Volume 1, Issue 1 February, 2015

Texas Weather Wire

AUSTIN / SAN ANTONIO

Employees **Spotlight** Section

"Coming together is a beginning,

Keeping together is progress,

Working together is SUCCESS"

-Henry Ford-

Inside this issue:

A New Beginning…

By Joe Arellano, Jr., Meteorologist-In-Charge

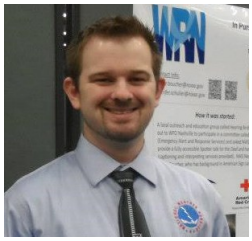
Howdy! Welcome to the inaugural edition of the National Weather Service (NWS) – Austin/San Antonio office's newsletter – Texas Weather Wire. One of our goals is not only to provide you the best weather and hydrologic forecasts and warnings for South Central Texas but also to keep you informed of weather related current events and meteorological information. To that end, we will be publishing our newsletter quarterly with weather stories, factoids, and reviews of significant weather impacting South Central Texas.

Not only is this a new beginning for our newsletter but it is also a new beginning for our Weather Forecast Office in Austin/San Antonio. Due to a number of retirements, we have had a significant number of new personnel come aboard over the past seven months. I would like to take this opportunity to briefly introduce our newest staff members (listed alphabetically):

Jared Allen – General Forecaster. Jared earned his B.S. degree in Operational Meteorology from Mississippi State University in 2007 and his M.S. degree in Geographic Information Systems (GIS) in 2009 which focused on forest damage vulnerability in a hurricane environment. Upon graduating, Jared became a full-time intern meteorologist in 2009 with the NWS office in Jackson, MS and was promoted to general forecaster in 2011. His main areas of interest include: innovating new flood extent maps using hydrology and GIS modeling, developing new weather situational tools, establishing new GIS and hydrology webpages, and optimizing weather hazard communication to the public through graphics and maps. Jared brings a high amount of severe weather experience having worked some of the largest tornado outbreaks in the country over the past 5 years.

Employees Spotlight Continues...

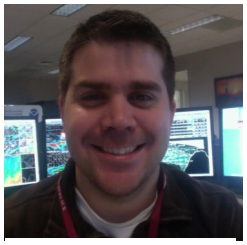
New Staff Continues...



Trevor Boucher

"TEAM = Together Everyone Achieves More"

Tony Freund



Nick Hampshire

Trevor Boucher – General Forecaster. Trevor, a graduate of Texas Tech University, comes to us formerly from the NWS office in Nashville, TN. He received a B.S. degree is Geophysics and M.S. degree in Atmospheric Science. While in Lubbock, Trevor worked at NWS Lubbock as a volunteer and a SCEP. In December 2010, he was hired as a meteorologist intern at NWS Nashville. Trevor's meteorological interests are low-cape high shear QLCS's, severe weather mesoscale analysis, and supercell thunderstorms. In addition, his special interests include societal perception of severe weather, outreach and education, social media innovations, and serving the Deaf and Hard of Hearing community (having experience using American Sign Language).

Tyler Douglas – Electronic Technician. Tyler started his NWS career with the Weather Forecast Office in Seattle, WA in May 2012. Before that, he was in the Marine Corps as an Airfield Radar Technician based at Camp Pendleton, California. Tyler was selected as one of the Electronic Technicians at the NWS Austin/San Antonio in August 2014. In addition to his work with the NWS, Tyler continues to study as a full time student at Texas State University. He enjoys working on cars and spending time with his wife and two kids.

Tony Freund – Electronic Technician. Tony, originally from Bastrop, TX, joined the Air Force at Lowry AFB in Denver in 1984 and completed Avionics Test Measurement and Diagnostics Technician training. He then transferred to MacDill AFB in Tampa before leaving active duty Air Force in 1990 and joined the AF Reserves at Carswell AFB. Tony secured a position with Fluke Corporation in Carrollton, TX and worked as an electronic technician with Fluke until 1999. He was then hired by the Department of the Air Force as an Air Reserve Technician in Avionics until September 2014 when he came aboard at the NWS Austin/San Antonio.

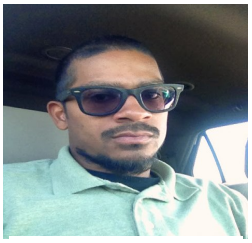
Nick Hampshire – Senior Forecaster. Nick a graduate from Texas A&M University started his NWS career at the Corpus Christi office as a student intern in 2006. In 2007, he was hired as a meteorologist intern at the NWS office Fort Worth, TX and was later promoted to General Forecaster at Fort Worth before coming to NWS Austin/San Antonio in June 2014 as a Senior Forecaster. Nick is most interested in outreach, research, and computer programming and hopes to meet as many people as possible when out conducting talks and SKYWARN training.

Employees Spotlight Continues...

New Staff Continues...

Larry Hopper

Larry Hopper – Meteorologist Intern. Larry is originally from Oklahoma City where he experienced his share of severe weather including the historical May 3, 1999 F5 tornado. He earned his B.S. degree in meteorology at the University of Oklahoma in 2005 and attended graduate school at Texas A&M University where he investigated a variety of storm structures using mesoscale models and the Aggie Doppler Radar (ADRAD). After receiving his doctorate in 2011 from A&M, Larry taught and mentored undergraduate research at the University of Louisiana at Monroe before joining the NWS Austin/San Antonio office in July 2014. In addition to his routine duties, he responds to public requests for information, engages in community outreach, and serves as the Aviation and Climate Focal Point. Larry is also a member of the AMS and NWA and has published and reviewed several journal articles.



Halvert Roberts

Halvert Roberts – Electronic Technician. "Hal" served in the United States Air Force from 2007-2014 as a Radar Maintenance Technician. His electronics background was gained while managing airport surveillance and weather radar systems, in Grand Forks, ND and Valdosta, GA. Upon leaving the Air Force as a Staff Sergeant, he was hired as an Electronics Technician for the NWS Austin/San Antonio in August 2014. He is married with 3 children, 8-year old twin daughters and a 3-year old son.

Jason Runyen

Jason Runyen – Senior Forecaster. Jason joined the NWS Austin/San Antonio as a Lead Forecaster in June of 2014. Jason's interests and specialties are in Tropical Weather, Severe Storms, and providing impact based decision support information to Emergency Managers and other core partners. Prior to arriving at NWS Austin/San Antonio, Jason was a forecaster at the NWS Corpus Christi for 11 years, NWS Lubbock for 1 year, and worked in the private meteorology sector in Houston for 4 years. Jason graduated from Texas A&M University-College Station in 1998 and was born and raised in San Antonio.

Robert Sandifer

Robert Sandifer – Regional Maintenance Specialist (RMS). Robert started his electronics maintenance career in 1986 as a Computer Maintenance Technology student at Texas State Technical College in Waco. After completing a certificate program at TSTC, he joined the U.S. Navy in 1988 and spent 7 years on active duty as an Electronics Technician. Upon discharge from active duty in 1995, he was offered a Navy DoD civil service position supporting meteorological equipment maintenance for the Navy and Marine Corps over the west coast region of the U.S. In 2001, he was hired as an electronic technician at the NWS office in San Angelo and was selected as the RMS for all of South Texas stationed at NWS Austin/San Antonio in August 2014.

Employees Spotlight Continues...

One Last New Staff Member

John Sullivan

John Sullivan – Information Technology Officer. John received his B.S. (2005) and M.S. (2008) in Meteorology from Florida State University. Upon graduation from FSU, John continued relevant work from his master's thesis on rainfall estimation in watershed modeling with the Florida Department of Environmental Protection. Shortly after graduation, he was offered to begin his career in the NWS as a contractor in the Meteorological Development Laboratory at NWS HQ in Silver Spring, MD. There he assisted in development of software focused on improving gridded aviation forecasts of turbulence and icing. In 2010, John was hired as a meteorologist and programmer at the National Hurricane Center in Miami, Florida where he managed the NHC web services and dataflow, supported operations, implemented computer processing enhancements, and assisted with improvements to NHC products and services. John was selected as the Information Technology Officer (ITO) for the NWS Austin/San Antonio in July 2014 and is happy to bring his family to Central Texas.

Office Group Photo
(not all staff members shown)

Good teams become great ones, when the members trust each other enough to surrender the "me" for the "we"
-Phil Jackson-

Radar is next...

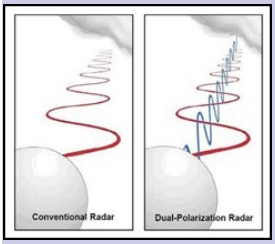
RADAR SECTION

Using Dual-Polarization Radar for Winter Weather Detection

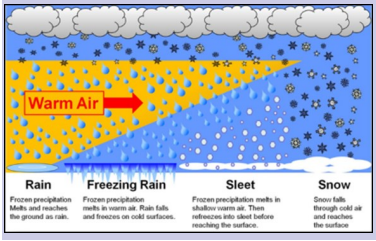
By Jared Allen

Hello! Welcome to the radar section of the newsletter where we will talk about all the recent upgrades to the National Weather Service (NWS) radar network. From 2011-2013, the largest radar upgrade project since the 1970s took place for all 160 NWS/DOD/FAA radars across the country. These enhancements help meteorologists better visualize and analyze many different weather situations and their hazards from thunderstorms to winter precipitation. Since it is January, we will first look at how the newly updated system helps forecasters during winter weather.

First off, what does Dual-Polarization even mean? Great question! Dual-Polarization, or Dual-Pol for short, means that the radar now scans in two axes instead of one.
Let's look at Figure 1 below.



Before the upgrade, the radar would only scan in the horizontal direction (left). After the upgrade, the radar now scans both horizontally and vertically (right). Depending on how the two radar beams hit different objects like snow, sleet, or rain, it can give a different signal. Winter precipitation does not happen often in south-central Texas, but the processes for snow, sleet, and freezing rain are the same everywhere. Here is how each develops before hitting the ground (Figure 2):



Radar continues...

One of the key aspects when forecasting winter weather is understanding the vertical temperature profile. As seen in Figure 2, the placement and thickness of warm and cold layers will determine if it will snow, sleet, or completely melt but then refreeze when it reaches the ground. So how does Dual-Pol help in these situations?

1. Helps Identify the Melting Layer

Dual-Pol helps identify if a melting layer exists and can "see" how it changes with height over time. If a melting layer does not exist and there is enough moisture and lift, then snow will make it to the ground (right side of the Figure 2). However, if a melting layer does exist (in a perfect setup) it can look like a ring around the radar like Figures 3 & 4 show below.

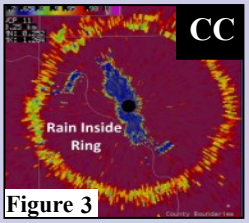


Figure 3

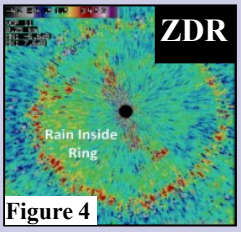


Figure 4

Since snow melts and begins to mix with rain, the vertical and horizontal radar beams pick up different information and measures its similarity or Correlation Coefficient (CC). This gets processed and shows up as a lighter color then the darker purple in Figure 3. The same goes for Figure 4 where we are looking at the difference in the vertical and horizontal cross sections of different objects. This is known as differential reflectivity or ZDR. In the two figures above, we are looking at snow transitioning to rain at a specific height above the ground. Now the question becomes, will the rain refreeze before hitting the ground as sleet?

2. Detects Sleet near the Radar

A general rule from observational studies is that sleet will be the dominating precipitation type if the refreezing layer reaches -5 to -6 degrees Celsius and is >=2,500 feet thick. Using this knowledge and having supportive dual-pol data will further refine meteorologists' awareness and the potential impacts of the winter precipitation.

"Depending on how the two radar beams hit different objects like snow, sleet, or rain, it can give a different signal. Winter precipitation does not happen often in south-central Texas, but the processes for snow, sleet, and freezing rain are the same everywhere."

RADAR CONTINUES...

First, let's take a look at a regular radar image in Reflectivity (Z) with two areas highlighted (Figure 5).

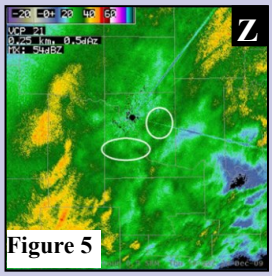


Figure 5

From the regular radar image, there is little to no difference that can be determined between rain, snow, and sleet. But if we look at the correlation coefficient product of the same image, the differences stand out (Figure 6).

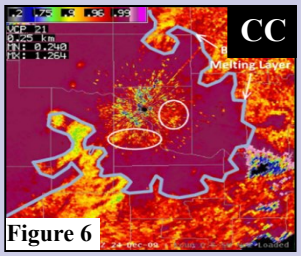


Figure 6

Here we see a non-uniform melting layer (which will typically be the case here in Texas) that is not in a perfect ring shape. We know the darker purple is all rain but, what is happening in the white oval highlighted areas? The CC has dropped to lower values. Since the CC dropped to lower values, this can only mean that a new phase change is occurring after the melting as already occurred. If a weather balloon was launched recently or model data suggests that a -5 to -6 degree Celsius later exists and could be thick enough, then this image will confirm that sleet is occurring very near the ground.

Can Dual-Pol detect Freezing Rain?

Dual-Pol cannot detect freezing rain since it is just that: rain. Referring back to Figure 2 in the freezing rain section, the rain never changes phases to anything frozen that the radar can "see." The phase change comes after the rain hits the ground or an elevated surface where freezing temperatures are occurring. Since the radar cannot "see" what is on the ground, this is when meteorologists would rely on surface observations to determine where freezing rain is most likely to occur.

Hydrology is next...

Shows difference between dry vs. wet Snow

Snow is snow is snow, right? Well, not quite. All snows are not created equal and depending on how much moisture is available in the snow growth region (-12 to -18 degrees Celsius layer) above the ground, the snow could be dry like a powder or wet and really stick when it reaches the ground. Generally, a dry snow will accumulate at a faster rate since it is lighter and "fluffier" whereas wet snow will compact more due to its own weight.

It does not snow all that often in south-central Texas but it certainly can happen like it did in 1985. Since 2000, San Antonio has had 6 times when at least 0.1 inches of snowfall occurred. The Austin area has experienced 9 such cases with one such case having occurred at Camp Mabry just this past year on January 23rd, 2014. See Figures 7, 8, and 9 below.

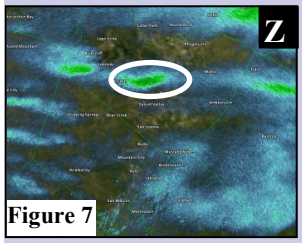


Figure 7

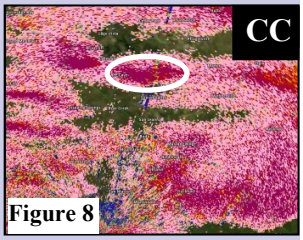


Figure 8

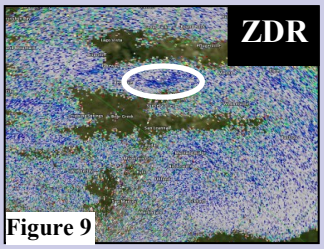


Figure 9

The area highlighted in the white oval is where Camp Mabry is located. The high CC values in Figure 8 tell us the precipitation was all the same type at the radar beam height. At this point, the radar could be picking up light drizzle or light snow. In this case, there was no melting layer observed by any phase change and thus it would mean Figure 7 is picking up light snow. The ZDR image in Figure 9 shows low but positive values in the 0.1-0.4 range. Since we know snow is falling, these values are indicative of a drier snow. If it was more of a wet snow, the ZDR values would be higher in the 2-3 value range as heavier snow tends to fall more flatly then tumbling or vertical dry snow.

Here at the Weather Service in New Braunfels, we are excited to use this new technology to further enhance our warning operations and communications with you, the media, and emergency management operations. Winter weather may not happen often here but we can now see it better than ever.

Stay tuned for the Spring Edition where we will talk about how Dual-Pol can "see" if there is a tornado on the ground and where the hail core is in a thunderstorm.

"It does not snow all that often in south-central Texas but it certainly can happen like it did in 1985"

HYDROLOGIC SECTION

By Mark Lenz

Ever wondered why your area saw two one-percent annual exceedance floods within several years of each other? The answer may be more involved than you might imagine.

First, a flood is a large amount of water covering and area of land that is normally dry. When talking about rivers, stream and creeks, flooding is defined as water rising and overflowing of a body of water especially onto normally dry land. Floods occur for a variety of reasons, such as prolonged heavy rainfall, locally intense rainfall, or the rapid melting of a snowpack.

Back in the 1960's the United States Government began "to use the 1-percent annual exceedance probability (AEP) flood as the basis for the National Flood Insurance Program". The 100-Year terminology came about since the "1-percent AEP flood has a 1 in 100 chance of being equaled or exceeded in any 1 year, and it has an average recurrence interval of 100 years".

Due to the confusion that or uncertainty that the term 100-year flood may cause to those not familiar with flood science, the USGS and other agencies, including the National Weather Service, are encouraging the use of the one-percent annual exceedance probability (AEP) terminology. So basically you should just say there is a 1-percent chance of a flood of that magnitude occurring in any one year.

In our local area the October 17-18, 1998 flood was categorized as having 0.2 of a percent annual exceedance and the June 30 – July 7, 2002 event was categorized as having a 0.4 of a percent annual exceedance. So we have two-tenths of a percent chance of a flood of the magnitude of the 1998 flood in any given year and four-tenths of a percent chance to see a 2002 type flood in any given year. Not great chances, but not zero.

"The 100-Year terminology came about since the "1-percent AEP flood has a 1 in 100 chance of being equaled or exceeded in any 1 year, and it has an average recurrence interval of 100 years".

Chances of a Major Flood	
Return Period	Chances
500 - year	1 in 500 (0.2%)
250 - year	1 in 250 (0.4%)
100 - year	1 in 100 (1%)
50 - year	1 in 50 (2%)
25 - year	1 in 25 (4%)
10 year	1 in 10 (10%)
5 - year	1 in 5 (20%)
2 - year	1 in 2 (50%)

Climate Section Next...

CLIMATE SECTION

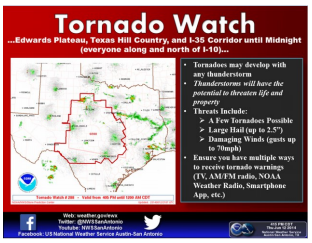
By Aaron Treadway

2014 Year End Review

Looking back at the climate statistics for 2014, the area was drier than normal, but temperatures for the year were fairly close to yearly normals. As you can see from the graph below, only Austin Camp Mabry recorded more rain than normal for the year, with the other 3 climate sites being 4 to 6 inches below normal. The temperature graph shows that the Austin climate sites were slightly cooler than normal for the year while San Antonio and Del Rio were 0.5 to 1.0 degrees warmer for 2014. South Central Texas saw more days with temperatures greater than 90 degrees, more days with temperatures less than 32 degrees, and fewer days with 0.01 inches rainfall or more than normal. If the summer seemed a bit cooler as a whole, it may be because we only had half as many 100 degree days as we did in 2013!

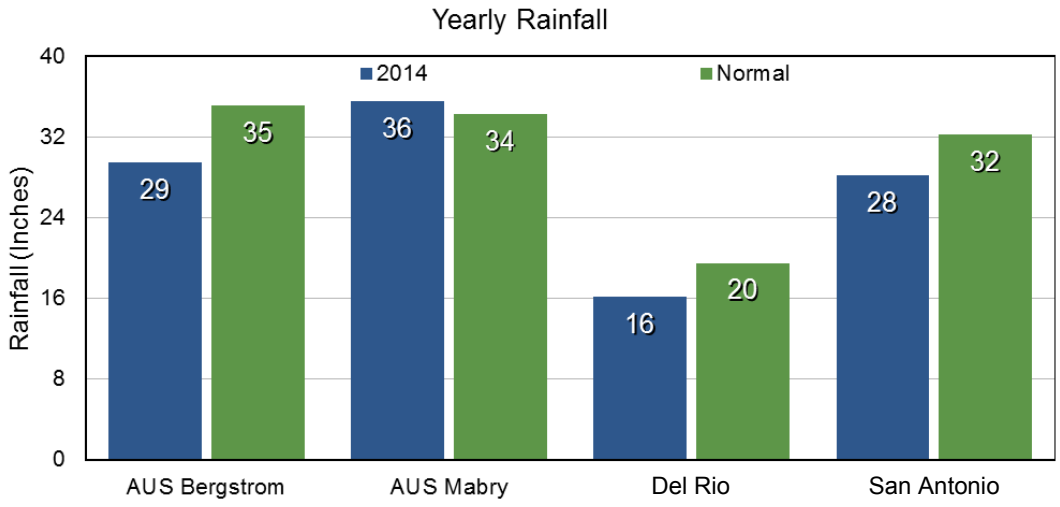
As for severe weather, our office issued about the same number of Severe Thunderstorm, Tornado, and Flash Flood warnings as it did in 2013. There were 3 confirmed tornadoes across South Central Texas this year. The first was an EF0 (the weakest tornado rating) that occurred in Cedar Creek in Bastrop County. The other two, an EF0 and EF2, occurred on June 12th in Burnet County. The EF2 picked up a house intact and moved it the length of a football field. The family, which had taken shelter in the bathtub in their interior bathroom, escaped without injury. Several floods were also seen from May to November across the Rio Grande Plains, I-35 Corridor, and Coastal Plains.

To check out our full year-end review, read our Public Information Statement here: https://nwschat.weather.gov/p.php?pid=201501040048-KEWX-NOUS44-PNSEWX



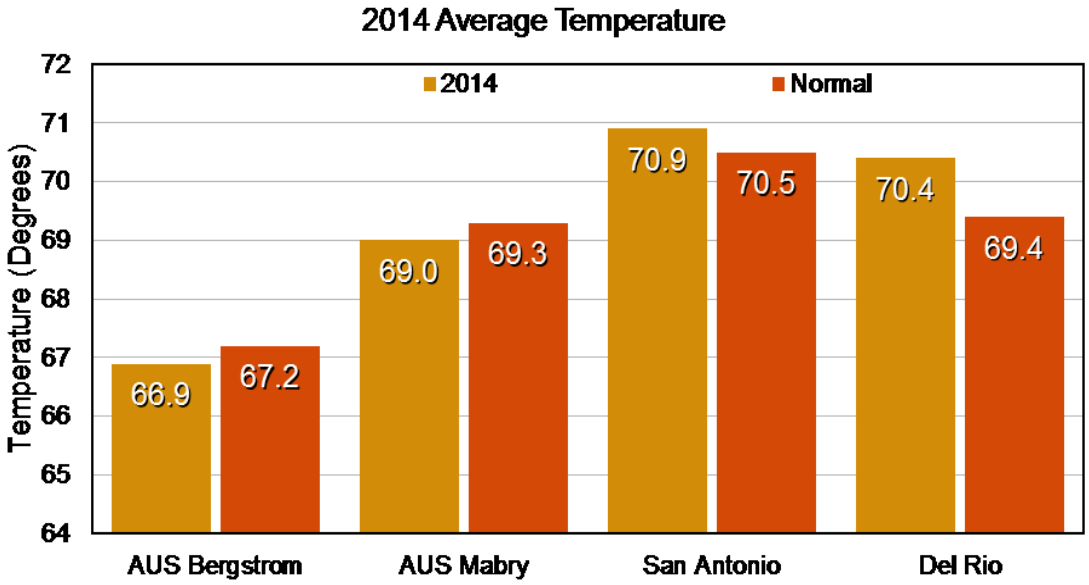
'There were 3 confirmed tornadoes across South Central Texas this year".

Home in Bertram was damaged by the tornado Credit: Erin Cargile/ KXAN



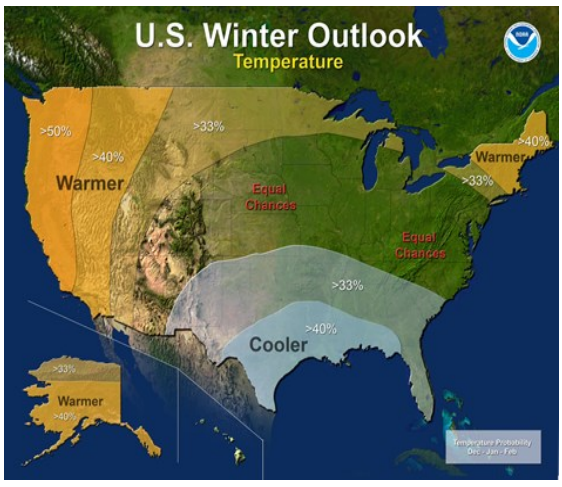
Story Continues...

CLIMATE SECTION...CONTINUES



Winter Outlook / El Niño Update

The Climate Prediction Center (CPC) has issued their winter 2014/2015 outlook. This outlook for the months of December, January, and February is just one of the outlooks that the CPC issues for various time periods. These outlooks are pictured below.



"CPC is predicting a 40% chance that the winter months will be both wetter and cooler across much of the state of Texas"

As you can see, the CPC is predicting a 40% chance that the winter months will be both wetter and cooler across much of the state of Texas. We ended the year of 2014 with many areas below normal for precipitation, and parts of the Hill Country and Rio Grande Plains are still in Extreme Drought.

Spanish Section Next...

SPANISH SECTION

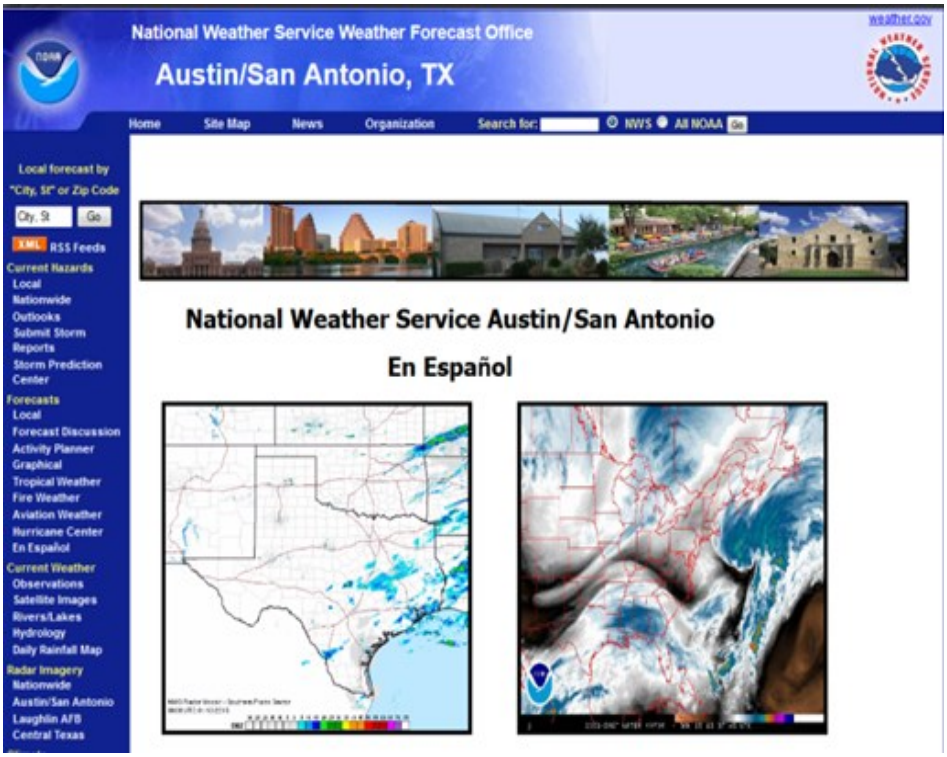
Por Orlando Bermúdez

El Tiempo en Español

El centro del estado de Texas en un lugar frecuente visitados por muchos, ya que ofrece un clima subtropical durante gran parte del año. También, es un lugar lleno de diversidad con representación de todas las culturas del mundo, especialmente la población hispana. Son más las personas que migran a la ciudad de San Antonio y de Austin, capital del estado de Texas, por mejores recursos y ofertas de trabajo. Ahora, a pesar de la belleza del lugar, la hospitalidad de sus habitantes y su gran crecimiento económico; debemos seguir bien de cerca los sistemas meteorológicos cuando estos representan una amenaza. Un entendimiento básico de estos fenómenos naturales en el área, tales como inundaciones repentinas, tormentas severas y tormentas invernales por mencionar algunos, es de gran beneficio para todos. De aquí nace la idea de producir una página del tiempo en español y de esta manera llevarle la información más precisa en su idioma.

"Un entendimiento básico de estos fenómenos naturales en el área, tales como inundaciones repentinas, tormentas severas y tormentas invernales por mencionar algunos, es de gran beneficio para todos."

Pronóstico Extendido para Austin



Spanish Section Continues...

SPANISH SECTION CONTINUES...

En esta página del tiempo (Fig.2) local encontraras las condiciones meteorológicas de su comunidad como ciudades adyacentes. También, ofrecemos enlaces importantes de otras agencias en español, lecturas y guías.

"Tener una comunicación clara sobre las condiciones del tiempo, le sirve para organizar su día"

En esta página del tiempo (Fig.2) local encontraras las condiciones meteorológicas de su comunidad como ciudades adyacentes. También, ofrecemos enlaces importantes de otras agencias en español, lecturas y guías.

Spanish Section Continues...

SPANISH SECTION CONTINUES...

"No es algo nuevo. El término "vórtice polar" solo se ha popularizado recientemente, llamando atención a una característica del tiempo (o atmosférica) que siempre ha estado presente"

En esta temporada invernal se anticipan temperaturas por debajo del normal sobre nuestra región. Y esto acido el caso, donde las temperaturas estuvieron por debajo del normal la última semana de diciembre 2014 y comienzos del nuevo año. Según los archivos meteorológicos del área, las temperaturas deben comenzar ascender al menos 3 grados (F) de su promedio (63.3 F) a unos 66.9 grados (F) para comienzos de febrero. Ya hemos observados temperatures en los altos 70s y bajos 80s, pero estas han sido temperaturas anomolas de la temporada. En otras palabras, no guarde su abrigo todavia y mantengase informado de cambios ligeros en el tiempo.

A continuación, unos de los temas más escuchados durante las pasadas temporadas invernales: "Vórtice Polar".
El vórtice polar es una gran área de baja presión y aire frío alrededor de ambos polos terrestres. Siempre existe cerca de los polos, pero se debilita en el verano y se fortalece en el invierno. El término "vórtice" se refiere en este caso al flujo de aire en sentido contrario a las manecillas del reloj el cual ayuda a mantener el aire más frío cerca de los polos. Muchas veces durante el invierno del hemisferio norte, el vórtice polar se expande, transportando aire frío hacia el sur con la ayuda de la corriente de chorro (Fig.4). Esto ocurre con bastante regularidad durante el invierno y muchas veces se asocia a grandes brotes de aire del ártico sobre los Estados Unidos. El que ocurrió en enero y mediados de noviembre del 2014 son similares a muchos otros brotes del pasado, incluyendo brotes notables en el 1977, 1982, 1985 y 1989.

Sin embargo, hay varias cosas que el vórtice polar no es. No es algo nuevo. El término "vórtice polar" solo se ha popularizado recientemente, llamando atención a una característica del tiempo (o atmosférica) que siempre ha estado presente. Tampoco es algo que ocurre en la superficie terrestre. Los pronosticadores del tiempo examinan el vórtice polar viendo condiciones atmosféricas a decenas de miles de pies sobre la tierra. Sin embargo, cuando sentimos el aire bien frío desde las regiones del Ártico de la superficie de la Tierra, a veces está vinculado al vórtice polar. Esto no está limitado a los Estados Unidos. Partes de Europa y Asia también experimentan brotes de aire frío vinculados al vórtice polar. Por sí solo, el único peligro a los humanos es la magnitud de las temperaturas del aire frío que ocurren cuando el vórtice polar se expande, causando temperaturas más bajas de lo usual en regiones al sur.
En breve, no hay que alarmarse al oír del vórtice polar, pero debe prepararse para temperaturas bajas. Coteje su pronóstico local en www.weather.gov/ewx para así asegurarse de estar vestido adecuadamente. También es buena idea cotejar artículos en su hogar y suministros de emergencia en el auto al comenzar cada invierno para asegurarse que está preparado para cualquier tipo de inclemencia de invierno.

Next Newsletter Issuances...

Texas Weather Wire

National Weather Service
Austin/San Antonio
Weather Forecast Office (WFO)
2090 Airport Road
New Braunfels, Texas
Phone: 830-606-3617

National Weather Service Mission Statement

"The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community."

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Thank you for reading our newsletter!

- ***What will the spring severe weather season be like?***
- ***Are we expecting a normal summer this year?***
- ***Is it time for a tropical cyclone to hit the Texas coast?***

Answers to these questions and more will be included in the spring/summer edition of the Texas Weather Wire expected to be posted in May.