NOAA 'Bout Weather

Welcome to the Fall 2012 Newsletter of the Blacksburg, Virginia Weather Forecast Office (WFO RNK) of the National Weather Service (NWS)! In this issue we present a variety of information on weather, water and climate topics as well as information about our office. This newsletter is meant to be interesting and informative, but by no means exhaustive of its subject matter. If you have comments, ideas for improvement, or questions, we welcome them! Please contact the newsletter editor.

A semi-annual publication of the National Weather Service Blacksburg WFO. All articles written and prepared by staff.

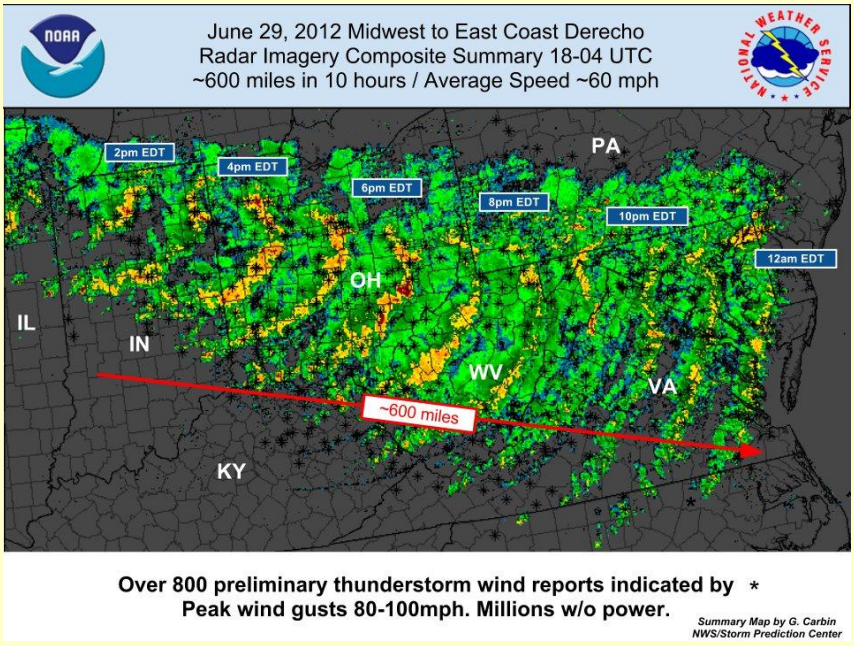
Inside this Issue:

Weather Highlight

The Historic June 29th "Derecho"

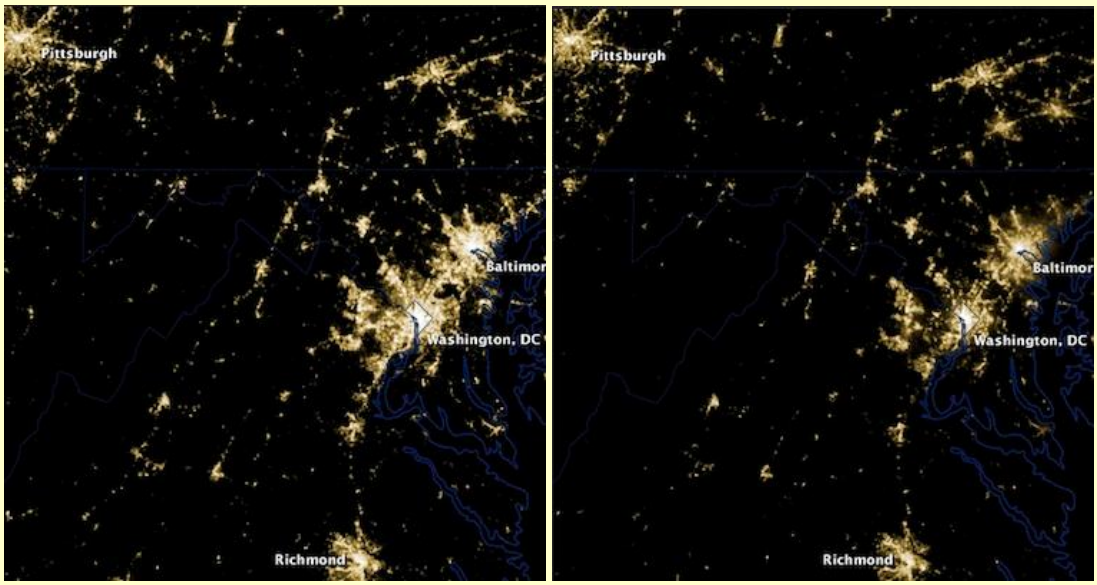
Steve Keighton, Science and Operations Officer

Most people in the area will remember the severe "derecho" windstorm that roared through the Appalachians during the evening of June 29th, 2012 for a long time, and many have shared stories with us of trees lost or how long they had to deal without power, some for many days. Tragically, there were 22 fatalities associated with this event. It is fortunate that there were not even more injuries or lives lost across the expansive region that this entire storm impacted.



Composite Radar image of the Storm

The following images also show another indication of the "mark" left by these extreme winds, which caused a total of over five million customers to lose power. These are nighttime NASA satellite images of before (top) and after (bottom) showing indications of where power was lost across parts of WV and VA (especially in the smaller towns and more rural areas).



June 28 (before derecho) **June 30 (after derecho)**

While derecho wind storms are most common in the upper Midwest, and do on rare occasion reach the Appalachians and cross into the Piedmont and Atlantic Coastal regions, the last one to even begin to compare with the June 2012 event occurred back in August of 2000. The June 29 event, however, was more extreme than any in recent memory for this region, in part due to the magnitude of the maximum winds (over 80 mph in many cases) and also because it was so expansive. The air mass that helped this system sustain its intensity for so long was very unusual, with extreme heat at the surface and what is known as an "elevated mixed layer" (EML) just above the surface, created extremely unstable, yet relatively dry, conditions. Rather than repeat many of the details of this historic event in here in this text, the reader is referred to the following links which provide a better overview from a couple different perspectives. The first link is to our local office summary, created several days following the event, which includes radar imagery, wind reports, and a comparison to the August 2000 "dual derechos". The second link is to a summary developed by the NWS Storm Prediction Center in Norman of the entire event, which includes several radar and satellite loops from a larger perspective.

http://www.erh.noaa.gov/rnk/events/2012/Jun29_derecho/summary.php

http://www.spc.noaa.gov/misc/AbtDerechos/casepages/jun292012page.htm

NOAA 'Bout Weather

Summer 2012: Record breaking heat in July

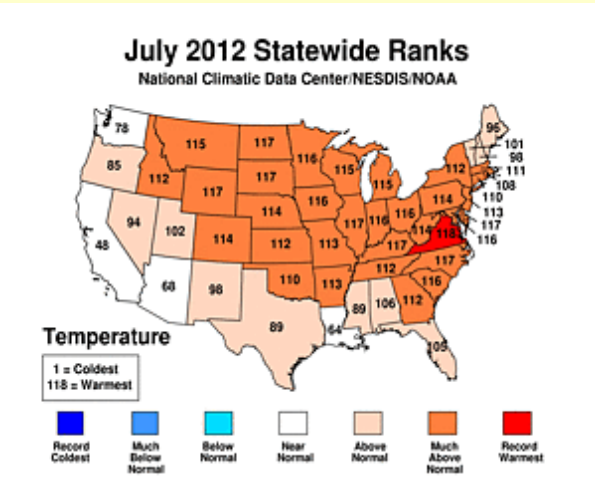
Peter Corrigan, Service Hydrologist

The meteorological summer of 2012 (June 1 – August 31) was notable primarily for a scorching month of July that set numerous records for heat. The table below shows average July temperature at the five local climate sites, departures from normal (from 1981-2010), along with the rank and warmest year on record. Roanoke experienced its hottest July in 101 years of weather records and amazingly, the previous record was set (actually tied with 1993) just last year. Only August 2007 (82.0°F) was warmer month at Roanoke. At both Bluefield and Danville, albeit with much shorter periods of record, July 2012 ranked as the 2nd all-time warmest July and Blacksburg the 4th warmest.

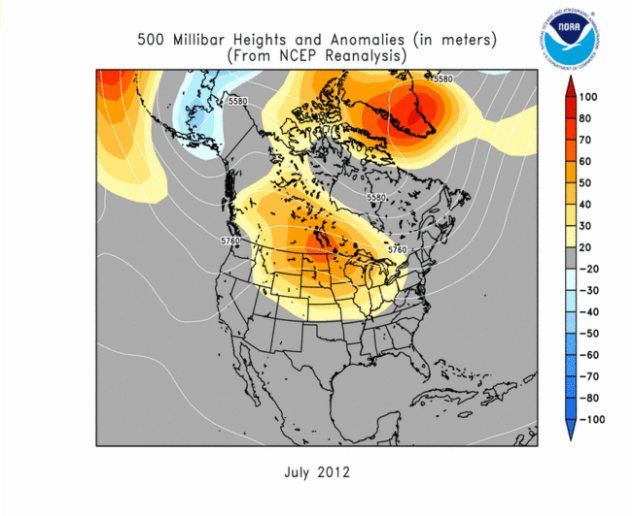
Local Climate Data: July 2012

Climate Site	Avg. temperature (Anomaly)	Rank (Warmest or previous, year)	Period of Record
Roanoke	80.8 (+4.1)	1st (80.2, 2011+)	1912-2012
Bluefield	75.4 (+2.4)	2nd (76.2, 2011)	1959-2012
Danville	82.0 (+3.7)	2nd (82.1, 1986)	1948-2012
Blacksburg	74.4 (+3.2)	4th (75.9 1993)	1952-2012
Lynchburg	79.4 (+4.1)	8th (81.8, 1934)	1893-2012

What caused the intense heat in July? The weather over North America in July 2012 was dominated by an unusually strong and persistent upper level high pressure ridge over the central U.S. (see Figure below). Few cool fronts were able to penetrate the high, and descending air associated with it played the dominant role in the intense heat. Nor was the heat exclusively confined to our region since most of the nation baked under the influence of this area of high pressure. Yet as shown in the Figure below, Virginia had its warmest July ever (118 years), while North Carolina and West Virginia ranked just behind.



July 2012 Temperature Rankings by State



500 Millibar Height Anomaly – July 2012

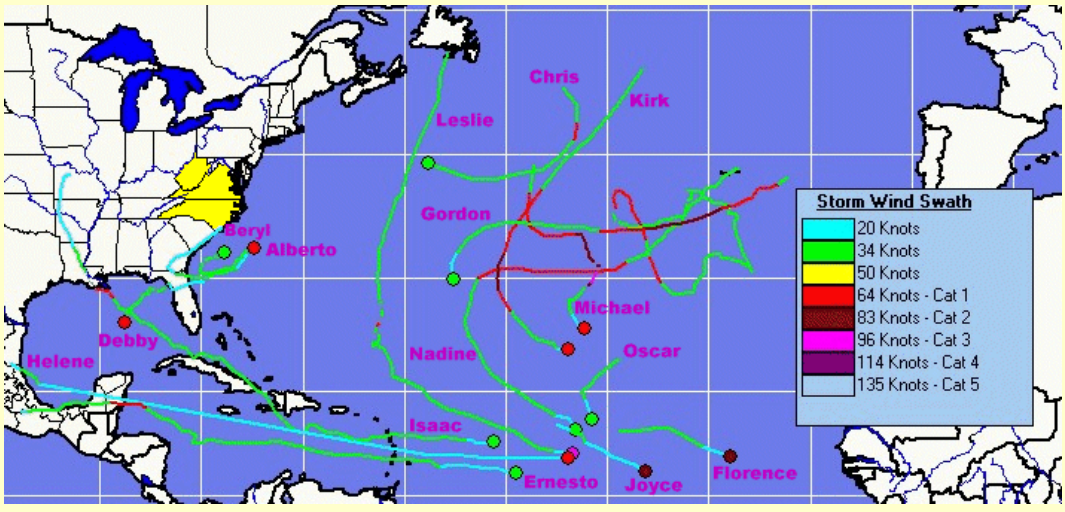
The rest of the summer, both June and August, wound up being fairly close to normal in terms of temperature - making the overall summer season warmer than normal, but not especially remarkable. Summer 2012 precipitation was somewhat below normal at the five climate sites, with Danville recording its 4th driest summer on record with only 7.56" versus the long-term normal of 12.41". There was frequent convection, however, and July was particularly stormy with several widespread severe weather episodes.

2012 Tropical Season: Another Quiet One for the Area

Jim Hudgins, Senior Forecaster

The 2012 Atlantic hurricane season (to the date of writing) was once again above normal in regards to the number of named storms (15) as well as the number of hurricanes (8). However, most of these systems again stayed either well out in the open waters of the Atlantic, or to the south affecting the Caribbean or Gulf of Mexico (below). Remnants of once Hurricane Isaac, that made landfall in Louisiana, did contribute to a period of heavier rainfall in early September as it interacted with an old frontal boundary along the Appalachians. This rainfall of 1 to 2 inches in spots was not enough to cause flooding due to the dry conditions that were in place. Another early season tropical storm, Beryl, also affected the Carolinas but kept its heavy rainfall to the south of the region.

Otherwise the season was unique in that two tropical storms, Alberto and Beryl, formed in May before the actual start of the season on June 1st. In addition, the development of Tropical Storm Debby on June 23rd marked the first time that four named storms had occurred before July 1st since 1851. However the fast start was tempered by having no named systems in July, only to be followed by eight in August tying the old record for the month set back in 2004. The season was also lacking strong hurricanes with only Michael reaching major levels (Category 3), which only lasted for 12 hours during the first week of September. To date, fatalities in 2012 across the Atlantic basin resulting from landfalling tropical storms have been around 65 - with damages totaling nearly $2.6 billion.

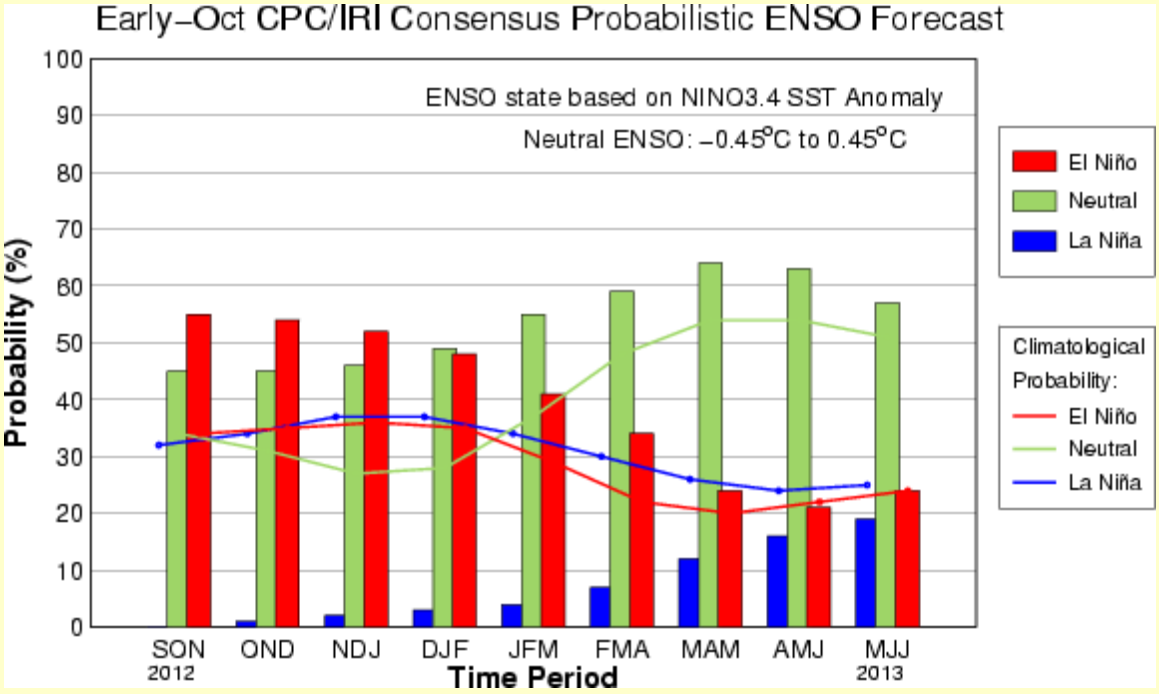


Tropical Tracks for the 2012 hurricane season (ending 10/10/12).

Winter 2012-13 Outlook

Robert Stonefield, General Forecaster

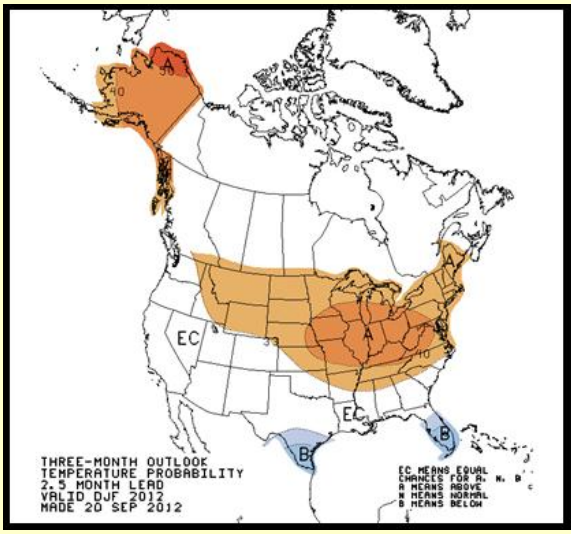
The weather we experience this winter may well hinge on the status and evolution of the El Niño/Southern Oscillation cycle (ENSO) which can have either a profound or very slight impact on the weather across North America depending on a variety of factors. Over the past summer and early autumn, sea surface temperatures (SST) were warming in the Niño 3.4 sector of the equatorial Pacific Ocean (basically the central Pacific). This warm water reservoir represents a vast heat source which can exercise a significant influence on the position and strength of the sub-tropical jet stream and hence winter storm tracks. These warm waters in the equatorial Pacific are associated with the El Niño phase of the ENSO cycle (conversely, cooler than normal waters in the same region are associated with the La Niña phase of ENSO). Forecast models have continued maintain this warming into the winter (Dec-Jan-Feb), which has led the Climate Prediction Center (CPC) to issue an El Niño advisory earlier in the fall. In September, however, the rate of warming slowed and forecast models began trending toward more neutral SST conditions in the Pacific. Since the water is still relative warm, the advisory remains in effect. Below are a graph and table of CPC's Consensus Probabilistic ENSO Forecast. The numbers for El Niño are trending lower while Neutral probabilities are increasing. Therefore, this winter may wind up near Neutral or only a weak El Niño.



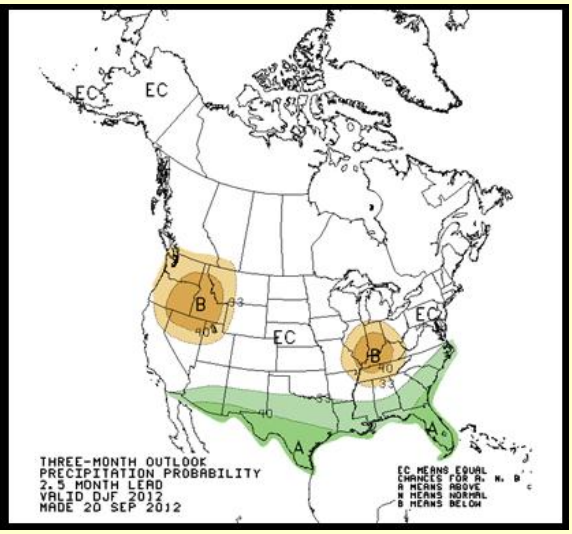
Percent Chances of ENSO categories

3-Month Season	La Niña	Neutral	El Niño
SON 2012	~0%	45%	55%
OND 2012	1%	45%	54%
NDJ 2013	2%	46%	52%
DJF 2013	3%	49%	48%
JFM 2013	4%	55%	41%

Under the current CPC forecast indicating the highest likelihood of either neutral or weak El Niño conditions in the equatorial Pacific, the three-month average temperatures (see Figure below) will likely be above normal for the Mid Atlantic-Southern Appalachian Mountains this winter. This same scenario also suggests that above normal precipitation chances are highest across the southern United States (see below), while our region lies in an area of Equal Chances (EC) for the probability of each category of precipitation. Equal Chances means there are no significant predictive signals to place an above, at, or below normal probability of precipitation for the region. So, how much **snow** will this mean for our area? This is the most frequently asked question of meteorologists as we approach winter each year. While the NWS does not make an official snowfall prediction the best answer at this point might be somewhere close to average (based on Equal Chances of each precipitation category) or perhaps a little less due to warmer than normal temperatures. Our average winter snow totals range from 8 inches at Danville up to 34 inches at Bluefield, with Roanoke and Blacksburg both averaging about 23 inches.



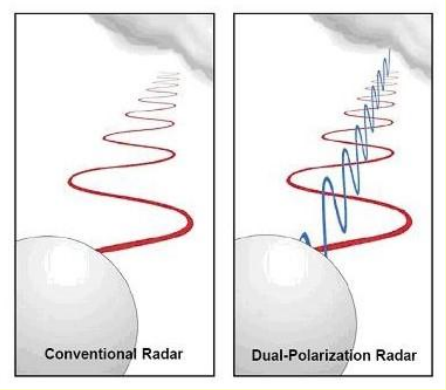
Winter Temperature Outlook



Winter Precipitation Outlook

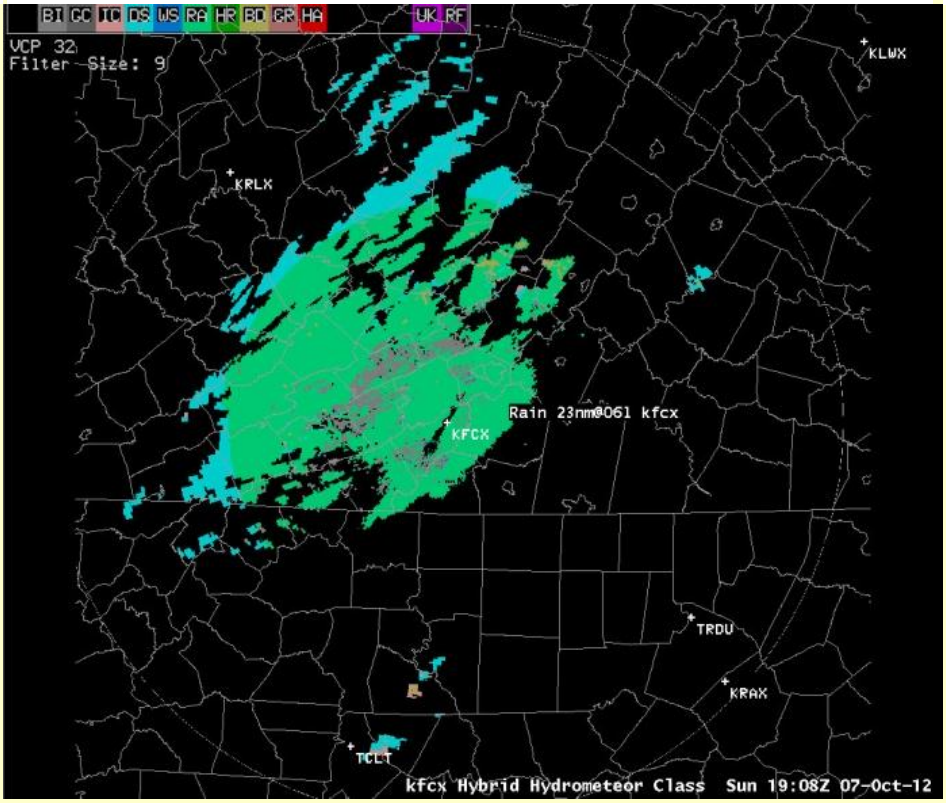
Dual Polarization Technology Arrives at NWS Doppler Radar Site!

Steve Keighton, Science and Operations Officer



We are excited to report that the National Weather Service Doppler radar in Floyd County (KFCX) has been upgraded to Dual-Polarization technology as of October 7th! This represents the first major hardware upgrade to the radar since its original installation back in 1994. Dual-Polarization technology, which is explained in more detail at the link below, allows Doppler radars to better detect precipitation types, to weed out non-meteorological, and ultimately provide better precipitation estimates. It also provides other important new signals in severe thunderstorms and changing winter precipitation types. Other nearby NWS Doppler radars that have recently upgraded to "Dual-Pol" technology include Morristown TN, Sterling VA, Wakefield VA, and Charleston WV. Later in October, the Greenville-Spartanburg SC radar will be upgraded, and then Raleigh NC in November.

Below is one of the very first new products we received when the radar data began flowing into the office after the upgrade, and is called the "Hydrometeor Class". It is based on output from an algorithm that utilizes several different kinds of raw data from dual-polarization returned energy. It shows the computer's best guess at what is causing the radar echoes at the height above the ground the beam is detecting a signal. Here you see green for light rain, light blue for dry snow (at farther ranges, thus higher up in the atmosphere), two grey shades for ground clutter and biological return (insects, birds, etc.), and some beige color for bigger drops.



Dual Polarization - KFCX Hybrid Hydrometeor Class Image

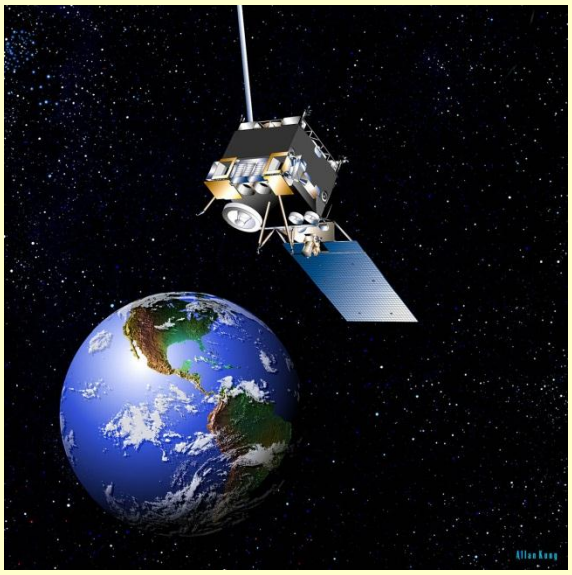
More explanation of this product, as well as the other new products and how they help us, can be found at this link:

www.weather.gov/rnk/news/Dual.pdf

The above document also has information on how you can learn even more about Dual-Polarization technology and products, and how you can access some of the live data if you are interested. Watch for some examples of various Dual-Pol products from the KFCX radar on our Facebook and Twitter sites over the coming months!

Recent Changes in NOAA Satellite Coverage

Michael Sporer, Meteorological Intern



NOAA operates a fleet of satellites to fill the very specific data needs of the National Weather Service. Most people are familiar with the fantastic visible and infra-red cloud images satellites take on a regular basis, but of equal importance are the data products generated by the satellites which go into massive supercomputers to produce computer model forecast guidance. In order to obtain the best data possible, two different types of satellites are used: polar-orbiting and geosynchronous. Polar-orbiting satellites orbit the Earth a little over 500 miles above the surface. Their orbit takes them over the poles of our planet as they circle the globe about once every 100 minutes. They will pass over the same point on the surface twice per day – once during the daylight and once at night. Their low-earth orbit allows them to obtain very high resolution data from a number of different instruments and they are excellent tools for monitoring phenomena anywhere on the Earth which evolve gradually.

Geosynchronous (GOES) satellites orbit the Earth at a much greater distance – over 22,000 miles above the surface! Their orbit rotates with the Earth so they essentially remain over the same location, providing critical data coverage 24 hours per day, 365 days per year, day or night. This allows geosynchronous satellites to continually monitor an area for phenomena which occur on very short time scales and may not last very long. Geosynchronous satellites are the primary source for loops of satellite pictures which show the development and movement of fronts, hurricanes, and winter storms.

In late September 2012, the GOES satellite covering the eastern CONUS, known as GOES-13, began to experience data anomalies and the satellite was placed into safe or standby mode while it is investigated for possible repairs. Several days later GOES-14 was moved into position to replace the lost data from GOES-13. Over the western CONUS GOES-15 continues to operate normally.

New: Mobile Weather Warnings

Phil Hysell, Warning and Coordination Meteorologist

This year, America's wireless industry is rolling out a new nationwide text emergency alert system, called Wireless Emergency Alerts (WEA), which will warn you when significant weather threatens.

The text alert service is free and automatic for select cell phone models. And, there is no need to sign up or download an app. As long as your cell phone is WEA-capable, you will receive wireless alerts for the most dangerous types of weather from NOAA's National Weather Service (NWS) no matter where you are. The NWS will broadcast warnings for weather emergencies that are most dangerous to life and property: tornadoes, flash floods, hurricanes, extreme wind, blizzards and ice storms, tsunamis, and dust storms.

The WEA system relies on "best-effort" networks, so delivery of alerts at a given place and time is not guaranteed. The new alert system is not a replacement for other alert systems, and you should not rely on it as a sole source of emergency information. A weather alert sent through WEA is intended to notify the public that a warning has been issued and that you should seek additional information. Remember: Not all phones are capable of receiving Wireless Emergency Alerts. To find out if your phone is WEA-capable and when the alert system will be available in your area: Contact your wireless carrier today, or visit: http://www.ctia.org/consumer_info/safety/index.cfm/AID/12082.

Cell service customers can opt out of weather alerts, but we strongly discourage you from doing so. These weather alerts are a vital public service that ultimately helps America become a more weather-ready nation. Armed with late-breaking weather warnings, people will have the timely information they need to make smart decisions about how to protect themselves, their families, their friends and neighbors, and their personal property.

NWS Blacksburg is now on Twitter!

Chris Fisher, Meteorological Intern

More and more people are turning to alternate sources to obtain their weather information, and this includes social media and other micro-blogging sources. In early August, NWS Blacksburg joined the Twitter world. Twitter is a social media site that allows users to communicate a message to the world in 140 characters or less, also known as a "tweet." With over 500 million active users, messages can be seen by a large number of people almost instantly. NWS Blacksburg uses Twitter to educate the public about weather, water, and climate, along with providing awareness and preparedness of upcoming major weather events. To date, our Twitter page has almost 200 followers and continues to grow in popularity daily. To follow us on Twitter our handle is @NWSBlacksburg or you can enter the following link into your search browser: https://twitter.com/NWSBlacksburg.

Personnel Changes at WFO RNK

The next several months will see the retirement of two long-time stalwart employees at WFO RNK. Both Electronics Systems Analyst (ESA) Bill Riehl and Observation Program Leader (OPL) Jim White will retire around the New Year. Below are short bios of their long and productive careers. In addition, Electronics Technician (ET) Rob Boyle has accepted the ESA position at WFO Wakefield, VA. He will report to his new duty station sometime in November. Congratulations Ron, and best of luck Bill and Jim!

William (Bill) Riehl

Bill plans to retire from the Federal Government on January 3, 2013 after more than 42 years of service.

Bill started his Federal career in the U.S. Navy serving from 1969 to 1972 before joining the Navy Reserves in May 1973 until retirement in 1990. During a 4-year tour of duty with the regular Navy he went to boot camp in Great Lakes, IL, avionics school in Memphis, TN, maintained target drone avionics in Virginia Beach, VA, and reconnaissance aircraft in Lexington Park, MD, where he was honorably discharged. Shortly thereafter, his Federal civilian career began as an Electronics Mechanic Apprentice with the Naval Aviation Depot in Norfolk, VA. After his apprenticeship graduation in 1979, Bill operated an automatic test station and performed depot-level testing and maintenance on the Navy's F-14A Tomcat aircraft.

He later he advanced to the General Service (GS) ranks as an Electronics Technician, Computer Specialist, and Computer Systems Programmer where he evaluated and corrected software which tested the 'black-boxes' of the Navy's F-14A Tomcat aircraft. In 1990, he moved to the acquisition section where a team prepared the acquisition documents to procure the Navy's new automatic test station.

Bill started with the National Weather Service in 1994 at State College, PA as the local Electronics Program Manager and Network Administrator, transferring to the Blacksburg Weather Office in 1998 - serving in the same capacity until his impending retirement.

With his wife and 15 year old daughter, Bill is planning extended visits with family and grandchildren and plenty of travel to keep him busy.

James (Jim) White

Jim White the Observing Program Leader at Blacksburg Virginia will retire on January 2nd, 2013 with over 37 ½ years of federal service.

Jim started his weather career in 1974 serving honorably within the Air Weather Service of the United States Air Force. His main duties centered around weather briefings to military pilots in all branches of the service in support of the Air Defense Command over the north central U.S.

Jim entered the National Weather Service in 1978 with a Meteorological Technician job at the NWS Forecast Office in Bismarck, ND. Agency work during that era included teletype data processing, coloring and posting facsimile charts and gathering, hand-plotting and analyzing surface and upper air weather charts. The arrival of the Automation of Field Operations & Services (AFOS) computer signaled the end of one era and the beginning of another.

In 1985, Jim transferred to the NWS Weather Service Office in Lexington, Kentucky. During his time there, he honed his forecast, warning and computer skills. The majority of his time at this location was spent working shifts in a stand- alone capacity.

In 1995, NWS modernization and restructuring brought a closure to the Lexington office and Jim transferred into a Hydro Meteorological Technician position at the NWS Forecast Office in Blacksburg Virginia. The Doppler radar era began, and AFOS advanced to a much more powerful computer-based named AWIPS (Advanced Weather Interactive Processing System). Among many other duties, Jim became a Cooperative Program Manager. This led to an eventual promotion to Observing Program Leader in 2009.

Jim and his wife Julie will remain in Virginia along with their two daughters and three grandchildren.

WFO Blacksburg Hosts Open House

The WFO will host its biennial Open House on Saturday November 10, 2012 from 10 AM to 3 PM. These open houses have proven to be a popular event in recent years with anywhere from 300 to 600 visitors coming through the office for a roughly 45-minute tour. After an introductory slide show presentation, visitors will get a chance to see how routine weather forecasts are made, how severe weather warnings are created and disseminated, examine weather instruments, and speak with meteorologists and hydrologists. In addition, visitors can get a close-up look at a weather balloon and the process of how they are launched. There will be activities in the parking lot including the City of Roanoke Tornado trailer, VDOT “Snow-Eater” machine, Red Cross Trailer, and Virginia Tech Meteorology Department Storm Chaser vehicle. The event will be held at the NWS Blacksburg Forecast Office at 1750 Forecast Drive in Blacksburg (located within the Virginia Tech Corporate Research Center).