ABSTRACTS

Title	**An Introduction to Severe Weather**
Speaker	Leonard Vaughan NOAA/National Weather Service, Columbia, SC
Abstract	An introduction to Severe Weather will present a brief introduction to Hurricanes, Thunderstorms, Tornadoes and Flooding. The areas where hurricanes develop, their seasonal variations and the favorable conditions that strengthen their development will be discussed. The presentation will describe the Saffir-Simpson Scale and the various impacts of hurricanes as they affect the region. Across Western North Carolina and the Upstate of South Carolina, the impacts from hurricanes would be damaging winds, flash flooding, tornadoes and possible debris flows (mud-slides). The presentation will discuss the basic meteorological ingredients needed for thunderstorm development, the types of thunderstorms, and the seasonal variability of thunderstorms. What makes a thunderstorm severe and the criteria for severe thunderstorms will also be presented. Additionally, tornado development and the key ingredient of wind shear will be covered in the presentation The Enhanced Fujita Scale for tornado intensity will be studied from radar images and storm damage pictures. Flooding comes in different forms and is driven by different weather events. The presentation will discuss flash flooding (which is more common across Western North Carolina), regular flooding and river flooding.
Biography	I am originally from Richmond, Virginia. I am a graduate of UNC-A, class of 1988. I have been employed by the National Weather Service since 1990. I began my NWS career in Wilmington, DE as an intern with the NWS. In 1995, I moved to the Weather Service Forecast Office in Columbia, SC as a Journeyman Forecaster. I'm married to Sarah Vaughan and have a daughter, Rachel, who is a sophomore in high school. I enjoy the outdoors and use my interest in photography to capture the places I visit.

Title	**Severe Weather Forecasting: A Western North Carolina Case Study**
Speaker	Laurence G. Lee Science and Operations Officer, NOAA/National Weather Service, Greer, SC
Abstract	Severe weather forecasting is a complex operation requiring skilled analysis and the proper application of meteorological principles at a number of time and space scales. Successful outcomes rely on effective collaboration with the Storm Prediction Center (SPC) and neighboring NWS offices. Forecasters must understand regional severe weather climatology, synoptic scale patterns that support severe weather development, mesoscale features that trigger severe weather development, and radar reflectivity and velocity signatures associated with tornadoes, damaging wind, and large hail. The severe weather forecasting process at WFO Greenville-Spartanburg (GSP) will be summarized by examining the events of 4 March 2008. During the afternoon and evening, a line of thunderstorms moved across the western Carolinas producing numerous damaging wind gusts and hail. A storm survey determined that the damage was caused by straight-line winds, but a small tornado occurred in Davie County. The possibility of severe weather on Tuesday, the 4th of March , was highlighted in the Hazardous Weather Outlook prepared by WFO GSP on Sunday afternoon. The SPC placed the western Carolinas in a "Slight Risk" of severe weather in the Day 1 Severe Weather Outlook issued during the early morning hours on the day of the event. Tornado Watches were issued by SPC in advance of all severe weather occurrences. WFO GSP issued 19 Severe Thunderstorm Warnings, three Tornado warnings, and one Flash Flood Warning. The primary environmental clues that supported the forecast included strong jet stream winds, dry air in the mid-levels of the atmosphere, a surface low pressure system, low-level moisture, convergent wind flow near the surface, and an unstable atmosphere. Methods for identifying these clues and how they interacted to produce severe weather will be discussed.
Biography	Larry Lee is the Science and Operations Officer at the National Weather Service Forecast Office in Greer, SC. Mr. Lee is a native of Hendersonville, NC. He received a B.S. in meteorology from the University of Wisconsin-Madison and an M.S. in meteorology from the University of Oklahoma. Mr. Lee has been in NOAA for 36 years. Prior to arriving at WFO GSP in 1994, he served at the National Climatic Data Center in Asheville and at the NWS Forecast Offices in Anchorage, Atlanta, Raleigh-Durham, and Louisville. Mr. Lee is a Fellow of the American Meteorological Society and a member of the National Weather Association and the Canadian Meteorological and Oceanographic Society. His primary professional interests are related to the application of sound scientific principles to weather analysis, forecasting, and warning.

Title	**Storm Data at NCDC: and Other Products and Services**
Speaker	Stuart Hinson Meteorologist, NCDC/NOAA
Abstract	The Storm Data product is a collection of severe weather data across the United States. It has gone through many different transformations in the past 50 years. This presentation will put all the different forms of Storm Data into perspective as well as to describe some of its limitations and to look at some other uses and the future of this dataset.
Biography	Duties include: Ingest, Processing, Quality Control, Archive and Publication of NOAA's Storm Data, Hourly Precipitation Data, Upper Air Data. Also, Global Climate Observation System Archive Center Representative to the World Meteorological Organization. Graduated from the University of North Carolina, 1997

Title	**Radar Observation of Severe Weather**
Speaker	Jeffrey P. Taylor NOAA/National Weather Service, Greer, SC
Abstract	Over the past several decades advances in radar technology have enabled meteorologists to gain tremendous insight into the evolution and structure of severe weather systems. These advances have not only increased our understanding of severe weather, they have also allowed operational forecasters to substantially improve warning services provided to the public. This presentation will provide a general overview of meteorological radar and how it has advanced through the years. Techniques employed by the National Weather Service to utilize its network of WSR-88D Doppler radars to monitor severe weather and issue watches and warnings will be discussed. Finally, some real-world examples of storm signatures observed by NWS Doppler radar will be provided.
Biography	Jeffrey Taylor is a Meteorologist at the National Weather Service Forecast Office in Greer, South Carolina. He is originally from Pine Bluff, AR and attended the University of Hawaii at Hilo where he received a B.A. degree in Oceanography. Before returning to graduate school, Jeff was a commissioned officer in the NOAA Corps and was stationed on one of their research vessels. He attended graduate school at Florida State University where he received his M.S. degree in Meteorology. Before coming to South Carolina, he worked as an operational forecaster for Weathernews Inc. in Norman, OK. His current interests include: improving operational warning performance, aviation weather, and local climate research.

Title	**Operational Hazard Detection and Monitoring in the Satellite Analysis Branch**
Speaker	Jamie Kibler Senior Meteorologist, NOAA/NESDIS/OSDPD/SSD/SAB
Abstract	The National Environmental Satellite Data and Information Service (NESDIS) is a line office within the National Oceanic and Atmospheric Administration (NOAA) charged with the development and operation of the Nations' environmental satellites and the creation of associated data and products. These satellite derived products support all of NOAA's core missions, including ensuring safe and efficient commerce and transportation, monitoring of weather and water, ecosystem management, and climate services. As such, NOAA's satellites enjoy a unique perspective of the Earth to allow scientists to detect and monitor significant environmental and manmade hazards that pose a threat to life and property. This presentation will focus on the hazard and disaster detection, product generation and product distribution of the Satellite Analysis Branch (SAB) of NESDIS. The SAB is staffed 24x7 to monitor and distribute products related to volcanic eruptions, ash extent and movement, global tropical cyclone analysis, wildfire detection and smoke emissions monitoring, and heavy precipitation nowcasting and analysis. SAB also participates as an operation test-bed for new satellite product algorithms, before products are placed into routine operations. An overview of SAB operations, satellite data used, how these data and derived products are used in operations, and linkage to users will be presented.
Biography	Customer Outreach Lead and Senior Meteorologist for the Satellite Analysis Branch - Line office of NOAA's Satellite and Information Service (NESDIS) in Camp Springs, Maryland. I train and educate scientist in the government, private and collegiate sector on satellite data and products. I am married to Janet Kibler (10 years) and have a child named Braxton. He is almost 1 year old.

Title	**Future Radar and Satellite Technology**
Speaker	Daniel C. Miller NOAA/National Weather Service, Columbia, SC
Abstract	The National Weather Service (NWS) will implement new radar and satellite technologies in the future. The NWS will install Dual-Polarization technology into its current network of WSR-88D Doppler Radars nationwide. This will add several new products and algorithms that will help to better determine precipitation type, improve precipitation amount estimates, and improve hail detection. The next generation of Geostationary Operational Environmental Satellites (GOES-R) will provide higher resolution images, and at much more frequent time intervals, than current satellite technology. GOES-R will also provide a large suite of new products. These new features will enable better detection of cloud structure, type, phase, and height; provide better measurements of wind, moisture, temperature, and lightning; and provide better estimates of turbulence, tropical cyclone intensity, and rainfall amounts. The new radar and satellite technologies will give NWS meteorologists additional information and expanded capabilities, which in turn will yield more efficient and effective forecast and warning operations. This presentation will provide an overview of the new technologies and discuss their applications with emphasis on NWS severe weather operations.
Biography	Dan received a B.S. in Atmospheric Sciences from UNCA in 1990. He began his career with the NWS in 1990 at the NWS office in Tampa FL. Since 1998, he has served as a general forecaster at the NWS office in Columbia, SC, where he is the leader of the office Severe Weather Team, and a member of the Radar Team. Dan co-authored an NWS Eastern Region Technical Attachment in 2008, and has presented case studies of significant meteorological events at the last five annual Mini-Technical Conferences hosted by the Palmetto Chapter of the AMS in Columbia, SC.

Title	**Menacing Beauty: The Seductive Power of Hurricanes**
Speaker	Christopher C. Hennon Atmospheric Sciences, UNC Asheville
Abstract	Since 1980, the State of North Carolina has experienced over 30 natural disasters that resulted in an estimated loss of at least $1 billion, ranking it among the top 5 states in the nation. Most of these events can be attributed to hurricanes that come ashore from the Atlantic Ocean. North Carolina has been fortunate to largely escape the strongest hurricanes. As evidenced by Hurricane Andrew in the 1990s and Hurricane Katrina more recently, these large impact events can have catastrophic consequences for populations in their path. It is therefore important to understand the conditions that allow tropical cyclones to form and then strengthen into dangerous storms. Furthermore, we would like to understand how potential changes in the world's climate will affect the number and intensity of tropical cyclones. This presentation will provide a basic understanding of tropical cyclone formation, lifecycle, and structure. Numerous images and video footage will provide participants with a small hint of the power of these storms. The presentation will conclude with predictions for future tropical cyclone activity and how the southeast United States may be affected.
Biography	Dr. Christopher Hennon is an Assistant Professor in the Department of Atmospheric Sciences at the University of North Carolina Asheville (UNCA). Before beginning his position at UNCA in 2005, Dr. Hennon was a post-doctoral fellow and visiting scientist at the Tropical Prediction Center/National Hurricane Center (NHC) in Miami FL. During his tenure at NHC, Dr. Hennon researched ways of using satellite data and information to improve hurricane forecasts. Dr. Hennon received his Ph.D. from The Ohio State University in 2003, specializing in the prediction of tropical cyclone formation.

Title	**Some Examples of Severe Weather Events in the Southern Appalachians**
Speaker	Visual Materials by: Grant W. Goodge NCDC/NOAA
Abstract	Severe weather can occur at the synoptic, meso, or micro scale. However when mountainous terrain is involved, damage is most often seen at the meso and micro scale. Indeed some synoptic weather conditions would not be severe without the interaction of complex elevated surfaces. Through the use of graphs and photo images, I hope to illustrate these various scales of damage.
Biography	Mr. Goodge worked at the National Climatic Data Center for 28 years, then after four years of retirement he returned to NCDC on contract to be the QA focal point for the newly established Climate Reference Network. He has now filled that position for the last 9 years. During much of his life Mr. Goodge has had an intense interest in severe weather and its results. As a private pilot he was able to investigate many events from the air as well as the ground.

Title	**Flooding in Western North Carolina: Some Spatial and Seasonal Characteristics**
Speaker	J. Greg Dobson NEMAC, UNC Asheville
Abstract	Floods are the most common, costly, damaging, and deadly source of all weather-related and natural hazard phenomena. Each year, floods account for over four billion in property loss and 150 deaths in the United States alone. Western North Carolina is no stranger to flooding. While flooding in this region can be characterized by different types of floods, flash and riverine flooding are the most common, with some urban flooding occurring in the Asheville vicinity. The dynamic hydrology of watersheds in mountain environments, such as Western North Carolina, is spatially and temporally complex. This combined with complex geomorphic and land cover characteristics (e.g. elevation, aspect) can often lead to high spatial variability in precipitation, which impacts local flooding. In Western North Carolina, floods can result from different types of weather systems, including mid-latitude wave cyclones, local convection, and tropical systems. While flooding can and does occur during any month of the year, winter and early spring are typically the periods in which most floods occur, with a second maximum occurring in late summer and fall due to tropical systems. The later often produces the most extreme and wide-spread flood events. Flash Floods most commonly result from heavy precipitation caused by warm season severe thunderstorms. This presentation will provide an overview of flooding in Western North Carolina, with a focus of placing it into spatial and seasonal contexts. Differences between flash and riverine floods will be discussed. An examination of historic floods will be provided, including the recent flood events of 2004. Finally, it will demonstrate how geographic information systems (GIS) and 3D visualization techniques can be useful tools for analyzing, displaying, and mapping flood information.
Biography	J. Greg Dobson has served as the GIS Research Coordinator for UNC Asheville's National Environmental Modeling and Analysis Center and the RENCI at UNC Asheville Engagement Center for the past 3 ½ years. He also currently teaches GIS in Meteorology as an Adjunct Faculty Member in the ATMS Department. Mr. Dobson's current research interests include GIS applications in weather, climate, hydrology, and societal impacts; GIS and 3D visualization; and geospatial decisions support tools. He holds both a Bachelors and Masters Degree in Geography.

Title	**Basic Skywarn Spotting – High Impact Weather (Thunderstorms) and Their Attributes**
Speaker	Tony Sturey Warning Coordination Meteorologist NOAA/National Weather Service, Greer, SC
Abstract	Approximately 90 percent of all presidentially declared disasters are weather related. On average there are 500 weather deaths each year across America. Severe weather causes near 14 billion in property damage each year. We can help ready ourselves for the storms through commitment, education and awareness. This underlying foundation, although now allowing us to become storm proof, may provide us the knowledge to make key, perhaps life saving, decisions for our family and friends, when High Impact Weather strikes.
Biography	Tony Sturey works at the National Weather Service Office (NWS) in Greenville-Spartanburg South Carolina (GSP) as the Warning Coordination Meteorologist (WCM). Since 1983 Tony has worked at the following NWS offices: Jackson Kentucky, Milwaukee Wisconsin, Louisville Kentucky and Caribou Maine where his jobs have ranged from Intern, Senior Meteorologist to WCM. In his current position Tony provides High Impact Weather Education and Outreach for a variety of constituents and customers and Georgia, South Carolina and North Carolina. He currently lives in Simpsonville with his wife Patrice and daughter Jenna. When not working he enjoys golfing, grilling and wine tasting.

Title	**“We Had No Warning”: An overview of available forecast products before and during severe weather events**
Speaker’s name	Christopher Godfrey Atmospheric Sciences, UNC Asheville
Abstract	In interviews with the general public after severe weather events, we often hear the phrase, “We had no warning”. On very rare occasions, the National Weather Service will in fact fail to warn for a high-impact severe weather event. In the vast majority of cases, however, responsible entities will issue several products on a range of timescales from days to minutes prior to the onset of severe weather. These products include convective outlooks, mesoscale discussions, watches, and warnings. Despite the availability of these products through a variety of media, it ultimately becomes the responsibility of the individual to find, interpret, and respond to severe weather notifications. Here, we present several sources for these products and how to interpret the information they carry.
Biography	Professor Godfrey came to UNC Asheville in 2007 after receiving a Ph.D. in meteorology from the University of Oklahoma, specializing in land surface modeling. Building upon his experience in a number of severe weather field projects with mobile radar vehicles and professional chasing activities, he has taken several UNCA atmospheric science students to the Great Plains to observe severe weather and interact with professional meteorologists.

Title	**Tips to Self-Forecasting Severe Weather & Severe Weather Communication**
Speaker's name	Gerald M. Satterwhite, Jr. and Philippe Papin Juniors, Atmospheric Sciences, UNC Asheville
Abstract	Through the use of endless weather data available on the internet, generalized forecasts of potential severe weather set-ups can be made from home. Items ranging from surface maps, to upper-air maps, to soundings can be used to construct a personal forecast, which can compliment official forecast from NWS and SPC forecasters. This presentation will focus on how you can use various weather venues to compile data to be used in local forecasting of severe weather. A sample event will be shown as a guideline for future occurrences of severe weather. In addition, time will be spent on why you should report severe weather, how you can follow reports on-line and participate in real-time reporting, and various weather software packages that are available to assist in tracking severe weather.
Biography	Gerald M. Satterwhite, Jr. is a junior level meteorology student at the University of North Carolina – Asheville. His career goal is employment with the National Weather Service with a focal point in public communication/outreach. He volunteers at his local weather office often and participates in several other meteorology related activities. His forecast interest lies with severe weather across the Great Plains and southeast region, as well as coastal weather and boundary layer meteorology. Philippe Papin is a junior majoring in the Atmospheric Sciences at the University of North Carolina Asheville (UNCA). He has been conducting field work for UNCA Professor Dr. Doug Miller for the Northwest Flow Snowfall Research project by launching radiosondes in the snow storms on top of Poga Mountain to aid forecasters at the National Weather Service. Philippe also is working with UNCA's Dr. Chris Hennon on tropical cyclone research, and is planning to present his findings at the annual UNCA Undergraduate Research Symposium in spring 2010. Additionally, Philippe works as an intern GIS analyst at the National Environmental Modeling and Analysis Center (NEMAC) of UNCA. Philippe is the vice president of the UNCA Chapter of Atmospheric Meteorological Society.