NATIONAL WEATHER SERVICE

ALBUQUERQUE, NEW MEXICO

New Mexico

Skywatcher

VOLUME 1, ISSUE 2 OCTOBER 2005

UPCOMING COOPERATIVE OBSERVER AWARDS:

- **October 2005**
  Louis Mares
  2 NW of Ocate, NM
  10 Years of Service
- **October 2005**
  Patricia Garcia
  Villanueva, NM
  10 Years of Service
- **October 2005**
  Robert Deblassie
  ABQ South Valley, NM
  25 Years of Service
- **October 2005**
  Betty Jane Curry
  Wolf Canyon, NM
  30 Years of Service
- **January 2006**
  Skiles Family
  Torreon Navajo Mission
  45 Years of Service
- **January 2006**
  Robert W. Prunty
  Red River, NM
  50 Years of Service
- **March 2006**
  Richard Hammer
  1 NE of Mosquero, NM
  35 Years of Service

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Fall Edition

Welcome to the second issue of the New Mexico Skywatcher. The staff at the National Weather Service office in Albuquerque would like to thank all of our cooperative observers throughout New Mexico for their dedication and hard work.

This fall issue of the New Mexico Skywatcher features several stories that highlight the latest news in the cooperative observer world, interesting weather facts for the past winter and summer seasons, and special features that show how your data and information is valuable to the world.

Congratulations to those receiving awards for late 2005 and early 2006 (shown in the left column). Your weather observations are vital in developing climatological databases and supporting weather forecasting. Thanks for your dedication.

This newsletter was designed with you in mind. If you have any questions or would like us to highlight a story in the New Mexico Skywatcher, contact us via the web at http://www.srh.noaa.gov/abq.

As always, if you would like to take a tour of the National Weather Service office in Albuquerque and see how your data is used, contact us at 1-888-386-7637.

We wish you the best during the fall and winter seasons!

Author: Daniel Porter

Wind Observations at CCEN5

Ever wonder how meteorologists and other interested persons analyze wind data over long periods? The answer is a wind rose, which is a diagram that depicts the distribution of wind speed and direction for a particular location over a set period of time. Wind roses can represent conditions for a single month, a single year or a multi-year average. They have been traditionally used to represent wind conditions at airports with fully instrumented, 24-hour observations. However, some coop stations in New Mexico report wind at least once a day using WxCoder II, and wind roses can be generated from these reports. (continued on Page 2)

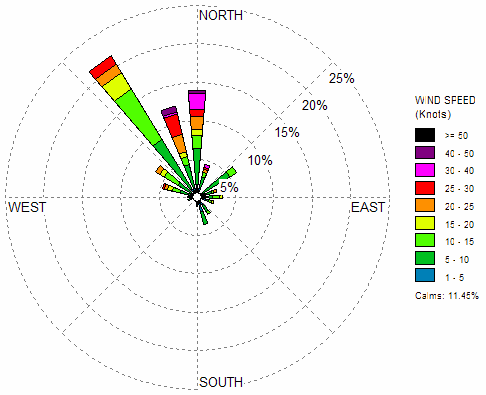


Figure 1. Wind rose plot at 0700 LST from Edgewood/Cedar Grove (CCEN5) at 0700 LST from Sep. 1, 2004 to Aug. 31, 2005.

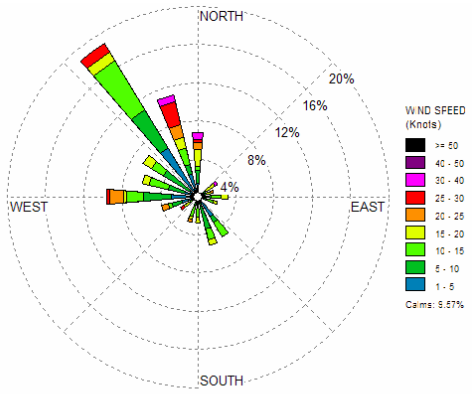


Figure 2. Same as Fig. 1 except at 1900 LST.

Joe's Place

Joe Alfieri
Observing Program Leader

Welcome to the second issue of the New Mexico Skywatcher! Stay abreast of the latest news in the cooperative observer program by reading Joe's Place.

Cooler weather and snow is on the horizon. Please remember, when taking snow measurements, there are three values you are recording: snowfall accumulation, snow melt (or liquid equivalent), and snow depth (if snow is present at observation time). If you would like to view a 22-minute video on how to measure this data, please give us a call and we will gladly mail you a copy.

If you have a standard 8-inch rain gauge, it is approaching the time to remove the inner measuring tube and the funnel. This will help with melted snow measurements and prevent an overflow of snow in the funnel.

Please place any comments concerning the weather on your form in the remarks column. The data columns need to be filled out completely. Much appreciation is given to those observers who fill in the necessary zeros in the precipitation, snowfall, and snow depth columns. This saves our staff a considerable amount of time while quality controlling the forms.

Do you need supplies, such as a replacement snow stick or additional envelopes and forms? If so, please contact our office at 1-888-386-7637.

Thanks to everyone who sends in their forms on time. This helps our office meet the mailing deadline to the National Climatic Data Center, which is the 15th of every month. The data you report is recorded and made available to the world. Your accurate reports are the backbone of our nation's climatological history. Keep up the great work!

Wind Observations Cont.

Edgewood/Cedar Grove (CCEN5) reports wind observations daily at 0700 and 1900 LST and peak winds as they occur. Using *WRPLOT View* software (ver 5.0, Lakes Environmental Software, 2005), nearly 1400 wind observations from CCEN5 were analyzed between September 1, 2004 and August 31, 2005. The resultant wind rose plots are depicted in Figs. 1-4. The length of the rose petal or "spoke" is directly proportional to the frequency of time that the wind blows from a particular direction. Moreover, each "spoke" is sub-divided to show the relative frequency of various wind speed categories. For a more detailed examination of the CCEN5 wind data please visit: http://www.srh.noaa.gov/abq/coop/wind/CCEN5.htm

Authors: Kerry Jones and Deirdre Kann

"Edgewood/Cedar Grove (CCEN5) reports wind observations daily at 0700 and 1900 LST and peak winds as they occur."

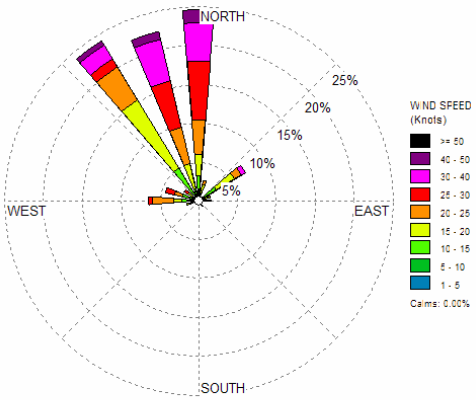


Figure 3. Wind rose plot of nighttime peak winds between 2200 and 0600 LST from Sep. 1, 2004 to Aug. 31, 2005.

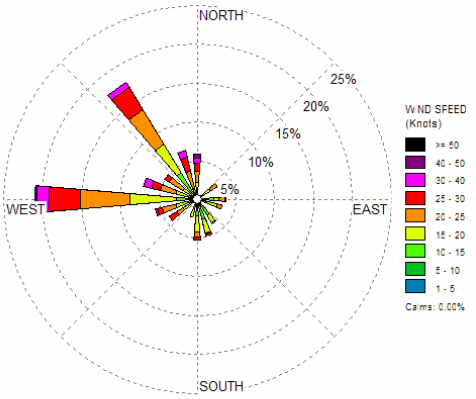


Figure 4. Same as Fig. 3 except afternoon peak winds between 1200 and 1800 LST from Sep. 1, 2004 to Aug. 31, 2005.

New Mexico Drought Status

In Spite of Wet Beginning to 2005…Drought not Ready to Go Away

In our Spring edition, we showed maps for August 2004 and February 2005 that depicted drought conditions in New Mexico and how much conditions had improved over that time period. These assessments are the best estimates of conditions as determined by the governor's drought monitoring group, of which the National Weather Service is an integral part. The figures below show the changes in drought depiction during the past 12 months. One can easily see the significant changes between August 2004 and February 2005, with only minor changes between February and August 2005.

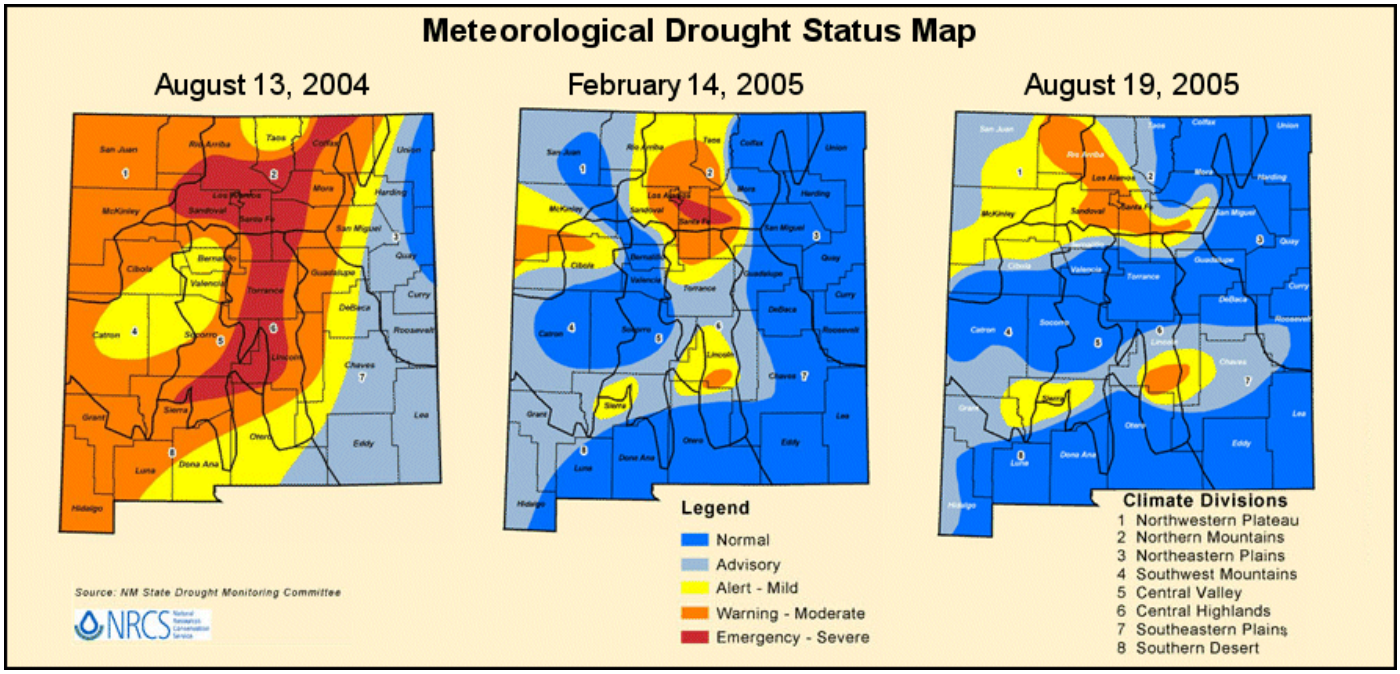
This summer's drought status image shown below (August 19, 2005) indicates the worst drought conditions in New Mexico are still over the mountainous regions of the north and south. Five-year precipitation budgets for the area from Las Vegas to Santa Fe – Los Alamos and Jemez Springs are still generally 15 to 20 inches, which is roughly equivalent to one year's precipitation "lost" in the five-year period. Meanwhile, deficits in the Capitan Mountains and northern Sacramento Mountains are generally 10 to 15 inches, or a little less than one year's precipitation. Since August was a relatively wet month, the land surface looks quite good right now. But, the long-term deficits would suggest all is not "right" beneath the surface.

How the Year Has Progressed on the "Drought Front"

January through April 2005 was wet over virtually all of New Mexico. However, since that time, conditions have been drier than normal for much of the state. June 2005 was 11th driest of the past 111 years, and July 2005 was 5th driest. When you put those two months together, it was the driest June-July combination for some areas, especially over the Sacramento Mountains, the Southwest Desert and Gila Region. August precipitation was generally above normal, which helped salvage the summer of 2005 to some degree, but even a wet August couldn't produce a "normal" summer (June through August) for the vast majority of New Mexico. For example, the Ruidoso-Alto area received anywhere from 5.5 to 7.5 inches of rainfall in August, which was 1 to 3 inches above normal. But, the June-July period was 4 to 5 inches below normal, thus the summer season was still a bit on the dry side. Overall, the summer of 2005 was the 13th driest of the past 111 years in New Mexico, and the 15th warmest. The table on the next page shows how the summer of 2005 shaped up at some of the locations.

What's Ahead?

Long-range (seasonal) forecasting is still in its infancy. Anytime there is no El Niño or La Niña in effect, confidence in seasonal forecasts is especially low. Without those two phenomena, we are said to be in an El Niño/Southern Oscillation (ENSO) neutral phase, and that's precisely where we are now. Still, composites of long-range models suggest the

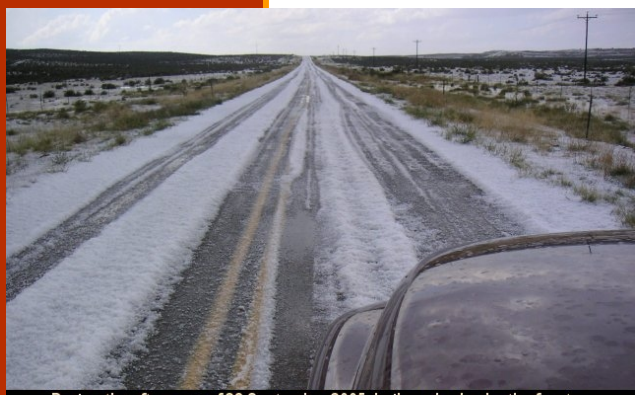


New Mexico Drought Status Cont.

coming winter is more likely to be dry than wet. These long-range models actually indicate the period from Autumn 2005 through the Spring of 2006 is going to be on the dry side. One thing that can be said with high confidence is that the winter of 2005-2006 is very likely to be dry compared to the winter of 2004-2005. Consequently, we should expect some drought to linger in New Mexico.

Author: Charlie Liles

Lightning over Santa Fe. Photo was taken Monday, July 18, 2005 at 10:25 pm MDT. The severe thunderstorm produced very heavy rain and hail up to nickel size just northwest of Santa Fe. By Memphis Barbree.



During the afternoon of 28 September 2005, hail reached a depth of up to three inches along Highway 197 in Sandoval County 18 miles southwest of Cuba. Photo by Mark Kannon

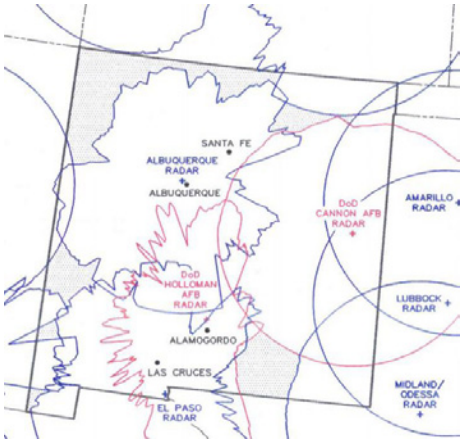
Location	Jun-Aug 2005	Normal	Percent of Normal
Rosebud (Harding)	11.08	7.06	157
Bosque del Apache	4.15	3.57	116
Chama	6.55	5.97	110
Farmington	2.47	2.31	107
Mosquero	8.25	7.94	104
Ocate	9.95	9.69	103
Clovis	7.87	8.22	96
Conchas Dam	6.38	6.77	94
Los Alamos	7.65	8.24	93
Fence Lake	4.85	5.23	91
Gallup	3.60	3.95	91
Red River	6.82	7.52	91
Capitan	6.60	7.49	88
Roswell	4.64	5.54	84
Cloudcroft	9.81	11.89	83
Picacho	6.99	8.54	82
Cimarron	6.03	7.31	82
Lindrith	4.05	4.92	82
Quemado	3.93	4.93	80
Fort Sumner	5.09	6.41	79
Tucumcari	5.70	7.29	78
Carlsbad	3.89	5.11	76
Deming	3.15	4.18	75
Estancia	3.83	5.45	70
Clayton	4.68	6.83	69
Tatum	4.80	6.96	69
Ghost Ranch	3.04	4.66	65
Ruidoso	6.41	10.14	63
Socorro	2.35	3.81	62
Reserve	3.54	5.76	61
Grants	2.53	4.38	58
Jemez Springs	3.86	6.89	57
Johnson Ranch	2.44	4.47	55
Truth or Consequences	2.79	5.08	55
Mountainair	3.07	6.00	51
Animas	2.35	4.87	48
Albuquerque Sunport	1.61	3.44	47
Santa Fe	2.55	5.43	47
Cliff	2.74	6.09	45
Wolf Canyon	3.73	8.23	45
Sandia Park	3.07	7.01	44
Las Cruces	1.83	4.34	42
Albuquerque Foothills	2.16	5.89	37
Gila Hot Springs	1.82	6.55	28
Los Lunas	0.98	3.60	27
Moriarty	0.46	2.60	23

Limitations Make Observers Invaluable

Since the deployment of the national network of Doppler weather radars in the mid 1990's, the ability to detect and warn for severe storms has improved dramatically. The number of weather warnings issued for New Mexico increased ten times in 1995 with the Doppler installation, and average tornado forewarning increased from under 2 minutes in the early 1980s to almost 13 minutes in 2004. Doppler radars helped forecasters achieve these improvements by providing higher resolution weather echoes, information on the speed and direction of movement of some of the droplets and other small particles in the atmosphere, and derived products depicting various weather hazards. While this information is useful, Doppler radars have a number of limitations that make accurate detection of tornadoes, strong winds, heavy rain, large hail and heavy snow challenging. The two chief limitations include radar beam broadening and the gradual rise of the radar beam as it moves away from the radar, but mountainous terrain and computer algorithm assumptions also pose problems. As a result, the National Weather Service will always need the help of observers who can physically view and measure the weather.

One of the most significant radar limitations, beam broadening, occurs because the beam spreads out like the light from a flash light as it travels away from the radar. At a distance of 60 miles from the radar, the beam widens to 1.15 miles in diameter, which dwarfs most tornadoes, as well as many rain, snow and hail shafts. Radar computers have great difficulty distinguishing between the few echoes from these potentially significant weather features and the much more numerous echoes from the rest of the radar beam at long ranges. As a result, computer algorithms calculate averages and make assumptions that sometimes lead to the underestimation of rain and snow amounts, as well as wind speeds. In fact, the radar beam is too large to detect any tornadoes, but rather depicts the larger circulations in which strong and damaging tornadoes embed themselves. Computer assumptions made erroneous by beam broadening also result in the overestimation of the aerial coverage of precipitation, especially at long ranges from the radar.

The gradual rise of the radar beam as it moves away from the radar may be a more significant limitation than beam broadening. At ranges beyond 29 miles, the beam can overshoot shallow tornadoes and the surface boundaries on which they form. Many warnings for strong surface winds also depend on the detection of these boundaries. At ranges beyond 100 miles, the center of the lowest beam rises above 13,000 feet, causing the radar to miss the lower portion of precipitation shafts and miss shallow shafts entirely. Thus, overshooting can be the largest single contributor to precipitation underestimates at long ranges.



Radar Coverage at 10,000 Feet. Beam blockage by mountains in western New Mexico prevent perfect circles of coverage around the Albuquerque, Holloman Air Force Base, and El Paso Radars.

Mountainous terrain and a few other computer algorithm assumptions also limit the radar's effectiveness during the detection of severe weather. The figure above illustrates the gaps in radar coverage caused by mountains intercepting the radar beams. New Mexico's radars are too far apart to detect severe weather in areas where mountains block the beam, so forecasters depend on reports from observers and weather spotters. Errors due to computer algorithm assumptions can be more difficult to detect in radar data than beam blockage by mountains, but they complicate severe weather detection just as significantly. Radar computers commonly underestimate or overestimate rain rates because the calculation depends on the distribution of rain drop sizes, which changes for each storm. Furthermore, the presence of hail in a storm can cause huge rain overestimates, because hail coated by water looks like a giant water drop to radars. Radar algorithms also commonly overestimate the size of hail stones by a factor of two or more, because the calculation depends on the elevation of the freezing level, which varies within each storm.

Meteorologists overcome radar limitations caused by the broadening and rising of the radar beam, as well as beam blockage by mountains and computer algorithm assumptions, by using data from a variety of other sources including observers, automated surface weather observations, weather satellites, and weather balloons. Some of the most important information comes from people in the field who describe a threat in a timely manner. Sometimes, all of the various radar limitations can work together to prevent meteorologists from detecting severe weather. At these times, cooperative observer and spotter reports are invaluable. They can help forecasters decide which warning to issue, how long it should last, and when to cancel it. Severe weather reports from the field not only confirm the presence of suspected severe weather, but also verify its severity for people in the path, and help meteorologists track and improve their forecast accuracy. Given the radar limitations described above, please relay timely details on tornadoes, strong surface winds, heavy rain, large hail and heavy snow to the NWS via the web or toll free number, 1-888-386-7637. Your report can mean the difference between a warned or unwarned hazard.

Author: David Craft

Meet Your Observers

Within each issue of your New Mexico Skywatcher, the National Weather Service in Albuquerque will highlight cooperative observers from across our forecast area (which includes the northern two –thirds of New Mexico). This section was designed to allow observers across the state to meet fellow hard-working volunteers within the region. We are proud of the service you provide our nation, and we want to acknowledge your hard work. If you would like to nominate someone for this section, let us know.

Authors: Joe Alfieri/Daniel Porter

A tour by Joe Alfieri of the NWS observing equipment.

Eastern New Mexico

Cindy Scott

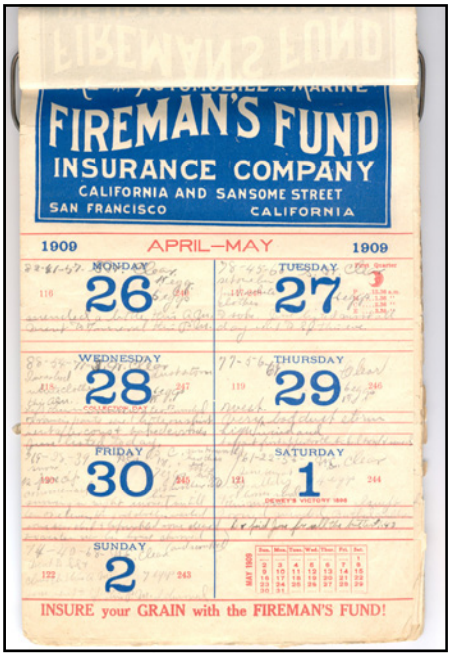
Nakita Fluhman

A young girl in Roy, New Mexico, took over the weather station in September 1984 when the previous observer moved away. Cindy Scott was only seven years old at the time, and the youngest weather observer in the cooperative observer network. An article about children making a difference across the nation was written in the National Geographic World Magazine in May 1986, which included Cindy. She volunteered her time to report temperature, rainfall, and snowfall observations. She was quoted in this article that "gardeners from all over the neighborhood call and ask me about the weather." After five years of observing, the July/August 1989 edition of Commerce People Publication also cited Cindy's noteworthy contributions to the NWS. When Cindy went to college after ten years of service, her parents took over observations for nine and a half years. Then in April of 2004, another young girl, Nakita Fluhman, started taking weather observations for the city of Roy. Nakita was a little older than Cindy when she started, which was on her ninth birthday. She continues to take observations for this site. Cindy was an excellent observer and Nakita is following in her footsteps. She sends her observations to the NWS on a daily basis and mails the forms to the National Weather Service early each month. Nakita contributes information to the NWS during severe weather events, including heavy rainfall, strong winds, and hail.

Western New Mexico

Betty Jane Curry

Jim Curry II started observations near Espanola in 1895. He instructed his son Jim Curry III at the age of 9 on how to take observations and continued to do so for seven more years. Jim Curry III started taking observations on his own near Senorita on January 1, 1912. Service was interrupted in 1925 and again from 1927 to 1952. Jim then took over observations when the station became known as Wolf Canyon, where he was a rancher. He took observations until October 1, 1975 for a total of 43 years. Betty Jane Curry, Jim's daughter-in-law, took over at this time and remains the cooperative observer 30 years later. Jim Curry III received the Holm Award in 1967 and the Jefferson Award in 1972. Like her father-in-law, Betty is very conscientious and mails her data in a timely manner when the weather and her health cooperates. Jim Curry III missed only one month of records during his tenure of service due to an illness. At one time, when he was sick, Jim moved his equipment to his son's ranch located five miles away to record weather data. Now that was some serious dedication!



White Family 1909 Calendar
Courtesy of Gerald White

White Family Weather Observers

Weather observation has been a family tradition for the Whites of San Jon, NM, for nearly 100 years. The Whites came west from Iowa for health reasons, settling near San Jon in April, 1905. A weather station was established there in 1907 by Mr. H.C. Miller. On February 1, 1909, Jesse and Arba White became cooperative observers for the U.S. Dept of Commerce, Weather Bureau (now known as the National Weather Service). They took over from Mr. Miller, first recording the temperatures (high, low, present), prevailing wind, precipitation, and 'character of day' on a wall calendar shown to the left (which also recorded the number of eggs gathered and places visited that day). The weather data was then transferred to the official forms to be sent to the Bureau. Before retiring, Mrs. White worked as a school teacher, farmer, rancher and newspaper editor (founding and publishing the weekly San Jon Sentinel newspaper between 1914 and 1926). She graduated from Eastern New Mexico Junior College at age 57. She recalled the big snow of 1918, the big rain (6 inches in 24 hours) of 1930, and the 'dust bowl' days that followed. After Jesse died in 1931, Arba continued the volunteer job until 1959 and was awarded the John Companius Holm Award for 50 years of service to the Bureau in 1960. In 1959, a letter to Mrs. White from the President of the Air Line Pilots Association stated that "air line pilots place extreme reliance on accurate weather information…" (as provided by the cooperative observers). Around age 71, when requested by her daughter that she give up the ranch and weather observations to live with her, she replied "I've been too busy all my life to stop now. I wouldn't last long with nothing to do."

The weather reporting was turned over to Arba's son, Clark White, in 1959, and he reported the weather until 1969. During his tenure, the weather station was moved to town from two and a half miles southwest of town. At some point, the observing actually became a paying job. In the 60's, Clark received $3.50 per month for his reporting. When Clark became Post Master of San Jon, the cooperative weather observation job was given to Mrs. Clark White (Fern). The weather station was then modernized and the old weather box became just a 'yard ornament' (the thermometers are still intact inside). The temperature was now detected with an electronic device which delivered the temperatures to a digital readout inside the house. Fern continued the reporting during her years of employment as Village Clerk, then as Mayor of San Jon. In 2000, she was awarded the John Campanius Holm Award for 30 years of reporting to the National Weather Service. In an interview with Mrs. White, she reached back in time to describe several instances where major weather events made a serious impact on living in the far eastern plains of New Mexico. Tornadoes, as one might expect in that part of the state, figured prominently among those events. Back just before the 'Roaring 20s', a tornado did significant damage to outbuildings on the family ranch, but fortunately the main house was spared. Also in the early 90s, when she was in the San Jon area and living on the ranch, strong winds, damaged some buildings in the San Jon area. Lightning also created some havoc for Clark White some years before he and Fern married, as his home sustained some damage due to these strikes. On a lighter note, she remarked on the variability, from one year to the next, of precipitation at the site. As in most any ranching operations, cattle must be periodically counted. In 1941, there was so much rainfall that vegetation really took advantage of it, growing like weeds. In fact the sunflowers that grace the plains area grew so tall that the cattle on their ranch had to be counted on horseback.

In 2000, Fern White moved to Clovis, NM, and her son, Gerald, moved to her former home in San Jon, becoming the official weather observer for the community, continuing the family tradition of observing the weather for the little town in Eastern New Mexico. The weather reporting has become even more modern in this computer age with the temperatures now recorded online via computer. The weather station location is set by GPS technology.

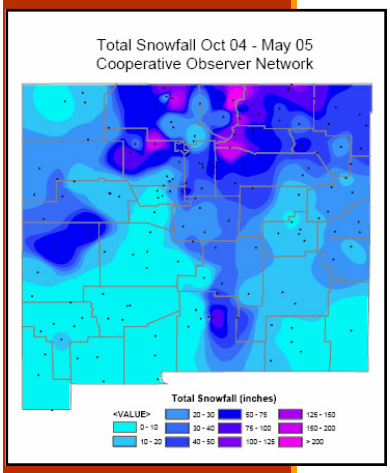
Amid all this upgrading, however, Gerald still searches the skies for the next change in atmospheric phenomena that require reports to the National Weather Service. Through the years, these phenomena have included tornadoes, Blue Northers, dust storms that blocked the sunlight and left sand piled on window sills, flooding rains, thunderstorms which sometimes hailed out precious crops, damaging winds, smoke, auroras, snow and ice storms, halo phenomena and rainbows.

John Campanius Holm was a Lutheran minister who was the first person known to take systematic weather observations in the United States. The Reverend Mr. Holm took daily observations near what is now Wilmington, Delaware in 1644 and 1645. The White family is proud to continue the legacy of observing and recording weather conditions for the United States National Weather Service which Rev. Holm began so long ago. In a way, the White family has brought this 360-year old tradition full circle back to the religious foundations of the Reverend Mr. Holm. Gerald White is a United Methodist Minister who retired in 2000 after serving as a pastor for 40 years in New Mexico and Texas.

Authors: Carol Nash and Mark Fettig

By The Numbers

The final snowfall totals from last winter season are shown in the table to the right. Some impressive snows were observed over the northern mountains, thanks to above normal precipitation through much of the winter of 2004-2005.



Visit the NWS website for a larger image.

After a cold December 2004, the remainder of the winter was generally warmer than normal across the state. The coldest temperatures were on Christmas Eve and Christmas Day.

In contrast, the summer brought plenty of heat to New Mexico. Late June through most of July was the hottest. Of special note was Farmington, which hit 105 degrees on July 19th, 20th and 21st, their highest temperature ever recorded at the Four Corners Regional Airport.

Precipitation so far this year has been adequate over most of the state. Precipitation was above normal from January through April, then below normal at most locations from May through August.

Author: Chuck Jones

Location	Snowfall (Oct-May)	Co-op Observer
Red River	242.1	Robert Prunty
Gascon	176.5	Editha Bartley
Wolf Canyon	158.8	Betty Curry

Location	Coldest Temp	Co-op Observer
Eagle Nest	-27 (Dec 24)	Ernest Sutliff
Angel Fire	-25 (Dec 24)	Lisa Sanchez
Cimarron	-22 (Dec 24)	Maralyn Vargas

Location	Precip (Jan-Aug)	Co-op Observer
Ocate	24.78	Louis Mares
Cloudcroft	21.01	David Gilbreath
Chama	20.79	Bud Harris

Location	Warmest Temp	Co-op Observer
Bosque del Apache	110 (Jun 21)	National Wildlife Refuge
Bitter Lake	109 (Jul 4)	National Wildlife Refuge

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Albuquerque,
New Mexico

2341 Clark Carr Loop SE
Albuquerque, NM 87106-5633
Phone: 505-243-0702
E-mail: sr-abq.webmaster@noaa.gov

Working Together to Save Lives.

How would you like to receive future issues?

The New Mexico Skywatcher will be available on your NWS website at http://www.srh.noaa.gov/abq. If you do not have access to the internet or would simply like a copy in the mail, return this portion to the NWS at the address on the left. We can notify you when the newest version of the newsletter is updated on the NWS website via email. If you would like to be notified via email, submit your request to **sr-abq.webmaster@noaa.gov** (make sure to state your name and email address).

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