The Four Peaks Post

Fall 2011

National Weather Service — Phoenix, AZ

Fall Edition of The Four Peaks Post Newsletter!

By Charlotte Dewey, Meteorologist Intern

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Office Leadership

Meteorologist in Charge

Gary Woodall

Warning Coordination Meteorologist

Ken Waters

Science and Operations Officer

Doug Green

Questions: w-psr.webmaster@noaa.gov

As the summer comes to an end, we will reflect on some interesting information from this summer as well as a few things to look forward to this fall. With the Monsoon still in progress, look for a wrap-up of stats on the Monsoon in the next issue, since the official end of the Monsoon is September 30th. One major addition this summer was the upgrade of our weather radar, WSR-88D radar, to Dual-Polarization out at Phoenix-Mesa Gateway Airport. This has proved helpful in the aid of issuing products and warnings this summer.

We look forward to many more newsletters coming out with great information that will hopefully be helpful and informative.

Image credit Arizona Highways Magazine 2001

The Summer Was Sizzling and Records Were Breaking

By Paul Iniguez, Forecaster/Climate Services Program Manager

As the summer nears an end, the hope for cooler weather is in the minds of most people that live in the desert Southwest , especially after a summer like the one we've had here. August 2011 topped out as the warmest August on record for Phoenix (official weather data are measured at Sky Harbor Airport) with an average high temperature of 109.0 °F , breaking the previous record of 107.3 °F set in 1962. The average temperature for the month was 98.3 °F , which also set a record for the warmest by breaking the previous record set in 2007 of 96.2 °F . The average temperature also tied July 2009 as the all-time warmest month on record. As for the average low temperature, yet another record was set with a temperature of 87.5 °F , breaking the previous record of 86.1 °F set in 2007. Including As of September 1st 5th, there have been 33 days so far this year in Phoenix with a high temperature of at least 110 °F . This ties breaks the record of 32 days set in 2007.

A number of daily records were also set, the first of note being August 26 with a new record high temperature of 117 °F , breaking the old record by three degrees of 114 °F set back in 2001 by three degrees. This was also the hottest temperature ever recorded in the month of August, surpassing the previous record of 116 °F . Including the 117 °F day, Phoenix set or tied 7 record high temperatures throughout the month, and also set or tied 7 record high low temperatures, also referred to as warm low temperatures. It is no wonder the month of August felt hot, it was!

Taking a look at the summer as a whole, defined by meteorologists as June-July-August, Phoenix set or tied 14 daily record temperatures, 8 of which were record high temperatures and 6 record high low temperatures. This summer's average high temperature was the 3rd warmest with a temperature of at 106.8 °F (normal 104.8 °F) and the average low temperature was tied for the 5th warmest with a temperature of at 82.8 °F (normal 81.3 °F). The summer on average temperature was tied for the 2nd warmest ever with a temperature of at 94.8 °F (normal 93.1 °F). The record for the warmest average temperature for the summer still stands at 94.9 °F set back in 2007.

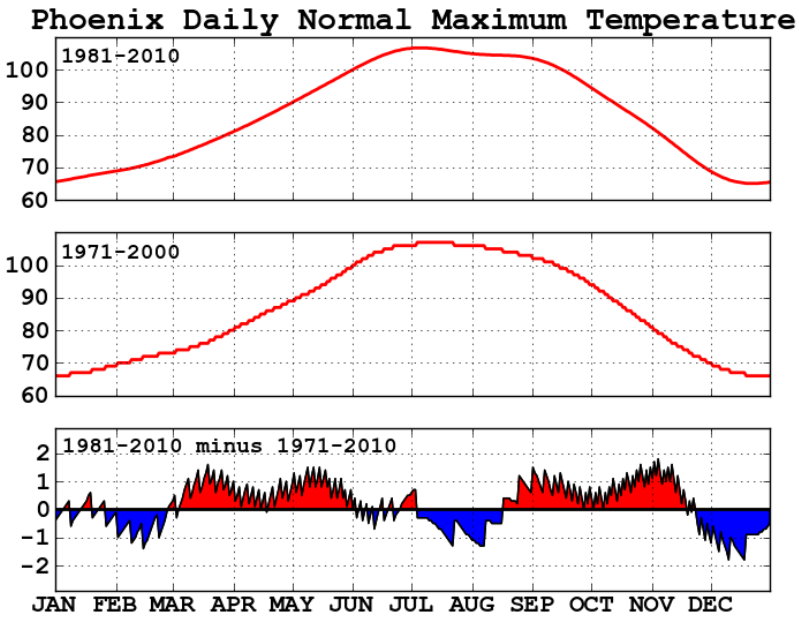
(continued on next page)

Sizzling Summer (continued)

As for precipitation during the summer, Phoenix tied for the 53rd wettest summer measuring 1.58 inches of rain (normal 2.07 inches).

This summer saw many daily records as well as numerous records in the month of August alone in Phoenix.

Also of note, the new 1981-2010 climate normals became available this summer. What did the new normals show for Phoenix and Yuma? In Phoenix the normal average annual temperature increased 0.9 °F while Yuma warmed 1.0 °F . The normal annual precipitation decreased by 0.26 inches in Phoenix and increased by 0.16 inches in Yuma. Month-by-month, maximum temperatures increased in Phoenix primarily during the spring and fall months with a slight decrease during the summer and larger decrease during the winter. Minimum temperatures warmed all twelve months. Summer precipitation increased slightly with fall precipitation decreasing. The wettest month of the year changed from March to July. Similar changes occurred in Yuma, with the exception that minimum temperatures increased more uniformly throughout the year and precipitation values showed minor changes. Below is a graph comparing the new normals (1981-2010) to the previous normals (1971-2000) and the differences in the two. For more infor-



NWS Phoenix Radar Upgrade: Dual-Polarization

By Charlotte Dewey, Meteorologist Intern/Assistant Radar Focal Point

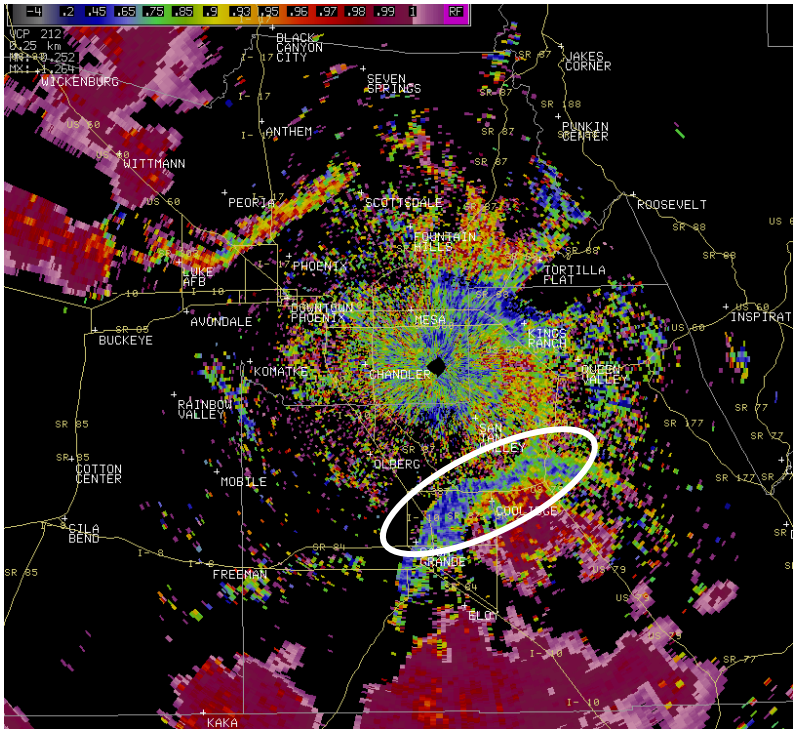
The National Weather Service in Phoenix is pleased to announce that the much anticipated process of the Dual-Polarization Radar upgrade to the KIWA WSR-88D, located at Phoenix-Mesa Gateway Airport, has been completed and is operational as of May 27 2011. The KIWA radar was one of the first in the nation to receive this upgrade, as all WSR-88D's are scheduled to be upgraded through 2011-2012. As of July 16 other locations that have received the dual-pol radar upgrade include Morehead City, NC; Pittsburgh, PA; Vance Air Force Base, OK; and Wichita, KS.

How does this dual-polarization radar differ from the conventional Doppler radar? Dual-polarization, or polarimetric, radars transmit radio waves in both a horizontal and vertical directions. Being able to analyze targets in this manner is expected to result in significant improvements in the estimation of precipitation rates and amounts, ability to discriminate different precipitation types (i.e. rain vs. hail), and the identification of non-meteorological returns. An added benefit for aviation concerns, with polarimetric radar forecasters will be able to better discern areas of icing and other hazards such as birds.

The basic radar products that have been available to users are reflectivity (Z), mean radial velocity (V), and spectrum width (SW). Three new products available after the upgrade are differential reflectivity (ZDR), correlation coefficient (CC), and specific differential phase (KDP). Shown below is an example of a Dual-Pol product (ZDR on the left) next to a reflectivity image (Z on the right). The area circles on both images is a hail cord in a thunderstorm, not in Arizona. This

The image to the right shows a Dual-Pol product, Correlation Coefficient (CC) from the KIWA radar at the NWS Phoenix office. This image was taken on the evening of July 5, 2011 at 6:44pm during the large dust storm event.

RIGHT: Lower Correlation Coefficient (CC) values inside the white oval suggest targets that are "non-uniform", values that are less than 0.8. In contrast, the higher CC values to the south, values above 0.95, indicate uniformity such as all water precipitation or all hail.



Southwest Aviation Weather Safety Workshop

October 25-26, 2011

National Weather Service Offices across the southwestern U.S. are gearing up to host the fourth cross-regional **Southwest Aviation Weather Safety (SAWS) Workshop** in Albuquerque, New Mexico this October 25-26, 2011. The two day workshop is designed for pilots, air traffic controllers, and meteorologists. SAWS Workshops have been highly successful in years past with representation from NWS Headquarters, AWC, FAA Academy, Southwest Airlines, US Airways, FAA , NWS Office of Science and Technology, dozens of regional GA pilots, and interested people from across the entire Southwest region.

Southwest Aviation Weather Safety (SAWS) Workshop IV

October 25-26, 2011

Albuquerque, New Mexico

The theme for this year's event is Aviation Weather Hazards, Decision Support Services, and Customer Relations. The first day of the Workshop is geared toward pilots and controllers and provides FAA WINGS Pilot Proficiency Program credit for pilots and instructors. Topics covered will include aviation weather hazards in the Southwest, effective use of NWS TAFs and forecast discussions, convective weather patterns, and atmospheric sounding interpretation. The second day of the Workshop is primarily designed for meteorologists but is open to all aviation partners and customers. Topics for day 2 include improved aviation decision support services, case studies of high impact aviation events, briefings from Southwest Airlines and NetJets, Inc., and an open discussion of hot topics within the NWS aviation program.

SAWS is an excellent opportunity for aviators and meteorologists to get together and discuss improvements and best practices in aviation meteorology training, customer relations, and aviation decision support services. For more information about the SAWS Workshop, including upcoming agenda, registration, and lodging information, please bookmark our SAWS web site at http://www.wrh.noaa.gov/psr/SAWS4/index.php . If you have questions about the Workshop, please contact the WFO Phoenix Aviation Program Manager Hector Vasquez Hector.Vasquez@noaa.gov or WFO Albuquerque Aviation Contact David Craft David.Craft@noaa.gov . We look forward to sharing the SAWS experience with our NWS aviation colleagues, partners, and customers.

Major Dust Storm: July 5, 2011

During the late afternoon and evening hours of July 5th a very large dust storm moved through a large portion of Arizona. There were widespread reports of near zero visibility and winds gusting over 50 mph, as received by the NWS Phoenix office. Preliminary statistics based on radar data estimated that this dust storm reached a peak height of at least 5,000 to 6,000 ft. (1,500 to 1,800 m). As far as the aerial coverage, it was very large with a leading edge stretching for close to 100 miles and traveling a distanced of at least 150 miles.

What caused this? Thunderstorm development east of Tucson in the early afternoon intensified as they moved west, producing downburst winds greater than 70 mph. As these downburst winds moved down the terrain, since Tucson is a higher elevation than Phoenix, these strong outflow winds began to race to the northwest with the leading edge moving 30—40 mph. By 6:30pm the first calls came in to NWS Phoenix that a large wall of dust was nearing the Casa Grande/Eloy, AZ. Of course the added factor of the on-going drought across the region also aided the dust to be significant with rainfall since last summer being less than 50% of normal.

By 7:00pm the leading edge of this large dust storm approached the far southeast portions of the Phoenix area. As the storm continued to push further into the metropolitan area through the next two hours, trained spotters swarmed NWS Phoenix with reports of literally zero visibility and winds gusting 30-50 mph. A few measured wind gusts near 70 mph.

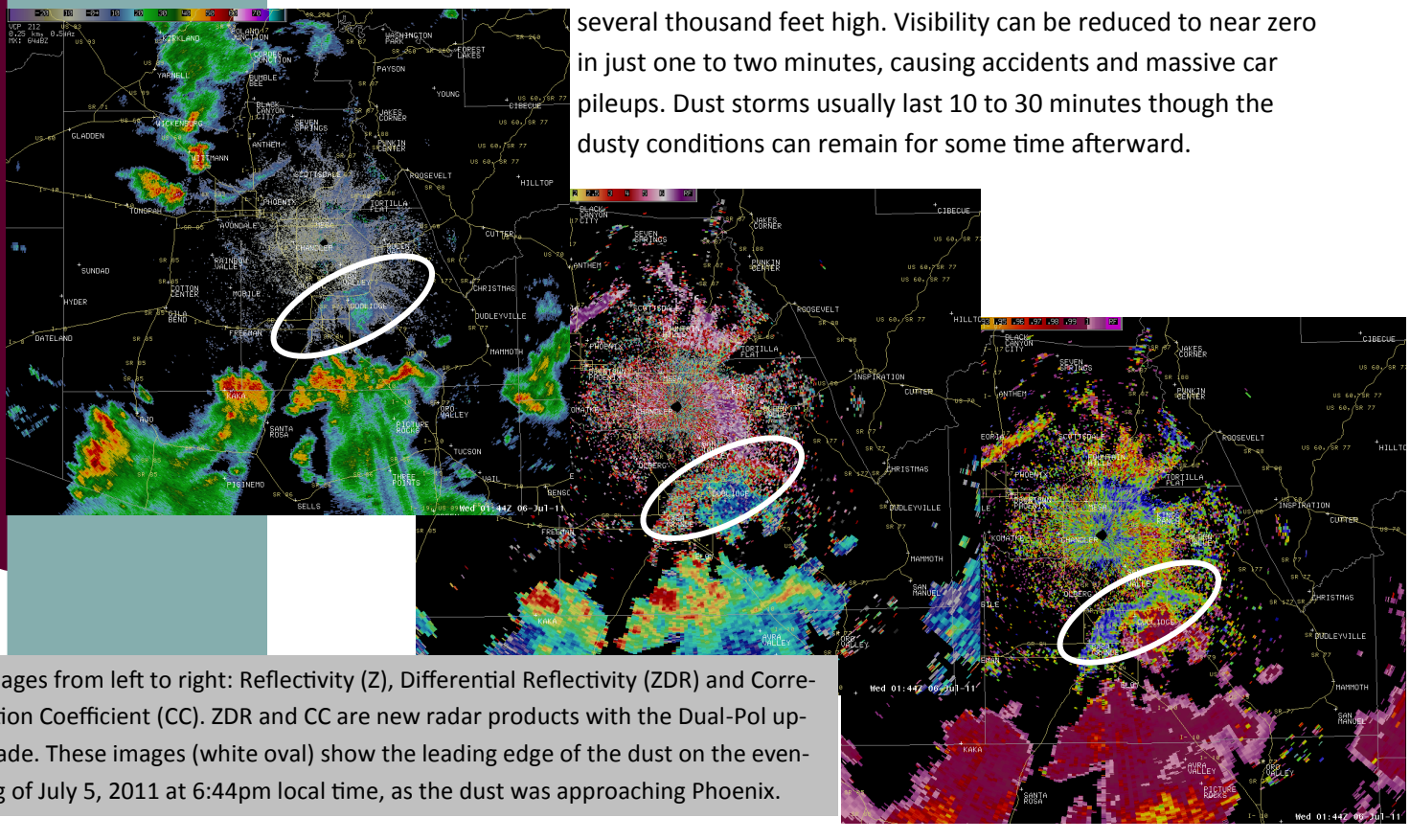
Image taken at 7:45pm looking south toward South Mountain from the NWS Phoenix office near Priest & Washington, as the dust storm approached.

Major Dust Storm (continued)

NWS Phoenix meteorologists are well aware that the strong to severe thunderstorms in the Tucson area are capable of producing dust storms in the area between Tucson northwest to Phoenix, given the right atmospheric conditions. One key ingredient to detecting dust storms are trained spotters, who can help provide ground truth when Doppler radar can't see every aspect of the storm, such as how dense the dust is and visibility conditions.

There were many impacts from this massive storm. Traffic on highways and roads came to a stop in many areas. Air traffic out of Phoenix Sky Harbor International Airport came to a halt for 45 minutes. Damages to structures and trees blown down were also noted, however no estimate of cost has been associated with this event.

During an average year, the Phoenix area will see generally one to three dust storms—predominantly from the southeast. Across all of Arizona, over 100 dust storms have been reported in the past 10 years, according to NCDC Storm Data. A dust storm usually arrives suddenly in the form of an advancing wall of dust and debris which can be miles long and several thousand feet high. Visibility can be reduced to near zero in just one to two minutes, causing accidents and massive car pileups. Dust storms usually last 10 to 30 minutes though the dusty conditions can remain for some time afterward.



Images from left to right: Reflectivity (Z), Differential Reflectivity (ZDR) and Correlation Coefficient (CC). ZDR and CC are new radar products with the Dual-Pol upgrade. These images (white oval) show the leading edge of the dust on the evening of July 5, 2011 at 6:44pm local time, as the dust was approaching Phoenix.

NWS Phoenix is now on Facebook!

Starting in April 2011, NWS Phoenix went live with a Facebook page. The NWS had created some other operational experimental pages that have been active since October of 2010, but as of spring 2011 the Phoenix National Weather Service office has a live Facebook page. This is a great addition to our decision support services and product dissemination to the public and our customers.

The page can be accessed here: US National Weather Service Phoenix Arizona on Facebook. The page is designed to interact with local community, including highlighting upcoming significant weather events, sending out climate and weather information and promoting weather awareness activities.

As of September 1st, we have over 600 fans of our page. We look to continue to grow and increase this number. Various questions as well as weather pictures have been posted to the NWS Phoenix Facebook page.

There is also a link on the left hand column at the bottom of our home page (www.weather.gov/Phoenix) that will take you directly to our Facebook page.

New additions to the NWS Phoenix office

By Charlotte Dewey, Meteorologist Intern

Since this spring, we've added four new people to the Phoenix office. Elizabeth Padian our SCEP student; James Sawtelle, our newest Met Intern; Jessica Nolte one of our new General Forecasters; and Chris Kuhlman our second new General Forecaster. We've really enjoyed the new additions and new faces around the office!

Elizabeth will be starting her senior year at Embry Riddle Aeronautical University in Prescott, AZ. She has been a big help to our Public Service Unit in the office taking on many duties and fielding phone calls when the office becomes busy. She has been a key player during the monsoon this year, having already taken classes in radar analysis and thunderstorms and convection. Elizabeth was born and raised here in Arizona so the weather here is pretty familiar to her.

James joined the office in late spring and came from El Paso, TX. He has a Bachelor's degree in Meteorology and an MBA from Texas A&M University. James served in the Air Force as a Weather Forecast Production Team Chief and with the Weather Technology Programs and Plans unit. He has worked for Advanced Designs Corporation, a company that builds and installs 3– and 5-cm Doppler radars, as well as for Clear Channel Communications, a company that specializes in the areas of digital media and EAS (emergency alert services).

Jessica comes to our office from the Missoula, MT weather service office. Before Missoula, Jessica was a SCEP here in Phoenix. Jessica was also born and raised here in Arizona so she is no stranger to the desert weather. She has a Bachelor's degree in Geography/Meteorology from Arizona State University and is in the process of completing her Master's work at ASU as well. Jessica has been a big player in helping shape decision support and outreach programs up in Montana and has been involved in research on both meteorology and climatology and how we communicate that information to the public.

Chris joins us from Milwaukee, WI. He has a Bachelor's degree in Meteorology from Valparaiso University and a Master's degree in Meteorology from the Naval Postgraduate School. Chris has done some research in convective wind forecasting and has studied rainfall estimates with radar.