulative Precipitation Graphs – Flagstaff, Phoenix and Tucson:

Precipitation is well below average statewide.





The downloadable normals and extremes calendars use the following abbreviations:

NORM = 30 year (1971-2000) average value (degrees Fahrenheit (F))

OBS = The temperature observation for that day this year

AVG = Average daily temperature

HI MAX = Highest maximum temperature for that day (F)

LO MAX = Lowest maximum temperature for that day (F)

LO MIN = Lowest minimum temperature for that day (F)

HI MIN = Highest minimum temperature for that day (F)

Mx PCP = Maximum precipitation for that day (inches)

Mx SNO = Maximum snowfall for that day (inches)