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COMMERCE DEPARTMENT AWARDS BRONZE MEDALS TO NWSFO ALBANY

Gene Auciello
Meteorologist In Charge, NWS Albany

The U.S. Department Of Commerce has awarded two Bronze Medals to NOAA's National Weather Service Forecast Office in Albany, New York. The staff was recognized for exemplary customer service in enabling public officials and citizens to take life-saving action during both the Warren County flash flood of June 2005, and the unprecedented flooding across the Northeast in October 2005.

On June 13, 2005, thunderstorms in Warren County, New York produced rainfall totals of 4 to 5 inches per hour, resulting in catastrophic flash flooding. The challenge for the Albany office was to issue Flash Flood Warnings with sufficient lead time to allow for life-saving actions. Despite devastating damage, no deaths, and only twelve injuries, were reported. A warning accuracy of 100 percent and a 68 minute average lead time attained through the efforts of the Albany office far exceeded national averages.

From October 7 to 15, 2005, three back-to-back episodes of prolonged heavy rain produced 12 to 24 inch total rainfall amounts, which caused severe flooding across the Northeastern U.S. The heavy rain forced thousands of people to evacuate, knocked out electricity, weakened dams, and made roads impassable throughout the region. Significant flooding also occurred in many low-lying urban areas, where several major roadways were under 4 to 6 feet of water. Many bridges in the area were destroyed. Advanced warning and detailed localized information prompted officials to pre-position assets, evacuate low-lying areas, and provide immediate relief to impacted areas. These monitoring and evacuation actions saved numerous lives.

"Saving lives and property is the central function of each National Weather Service Forecast Office," said Brig. Gen. David L. Johnson, U.S. Air Force (Ret.), Director of NOAA's National Weather Service. "The Bronze Medal awards demonstrate the hard work of the Albany Forecast Office to accomplish this goal."

Retired Navy Vice Adm. Conrad C. Lautenbacher, Ph. D, Under Secretary of Commerce for Oceans and Atmosphere, and NOAA Administrator, presented the awards during a ceremony at DAR Constitution Hall in Washington, D.C. The Bronze Medal honors superior performance characterized by outstanding or significant contributions that have increased the efficiency and effectiveness of the Commerce Department.

SUMMER SWELTER CAN BE DOWNRIGHT DANGEROUS!

Kevin S. Lipton
Meteorologist, NWS Albany

Evan L. Heller
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Although many people look forward to the hot, sultry days of summer, too much heat over an extended period of time can be downright dangerous – even deadly! This is particularly true for the sick and elderly living in urbanized areas. And the combination of heat and high humidity is especially hazardous, making the body difficult to cool, and placing extra stress on the body's circulatory system – especially the heart.

Since 1997, heat has been the number one weather-related killer in the United States, with an average of 170 fatalities per year. In the 40-year period from 1936 to 1975, it's estimated that nearly 20,000 people in the United States succumbed to the heat, with more than 1,250 deaths during one year alone – 1980. And these numbers may actually be underestimated, with many of the deaths possibly having been attributed to 'old age' or pre-existing heart ailments. In reality, the inability of the body to stay sufficiently cool during extreme heat may have been the true cause.

Considering the staggering effects that heat can have on the human population, the National Weather Service has developed a useful tool in its efforts to more effectively alert the public to the dangers of heat waves. The Heat Index (HI) uses a combination of actual air temperature and relative humidity (RH) to produce an 'apparent temperature' – a measure of how hot it actually feels with the humidity factored in. Weather forecasters can assess the effects of heat and humidity on the human body, and relay this information to agencies that, in turn, develop plans for mitigating the ill effects of the heat.

Below is the Heat Index table, displaying values of the index. The HI always increases for any given temperature as the RH increases, and vice versa. For example, at an air temperature of 90 degrees when RH is 45 percent, HI is 93 degrees, while for the same air temperature with an RH of 55 percent, HI increases to 97. This index is a good indicator because the higher the humidity, the less apt sweat is to evaporate, and thus, the lesser is the cooling effect on the skin. In contrast, the lower the humidity, the more readily sweat can evaporate, thus producing a <u>greater</u> cooling effect. This effect is indeed why the expression "It's not the heat, but the humidity" came about. In Arizona, when the air temperature is over 100 degrees, the RH is often under 15 percent, creating an HI nearly identical to, or even lower than, the actual air temperature. It should be noted that the HI values were devised for conditions of light wind and shade. Exposure to full sunshine can actually increase HI values by up to 15 degrees F.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

<u>**Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity**</u>
Caution · Extreme Caution · Danger · Extreme Danger

Heat Index table

Here are heat risk categories, as listed by the National Weather Service, for people in elevated risk groups:

<u>**CAUTION**</u>: Fatigue possible with prolonged exposure and/or physical activity.

<u>EXTREME CAUTION</u>: Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.

<u>DANGER</u>: Sunstroke, heat cramps and heat exhaustion likely, and heatstroke possible, with prolonged exposure and/or physical activity.

<u>EXTREME DANGER</u>: Heatstroke/sunstroke highly likely with continued exposure.

Here are definitions of heat-related problems, and the actions to take regarding the varying degrees of heat symptoms listed above:

<u>Heat Cramps:</u> Painful spasms (usually in muscles of legs and abdomen) possible; heavy sweating.

<u>First Aid Actions for Heat Cramps (self or other)</u>:
1. Apply firm pressure on cramping muscles, or apply a gentle massage to relieve spasm.
2. Give sips of water. If nausea occurs, discontinue.

<u>Heat Exhaustion:</u> Heavy sweating; weakness; cold, pale or clammy skin; fainting and vomiting. A normal body temperature is possible, and, therefore, this factor should not be used to indicate the occurrence of heat exhaustion.

<u>First Aid Actions for Heat Exhaustion</u>:
1. Get victim out of sun. Lay victim down and loosen victim's clothing.
2. Apply cool, wet cloths to victim.
3. Fan victim, or move victim to air-conditioned room.
4. Give victim sips of water. If nausea occurs, discontinue. If vomiting continues, seek immediate medical attention.

<u>Heat Stroke (also known as Sunstroke):</u> Elevated body temperature of 106ºF or higher; hot, dry skin; rapid and strong pulse; possible unconsciousness.

<u>First Aid Actions for Heat/Sunstroke</u>:
1. HEAT STROKE IS A MEDICAL EMERGENCY! SUMMON EMERGENCY MEDICAL ASSISTANCE OR GET THE VICTIM TO A HOSPTIAL IMMEDIATELY! DELAY CAN BE FATAL!
2. Move victim to a cooler environment. Reduce victim's body temperature with a cold bath or sponging.
3. Remove victim's clothing, and use fans and air conditioners.
4. If victim's body temperature rises again, repeat steps 1-4. Do NOT give fluids.

Fortunately, there are ways to mitigate the worst effects of extreme heat, several of which are listed below.

<u>Heat Wave Safety Tips:</u>
1. **Slow Down**. Strenuous activities should be reduced, eliminated or rescheduled to the cooler times of the day (e.g., early morning or late evening hours). Individuals at risk, particularly the elderly, should stay in the coolest available location (which may not necessarily be indoors).

2. **Dress for summer**. Wear lightweight, light-colored clothing. Lightweight materials 'breathe' easier, and the light colors reflect heat and sunlight, helping your body maintain a normal temperature.

3. **Eat less**. Certain foods, such as those rich in proteins, increase the body's heat production, and can actually increase water loss.

4. **Drink plenty of water or other NON-ALCOHOLIC fluids**…even if you don't feel thirsty. Your body needs water to keep cool. Persons who have epilepsy, heart or liver disease, are on fluid-restrictive diets, or who have a problem with fluid retention, should consult a physician before increasing their consumption of fluids.

5. **DO NOT DRINK ALCOHOLIC BEVERAGES**. Alcoholic beverages actually cause the body to increase the rate of water loss – something which is dangerous during a heat wave.

6. **Spend more time in an air-conditioned location**. Air conditioning in homes and other

buildings significantly reduces heat danger, and spending adequate time in an air-conditioned environment offers relief.

7. **DO NOT spend too much time in the sun**. Sunburn makes the job of heat dissipation by the body that much more difficult.

By following these safety tips during the next heat wave, you can greatly diminish the potential dangers of heat stress on your body. Don't let hot summer weather turn you into a fatal statistic!!!

Much of this information is from NOAA's National Weather Service brochure entitled *Heat Wave: A Major Summer Killer*, which was produced as a cooperative effort between NOAA's National Weather Service, the Federal Emergency Management Agency, and the American Red Cross.

LOCAL WINDS PART I: DOWNSLOPING WINDS

Thomas A. Wasula
Meteorologist, NWS Albany

Winds are caused by temperature differences that occur due to the uneven heating of the earth's surface. The temperature differences cause air density variations which result in a locally-produced pressure gradient that produces small-scale local winds. Many kinds of local winds are caused by certain topographical features or other physical variations of the local surface. For example, land and sea breezes are considered local winds that develop due to the local heating and cooling of the land and water. Three common downsloping local winds that impact valley locations in different parts of the world are the Chinook/Foehn, Santa Ana, and katabatic/fall winds.

Chinooks are warm, dry winds that progress down the east (or leeward) side of the Rocky Mountains. These winds also occur on the east side of the Alps in southern Europe. There, these local winds are called Foehns. These winds are generated on the leeward side of the Rockies or Alps as low pressure pulls in air across these high terrain barriers. This air is pulled down the leeward side of the mountain and, as the pressure of this air increases, it's heated and dried due to compression. Conversely, on the west (or windward) side of the mountains, condensation is occurring due to the rising air expanding and cooling as the pressure decreases. While being relatively mild, the temperatures associated with these downsloping winds are usually less than 50˚F (10˚C). The Chinooks and Foehns usually occur in the winter and spring, when surface air temperatures are below freezing. These warm, dry winds bring significant changes to the local weather in valley locations. Chinooks can cause temperature rises of greater than 35˚F (20˚C) in less than 5 minutes, causing snow to melt rapidly. Chinook means "snow eater" in Native American language. Chinooks can be beneficial to ranchers east of the Rockies as they keep the grasslands clear of snow during the majority of the winter. However, the lack of snow can hurt the agriculture during the seasonal spring snow melt. Also, Chinooks can play havoc with Winter Olympics venues in North America. Extra preparations were made during the 1988 Olympics in Calgary to have sufficient snow made available for the venues in case Chinooks occurred.

Santa Ana winds are another Chinook-like wind that occurs in the United States. These winds impact southern California. Named after the Santa Ana pass, they're hot, drying winds that significantly increase the threat of forest fires, and are most common in the fall. Temperatures often reach the 90-100˚F (32-38˚C) range. Santa Anas have a large societal impact on the people of southern California. A strong area of surface high pressure, or an anticyclone, is typically centered over the Great Basin. The clockwise flow around the high helps advect desert air from Arizona and southern Nevada towards the Pacific Coast. Wind speeds increase as the air is funneled through the canyon passes of the coastal mountain ranges. The Santa Ana winds are further enhanced by compressional heating. The warm, dry air further dries the valley locations, and the already dry environment becomes exceedingly parched by the desiccating effect of the Santa Ana winds. Vegetation becomes scorched, and timbers, volatile for explosive fire danger. A simple spark could ignite a major wildfire, impacting thousands of acres of land. For centuries, very dry summers coupled with strong and persistent Santa Ana winds have produced numerous wildfires in southern California. These fires typically impact residents from Santa Barbara south to San Diego. Unfortunately, residents living in fire-prone areas who landscape their yards with highly flammable trees such as pines and eucalyptus have enhanced fire danger threat from Santa Anas. Wildfires induced by the Santa Anas will continue to be a major problem in the future. But these winds also help the ecology by ridding the land of dry chaparral thicket and sage scrub, thereby promoting new plant and tree growth.

Katabatic winds occur in the winter. These local winds involve cold, dense air descending down the mountains or highlands into valley locations. They're produced by cold air originating near the crest of ice sheets, such as in Greenland or Antarctica. The cold air is set in motion by the force of gravity, and it descends down the rim of a highland or mountain like a waterfall. The air is heated as with a Chinook, but starts out so frigid that the wind arriving in the valleys is colder and more dense than the air it's replacing. The air must be colder than that which it is displacing, since it's the incoming air's greater density that causes the down glide. Sometimes, as the frigid air descends from the mountains or highlands, enough channeling can occur to produce winds strong enough to cause the destruction of trees and other structures. The Mistral and Bora are two popular katabatic winds. The more famous, the Mistral, is directed from the French Alps to the Mediterranean Sea. The Bora forms in the mountains of the Slavic republics (former Yugoslavia), and is driven toward to the Adriatic Sea.

Local winds are a part of the global circulation around the world. The Chinook, Santa Ana and katabatic winds are just three popular downsloping local winds that impact portions of North America and Europe. There are many more types of local winds, including unique upsloping winds, which will be explored in the next edition of Northeastern StormBuster.

UNDERSTANDING AIR QUALITY… AND BREATHING EASIER!

Kevin S. Lipton
Meteorologist, NWS Albany

Summertime livin', and the breathing is…not easy. At least this is the case for many who live in the northeastern part of the United States. Summer is perhaps the season with the poorest air quality in the northeast states – mainly due to two pollutants: ozone and particulates. On days when either or both of these fill the air, many will experience an exacerbation of general allergies, some symptoms of which may include breathing difficulties and unusual fatigue. And for those who are particularly vulnerable to poor air quality (e.g., young children, the elderly and individuals with lung or heart ailments), such days may be downright dangerous. Fortunately, we're able to predict when such highly polluted conditions are likely to occur, enabling people to take the necessary precautions to protect themselves from the unhealthy air.

The Environmental Protection Agency (EPA) has created the Air Quality Index (AQI) to indicate how clean or polluted the air is, or is expected to be, on any given day. This index focuses on the health effects that may be produced after breathing varying concentrations of polluted air – whether these effects occur a few hours, or even several days, after breathing the air. The EPA calculates five major pollutants regulated by the Clean Air Act: ground-level ozone; particle pollution (particulate matter); carbon monoxide (CO); sulfur dioxide (SO_2), and; nitrogen dioxide (NO_2). Of these, ground-level ozone and airborne particles have the greatest impact on human health in the United States.

Ozone (O_3) is a colorless gas that can be found in the air we breathe. That which is present very high up in the atmosphere, at altitudes over 12 miles above the earth's surface, is actually a good thing, since it shields the earth from the sun's harmful ultraviolet rays. But the same gas right near the earth's surface, where we can breathe it in, is a potentially harmful pollutant. It causes inflammation and irritation of the respiratory system, especially during physical activity. This may produce such symptoms as shortness of breath, coughing, and throat irritation, and may exacerbate asthma and allergies. In addition, repeated short-term ozone exposure may cause damage to the developing lungs of children, which may lead to reduced lung function in adulthood. In adults, frequent ozone exposure may accelerate the natural decline in lung function that occurs as part of the normal aging process. So, although ozone may be good high up in the atmosphere, it's real bad down below. So, how does ground-level ozone form? It's the result of a reaction in the presence of sunlight between chemicals known as Volatile Organic Compounds, or VOCs, and oxides of nitrogen. Some sources of VOCs and nitrogen oxides include: automobile exhaust; electricity generation stations; gasoline dispensing facilities; consumer products such as paints and cleaners, and; off-road engines such as those run by aircraft, trains, construction equipment, and even lawnmowers. The key is that sunlight initiates chemical reactions amongst these substances to form ozone – which is why ground-level ozone tends to be much more problematic in the summer, especially when the weather is sunny and hot.

Particulates, or particle pollution, refers to particles present in the air which are a mixture of solids and liquids of varying sizes. The smaller particles – those that are less than 10 micrometers in diameter – pose the greatest threat to human health since they can pass through the nose and throat more easily without being filtered out by hair or mucus. This means they're more apt to reach deep into the lungs and sinuses. For reference, ten micrometers in diameter is just a fraction of the thickness of a single human hair. Very small particles, with diameters less than 2.5 micrometers, are referred to as 'fine particles', and can be particularly dangerous due to their small size and ability to penetrate sensitive membranes. Such small particles are typically produced from the burning of fuels such as coal, wood, oil and diesel, and come from such sources as power plants, motor vehicles and wood stoves. Unlike ozone, high concentrations of particulate matter don't necessarily need sunlight in order to build up. Such buildups can even occur during cold winter months. Breathing air that contains high concentrations of particulate matter can cause a wide array of negative health effects, particularly for people with lung or heart disease, and in older adults. In these cases, short-term exposure to high concentrations of these particulates can aggravate heart or lung problems, often resulting in shortness of breath, coughing, chest pain, palpitations, fatigue and, in rare cases, an irregular heartbeat or even a heart attack. Even healthy individuals may experience reduced lung function and wheezing. High levels of particulate matter can even increase the body's susceptibility to respiratory infections. And even longer-term exposure has been associated with the development of lung diseases like bronchitis.

So, with all the negative effects unhealthy air can have on humans, the EPA developed the AQI. It's on a scale from 0 to 500. The higher the AQI, the higher the level of air pollution, and the greater the health concern. As can be determined from the color table which follows, an AQI value of 45 represents good air quality with little potential ill effect on public health, while an AQI over 300 represents hazardous air quality. An AQI of 100 generally corresponds to the national air quality standard, or the level the EPA has set as the threshold value for healthy vs. unhealthy air. Thus, AQI values below 100 are generally considered satisfactory. When AQI values rise above 100, the air quality is considered to be unhealthy - at first for certain sensitive groups of people, then for a broader base of the population as AQI values increase.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

The EPA AQI (Air Quality Index).

So – when AQI values reach unhealthy to very unhealthy levels – what should you do? First and foremost, limit your exposure to the outside air as much as possible. In particular, reduce prolonged, strenuous outdoor activity. Generally, the higher the AQI, the more people who will be adversely affected. So, for 'very unhealthy' air, even normally non-sensitive individuals should heed these precautions. Perhaps instead of jogging outside, take an indoor stroll – maybe at the local mall. When outdoor particulates approach high levels, some of them can 'spill' indoors through cracks and crevices. Fortunately, certain air filters and cleaners can help reduce these particulates indoors. In addition, eliminating indoor tobacco and candle use, as well as reducing the use of wood burning stoves and fireplaces, can also mitigate indoor particle levels.

When AQI values are expected to reach 100 or higher, the National Weather Service (NWS) office here in Albany disseminates Air Quality Advisories, based on information released by state agencies. For instance, the New York State Department of Environmental Conservation (NYSDEC) issues air quality health advisories for New York State, which the NWS then disseminates as an Air Quality Advisory, or AQA, that eventually reaches the public, media outlets and NWS web pages.

For more information on the effects of poor air quality on health, and ways to reduce exposure to pollutants, visit www.airnow.gov. Much of the information contained in this article can be found there, along with more information. Remember – stay informed, and breathe easy this summer!

SPRING 2007: RELATIVELY NORMAL…WITH A FEW PEAKS AND VALLEYS

Evan L. Heller
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Spring 2007 in Albany was fairly typical except mainly for heavier than normal precipitation in April.

March opened the season with near normal temperatures for Albany, but a 4-day stretch of 20 degrees or greater below normal temperatures occurred from the 6th to the 9th. Temperatures returned to normal for the next three days, followed by a brief warm spell into mid-month. This was followed by another stretch of double-digit below normal temperatures, and, finally, a more or less normal last third of the month. There were three daily temperature records set. Readings fell to at or below freezing during 26 days in March, and failed to climb above freezing on 8 days. The warmest reading of the month, 65º, was recorded on the 14th. This, coupled with the high minimum reading for the month of 46º, rendered the 14th the warmest day of the month with its resultant mean temperature of 55.5º. The high minimum was a record for the date, breaking the previous record of 45º, from 1990. The coldest reading in March was -3º, occurring on both the 6th and 9th. These were the entire season's only sub-zero days. With the low maximum temperature for the month of 14º occurring on the 6th as well, the 6th wound up being the coldest day of the month, with a mean temperature of just 5.5º. Both of these figures were new daily records, the former breaking the previous low maximum temperature record of 15º, from 1901, and the latter establishing a new low mean temperature for the date, breaking the 7.0º record from 1948. The average high for March was 41.6º, 2.9º below normal, and the average low was 22.0º, 3.4º below normal. This resulted in a mean of 31.8º, which was 3.2º below normal.

Albany's precipitation for the month was very close to normal. The 3.29" total was 0.12" above normal for March. At least a trace of precipitation was recorded on 21 days of the month, with measurable amounts on 14 of these days. A tenth of an inch or more occurred on 6 of those days, on 5 of which there was 0.25" or more. Of these 5 days, 0.50" or more fell on 4 of them. The wettest day of the month set the month's only daily precipitation record, when 0.93" fell on the 2nd. This broke the date's scant 0.81" record from 1902. At least one flake of snow fell in Albany during 12 days in March, with the snow being measurable on half of these. There was one major snow event, when 13.2" fell from the 16th to the 17th. The total snowfall for the month was 14.9", which was 4.0" above normal.

There were 15 clear, 14 partly cloudy and 2 cloudy days in March. Dense fog was recorded on the 2nd, 3rd, 10th, 11th, 16th and 17th; sleet on the 1st, 2nd and 24th; freezing rain on the 1st and 2nd, and; a thunderstorm on the 26th. The average wind speed for March was 9.5 mph, with the peak wind being 48 mph from the west northwest on the 20th. With an average speed of 17.5 mph, the 6th was the windiest day of the month. With an average of just 2.4 mph, the 12th was the calmest day.

The middle month of climatological spring was above normal for precipitation in Albany, but closer to normal for temperatures than March was, even though the great majority of days during the first two-thirds of April 2007 were below normal. The average high for the month of 53.7º was 3.6º below normal, and the average low of 34.9º was 1.0º below normal. This resulted in a mean value for the month of 44.3º, which was 2.3º below normal. There were two daily temperature records set in April, both on the same day, the 23rd. One was a record high, with the mercury topping out at 87º. This tied the 1902 record. The high minimum temperature for the month was recorded this day. The 52º reading combined with the high for the day resulted in the other daily temperature record, a high mean. The 69.5º value surpassed the 1896 record by a full degree. The low reading for April was 21º, occurring on both the 8th and 11th. The low maximum reading for April was 34º, on the 6th, which was the coolest day of the month with a mean value of 28.5º. A total of 11 days in April dipped to below the freezing mark. The 2007 growing season officially began on the 26th, the last day of freezing temperatures in Albany.

Precipitation for April 2007 was 5.96" (2.71" above normal), making it Albany's 6th wettest April, and placing it in a tie for Albany's 75th wettest month. There were 18 days with a trace or more of precipitation, on 13 of which it was measurable. A tenth of an inch or more fell during 6 of these days, 0.25" or more on five of those, and 0.50" or more on 4 of these. There were 2 days with an inch or greater precipitation. The wettest day, with a record daily 2.26" of precipitation, was the 15th. This amount blew away the previous record of

0.85”, from 1906. Snowfall, having fallen on 7 days during April, totaled 3.6”, and this was 0.7” above normal. Measurable snow fell on 4 of these days, with the most, 1.7”, falling on the 15th, the last day in Albany with recorded snowfall.

There were 5 clear, 14 partly cloudy and 11 cloudy days in April. Dense fog occurred on the 26th and 27th; sleet, on the 12th and 15th, and; hail, on the 5th and 15th. The average wind speed for April was 8.7 mph, with the peak wind being 52 mph, from the northwest on the 23rd. With an average speed of 17.3 mph, the 30th was the windiest day, while the 25th was the least windy, with an average speed of only 1.8 mph.

Overall, May 2007 was the most normal of the spring months in Albany. There were no new records of any kind. The average high temperature was 72.6º, 2.8º above normal. The average low was 48.0º, 1.5º above normal. This gave a mean temperature of 60.3º, 2.2º above normal. The high reading for the month, 89º, occurred on the warmest day overall, the 25th. The mean was 73.5º. The high minimum temperature for the month was 63º, on the 10th. The coolest day was the 19th, with a mean of 49.0º. This was also the date of the lowest maximum temperature, 52º. The mercury dipped to a low for the month of 36º, on the 5th, 7th and 14th.

There was 3.51” of rain in May, 0.16” below normal. There were only 11 days with rain, on 9 of which it was measurable. A tenth of an inch or more fell on 8 of these, 0.25” or more on 6 of those,, and 0.50” or more on 3 of these. The greatest amount of rain, 0.79”, fell on the 11th.

May was a very sunny month, with 22 clear, 9 partly cloudy and no cloudy days. There was no dense fog recorded, but thunderstorms occurred on the 10th, 11th, 15th, 27th and 31st. Hail was not recorded. The average wind for May was 6.9 mph, with the peak wind for the month of 46 mph from the north northwest occurring on the 15th. The windiest day was the 20th, with an average speed of 10.6 mph, the calmest day, the 22nd, with an average speed of 1.4 mph.

Wrapping up the season, Albany’s mean high for the 3-month period was 56.0º, 1.2º below normal, and the mean low was 35.0º, 0.9º below normal. This resulted in a mean for the season of 45.5º, 1.1º below normal. Precipitation totaled 12.76”, 2.67” above normal, and snowfall totaled 18.5”, 4.6” above normal.

HUDSON RIVER ESTUARY FORECASTS

Steve DiRienzo
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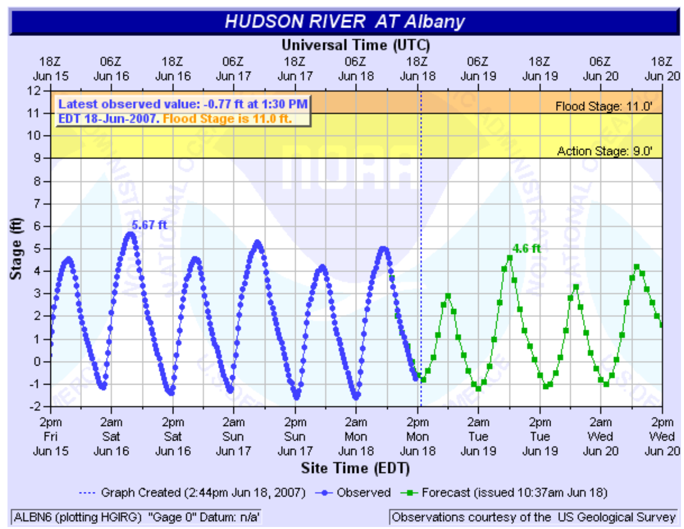
River level forecasts for the Hudson River near Albany and the Hudson River near Poughkeepsie are now available. The forecasts can be found on the Albany Advanced Hydrologic Prediction Service (AHPS) web page at: http://newweb.erh.noaa.gov/ahps2/index.php?wfo=aly. The forecasts are produced by the Northeast River Forecast Center in Taunton, Massachusetts, and are a technological milestone due to the complicated nature of forecasting the tidal portion of the river.



Sample river level forecast for Albany, New York

The Hudson River is unique in the Northeast as it has “fjord” characteristics with a deep tidal channel inland to about 151 miles from the mouth. Even at Albany, 150 miles from the ocean, the difference between high and low tide can be greater than 6 feet. The forecast river levels at these locations must include tide and storm surge influences from the Atlantic as well as fresh water flows from inland.

The National Weather Service (NWS) uses the computer model FLDWAV to make the forecasts. FLDWAV is a one-dimensional dynamic routing program developed by the NWS. It makes full use of the Saint Venant equations, taking into effect the movement of water in both directions within a river reach, i.e. in a downstream direction of flow due to inland runoff, and in an upstream direction of flow from astronomical tides and storm surges.

Input into the model includes the calibrated inflow hydrographs at key locations along the river, astronomical tide forecasts, and the NWS forecast parameters that influence the inland river flows and tides. Forecast parameters include winds and precipitation. During tropical storms and hurricanes, the downstream tidal boundary conditions will be initiated from the National Hurricane Center's Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model that adjusts the astronomical tide.

SPRING SNOW AND COLD SPOIL START OF BASEBALL SEASON

Brian Frugis
Meteorologist, NWS Albany

When people think of baseball games, they normally don't think of winter storms and cold temperatures. However, the start of the 2007 season featured many games being postponed or moved due to inclement winter weather. From Chicago to Cleveland to New York, cold temperatures and snow had players and coaches wishing that spring training had lasted a few weeks longer.

During early April, a persistent upper-level low pressure trough was situated over the eastern half of the United States. This allowed plenty of cold, Canadian air to continue pouring down across the Midwest and Northeast. As a result, temperatures were below normal across the entire northeastern quarter of the nation. During the first two weeks of April, high temperatures in the Albany area were in only the 30s and 40s, where they are normally in the 50s!

As this cold air crossed the Great Lakes, lake-effect snow showers and squalls developed and brought snow downwind of the Great Lakes. With a persistent northwest wind, Cleveland was in the direct path of continuous snow bands. This scenario wound up bringing over 13 inches of snow to the city over a span of 10 days! The Cleveland Indians' entire season-opening 4-game series against the Seattle Mariners was postponed. In addition, the Indians' next series against the Los Angeles Angels of Anaheim was moved to Milwaukee's Miller Park, this being a protective domed stadium. This wound up being especially important, as a strong area of low pressure passing across the upper Midwest brought 7 inches of snow to the city of Milwaukee on April 12th and 13th. Other clubs faced problems as well. The Chicago Cubs had a game against the Houston Astros moved to July thanks to light snow. A game between the Detroit Tigers and Toronto Blue Jays was postponed until September due to cold and snow.

While accumulating snow didn't make it to the East Coast cities, the cold air certainly did. With snow flurries in the air, the New York Yankees opened their 2007 season in 40-degree temperatures. This made it especially difficult for the pitchers to stay warmed up, as the wind chill combined to make it feel even colder. This also held true for the cross-town rival New York Mets, as well as for the Boston Red Sox, both of whom also started the first weeks of the season shivering in below-normal cold. Pitchers weren't the only players affected by the cold. During the frigid first week of April, home runs were at their lowest level since 1993.

The cold and snow affected more than just the major leagues. Cold temperatures and snow in Iowa City, Iowa moved the college baseball game between Michigan and Iowa to De Kalb, Illinois. Notre Dame's game against Bowling Green University was flat-out cancelled. Minor league teams felt the wrath of winter as well, as the home opener of the Buffalo Bison was postponed.

The cold start to the 2007 Major League Baseball season raised great debate. Some wondered if future major league seasons should be started later in April, or if early season games should be played only in warmer climes or in cities with domed stadiums. Regardless of what is done in the future, the start of the 2007 season will be forever remembered as a cold and snowy one for players, coaches and fans alike.

WCM Words

Raymond G. O'Keefe
NWS Albany Warning Coordination Meteorologist

It's a dangerous world out there! Summer heat can be a killer. Our article on the summer swelter offers tips on keeping cool and avoiding medical complications of heat. Along with summer heat comes increased risk of air pollution. Our article on air quality offers a primer on the science of air quality and an explanation of the air quality index. One more weather hazard lurking during the summer is lightning. Remember Lightning Safety Awareness Week is June 24-30. You can learn more about the threats posed by lightning and safety tips here: http://www.erh.noaa.gov/er/aly/Lightning/LSAW2007.htm

Know that the National Weather Service here in Albany is monitoring the weather – and rivers – 24/7 for severe threats. Our lead article this issue details our award winning efforts during two flooding events over the past couple of years.

This severe weather season has been characterized by hit and miss storms. This make for difficult verification. We always appreciate your reports. Keep them coming.

From the Editor's Desk

The warm weather is finally here…as are the many thunderstorms. This could be a long, hot summer. Several of our offerings this time around deal with summertime issues. You might find the articles dealing with heat stress and air quality to be of particular interest. Other articles recap winter and spring season events. We hope you enjoy all of our quality selections along with our more enhanced title page. Whether enjoying a day at the beach, the amusement park, or a summer barbecue, heed our advice…and stay cool. But whatever you do…enjoy the summer…and we'll see you again as the leaves begin to turn!