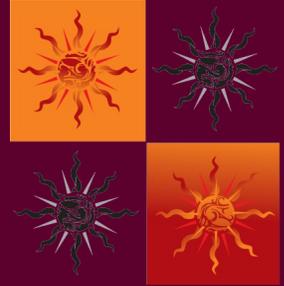




# The Four Peaks Post



Spring 2011

National Weather Service — Phoenix, AZ

## Welcome to the first issue of The Four Peaks Post Newsletter!

By Charlotte Dewey, Meteorologist Intern

### Inside this issue:

- Looking ahead
- Summer Outlook
- Monsoon Season
- Aviation Workshop Highlights

### Office Leadership

#### Meteorologist in Charge

Gary Woodall

#### Warning Coordination

#### Meteorologist

Ken Waters

#### Science and Operations

#### Officer

Doug Green

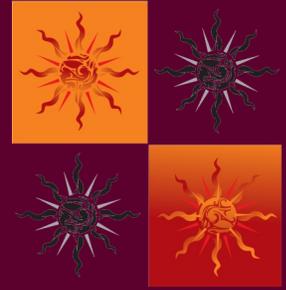
Questions: w-

psr.webmaster@noaa.gov

The Weather Forecast Office in Phoenix, AZ will be producing a quarterly newsletter, again! A newsletter used to be produced from this office many, many years ago but has been out of commission for quite some time. The thought behind this is to inform our customers and partners of news-worthy items and happenings in-office and on our web page that will be of interest. Quarterly production will allow some great topics to be brought up and outlooks to different seasons of weather.

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





## Skywarn Storm Spotter Training

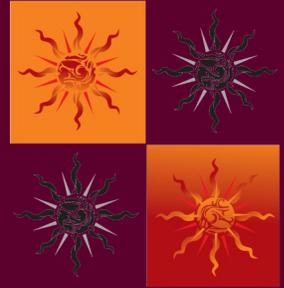
By Austin Jamison, Storm Spotter Focal Point

The WFO Phoenix Storm Spotter Training program is nearing the end of the season with only a handful of classes left. This year will be a record for the number of class offerings, 31, which have spanned our forecast area from El Centro to Globe. Through May 3<sup>rd</sup>, 460 people had attended our classes this year and it is projected that well over 600 people will have attended after the last class on June 15<sup>th</sup>.

For those unfamiliar with Skywarn, it is a cooperative effort between the National Weather Service and volunteers from the general public. The volunteers receive training from the NWS on how thunderstorms work, how to properly identify a variety of weather hazards, and how to submit reports. The information provided in a spotter report is known as “ground truth” and supplements other data sources such as radar, satellite, and automated weather stations. Spotter reports are vital because there are a number of things that still require the human eye to confirm such as storm damage, hail size, and tornadoes. For phenomena that weather sensors can detect, such as low visibility and heavy rainfall, spotters fill in the large gaps between those sensors. All these data sources taken together help the forecasters create a four dimensional picture of the weather situation so that we can in turn make better forecasts and warnings.

All of our Spotter classes, the schedules, are listed on our website but will be outdated when the classes come to a close this year: [www.wrh.noaa.gov/psr/general/spotter](http://www.wrh.noaa.gov/psr/general/spotter)



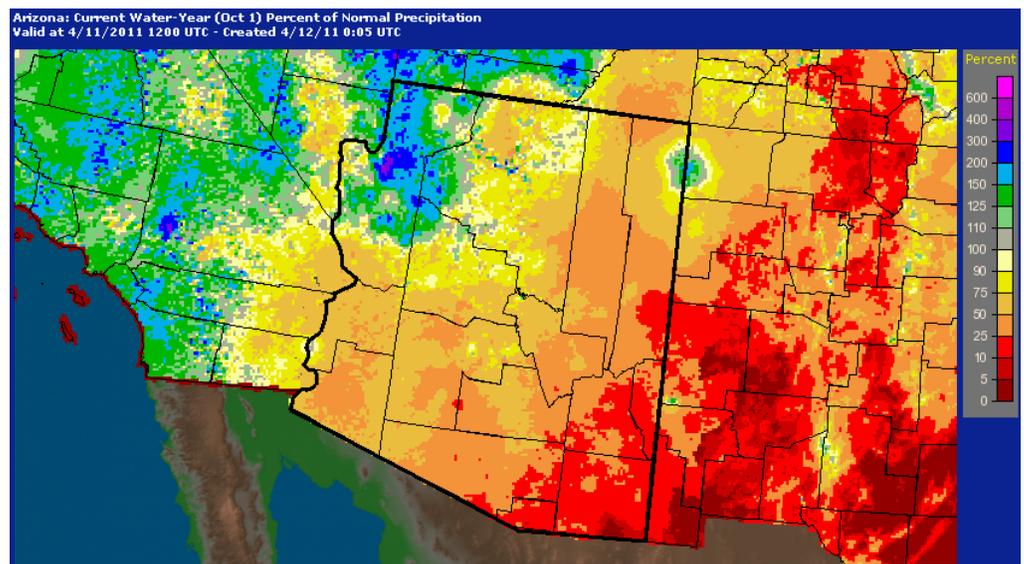


## What does this summer have in store for us?

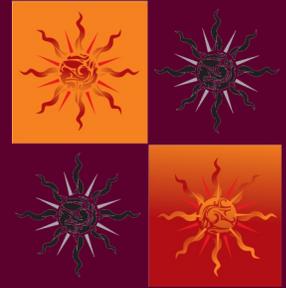
By Paul Iniguez, Forecaster/Climate Program Manager

A little background info on our Climate program and the Outlook for Summer 2011.

La Niña, the periodic cooling of equatorial sea surface temperatures in the Pacific Ocean, is rapidly coming to an end, but not before helping to bring about a very dry winter for portions of the Southwest (see image, below). Focus now turns toward the monsoon and what prediction can be made in terms of the temperatures and precipitation. Looking at past transitions out of La Niña events and the subsequent summers, several years pop-out as possible analogs. This includes the summers of 1967, 1984, 1993, 1996, and 1999. Precipitation those five years during the July-August-September months was above average for most of Arizona, with near average values for far Western Arizona and Southeast California. In Phoenix, precipitation ranged from a low of just 0.6" in 1993 to a high of 9.4" in 1984. A similar analysis for temperatures reveals the average seasonal temperature was near average to above average in the past when exiting a La Niña event similar to the current one.

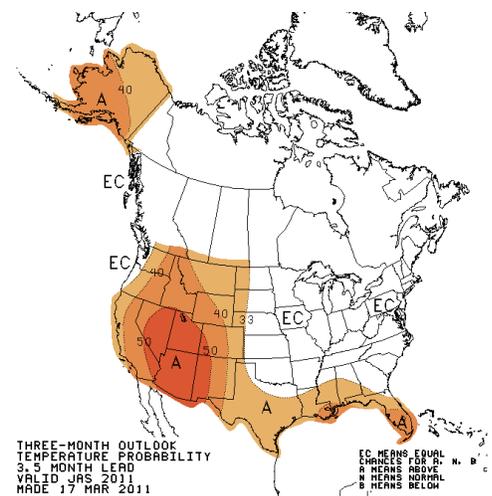
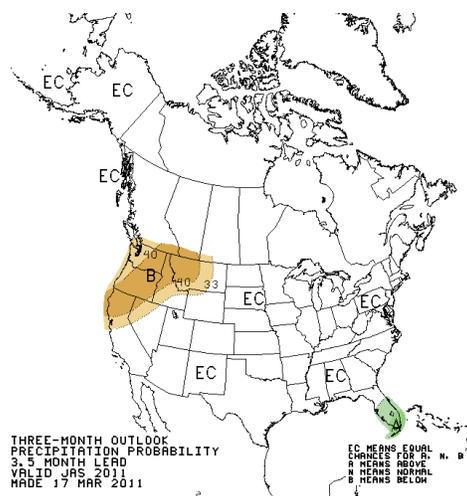


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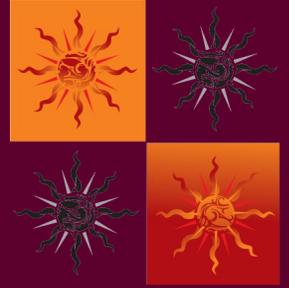


## Summer Outlook (continued)

However, when looking at a number of other factors that influence our climate, it appears that a wet summer is just as likely as a dry summer for the Southwest (image). As for temperatures, the average July-August-September values are more likely to be above normal for much of the region with a greater than 50% probability for all of Arizona (image).



NOAA's official climate normals were last produced for the 1971-2000 period, but the development of the 1981-2010 climate normals is already underway. Some changes and additions for 1981-2010 include higher-quality monthly temperature data, daily temperature and precipitation normals based on daily data (instead of smoothed monthly data), direct computation of degree days, normals derived from hourly data, along with a few other parameters.



## Hazardous Weather Coming!

By Chris Breckenridge, Forecaster

The monsoon is coming! It will be here before you know it, and will bring with it the daily onslaught of thunderstorms, heavy rain, damaging wind and blinding dust. The Weather Service will be busy issuing a suite of Hazardous Weather products, including Severe Thunderstorm and Flash flood Warnings.

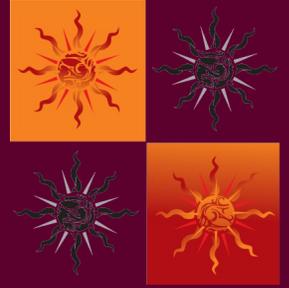
One issue that typically causes our customers some confusion is the difference between a WATCH and a WARNING. A **WATCH** indicates that conditions are extremely favorable for a weather phenomenon to develop whereas a **WARNING** means that phenomenon is imminent or already occurring. Let's use Flash Flooding as an example. A **Flash Flood WATCH** tells the customer that conditions are highly favorable for very heavy rain and flash flooding. It is possible that during such a watch, few if any thunderstorms actually form. However, should storms actually develop, watch out. Heavy rain and dangerous flash flooding will very likely occur. If you hear that a **Flash Flood WARNING** is in effect, know that very heavy rain has already occurred and flash flooding is either imminent or occurring. Head for HIGHER GROUND!

Here are some, but not all, of the common WWA (Watch/Warning/Advisory) products that Phoenix will be issuing this summer.

**SEVERE THUNDERSTORM WARNING:** Issued when radar data or storm spotter reports indicate the presence of a thunderstorm producing either damaging winds at least 50 knots (58 mph), or large hail at least 1 inch in diameter. Severe storms over the lower desert mostly generate damaging microburst (straight-line) winds, which have been known to exceed 100 mph!

**FLASH FLOOD WARNING:** Issued when flash flooding has been reported, or radar/rainfall data indicate flash flooding is imminent. Flash flooding refers to dangerous flooding that occurs rapidly, well inside of 6 hours. It can mean the proverbial "wall of water" rushing down a dry wash or stream bed sweeping campers and hikers to their deaths. It can also result from a sudden dam or levee failure.

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## Hazardous Weather Coming (Continued)

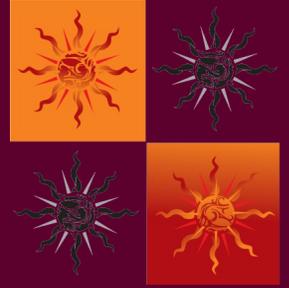
**TORNADO WARNING:** Issued when there is radar indication and /or reliable spotter reports of a tornado. Tornadoes are VERY rare during the monsoon; they require strong atmospheric wind fields and strong low/mid level wind shear, neither of which often happens during the summer.

**DUST STORM WARNING:** Issued when widespread or localized blowing sand and dust reduces visibility to one quarter mile or less. Strong thunderstorm outflow winds in excess of 40 mph are usually the cause of a dust storm. Some of the most impressive, and most dangerous, dust storms (haboobs) develop over open agricultural land in Pinal county, and move to the northwest eventually affecting all of the greater Phoenix metropolitan area. Near zero visibility in blinding dust has led to massive pile-ups on Interstate 10 between Casa Grande and Phoenix!

**EXCESSIVE HEAT WARNING:** Issued when excessive heat is expected that could lead to significant heat-related health impacts, and if caution is not exercised, could lead to life threatening situations. Of course it is hot during the Arizona monsoon. High temperatures exceed 100 degrees almost daily. However, heat warnings are usually limited to the HOTTEST of summer days, generally when high temperatures reach or exceed 113 degrees. Excessive Heat Warnings are usually confined to the afternoon/evening hours, during the hottest hours of the day. There are times when it does not cool off at night, when the lows stay above 90 degrees. In these cases the warnings will run 24 hours a day.

**HAZARDOUS WEATHER OUTLOOK:** For 9 months of the year, the HWO is a dynamic, event driven product that is issued whenever hazardous weather is forecast at any time during the upcoming 7 day period. The product will discuss any weather that warrants the issuance of a watch, warning or advisory. However, during the monsoon, the product is issued on a daily basis, usually before 7 am. It will discuss expected thunderstorm activity for the next day as well as the expected hazards for the next 6 days. Special emphasis is given to location and timing of damaging straight-line winds, large hail, and heavy rainfall leading to flooding or flash flooding.





## New Dust Storm Warning Product Beginning June 15th (Continued)

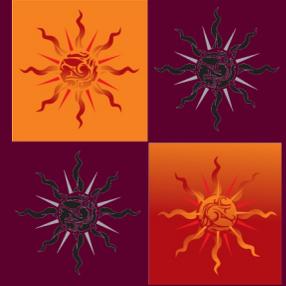
There are a number of advantages to this new service:

- The warning will be valid for a much smaller area and will be effective for a custom area defined by a polygon and will specifically target highways that are threatened by dangerous dust conditions.
- Warnings will be able to be issued much more quickly.
- Warnings will be issued at a finer start and stop time period.
- Warnings will no longer be included with other longer time-scale products.

This should be a great step forward in supporting Emergency Managers and the media in generating quick warnings that will alert responders and the public to these dangerous life-threatening dust storms. The Phoenix NWS is working closely with our partners to get the word out about these dangerous conditions and to use these new Local Dust Storm Warnings to help save lives and property.



Photo Dust Storm Arizona City, September 2, 2009



## The Arizona Monsoon: WHAT is it? WHEN is it?

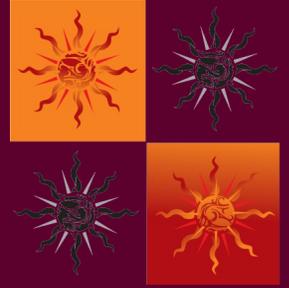
By Doug Green, Science and Operations Officer

It's only late April, but triple digit heat has already been recorded at the Sky Harbor Airport weather station. During May and June, average daytime highs and nighttime lows rise while the atmosphere remains very dry, keeping rain chances extremely low. Rain chances increase as summer continues, especially during July and August; this change in the climate is associated with the "Arizona monsoon".

In a nutshell, the monsoon can be defined as a **seasonal shift in the winds**. During the fall, winter and spring, winds aloft typically blow from the west. However, from late June through mid-September, winds aloft periodically blow from the south or east. The relatively light easterly winds transport moisture-laden air from the Gulf of Mexico over Arizona. Similarly, the light southerly winds transport moisture-laden air from the Gulf of California over Arizona. This moisture, combined with intense solar heating, results in an increase in atmospheric instability, with afternoon and evening thunderstorms a good bet somewhere over Arizona nearly every day. The seasonal wind shift is more pronounced over central and southern Mexico. Arizona lies on the northern fringes of the seasonal wind shift, which leads to notable day-to-day and year-to-year variability in observed weather over the state during the summer. Since some form of seasonal wind shift occurs every summer, and the NWS wants its customers and partners to focus on the increased potential for high impact weather hazards associated with the monsoon, the Arizona NWS forecast offices agreed that, from a statewide perspective, the Arizona monsoon would begin and end on fixed calendar dates each year. The Monsoon Season officially starts 15 June, and ends 30 September. Typically, the second week in June is designated as "Monsoon Awareness Week" by the Governor of Arizona.

During an ordinary monsoon afternoon, scattered slow-moving thunderstorms develop over the high country, and by evening, rain-cooled outflow winds from these storms push toward the lower desert where isolated thunderstorms may be triggered, especially where outflows collide with one another. This explains why the Greater Phoenix metro area experiences most of its summer thunderstorms during the evening/nighttime. Thunderstorms, though slow-moving (5-10 mph) and short-lived (30-45 minutes), can be very intense. Microburst winds can occasionally exceed 100 mph and cause as much damage as a weak tornado!

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## The Arizona Monsoon: WHAT is it? WHEN is it? (Continued)

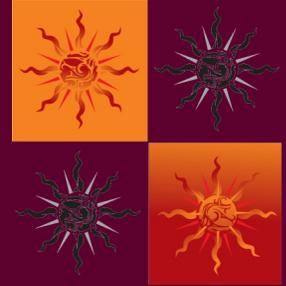
In addition, dense blowing dust often occurs over the lower desert in association with the stronger and more persistent thunderstorm outflows. Although the Arizona monsoon officially begins on June 15, thunderstorms typically do not affect the lower desert of south-central Arizona until early July. In fact, it is not that unusual to see the first monsoon thunderstorms develop close to the Fourth of July – providing nature’s own fireworks!

In order to provide customers with expected temperatures and thunderstorm chances for the upcoming week, National Weather Service meteorologists interrogate numerical weather model and associated statistical forecasts. However, for short term (one day or less) forecasts, National Weather Service meteorologists closely monitor changes in winds aloft, atmospheric instability, and moisture via surface observations, satellite imagery, and upper air soundings. NWS meteorologists combine knowledge of the near-storm environment, observed storm characteristics as depicted by Doppler weather radar, and trained storm spotter reports in order to provide customers with timely, accurate local storm warnings.



Lightning Phoenix, AZ July 2006

Image credit: [Ulrich Beinert & Jim Foster](#)



## Aviation Program & Upcoming Workshop

By Leslie Wanek, Forecaster/Aviation Program Manager

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.

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.

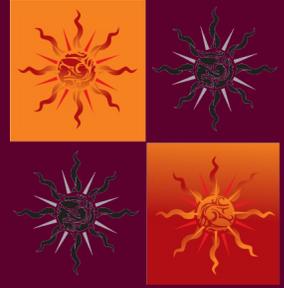
SAWS is an excellent opportunity for aviators and meteorologists to get together and discuss improvements and best practices in aviation meteorology training, customer relations, and aviation decision support services. For more information about the SAWS Workshop, including upcoming agenda, registration, 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 and WR SAWS Liaison, Leslie Wanek, at the following email address [Leslie.Wanek@noaa.gov](mailto:Leslie.Wanek@noaa.gov) . We look forward to sharing the SAWS experience with our NWS aviation colleagues, partners, and customers.



**Southwest Aviation Weather Safety (SAWS) Workshop IV**

**October 25-26, 2011**

**Albuquerque, New Mexico**



## Local WRF Forecast Model Modifications

By Dan Leins, Local Modeling Manager

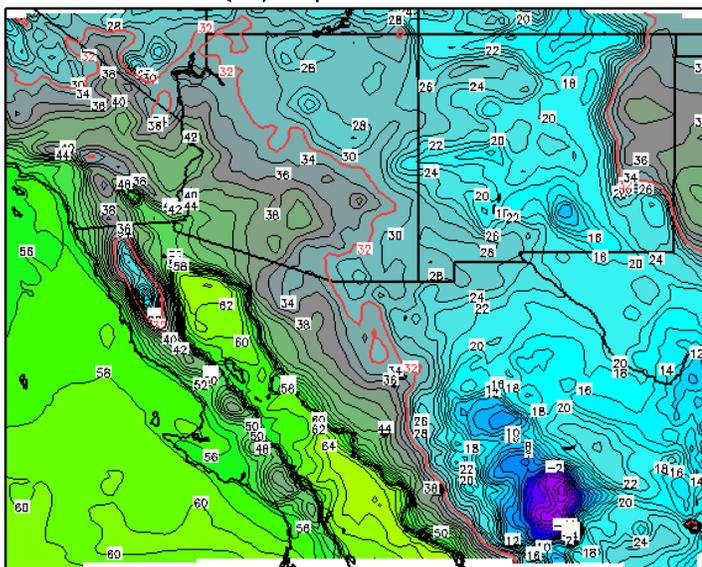
Here in the Phoenix office a local weather model is run, the Weather Research and Forecasting (WRF) model and it is run on a daily basis. There are two domains, areas of activity that the model is run in, and output from each run can be viewed through our office web page: <http://www.wrh.noaa.gov/psr/wrf> . Both domains are initialized from the GFS (Global Forecast System, a weather model) 0.5 degree latitude/longitude (~40km) model run at NCEP, a National Center for Environmental Prediction location in Washington D.C. . For more information about this model, please visit: <http://www.wrh.noaa.gov/psr/wrf/index.php?domain=about>.

Some updates to the WRF (Weather Research and Forecasting) model are underway as we approach the upcoming Monsoon season, and how the model will evolve. We are working on speeding up the runs so that forecasters have them available sooner in their shift. Also, he's working on extending the runs in time so that forecasters can look out beyond 48 hours, which is the time extent limit right now. There have been concerns within the office about the tendency of the model to show high winds all the

time, which are working to address this problem now that the model has been updated.

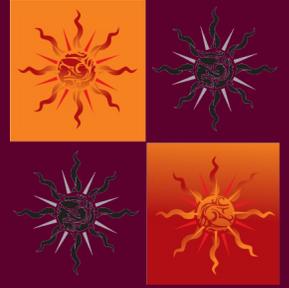
We look forward to these upcoming changes and modifications to better help our forecasting skills and tools especially in the upcoming convective Monsoon season this summer. The WRF model is a great tool that allows us to better look at how terrain plays a part in forecasting certain elements such as wind speed and direction.

Surface (2m) Dewpoints valid 15Z20APR2011



Cycle: 06Z20APR2011





## Steve Sipple—A Look Back

By Steve Sipple, Forecaster and Charlotte Dewey, Met Intern

Steve Sipple is a General Forecaster in the Phoenix NWS office and has worked for the National Weather Service for 40 years, and he will be retiring in May. Here is a look back across his career and how he came to be in Phoenix.

Steve was born and raised in Minneapolis, Minnesota, where there was a huge variety of weather to watch during the year. His mom and dad helped him develop a stronger interest in watching the weather by taking family trips around the state.

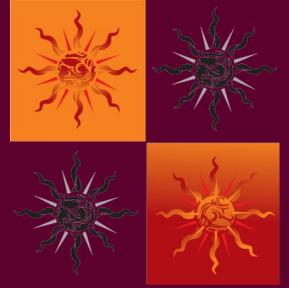
Steve attended the University of Minnesota and enjoyed the 8 mile bicycle ride to the main campus. After two years at the U of Minnesota, he transferred to Texas A&M, where he received his BS degree in 1968.

After graduation, the military wanted him. The Viet Nam war was on. But he was one step ahead of the draft, when he enlisted in the Air Force. In fact, Steve went through Officer Training School in Texas, and was assigned to a base weather station at March AFB California, near Riverside. There were pilot briefings for the crews of bombers and tankers, as well as the smaller jets. This was especially nice since he had the beaches and mountains to keep him busy “after hours”. Some of the other assignments in his Air Force career included Guam, Thailand, Alaska, Idaho, and Mississippi.( Yes - he learned to eat a lot of catfish there!). Steve left the Air Force as a Captain in the early 70s, and wanted to go into forecasting with a large consulting firm in Chicago.

He worked for Murray and Trettel, Inc for a few years, serving the numerous clients like O'Hare Airport with warnings and routine forecasts. There were many “live” broadcasts on local radio station WBBM. While in Chicago, he met Pam and they were married in June of 1974 in Hammond, Indiana. After a few years of predicting lake effect snow, and calling for the damaging winds in the summer, it was time again to move on.

After leaving the Chicago area, Steve took a job as an Instructor of Meteorology at Champaign AFB Illinois. A couple of cute baby girls came along while they lived in Champaign-Urbana.... Jeanine and Carrie. They only lived in Illinois for a few years before Steve and Pam saw an opportunity to work for the National Weather Service. Then a move to Phoenix happened in the spring of 1980. The other Met Intern opportunities were Great Falls, Los Angeles and San Francisco. In Phoenix, he learned about dust storms and floods. He learned quickly about how the flooded Salt River can make such a huge impact on the local economy.

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## Steve Sipple—A Look Back (Continued)

Still, the move was a good one. Since Steve had a background in aviation forecasting, he loved the day-to-day challenges that TAF's (and TWEB's) presented. In the middle '80s, there were opportunities to fly "up front" in some of the airplanes, and even assist the crew by providing advice.

America West was his favorite carrier, since there were many Midwest destinations available. Steve was also on the Aviation Committee of the NWA and studied LLWS. It was particularly timely since Steve's younger brother was a commercial pilot and gave him various bits of information along the way. The Delta Flight 191 crash was also a big force in driving Steve's interest in the subject.

During the past 15 years, Steve was the SKYWARN program leader at WFO Phoenix. He would help direct various coordinators and other volunteer ham radio operators. The timely reports about storms and damage due to weather was a big part of the warning process at "PSR."

Steve is looking forward to catching up on some of the sleep that he missed over the years, and he hopes to spend more quality time with Pam and the rest of his family, including his grandson Ryder.

We will miss you dearly Steve. It has been a great pleasure working with you and getting to know you.