NEW MEXICO SKYWATCHER

A Publication of the Albuquerque National Weather Service Office

Last November, in our Fall edition of the newsletter, we discussed the exciting prospects associated with a new satellite that was planned for launch: GOES-R Series. Recall that GOES-R (Geostationary Operational Environmental Satellite-R Series) represents the new generation in the line of geosynchronous weather satellites, and was touted to bring a suite of ground-breaking weather datasets to atmospheric scientists. Now that Spring has sprung, we are thrilled to update you on the status of this game-changing weather instrument.

On November 19, 2016 at 6:42 pm EST the GOES-R satellite successfully launched from Cape Canaveral in Florida. There were some delays with the initial launch schedule, but on November 19th, the proverbial stars aligned, the weather cooperated, and the Atlas V rocket launched with GOES-R onboard.

After weeks of precision maneuvering and diagnostics, the GOES-R satellite reached its temporary geostationary orbit near 89.5° West (roughly about the same longitude as the Mississippi River) and was dubbed GOES-16, as it is the 16th satellite in the GOES series. Being in a geosynchronous, or geostationary, orbit means that GOES-16 will orbit over the equator while maintaining a relatively fixed position (currently above the 89.5° West parallel). The exact permanent orbit has yet to be determined, but should be known after several more months during which extensive diagnostics and data validation tests will be performed. Once these pass, GOES-16 will be deemed operational.

Last month, some of the data imagery (still considered preliminary and non-operational) began flowing to National Weather Service offices. Scientists and meteorologists have been enamored with the images, witnessing atmospheric phenomenon on scales never seen before in a very high resolution format. As with most remote sensing instruments, the full benefits from the acquired data are often not even known during the initial research and development phase, but as scientists continue to analyze the imagery and develop correlations, there will be immense gains with meteorologists being the primary benefactors.
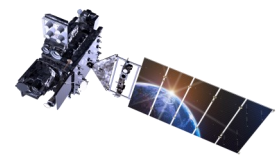
Photo Credit: United Launch Alliance

The Atlas V rocket launched on November 19, 2016 with the GOES-R Satellite onboard.
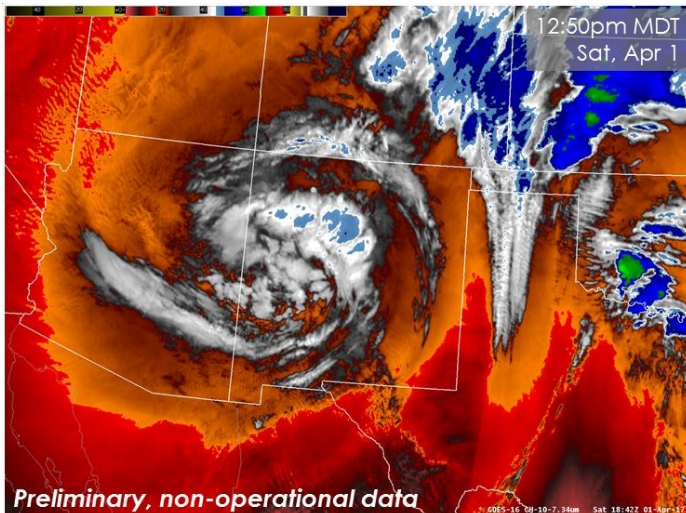
GOES-R Satellite Takes Orbit

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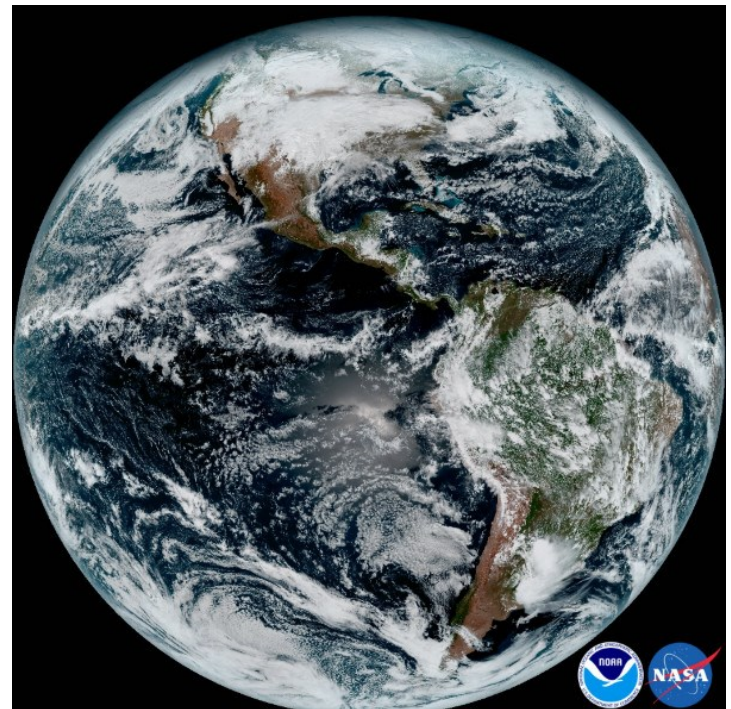
By Todd Shoemake

While satellite images of the full earth disk are not new, GOES-16 gave a higher resolution true color image than any other NOAA geostationary satellite (seen to the right). Viewing the new data from GOES-16 is analogous to making the jump from black and white television to High Definition programming. The frequency at which data imagery is sent from the satellite down to earth is also remarkably higher. Viewing satellite data used to mean that we observed changes in the atmosphere in a past tense at stale and often irregular intervals. However, now the near real-time retrieval of more frequent images from GOES-16 lets us watch atmospheric developments unfold right before our very eyes. Scientists are hopeful that this imagery will help close some gaps in our understanding of our ever-changing atmosphere.

Although the data imagery is still considered preliminary, some obvious benefits are already surfacing. The tenth channel of the GOES-16 imager is a perfect example. Past satellites had difficulty imaging water vapor in the lower to mid levels of the troposphere (surface to 15,000 feet above sea level), but GOES-16 has already rendered some beautiful imagery, revealing small scale atmospheric undulations that have never yet been sampled.
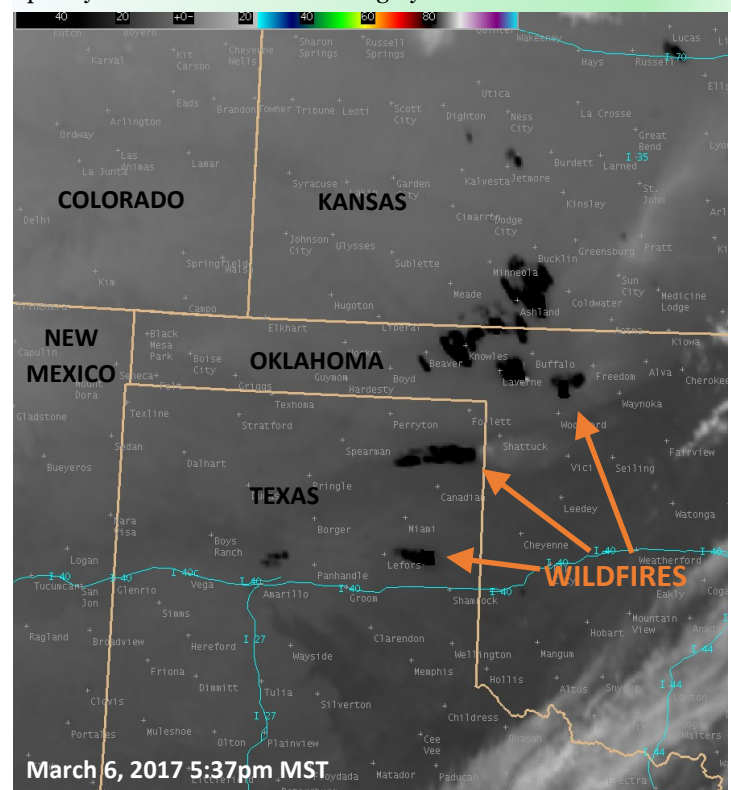

Above: One of the first full disk (color composite) images from GOES-R (Geostationary Operational Environment Satellite-R Series) taken on January 15, 2017. The upgraded imager aboard GOES-R is now rendering much higher spatial resolution images at much more frequent intervals than its predecessors.

Below: The 3.9 μm wavelength channel aboard GOES-R is sensitive to "hot spots" caused by wildfires (depicted by black or dark spots). On March 6th, the rapid spread of wildfires was quickly observed via GOES-R imagery.

Above: The low level water vapor channel is quite revealing, as seen on April 1st when a low pressure system crossed New Mexico. Orange and red portions of the image reveal dry air with little water vapor, beautifully contrasted by the gray to blue colors indicating more abundant water vapor.

Another imaging channel on the GOES-16 platform was put to quick use last month when prairie fires raged across the plains of Kansas, Oklahoma, and Texas. Gathering shortwave radiation, GOES-16 is able to decipher "hot spots" on the earth's surface, making it a great asset when pinpointing wildfires.

Our Beloved Mark Fettig Retires

By Jennifer Palucki

On December 28, 2016, General Forecaster, Mark Fettig, finally said goodbye to shift work. Mark was (and still is) quite the character, and appropriately so, he was a man of many names within the office. Fellow forecasters affectionately called him "Markus Fettigus," "Markito," and "Marky Mark". If you are an avid reader of Forecast Discussions, you may have known him as "43", his forecaster number. If you read even just one, you might have figured out that Mark loves moisture! Snow, rain, you name it, he never gets enough.
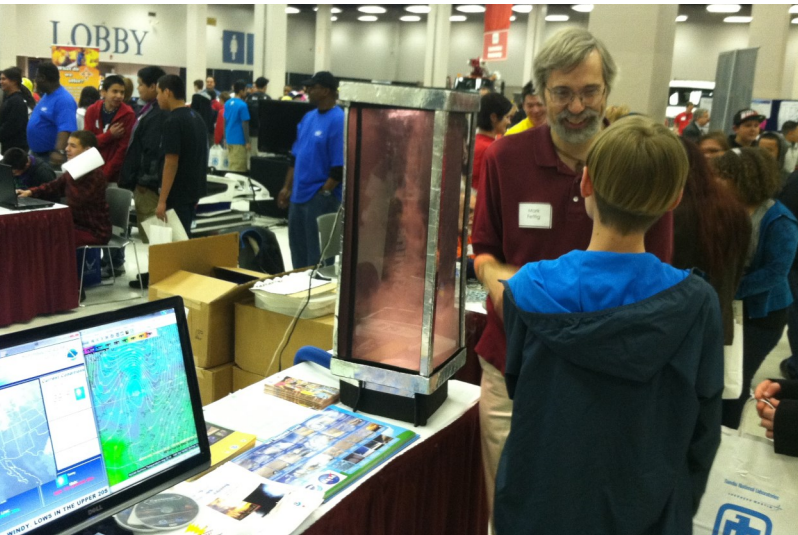
Mark participated in numerous outreach efforts, and often acted as a judge for science fairs for many different age groups.

As an example, let's go back to December 20, 2002 when he casually said at the end of his forecast discussion, "Figures, I will be away and we get dumped on with snow." But sometimes, the discussions displayed a little comic relief during occasional stressful forecast situations. You may have caught the discussion that started with "Oh the humanity!" or perhaps the one that discussed "the fog boogeyman." Ah, yes, he was a joy to work with and we already miss all the laughs. Whether he was humming along to the radio, or tapping his feet to the tune in his head, there was never a dull moment working with Mark. We only wish everyone could have seen his impression of a radar (Yes, you read that correctly).

Mark wasn't just all fun and games, he was also a fantastic forecaster. There was never any doubt that Mark loved weather. He often would get so immersed in the details, time would get away from him. He also ran the CityNet program in the office. CityNet is a network of volunteer weather observers that measured and recorded precipitation amounts across the Albuquerque metro. Mark main-

At his retirement party, Mark Fettig (right) was congratulated and commended on his years of public service by Meteorologist in Charge, Shawn Bennett (left).

tained this database for years, giving us clues on how precipitation amounts differed across the city. He also enjoyed working with the "young-uns" as he would call them. You could routinely see Mark volunteering to be a science fair judge or teaching 4th graders about the importance of water at Water Festivals across the state.

We sent Mark into retirement properly, with lots of laughs and good food. He tells us he will "haunt the place" and we look forward to when he visits so we can catch up with our good friend.   Congratulations on your retirement, Mark! We hope you enjoy sleeping at regular hours while missing out on the morning rush hour! Miss ya buddy!

Mark was always full of infectious smiles, and his funny demeanor has already been missed around the office.

Utilizing GIS to Verify Weather Warnings

By Todd Shoemake

Geographical Information Systems (more commonly known as GIS) are used for an immense number of applications these days. The National Weather Service as a whole has been incorporating technologies associated with GIS for decades now, and it certainly does not stop at the local level here in Albuquerque. After the storm passes, or during times of tranquil weather, many meteorologists polish other skillsets such as computer programming and analyses utilizing GIS applications. The opportunities for applying these skillsets in the realms of atmospheric science and public service are virtually boundless.

For example, the Albuquerque Weather Forecast Office has a longstanding Storm Data team that assesses our performance with regard to our advisories, watches, and warnings for adverse or severe weather. Whether it be for severe thunderstorms, high winds, or wintry weather, thorough examinations of our statements are compared to what really happened. Our warnings are sometimes verified by an automated surface observation, but often it is our valuable network of spotters (SKYWARN, CoCoRaHS, CityNet, etc.) that relay critical reports of severe hail, wind damage, or white-out conditions during winter storms. All of these treasured reports and observations are the basis for much of our verification statistics that enable us to learn from past events and ultimately refine our forecasts.

These reports of adverse or severe weather are carefully tallied in a database, and since each report contains detailed location information, they can be input into a GIS for extensive mapping uses. After exercising some computer programming skills and analytical techniques in tandem with GIS software, detailed maps can be generated to assist the Storm Data team as they assess how our warnings performed.

For example, the image in the upper right shows a recent high wind event where High Wind Warnings were issued. Those counties or forecast zones that met high wind criteria (sustained speeds of at least 40 mph or instantaneous 58 mph gust or greater) are shaded in dark orange with those that fell short shaded in the tan color.

For severe thunderstorm warnings, the approach is a bit different, as these warnings are issued for a case-by-case polygon rather than whole counties or pre-defined forecast zones. Thus, if severe hail (1" diameter or greater) or severe thunderstorm wind gusts (58 mph or greater) are observed or reported within the yellow-outlined polygon, the warning verifies. Verified severe thunderstorm warnings are outlined with the bold (thicker) yellow polygons

High Wind Verification 4 April 2017
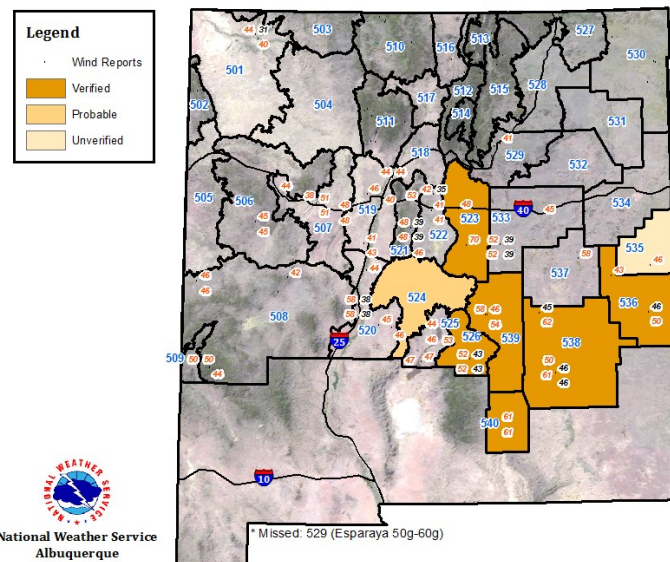
Map by Randall Hergert

Severe Storm Verification 15 September 2016
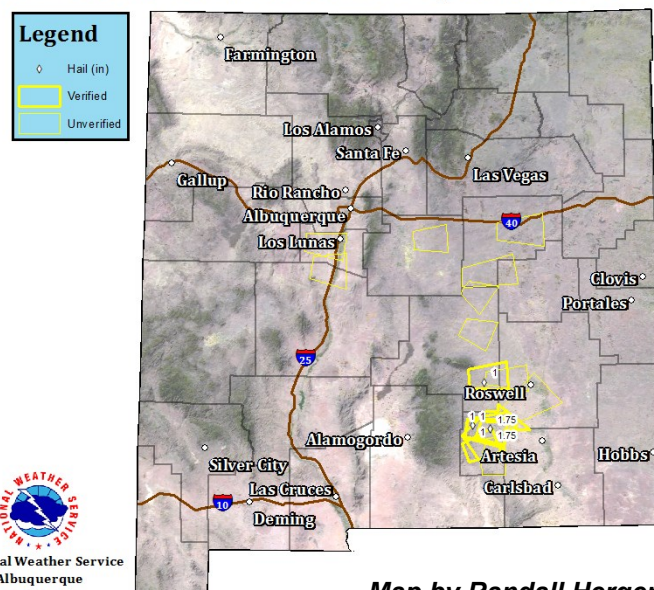
Map by Randall Hergert

on the map above while those warning polygons that did not verify are annotated with thinner yellow polygons. Ultimately these maps let forecasters know what types of weather events might need to be revisited, as learning from our past misses will lead to future improvements.

Is Your Community StormReady?

By Todd Shoemake

One of the goals of the collective National Weather Service is to build a Weather-Ready Nation. A Weather-Ready Nation is prepared and ready for extreme weather events such as record breaking snowfall, tornadoes, widespread flooding, or even devastating drought. The impacts from these events can be greatly reduced by taking advanced action before the storm hits. These mitigation efforts might be as simple as talking about preparedness and resilience in your home, office, school, or other community center or they can be more in-depth measures like enacting a community disaster plan.

One component of the Weather-Ready Nation is the StormReady® program, designed to better prepare local communities for extreme weather and water events. The StormReady® program ensures that communities have assessed their vulnerability to these extreme weather events and further educated and prepared themselves for these scenarios. StormReady® helps community leaders

**May 23, 2010
Near Clayton, NM**

Impacts from extreme weather events such as tornadoes and blizzards can be mitigated considerably when preparedness actions are put into practice. Communities that are StormReady® exemplify this notion.

*December 27, 2015
San Ignacio, NM
© Melody Perez*

and emergency managers strengthen local safety programs, and while no community is storm proof, the StormReady® program can help communities save lives by taking some proactive and preventative measures.

StormReady® uses a grassroots approach to help communities develop plans to handle all types of severe weather. The program provides clear-cut guidelines for improving a community's hazardous weather operations. Applying is easy. To be officially StormReady®, a community must:

• Establish a 24-hour warning point and emergency operations center.

• Have more than one way to receive severe weather warnings and forecasts and to alert the public.

• Create a system that monitors weather conditions locally.

• Promote the importance of public readiness through community seminars.

• Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

If you are interested in learning more, visit:

http://www.weather.gov/stormready

March Madness Results

By Todd Shoemake

© Jennifer Palucki
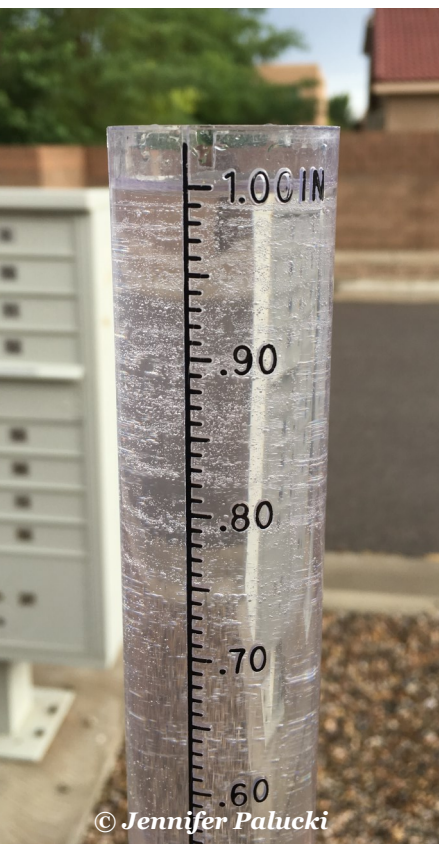
No! Not the basketball tournament! We are referring to the CoCoRaHS March Madness results, of course! What is CoCoRaHS, you ask? CoCoRaHS stands for the Community Collaborative Rain, Hail, and Snow Network, consisting of volunteer precipitation observers across the nation. Volunteer observers of all ages and backgrounds comprise this one-of-a-kind community-based network. Armed with inexpensive rain gauges and snow and hail boards, observers report daily precipitation amounts online. Once input, this precipitation database has vast uses, whether it be in meteorology, hydrology, climatology, agriculture, or academia. Anyone can join the CoCoRaHS network, so long as you have an enthusiasm for watching and reporting weather conditions.

Every March the CoCoRaHS network hosts a recruiting campaign, aimed at gathering interested precipitation observers and expanding the already blossoming database of precipitation amounts. Precipitation data often has gaps or areas void of any gauges or radar sampling. CoCoRaHS observers fill in these data gaps, and offer better representation of the spatial distribution of precipitation. During the March Madness campaign hundreds of new volunteers flock to the CoCoRaHS.org website to supplement this growing network, and this past March an impressive 1,097 new observers signed up across the nation! The state of Florida acquired the most new observers with 135 volunteers. Per capita, New Mexico actually ranked 3rd in the nation with 27 new observers gained in the month of March. This brings our total number of CoCoRaHS observers to 1,675 in New Mexico!

Just because March Madness is over doesn't mean it's too late to join! If you are interested in joining the CoCoRaHS team, simply visit cocorahs.org to sign up, and we will look forward to seeing your rain, hail, and snow reports!

Announcements

© Amy Howard
© Jim Tucker
© Corey King

SKYWARN spotter training is in full swing! A few training sessions have already been held with more on the way. Check out our webpage for the latest schedule: weather.gov/abq/skywarn_sked

Albuquerque
Wednesday, May 17th @ 6pm
Bachechi Open Space
9521 Rio Grande Blvd. NW
Albuquerque, NM 87114

Santa Fe
Saturday, July 8th @ 10am
Food Depot
1222 Siler Rd.
Santa Fe, NM 87057

Stay Tuned!
weather.gov/abq

What Does the Summer Forecast Look Like?

Are you curious about what is in store for the upcoming summer season? Our local climate expert, Andrew Church, will be posting the Summer Outlook in early May.
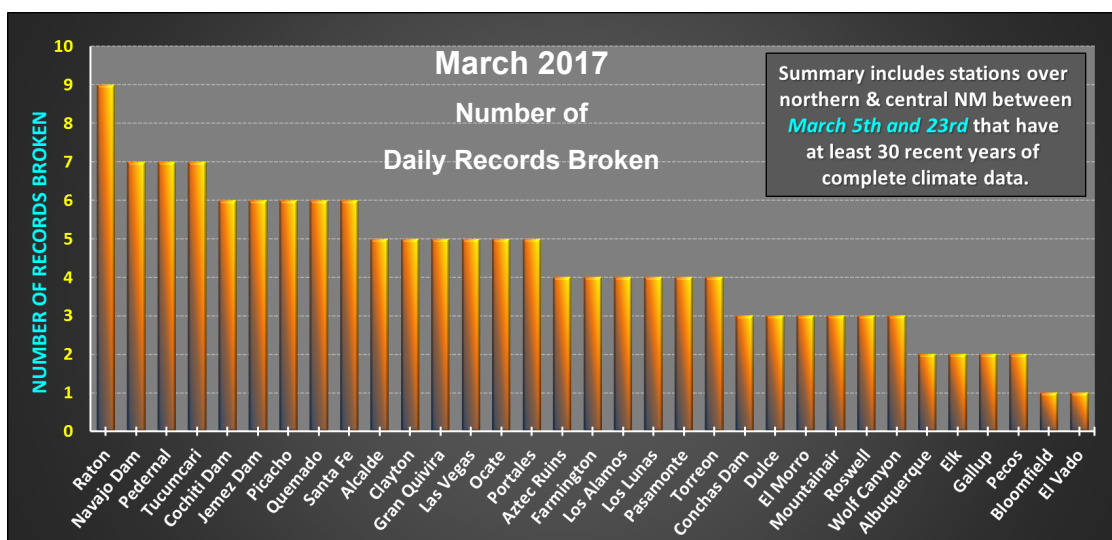
By The Numbers: March

By Brian Guyer

While temperatures each month this year have been above normal, March was **exceptionally** warm.

143 A total of **143** record highs were broken across 34 stations (sites) on 15 days throughout March.

1st Both Albuquerque and Roswell observed the 1st warmest March on record (Albquerque at 54.8°F and Roswell at 60.2°F).
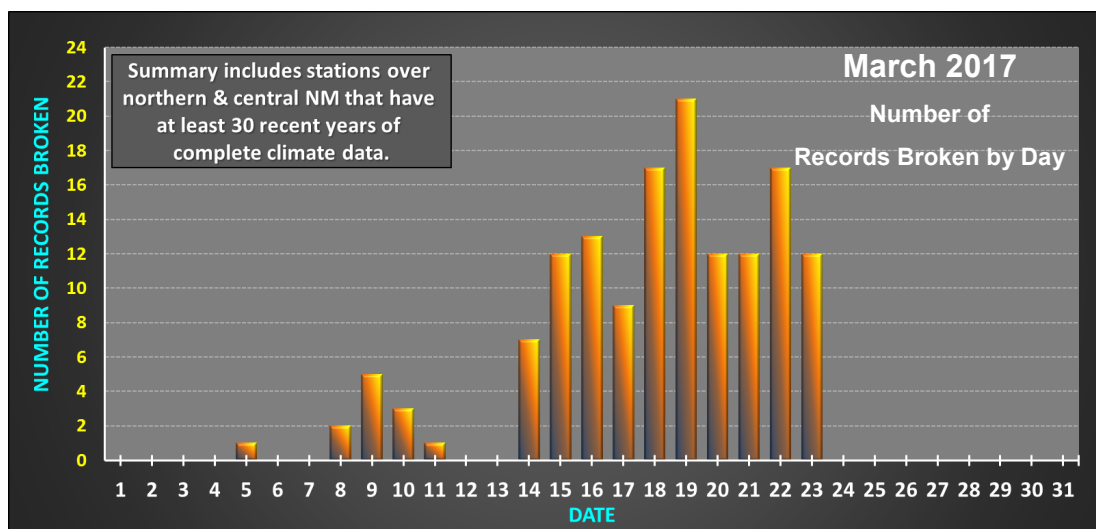
2nd Clayton observed the 2nd warmest March on record.

7th Albuquerque and Roswell observed the 7th March in a row that was above normal.

12th Clayton observed the 12th March in a row that was above normal.

By The Numbers: November through April

Take a look at some of the winter snowfall totals from November 2016 through mid April 2017.

Location	Nov-April Snowfall
Chama	139.7"
Wolf Canyon	126.0"
Angel Fire 1S	111.0"
Taos 11ESE	87.7"
Angel Fire 10SSE	77.5"
Arroyo Seco 1E	77.3"
Dulce	71.5"
Questa 2NNE	67.2"
Taos 4NNW	57.3"
Truchas 1ESE	48.8"

© Leah Ostro

Winter 2016-2017 Chill

Location	Observation Network	Coldest Temperatures (Nov-April)	Date of Occurrence
Aztec 43E	Climate Reference Network	-26 °F	January 28, 2017
Angel Fire	Cooperative Observer	-24 °F	January 6, 2017
Cerro	Cooperative Observer	-23 °F	January 7, 2017
Maxwell 3NW	Cooperative Observer	-21 °F	December 18, 2016
Valles Caldera	Climate Reference Network	-19 °F	January 27, 2017
Dilia	Cooperative Observer	-18 °F	January 7, 2017
Dulce	Cooperative Observer	-17 °F	January 27, 2017
Raton KRTN Radio	Cooperative Observer	-17 °F	December 18, 2016
Capulin	Cooperative Observer	-17 °F	January 7, 2017
Lake Maloya	Cooperative Observer	-17 °F	January 7, 2017

New Mexico
Emergency Management Association
Conference

By Todd Shoemake

On April 3rd through the 6th, emergency managers from the state, county, and city level converged upon Hobbs, New Mexico to collaborate with fellow partners and share best practices. With a focus on preparedness, representatives of different government levels met and discussed a wide array of topics that will keep New Mexico situationally aware and ready to act should emergency or disaster strike. A statewide conference such as this provides a unique opportunity for individuals from different sectors of law enforcement, the military, the Department of Homeland Security, and even the National Weather Service to meet face-to-face and forge valuable relationships. These relationships are just one example of the building blocks needed to construct a mindset of preparedness. National Weather Service representatives from the Midland, Texas and Albuquerque, New Mexico offices were in attendance, including Pat Vesper, Meteorologist In Charge, and Mark Strobin, Warning Coordination Meteorologist at Midland, and Kerry Jones, Warning Coordination Meteorologist from Albuquerque. Pat engaged the audience with the topic of risk communication and the role of Integrated Warning Teams while Kerry and Mark discussed the long range weather outlook for the Spring season, and also dove into new and improved decision support tools.

Left: At the New Mexico Emergency Management Association Conference in Hobbs, Pat Vesper, Meteorologist in Charge of the Midland, Texas Weather Forecast Office, discussed risk communication and Integrated Warning Teams.

Right: Mark Strobin, Warning Coordination Meteorologist of the Midland Weather Forecast Office, and Kerry Jones, Warning Coordination Meteorologist of the Albuquerque Weather Forecast Office, discussed the long range Spring weather outlook.

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