

# The Use of Uncertainty Information in Weather Forecasts

Elliot Abrams  
AccuWeather, Inc.  
State College, PA

The American Meteorological Society commissioned a study (ACUF) intended to help increase the effective use of uncertainty information to make more useful weather forecasts. One motivator: many aspects of a forecast involve uncertainty and yet (too many) forecasts produce deterministic (single answer) outputs. (Examples: High today 47. Snow accumulating 1-2 inches.) Probabilities now in use typically address only one aspect of uncertainty (probability of .01 inch of precipitation in a specified location in a 12 hour period). What about duration, intensity, timing of rainy and dry periods, etc?

The study committee included 60 people with specialties including numerical modeling, forecasting, broadcasting, consulting, basic and advanced research, and social science. The committee was organized into subgroups tasked with exploring specific areas of inquiry and information development.

Strategic goals that came out of the work:

1. Increase Enterprise (government, non-government organizations, commercial weather services and media, and academia, i.e; all the stakeholders in the field) understanding and knowledge of hydrometeorological uncertainty:

a. Assess what can be provided, how it can best be communicated. It also includes the tightly integrated need for users to know what they can expect from this type information (what is possible) and how they can provide guidance to providers about specific needs.

b. Increase understanding of the nature and causes of uncertainty and foster reasonable expectations about the accuracy and helpfulness of new types of probabilistic information for specific uses.

2. Actually use the new information properly:

a. Outreach and education to raise the level of awareness about why uncertainty information is important and how it can be used for better decision making.

b. Use social science and other interdisciplinary inputs; the enterprise needs to develop the most effective ways and most useful formats for presenting various types of uncertainty information.

c. Develop decision support tools and services that link uncertainty information (that is being delivered) to risk tolerance (among the users).

3. The NWS and other agencies (USGS, NASA come to mind) maintain and extend their foundational tools that can then be used by the entire Enterprise in order to enhance and tailor the information for specific users. This includes (among other things)

a. Improved ensemble prediction

b. Post processing of ensemble output to discover and correct biases, systemic errors, etc. that would otherwise limit the usefulness of those ensembles

1. Statistical work needed to improve forecast data sets

2. Non statistical work to handle variables that are not directly handled by the models or which are dealt with by separate statistical relationships

c. The role of the human forecaster: add value and collaborate/coach/work with users. A key requirement is to make the foundational tools available (in as close to real time as possible) to the entire Enterprise

To do all this requires new/expanded infrastructure.

A final draft of the committee report was delivered in summer 2010 and is currently under review.

## **Presenter's Bio**

Elliot was born in Philadelphia, PA, on May 31, 1947. There was a thunderstorm outside the hospital that day. He became interested in weather at the age of five when his father, a research chemist, built a barometer for him. Elliot was a weatherman in his second grade class play and was blamed for rainy weekends in fourth grade.

Elliot earned a B.S. and an M.S. in meteorology from the Pennsylvania State University. In college he was a charter member of Chi Epsilon Pi meteorology honorary society. Elliot is also a distinguished graduate of the United States Air Force Officer Training School. Elliot joined AccuWeather in 1967, and was a co-founder of AccuWeather's radio service in 1971. Elliot is now a Senior Vice President and Chief Forecaster for AccuWeather. He is heard daily on radio stations in Boston, Providence, Portland, Portsmouth NH, New York City, Philadelphia, Washington DC, Pittsburgh, Buffalo, Chicago, Morgantown WV, Kansas City, and Kalamazoo MI. (Some of the forecasts are right). His daily blog and video appear on AccuWeather.com. He was a co-author of the college text "Meteorology," published by McGraw-Hill. Elliot is also co-author of AccuWeather's On-Line With AccuWeather instructional program for junior and senior high school classes. In 2010, Elliot was co-chair of an American Meteorological Society committee that submitted a report designed to spur more effective use of uncertainty information in weather forecasting and weather decision support. The committee included 60 people, including meteorologists, researchers and social sciences.

Elliot has earned the accredited status of Certified Consulting Meteorologist along with the American Meteorological Society (AMS) Seals of Approval for both radio and television. In the AMS, Elliot has served on the Broadcasting Board and the Board of Certified Consulting Meteorologists. Elliot earned the 1993 AMS award for Outstanding Service by a Broadcast Meteorologist "for his decades of significant contributions to radio weather broadcasting and to weather education at all levels," and followed this up with the 1994 AMS Charles Mitchell Award for "outstanding and unique dissemination of weather forecasts to the nation's public by radio and television." In 1996, The National Weather Association named Elliot "Broadcaster of the Year."

Elliot is in his fifth elected term as a Township Supervisor in his locality, and serves as Chair. Elliot has been married to Bonnie since 1969. They have two sons: Mike and Randy. Bonnie was an award-winning second grade teacher, and now celebrates her retirement volunteering for several community groups. Randy interned in the AccuWeather promotions department and now manages the Credit-Suisse office in Taiwan, where he lives with his wife, Sonnie. Mike was a part-time broadcaster at AccuWeather, and is now on the editing team for the cultural and arts sections of The New York Times. He and his wife Rebecca have two children, Jacob and Maya. Neither has yet developed a keen interest in weather forecasting. Elliot has spoken at previous Southern New England Weather Conferences, and predicts that for this year, if there is no snow or ice, it not likely to be slippery.

## March 2010 Floods: River Crests, Impacts and Unique Challenges

Nicole M. Belk  
Senior Service Hydrologist  
NOAA/National Weather Service Forecast Office  
Taunton, MA

Edward J. Capone  
Service Coordination Hydrologist  
NOAA/NWS/Northeast River Forecast Center  
Taunton, MA

Mid and late March 2010 brought historic flooding to portions of southern New England. This presentation will review the compounding effect that multiple rain events had on area rivers, resulting in an increased vulnerability to flooding. A look will be taken at river flood crest values as well as the exceedance probability for those flood crests. Impacts related to those floods will also be presented. A brief look will be taken at the Blue Pond Dam failure in Hopkinton, RI.

This presentation will also discuss some unique challenges faced in modeling and warning during an extreme flood event. Examples include the need to acquire rating curve extensions, challenges with gauging, and special wording in NWS flood products used to convey the extreme flood threat. A film clip that illustrates working with the media during this historic event will be shown.

### **Presenters' Bios**

**Nicole Belk** is a Massachusetts native who graduated with a B.S. degree in Meteorology from The Pennsylvania State University in 1994. Nicole began her National Weather Service career as a Meteorologist Intern at the Weather Service Office in South Bend, Indiana. In 1996, Nicole transferred to the NWS Forecast Office in Charleston, West Virginia, where she was promoted to General Forecaster. In Charleston she became heavily involved in flood warning operations. During 2001 Nicole moved to NWS Taunton MA as Senior Service Hydrologist, and has been in Taunton ever since. She became an Association of State Floodplain Managers (ASFPM) Certified Floodplain Manager (CFM) in April 2007.

**Edward Capone** is the Service Coordination Hydrologist at the National Weather Service Northeast River Forecast Center in Taunton, MA. He received his Bachelor of Science in Civil/Environmental Engineering from Northeastern University in Boston in 1974. After 20 years in the private sector working on Dam Design and Dam Safety in the U.S. and Internationally, he joined the National Weather Service as a Hydrometeorological Analysis and Support (HAS) Forecaster in 1994. Since the NWS is the Nation's Steward regarding river forecasting, he has spearheaded an effort pertaining to river flood forecasting from potential catastrophic dam failures. He is a long time member of the Association of State Dam Safety Officials (ASDSO) and the Canadian Dam Association (CDA) and is an Association of State Floodplain Managers (ASFPM) Certified Floodplain Manager (CFM). Ed maintains a NWS COOP station (35 yrs) in Norton, MA and has created a website with a plethora of weather - hydro related data with even a real-time groundwater level and seismic monitoring station.

# **CAMNET: A Regional Network of Real-Time Visibility Monitoring Sites**

Norm Beloin  
Retired from Environmental Protection Agency  
Billerica, MA

This presentation will discuss the CAMNET visibility camera network which is a collaboration among Northeast States for Coordinated Air Use Management (NESCAUM) and a number of other organizations. The objectives of CAMNET are as follows:

- Primary Objective:  
To demonstrate to the public the degradation in visibility due to air pollution in real-time for both rural and urban areas in the Northeast U.S.
- Secondary Objective:  
To document for scientific and policy purposes specific cases of severely reduced visibility due to air pollution of both regional and local sources.

The focus of the discussion will be (1) to show how to access the CAMNET and other visibility monitoring sites via the internet; (2) to show several case studies of visibility impacts including the recent event of the Quebec fires on May 31, 2010 where the Mt. Washington, Burlington, VT and Boston sites were impacted; and (3) to briefly discuss the new high quality digital cameras used at several sites including Blue Hill.

## **Presenter's Bio**

Norm retired from the Environmental Protection Agency New England Region in 2008 after serving over forty years with the Agency. He served as the Team Leader for EPA Region I Office of Environmental Measurement and Evaluation's Air Monitoring and Assessment Team. The team provides air measurement technical expertise, advice, guidance, and policy interpretation to the regional air program offices, the New England States and Tribes and the general public. He also served on a number of EPA National Workgroups including workgroups revising the federal air monitoring regulations, revising the requirements for quality assurance in the air program, for the regional haze program, and as a representative to the Tribal Air Monitoring Support Center's Steering Committee. In addition Norm worked on air monitoring projects in Poland, Brazil, Russia, Malaysia, and Canada. He was a Public Health Service Commission Officer and has authored several technical papers on the effects of air pollution and air monitoring.

Norm has a Bachelor Degree in Chemical Engineering from the University of Detroit and a Masters of Public Administration from Western New England College. He is has been a Director of the New England Section of the Air and Waste Management Association and currently serves as Bi-law Chair. He has also been on the Board for the Blue Hill Observatory.

## **A 21<sup>st</sup> Century Weather Obsession**

Drew Butler  
stormtopia.com

21<sup>st</sup> century advancements in digital technology, especially the Internet, have been a boon to the amateur weather forecaster. I have learned a lot about forecasting by using software programs and websites such as NOAA/NWS, WeatherTAP.com, Accuweather Professional, College of DuPage NextLab, and other resources like online weather schools. As computer forecast models continue to develop more precise capabilities, especially in the convective field, weather forecasting—at any age—will be a finer, more accurate, and lifesaving hobby or profession. Drew will present one of his video forecasts and explain how he obtains data to compile his amateur weather forecasts.

### **PRESENTER'S BIO**

Drew is a sixth grade student at the Wayland Middle School. He's had a passion for weather all of his life, especially after the blizzard of '05 and witnessing Tropical Storm Fay ripping apart northern Florida right in front of his eyes. He loves all aspects of weather from a sunny day to a downburst; however, short range forecasting , storm tracking and, above all, storm chasing, is what he loves most. Drew maintains [stormtopia.com](http://stormtopia.com) along with a gang of weather fanatics who attempt to forecast for the lower 48 States and provide special interest weather stories to the amateur forecast community.

# **Project Climate Change**

## **An Inquiry Based Approach to Climate Change Education**

Jonathan Ariel Forest Byrne  
Instructor, Mad Science of Greater Boston  
Waltham, MA

[Byrnejonathan12@gmail.com](mailto:Byrnejonathan12@gmail.com)

The media is currently saturated with information regarding the controversial topic of climate change. However this hotly debated topic tends to be sensationalized by extremists, distorted or misrepresented by often well intentioned media icons such as actors and politicians, as even certain aspects of “legitimate scientific data” on climate change remain questionable. Consequently students on both the primary and secondary level exposed to this myriad of information become confused, misled, and even anxious about the possibility of a “grim future for planet earth” etc.. *Project Climate Change* is a guided inquiry into the topic of climate change in which students conduct their own investigation / research and draw their own conclusions. The project culminates with each team presenting / defending their research within a science meeting format. The goals of the project are to 1) promote active / cooperative learning, 2) foster a deeper understanding of climate change and its associated complexities including media distortions, politics, and hyperbole, and 3) foster deeper understanding of the scientific process and the format of a scientific meeting. This project is especially designed for grades 8-12.

### **Presenter’s Bio**

A meteorologist and science teacher, Jonathan was a teacher of physics and earth/space science at the Advanced Math and Science Academy Charter School in Marlborough, MA where he also served as Science Department Co-Chair and member of the Academic Board of Directors. A former student of Arthur Eisenkraft (founder of the *Active Physics* and *Active Chemistry* textbook series) Jonathan is currently entering his thirteenth year of teaching science and math on the secondary level. Jonathan has also written and presented numerous articles and monographs on science education and dynamic meteorology, and was a contributing author to *The Life Cycles of Extratropical Cyclones*, a textbook currently utilized in undergraduate and graduate programs in meteorology and atmospheric science worldwide. Jonathan holds a B.S. in Earth and Atmospheric Science from Boston University, and a M. Ed, in Secondary Science Education from the University of Massachusetts. Jonathan is also a member of the American Meteorological Society.

Jonathan has extensive public lecture experience. He was a guest lecturer in basic topics in astronomy and meteorology at the University of Massachusetts-Boston. He lectured on New England’s historic snow storms at the Blue Hill Weather Observatory in Milton, MA. He has given numerous conference presentations for the American Meteorological Society, including: 75<sup>th</sup> Symposium on the Life Cycles of Extratropical Storms in Bergen, Norway; 27<sup>th</sup> and 29<sup>th</sup> Symposia on Hurricanes and Tropical Meteorology; and he has been an annual speaker at the Northeast Storms Conference from 1994-present. Jonathan has also presented at Symposia on Education at the Toronto Science Center, the University of Edinburgh, Scotland, and at AMS Annual Meetings in 1995 and 1997.

## **La Niña's Back. Who Gets the Snow?**

Joseph D'Aleo  
Executive Director, Icecap.us  
Nashua, NH

2009/10 was an El Niño winter in which New England missed the Snowmageddon events of the Mid-Atlantic and frigid cold of the south and central. A lot like 1977 (one of the analog years), 2009/10 had a very warm end of winter and spring, so rare for this part of the country. Joe will review the very interesting winter of 2009/10 worldwide with its all time record winter negative arctic oscillation and continued solar slumber. He will then look ahead to 2010/11, with a return to La Niña and explain why parts of New England can expect some extreme cold and heavy snow.

### **Presenter's Bio**

Joseph D'Aleo received his BS and MS in Meteorology from the University of Wisconsin and was in the doctoral program at NYU. He was a professor of Meteorology and Climatology at Lyndon State College.

Joe left Lyndon to become First Director of Meteorology and co-founder of the cable TV Weather Channel. He left The Weather Channel to become Chief Meteorologist at WSI. He also designed the content for Intellicast.com and did R&D for statistical climate models used operationally in their energy and agricultural seasonal and long range forecasting.

He partnered with 6 others in a commodity hedge fund that traded in energy and ags for 4 years and he did weekly and daily AG forecasts for WSI and seasonal outlooks and weekly climate and weather stories for their web site Intellicast as "Dr. Dewpoint." Now he is doing that on his own.

He is a fellow of the American Meteorological Society and a Certified Consulting Meteorologist. He was also a Councilor and Chair of the Committee on Weather Analysis and Forecasting. He has chaired or co-chaired national conferences for the AMS and the National Weather Association.

Joe is Executive Director of ICECAP (<http://icecap.us>), a very popular web site devoted to climate change. ICECAP co-sponsored and Joe was a speaker at the three annual International Conferences on Climate Change organized by the Heartland Institute and featuring over 1800 attendees and 200 speakers from 24 countries.

# **NWS Digital Aviation Services**

Joe DelliCarpini  
NOAA/National Weather Service  
Taunton, MA

Requirements for the FAA's Next Generation Air Transportation System (NextGen) mandate that the Weather Information Database, provided by the NWS, "will include at least the elements of turbulence, icing, ceiling, visibility, convection, and winds." While NextGen is several years away from full implementation, there exists a unique opportunity to provide meaningful input to its development. In addition, stakeholders such as the FAA, U.S. Coast Guard, helicopter medical services, state police, and general aviation have expressed interest in digital and graphical ceiling and visibility forecasts, since they require information beyond the scope of the traditional airport-based Terminal Aerodrome Forecast (TAF).

In preparation for NextGen, and to provide enhanced aviation forecast services, the NWS Eastern Region has initiated a pilot project to explore how digital aviation services can be integrated into today's forecast operations. A regional Aviation Science Steering Team was formed with an initial vision to "assess the state of the science" for producing digital aviation forecasts – ceiling and visibility in particular. In tandem, four Eastern Region NWS offices (Taunton, MA, Greenville-Spartanburg, SC, Charleston, WV, and Caribou, ME) have developed tools and methodologies for preparing experimental gridded aviation forecasts.

Assessments are being made of a number of aviation guidance data sets and an assortment of tools and methods used to generate gridded aviation forecasts, all of which employ sound science. Forecasters populate hourly Ceiling and Visibility grids in addition to other aviation-related grids such as Temperature, Dew Point, Wind, Wind Gust, Sky Cover, and Weather for production of scheduled TAFs. This process allows forecasters to interact with model guidance, rather than simply "draw pictures." Internally, it has been demonstrated to be an efficient process which gives the forecaster additional analysis time. It also ensures consistency with other NWS forecast products.

This presentation will detail the process of creating digital aviation forecasts at NWS Taunton, including a demonstration of the various model guidance sets used by the forecasters. Web graphics of Ceiling and Visibility will be included, in order to show the end result of the process. Finally, a sample of verification statistics will be shown, which so far have been promising, especially during the cool season.

## **Presenter's Bio**

Joe DelliCarpini is the Science and Operations Officer at the National Weather Service in Taunton, MA. He is a native of the New York City area and received a Bachelor of Science degree in Meteorology from the State University of New York at Oswego.

His career with the National Weather Service began as a Student Trainee in Boston before going to the Binghamton, NY office as a Meteorologist Intern. He returned to southern New England in 1996 as a Hydrologic Forecaster at the Northeast River Forecast Center in Taunton, before heading back to the Weather Forecast Office as both a General Forecaster and Senior Forecaster.

One of Joe's interests includes aviation meteorology, and he recently led the effort to begin digital aviation services at the Taunton office. He is also involved with several regional and national aviation teams.

## **Extreme Weather in the Classroom**

Jeff DeRosa  
Mount Washington Observatory  
North Conway, NH

Few places on Earth experience the combination of high winds, heavy icing and extreme cold as frequently as the summit of New England's highest mountain. Remarkably, since 1932, there has been one organization responsible for recording these often record-breaking conditions: the Mount Washington Observatory. Weather observation, however, is not the Observatory's only mission – a mission that also includes education. As a result, in this talk I will discuss the work of our organization, how we function in such extreme conditions, and the methods we use to bring New England's unique alpine environments directly into your classroom.

### **Presenter's Bio**

Jeff DeRosa is the Outreach Coordinator for the Mount Washington Observatory; a private, non-profit scientific and educational institution responsible for observing meteorological conditions at the "Home of the World's Worst Weather."

Prior to serving as the Outreach Coordinator, Jeff spent three years at the organization's mountaintop weather observatory where he frequently recorded winds in excess of 100 MPH and a temperature as cold as -45 °F. Deciding this was not cold enough, Jeff left the organization to serve as the Chief Weather Observer for the United States Antarctic Program's Amundsen-Scott South Pole Station. During nearly two years at this location, Jeff saw the thermometer dip to -108 °F (Wind Chill = -160 °F).

After Antarctica, Jeff served as a fill-in weather broadcaster for WGME-TV in Portland, Maine and then departed for the United Kingdom. While in England, Jeff attended Newcastle University and earned an MA in International Relations with a focus on the politics of climate change and geoengineering.

A native of Bath, Maine, Jeff now resides in North Conway, New Hampshire.

## **Breakfast with Hayden**

Hayden Frank  
NOAA / National Weather Service  
Taunton, MA

Breakfast with Hayden will be an exciting discussion on many websites that professional meteorologists use on a daily basis to monitor and issue weather forecasts. This will be an interactive talk in which attendees can ask questions at any time during the demonstration. A lot of the websites presented will give you access to computer model data, along with real-time data and observations. Hayden plans on showing ensemble model data to explain how using a probabilistic approach to weather forecasting can allow you to have the most success in the long run. This talk will also explain the products that are issued by the National Weather Service and exactly where to find them.

At the end of the presentation, he will call on a couple of volunteers to work together as a team and prepare a 72 hour weather forecast for a city somewhere in the United States. After that is completed, attendees will be able to enter a forecasting contest for a random city. The winner of the contest will be announced late in the afternoon and also receive a prize.

A list of links developed for this presentation will be available as a separate handout, on the day of the conference.

### **PRESENTER'S BIO**

Hayden Frank is a senior meteorologist with the National Weather Service in Taunton, MA. He is the Doppler Radar and Fire Weather Focal Points at the office. He also works on various other programs, including StormReady, research, and many different outreach projects.

Hayden was born in Philadelphia, PA and always had a love for meteorology from a very young age. He graduated from the Pennsylvania State University in 1998 with a Bachelor's Degree in Meteorology. After graduation, Hayden accepted a temporary job with the National Weather Service in Tulsa, OK. Six months later, he became a permanent National Weather Service employee with the office in Wichita, KS before transferring to Taunton in 2003. Hayden loves all kinds of weather, but always had a special interest in snowstorms, so living in New England is a perfect fit for him. In November 2008, he married Sara Vecchio Frank in Cassenovia, New York. The couple resides happily in Boston, Massachusetts and had their first child last summer.

## **The Baltimore/Washington Region's Record-Breaking Climate Extremes of 2009-2010**

James E. Lee  
NOAA/National Weather Service  
Baltimore/Washington Weather Forecast Office  
Sterling, Virginia

In a period of less than seven months of the year 2010, the Baltimore, Maryland/Washington, DC, region experienced two significant climate extremes, with record-breaking seasonal snowfall and record-breaking seasonal heat. This talk will review several of the events that contributed to these extremes, provide comments on the need for consistent climate observations, and draw conclusions relating to the United States weather-enterprise. The talk will also include insights into the major National Weather Service (NWS) milestones that have been witnessed throughout the speaker's 25+ year career with the NWS.

### **Presenter's Bio**

Since September 2004, Jim Lee has been Meteorologist-in-Charge (MIC) of the National Weather Service Baltimore/Washington Weather Forecast Office, located in Sterling, Virginia. From December 2000 to his appointment as MIC in 2004, Jim was the Chief of Fire and Public Weather Services at National Weather Service Headquarters in Silver Spring, Maryland.

From 1993 to 2000, Jim spent seven years as the initial Science and Operations Officer for the Boston National Weather Service Forecast Office. Jim started his NWS career in the in the early 1980s, working in development, testing, and acquisition of the Next Generation Weather Radar (NEXRAD) Program and Advanced Weather Interactive Processing System (AWIPS) Program.

Jim has a Master's degree in Civil Engineering with specialization in Remote Sensing from Virginia Polytechnic and State University; and a Bachelor of Science degree in Physical Science, with specialization in Meteorology and Mathematics from the University of Maryland - College Park. Jim is a native Marylander, having graduated from Montgomery County's John F. Kennedy High School in 1977. Jim is also a 2001 graduate of the National Weather Service Senior Leadership Potential Program.

## **A Meteotsunami on the Maine Coast**

Jeffrey H. List, Maitane Olabarrieta, Rich Signell, Brad Butman, and Amy Farris  
U.S. Geological Survey  
Woods Hole, MA

During the afternoon of 28 October 2008, eyewitnesses reported of a series of anomalous waves entering harbors and tidal channels along approximately 30 km of Maine Coast, with strong, infrastructure-damaging currents that reversed direction on a time scale of 10-20 minutes. A time series of tide-removed sea-surface elevation extracted from video camera images at Boothbay Harbor reveals tsunami-like waves with a period of approximately 20 minutes and a maximum crest to trough height of 1.3 m. Hydrodynamics-based modeling supports the hypothesis that the event was a meteotsunami forced by a moving convective cell or rain band and its associated atmospheric pressure disturbance, which was identified from radar reflectance images and offshore buoy pressure measurements. Although the atmospheric processes generating the moving pressure disturbance are unclear, the pressure variation was approximately 2-3 millibars in magnitude, travelled towards the coast at a speed of about 41 m/s, and had an along-coast extent of about 40 km centered on the section of coast where the anomalous waves were reported. A sea-surface displacement on the order of 2-3 cm, expected through the standard reverse barometer effect, appears to have amplified by a factor of about 50 to produce the wave height observed at Boothbay.

### **Presenters' Bios**

**Jeff List** is an Oceanographer with the U.S. Geological Survey in Woods Hole, Massachusetts. He received his Bachelor of Science degree in Geological Sciences at The Pennsylvania State University in 1981, and his Ph.D. in Geological Oceanography from the Virginia Institute of Marine Science in 1989. Jeff List's research is focused on the processes leading to erosion of sandy shorelines, especially processes driven by waves generated during coastal storms. In 1992 he conducted research on a meteotsunami that impacted Daytona Beach, Florida.

**Maitane Olabarrieta** is a postdoctoral Oceanographer with the U.S. Geological Survey in Woods Hole, Massachusetts. She received her Ph.D. in Ocean Sciences from the University of Cantabria (Spain) in 2006. Maitane Olabarrieta's research is focused on the development and application of 2D and 3D hydrodynamic numerical models for long waves and surf zone hydrodynamics. Recently she conducted research on the feasibility of an alarm system against the meteotsunamis that sporadically hit the Ciutadella harbor (Menorca, Spain).

**Rich Signell, Brad Butman, and Amy Farris** are Oceanographers with the U.S. Geological Survey in Woods Hole, Massachusetts.

## Lessons Learned on Hurricane Forecasting and Emergency Messaging

Max Mayfield  
Hurricane Specialist, WPLG-TV 10 – Miami, FL  
Former Director of National Hurricane Center

Bryan Norcross  
Hurricane Specialist, The Weather Channel – Atlanta, GA  
President/CEO of America's Emergency Network



Max Mayfield



Bryan Norcross

Our Nation's Hurricane Program has always been a team effort. The effectiveness of this team depends, in large part, on interactions between meteorologists, emergency managers and the media. While we have seen tremendous improvements in observing and forecasting hurricanes, there are still weaknesses that could contribute to a large loss of life in a single hurricane event and meteorologists are still struggling with the age old issue of how to deal with forecast uncertainty. The critical role of emergency managers and the need to effectively communicate emergency messages are discussed.

In the United States, the messages from the meteorologists at the National Hurricane Center (NHC) as well as from federal, state and local emergency managers are typically filtered through the media. Behind-the-scenes stories during Hurricane Katrina provide examples of successes and failures in the way we communicate.

The status of a new emergency network that provides an improved way of communicating from the NHC, local National Weather Service Weather Forecast Offices, and Emergency Operations Centers is shared.

## **Presenters' Bios**

### **Max Mayfield**

Title: WPLG-TV Hurricane Specialist

Education: B.S. in Mathematics 1970, University of Oklahoma  
M.S. in Meteorology 1987, Florida State University

Professional Societies: American Meteorological Society  
National Weather Association

Positions Held: 2007-Present: WPLG-TV Hurricane Specialist  
2000-2007: Director, National Hurricane Center (NHC)  
1998-2000: Deputy Director, NHC  
1988-1998: Hurricane Specialist, NHC  
1972-1988: Satellite Meteorologist, NHC  
1970-1972: Forecaster, Air Weather Service, U.S. Air Force

#### Career Highlights:

Max Mayfield is a Fellow of the American Meteorological Society (AMS) who has presented invited papers at national and international scientific meetings, lectured in United Nations' World Meteorological Organization (WMO) sponsored training sessions, and provided numerous interviews to electronic and print media worldwide.

In 2010, Mr. Mayfield was named to Florida State University's list of 100 Distinguished Graduates and received the Regents' Alumni Award from the University of Oklahoma.

After a distinguished career of service at the National Oceanic and Atmospheric Administration's (NOAA) National Hurricane Center, Mr. Mayfield has been the on-air Hurricane Specialist for WPLG-TV in Miami, FL. The National Academy of Television Arts and Sciences' Suncoast Chapter recently recognized Mr. Mayfield with an Emmy for the station's 2009 Hurricane Special.

In 2006 he received the Government Communicator of the Year Award from the National Association of Government Communicators, as well as the prestigious Neil Frank Award from the 2006 National Hurricane Conference "for...efforts to significantly improve the accuracy of hurricane forecasting...as Director of the National Hurricane Center, a factor which has undoubtedly helped save countless lives and property."

In 2005 he received a Presidential Rank Award for Meritorious Service from President George W. Bush. He was named ABC Television Network's "Person of the Week" after 2005 Hurricane Katrina.

In 2004 the Federal Coordinator for Meteorological Services and Supporting Research sponsored Interdepartmental Hurricane Conference presented its Richard Hagemeyer Award to Mr. Mayfield for his contributions to the nation's hurricane warning program. Also in 2004, Mr. Mayfield received the Governor's Award, an "Emmy", for extraordinary contributions to television

by an individual not otherwise eligible for an Emmy from the Suncoast Chapter of the National Academy of Television Arts and Sciences.

In 2000 he received an Outstanding Achievement Award at the 2000 National Hurricane Conference for developing and expanding educational opportunities for state and local emergency management officials.

In 1996 the AMS honored him with the Francis W. Reichelderfer Award for exemplary performance as coordinator of the National Hurricane Center's hurricane preparedness training for emergency preparedness officials and the general public.

Max Mayfield has been recognized by the Department of Commerce with Gold Medals for his work during 1992 Hurricane Andrew, 2003 Hurricane Isabel, 2004 U.S. landfalling hurricanes, and the 2005 U.S. landfalling major hurricanes including Katrina, and a Silver Medal during 1988 Hurricane Gilbert. He was also awarded a NOAA Bronze Medal for creating a public-private partnership to support the nation's disaster preparedness. He is the former Chairman of the WMO's Regional Association-IV Hurricane Committee which supports 26 members from Atlantic and eastern Pacific countries. As former director of NOAA's National Hurricane Center he has played a key role in forecast and service improvements over a 34 year career.

Mr. Mayfield is married, has three children, and resides in Miami, Florida.

## **Bryan Norcross**

Bryan Norcross is a Hurricane Specialist at The Weather Channel, based in Atlanta. He joined the channel in the summer of 2010, bringing his extensive experience covering tropical storms and hurricanes to The Weather Channel's round-the-clock coverage.

In addition, Bryan is President and CEO of America's Emergency Network, Inc. (AEN), an emergency-communications networking company based in Miami. The system allows local governments and other agencies to stream live news briefings to the public and the media without news crews or other conventional video-transmission systems. AEN is in use at the National Hurricane Center, the Florida Division of Emergency Management, and other agencies in the state.

Bryan became nationally known after he "talked South Florida through" Hurricane Andrew in 1992. From 1996 through 2008 he was the in-house hurricane analyst for CBS News in New York and anchored the coverage of numerous hurricanes for WFOR-TV/CBS in Miami. Prior to that time, he worked for NBC in Miami and New York. Bryan appeared frequently on CBS News programs including the CBS Evening News with Dan Rather and Katie Couric. Bryan also appeared frequently as the primary fill-in weatherman on the CBS Early Show with Bryant Gumbel.

After Hurricane Andrew, Bryan was named Expert Advisor to the Academic Task Force on Hurricane Catastrophe Insurance by Florida State Treasurer and Insurance Commissioner Bill Nelson. Bryan was a member of the Governor's Committee to evaluate state response and recommend changes to the state emergency management system by Governor Lawton Chiles. In appreciation for his work before, during and after Hurricane Andrew, Bryan received the 1993 David Brinkley Award for Excellence in Communication. He was also publicly recognized with designations of Bryan Norcross Days in Miami, Miami Beach, and Ft. Lauderdale, among other

cities. In addition, he's the recipient of an Emmy Award from the southeast chapter of the National Association of Arts and Sciences, and the DuPont and Peabody awards, the highest awards given in broadcasting.

Bryan's comprehensive hurricane guide called "Hurricane Almanac" was released by St. Martin's Press in July 2006. The book covers hurricane science, history, preparedness and more. A follow-up edition was released in the spring of 2007. Bryan has a Bachelor of Science degree in Math and Physics and a Master of Science degree in Communications and Meteorology from Florida State University. In addition Bryan received an Honorary Doctor of Public Service degree from Florida International University. Bryan is a resident of Miami and New York City.

## **Weather and Your Lung Health The Facts May Take Your Breath Away!**

Nick Morganelli  
Freelance Broadcast Meteorologist  
MA Leadership Board Member, American Lung Assoc. of New England

Katie King  
Massachusetts Director, Health Promotion & Public Policy  
American Lung Association of New England

We breathe the lower atmosphere and that's the layer where, of course, we find weather. So, how is air quality affected by weather? Inversions, the chemistry of ozone creation, wind, precipitation, and amount of insolation are all key elements of our daily weather that play a role in the cleanliness of the air we breathe. We'll also examine how the broadcast meteorologist can convey a clear message about air quality and what elements of the on-air presentation are most critical to the viewer and more importantly to those with respiratory distress. These and other questions will be answered as we take a comprehensive look at air quality.

What exactly are the effects of air quality on lung health? The American Lung Association's 2010 State of the Air Report will be used to provide an overview of the current air quality in our region, and governmental standards in place to help regulate pollution levels and protect public health. This will be followed by a discussion on how poor air quality affects everyone's health and puts those with lung diseases, such as asthma and COPD, at higher risk. Lastly, recommendations will be provided for actions that individuals can take to reduce pollution and protect themselves on days with poor air quality.

### **Presenters' Bios**

**Nick Morganelli**, a Broadcast Meteorologist and teacher, has devoted more than 10 years to the mission of the American Lung Association of MA and New England. Speaking out against dirty power plants, emceeing or volunteering at events, and serving on the board, he is committed to promoting lung health and fighting lung disease. He holds a B.S. in Meteorology from Lyndon State College and has been in broadcasting for nearly 25 yrs. In the fall he will begin his 6<sup>th</sup> year teaching secondary sciences at Community Christian School in his home city of Westfield where he also serves on the City Council. Nick says: "As a father of four, anything I can do to keep our environment as clean as possible for them is a priority" A fun fact about Nick: He counts the rainbows he's seen and is currently at 85 !

**Katie King** is the Massachusetts Director of Health Promotion and Public Policy for the American Lung Association of New England. In this capacity, she advocates for statewide policy change and implements educational campaigns and programs to improve lung health across the state. Katie holds a BA in Sociology from Boston University and is a Master's Degree candidate at the Boston University School of Public Health with a concentration in Health Policy and Management.

## **A Roadmap for Engaging Students of All Ages in Science**

Matt Noyes  
New England Cable News  
Newton, MA

NECN Meteorologist Matt Noyes travels across New England every year to visit classrooms from the White Mountains to Martha's Vineyard, teaching approximately 10,000 students each academic year about meteorology, and is a recipient of a Massachusetts State Senate Citation for his work in Bay State classrooms. Driven by the challenge of transforming science-snoozing students into science-sleuths over the course of his one-time, 45 minute visits, Matt has inspired several students that have pursued careers in science. Matt will share his insight and techniques on making scientific concepts exciting and engaging for New England's youth via presentation, interaction and simple, hands-on experiments. This presentation is especially geared toward grades 2 through 12, though teachers of all ages are welcome to attend as scientific knowledge and understanding, rather than age, tends to be the best barometer for determining teaching methods.

### **PRESENTER'S BIO**

Matt Noyes began as NECN's weekend meteorologist in 2002, moved to mornings from 2004 to 2010, and now can be found on NECN each weekday evening, overseeing on-air and off-air implementation of weather broadcasting methods for NECN's team of meteorologists. Matt holds a Bachelor of Science degree in Meteorology from Cornell University, and is a member of the American Meteorological Society.

In addition to his forecasting experience, Noyes has been an instructor of Meteorology at the college level, spokesman for the annual record-setting New England-wide American Red Cross Blood Drive, and has traveled across New England to bring the science of meteorology into school classrooms, receiving commendation from the Massachusetts State Senate for his educational efforts with children. Matt's community dedication also earned him the Massachusetts State Police Public Service Award for assisting the organization in preparation for a major hurricane strike to New England, and he provided his services to the organization for street level weather forecasting and analysis during the Democratic National Convention in 2004. Noyes also conducts private forecasting for aviators, providing forecasts that have led to national victories in races requiring no use of instrumentation during flight.

Before joining the NECN family, Matt was the Morning Meteorologist at NewsChannel 34 in Binghamton, NY, and a meteorologist at NewsChannel 9 in Syracuse, NY.

## **Air Force Weather**

Lt Col Christopher Plonka  
104<sup>th</sup> Fighter Wing Combat Weather Team  
Barnes Air National Guard  
Westfield, MA

Air Force Meteorologists and Weather Technicians deliver accurate, relevant, and timely environmental information, products, and services anywhere in the world. They directly impact military decision superiority by enhancing predictive battlespace awareness and enabling military commanders at all levels to anticipate and exploit the battlespace environment, from the mud to the sun.

Information will be presented on the Air Force Weather mission along with information on training, equipment and services provided to the military commands.

A brief overview on the 104<sup>th</sup> Fighter Wing's mission will also be provided to include the new Air Sovereignty Alert mission.

### **Presenter's Bio**

Christopher Plonka is the Officer-in-Charge for the 104<sup>th</sup> Fighter Wing Combat Weather Team at Barnes Air National Guard Base in Westfield, MA. He joined the Massachusetts Air National Guard in 2000 after 8 years on active duty in the United States Air Force as a Meteorologist. Assignments while on active duty included Atmospheric and Space Environmental Forecaster for NORAD at Cheyenne Mountain Air Base in Colorado Springs; Staff Weather Officer for the US Army's V Corps in Heidelberg, Germany; and Requirements Section Chief, 7<sup>th</sup> Weather Squadron also in Heidelberg, Germany. Deployments include Sarajevo, Bosnia, and Herzegovina in 1996 to support Operation Joint Endeavor... and Iraq in 2003 to support Operation Iraqi Freedom.

Lt Col Plonka received a Bachelor of Science degree in Meteorology from Lyndon State College in 1991 and a Master of Science degree in Information Technology from the University of Maryland in 1999. Lt Col Plonka is also employed by General Dynamics Information Technology as an IT Project Manager.

# **The Record Rain and Floods of March 2010: Southern New England's *WaterWorld***

Eleanor Vallier-Talbot  
NOAA/National Weather Service  
Taunton, MA

Hemispheric and synoptic weather features converged across southern New England during mid and late March 2010 to bring an excessive amount of rainfall, especially across eastern Massachusetts and Rhode Island. Some locations received over 20 inches of rain during March, which is more typical of a season's rainfall rather than a single month.

The winter and early spring of 2009-2010 featured a highly amplified upper level flow pattern across North America thanks to a moderate El Niño across the tropical Pacific, which was starting to decay during March, along with a very strong negative North Atlantic Oscillation (NAO) over the northern Atlantic. In these cases, synoptic features tend to slow their movement across the contiguous United States as upper level cutoff lows develop.

Computer forecast models indicated a rather ominous repetitive pattern across southern New England during the middle and latter portions of March. They showed not one or two, but three successive cutoff 500 hPa low pressure areas developing across the Ohio Valley and mid Atlantic states, which would ultimately move off the New Jersey coast. Ensemble and operational model forecasts performed well in signaling the potential for excessive rainfall, indicating very strong low and mid level moisture convergence and onshore flow into the region. One deficient aspect of the operational models was the quantitative precipitation forecast (QPF). While there was an indication of the potential for excessive rainfall for two of the three events, and the placement of the axis of heaviest rainfall was reasonable, what actually occurred was up to double the amount of the model forecasts.

This presentation will show the hemispheric pattern in place during March, with a synoptic review of the three events as they came to fruition. A QPF model review will be included, along with rainfall reports for the three events showing the deficiencies of this model parameter. Photographs of the flooding will be shown, as well as the March rainfall records.

## **Presenter's Bio**

Eleanor Vallier-Talbot has been a meteorologist with the National Weather Service since 1985. She previously worked at NWS Taunton from 1993-98, then returned in August 2001 after a stint as a Senior Forecaster in Charleston, South Carolina. She has also worked at NWS offices in Portland, Maine and Providence, Rhode Island. Prior to her NWS career, she worked as weekend observer at the Blue Hill Observatory.

Eleanor has served as Outreach Program Leader at NWS Taunton since her first work assignment in 1993. She has visited numerous schools, scout troops, civic and philanthropic organizations, as well as presenting at educational and meteorological conferences. For her work with the AMS' DataStreme Atmosphere Project, she became a Weather Education Resource "Teacher." Eleanor is also a published author with her chapter in "*Weather: The Nature Company Guides*," republished by Fog City Press under the title "*A Guide to Weather*."

Eleanor has taken the lead as Satellite Program Leader for the office, serves as Equal Employment Opportunity Program Leader, and assists with SKYWARN spotter training and marine weather programs. She also serves as Co-Chair of the National Weather Association Education Committee.

Eleanor attended the University of Lowell (now the University of Massachusetts at Lowell) for two years before transferring to Lyndon State College, where she received her Bachelor of Science degree in meteorology in 1982. She resides in Taunton with her husband Dean and two kitties, Charly and Christy.