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FEATURES

DEPARTMENTS

NOAA'S 2011 HURRICANE OUTLOOK

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On May 19, 2011, NOAA's National Weather Service's Climate Prediction Center issued the 2011 Hurricane Outlook for the Atlantic Basin, which includes the Caribbean Sea and Gulf of Mexico, and an "above normal" season is expected. A "normal" hurricane season in the Atlantic Basin spawns 11 named tropical storms, 6 of which are hurricanes, with 2 potentially attaining "major" status (those reaching category 3 or higher on the Saffir-Simpson Scale of hurricane intensity). The CPC's forecast is for the number of named storms for 2011 to range anywhere from 12 to 18, with the expectation that 6 to 10 of them will reach "hurricane" status, 3 to 6 of them being major hurricanes (See Table). For comparison, the 2010 Atlantic hurricane season was above normal, with 19 named storms, 12 being hurricanes, 5 of them major.

This year's forecast is heavily weighted on three main factors. The first of these involves the expectation of favorable upper-level winds across the eastern tropical Atlantic Ocean in combination with an active African monsoon season. Many of the tropical cyclones which form over the Atlantic Ocean begin as atmospheric disturbances which form clusters of thunderstorms across northern Africa as part of the African monsoon. So, if the African monsoon season is unusually active, and winds across the eastern tropical Atlantic are favorable, there will be a greater tendency for these clusters to organize into tropical cyclones. This enhanced African monsoon activity, which is expected this season, is believed to be part of a longer-term active cycle, which began in 1995, and which has been associated with recently more active Atlantic hurricane seasons.

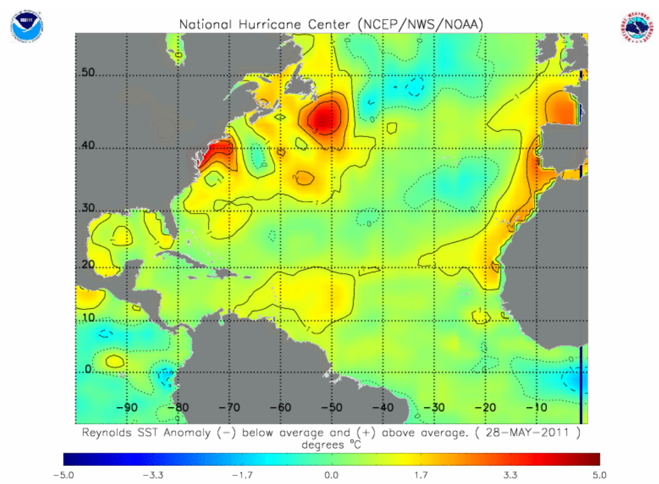
The second main factor in this year's forecast favoring an active hurricane season is the presence of abnormally warm sea surface temperatures across the tropical Atlantic Ocean – from off the west coast of Africa westward to the Caribbean Sea. Tropical cyclones need warm ocean temperatures to gather strength – normally water temperatures above 80° F. The initial atmospheric disturbances that can eventually transform into tropical cyclones pass across the tropical Atlantic on their long journey toward the western Atlantic Ocean. If water temperatures remain warmer than normal (above 80° F), these initial disturbances can organize and develop a circulation, potentially reaching tropical storm, or even hurricane, strength.

The third main factor in this year's forecast which should also favor an abnormally active hurricane season is the presence of near-normal sea surface temperatures across the eastern and central tropical Pacific Ocean. What do Pacific Ocean water temperatures have to do with hurricanes over the Atlantic? Typical conditions across the tropical Pacific involve warmer water across the far western Pacific along with associated thunderstorm development, while the waters in the eastern tropical Pacific normally remain relatively cool, limiting thunderstorm activity. The opposite is true when an El Niño is present – the warmer water and associated thunderstorm development shifts much further eastward in the Pacific. When this occurs, winds within the upper levels of the atmosphere strengthen across the eastern Pacific, and even stretch across the tropical Atlantic. These strong winds tend to rip apart thunderstorms across the Atlantic, limiting the potential for these to organize into tropical cyclones. Therefore, when an El Niño is present, as it was in 2009, tropical cyclone activity is usually below normal in the Atlantic Basin. When a La Niña is present, thunderstorms across the eastern Pacific are even more below normal. Under this scenario, upper level winds become weaker than normal from the tropical Pacific into the Atlantic, reducing the potential for thunderstorms being ripped apart, and thus creating conditions more favorable for thunderstorms to organize into tropical cyclones, which can lead to an active Atlantic hurricane season like that of 2010. For the 2011 Atlantic hurricane season, the expectation is for the current La Niña to gradually weaken, with temperatures returning to near normal across the central and eastern tropical Pacific Ocean. If this occurs, upper atmospheric conditions should remain at least somewhat favorable for tropical cyclone development in the Atlantic Basin this year. However, if temperatures warm too much, this could result in less favorable conditions in the upper atmosphere across the tropical Atlantic, potentially reducing the likelihood of an active hurricane season.

It should be noted that in May of 2010, NOAA's Climate Prediction Center forecast an "active to very active" season for the Atlantic Basin, with a prediction of 14 to 23 named storms, 8 to 14 reaching hurricane strength, 3 to 7 of these major. As noted above, the actual result was 19 named storms, 12 being hurricanes, and 5 reaching "major" status…all within the forecasted ranges.

So, the official forecast for the 2011 Atlantic hurricane season issued by NOAA's Climate Prediction Center favors an "active" season based on these three main factors. Of course, any changes in these factors could easily alter this year's outcome. Plus, this forecast does not provide any clues as to where any storms may strike – just whether there might be greater or fewer than normal forming in the Atlantic Basin. The Climate Prediction Center will issue an updated forecast in August 2011, taking into account these and other factors.

	2011 Forecast	**Normal Season**
Tropical Storms	12-18	11
Hurricanes	6-10	6
Major Hurricanes	3-6	2



Anomalies of sea surface temperatures in the Atlantic Ocean, as depicted on May 28 2011. The red and yellow colors denote warmer sea surface temperatures compared to normal, which would potentially enhance tropical cyclone development within the tropical Atlantic Ocean. **Image from NOAA's Climate Prediction Center/National Hurricane Center.**□

STREAM GAGING AND FLOOD FORECASTING

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As a hydrologist for the National Weather Service, I am often asked how we know what is going on along the rivers, creeks and streams for which we provide river forecasts. Much of the real-time river information we have access to in the comfort of our office is the result of an important partnership between the National Weather Service (NWS) and the U.S. Geological Survey (USGS). Below is an excerpt from a document written by Robert R. Mason, Jr. from the USGS, and Benjamin A. Weiger from the NWS, explaining the relationship between USGS stream gaging and NWS flood forecasting. The complete article is available at http://water.usgs.gov/wid/FS_209-95/mason-weiger.pdf. Additional information can be found at water.weather.gov (NWS) and water.usgs.gov (USGS).

The National Weather Service is widely known as the Federal agency in charge of weather forecasting and warning for the Nation. Many people, however, are not aware that the NWS also is charged by law with the responsibility for issuing river forecasts and flood warnings. The NWS uses many sources of data when developing its flood forecasts. The USGS is the principal source of data on river depth and flow. As part of its mission, the USGS provides practical information about our Nation's rivers and streams that is useful for mitigation of hazards associated with floods and droughts. The primary source of this information is the USGS streamflow-gaging station network. The USGS operates and maintains more than 85 percent of the Nation's stream-gaging stations, which includes 98 percent of those that are used for real-time river forecasting by the NWS.

The two most fundamental items of hydrologic information about a river are: stage, which is water depth above some arbitrary datum, commonly measured in feet, and; flow or discharge, which is the total volume of water that flows past a point on the river for some period of time, usually measured in cubic feet per second or gallons per minute. These two key factors are measured at a location on the river called a stream-gaging station.

By using automated equipment in the gaging station, river stage can be continuously monitored and reported. Linking battery-powered stage recorders with satellite radios enables transmission of stage data to computers in USGS and NWS facilities even when extreme high waters and strong winds disrupt normal telephone and power services. In this way, USGS and NWS hydrologists know the river stage at remote sites and how fast the water is rising or falling.

It is much more difficult to measure river discharge accurately and continuously. As a matter of practicality, discharge is usually estimated from pre-established stage/discharge relations, or rating curves. The rating curves are constructed by USGS field personnel who periodically visit the gaging station to measure river discharge. Even after a stage/discharge rating is well established, additional discharge measurements are required periodically to detect and track changes from channel scour or fill, and to update the rating. Because documentation of flood discharges is so important, USGS field personnel are routinely deployed to stream-gaging stations during periods of high flow to measure river discharge during inclement weather, day or night.

River-flood forecasts are prepared by 13 NWS river-forecast centers using complex mathematical models, which are then disseminated to the public. During periods of flooding, the NWS river-forecast centers issue forecasts for the height of the flood crest, the date and time when the river is expected to overflow its banks, and the date and time when the flow in the river is expected to recede to within its banks. These forecasts are updated as new information is acquired.

During a flood, the USGS and the NWS work together to collect and use the most up-to-date hydrologic data. The USGS furnishes continuous information on river stage and discharge, and provides rating revisions to the NWS as they become available. The NWS uses its river models and hydrometeorological data (and forecasts) to predict the discharge at each forecast service point, and the most up-to-date stage/discharge rating to forecast how deep the water will get.

Of all the USGS stream-gaging stations, 90 percent are operated by the USGS in cooperation with other Federal, State and local agencies. About 50 percent of the stations are funded through cost-sharing arrangements whereby the USGS provides one-half of the funds for the stations, and the cooperating agencies provide the other half. Another 40 percent of the stations are funded entirely by the cooperating agency. However, the resulting streamflow data are available to all potential users through USGS databases, on the Internet, and through USGS publications.

The NWS has developed extensive river-forecasting services that are based on access to USGS data. When cooperating agencies have obtained the information they need from a stream-gaging station, they usually discontinue funding for that station. When either party (USGS or its cooperators) discontinues funding for a gage as a result of budget reductions or for other reasons, the operation of the station must be discontinued. This arrangement has an unintended consequence for both the NWS and the communities that depend on NWS river-forecast services; gaging stations that are critical to the forecast service may be discontinued owing to circumstances beyond the control of the NWS or of its customers.

Demand for NWS river-forecast services continues to grow with an expanding population, urbanization and economic growth. The need for real-time verification of river discharge and subsequent model adjustment is more than a scientific quest for accuracy; it is critically important to maintain model accuracy in order to minimize economic damage and human suffering. The detail and timeliness of the required data can be furnished only by on-site stream-gaging stations.□

HISTORIC SEVERE WEATHER

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The spring (March-May) of 2011, particularly April, brought extreme weather and climate events to many parts of the United States. Preliminary data from the Storm Prediction Center indicated over 1,000 reports of tornadoes, with over 500 fatalities. In our own County Warning Area, we have confirmed at least two tornadoes along with several reports of very large, damaging hail. In addition, Spring 2011 was amongst Albany's top ten wettest, with 13.54" of rain. While these numbers are alarming, it reminds us of the importance of preparedness. Several tools are available to help you through the storms, including apps for your smart electronic devices, and NY-Alert, for New York residents and our broadcast media. The life-saving device that should be in everyone's home, along with smoke and carbon monoxide detectors, is a NOAA Weather Radio All Hazards. You can purchase these radios from many electronics distributers or directly from the manufacturers themselves. Many of your questions about NOAA Weather Radio All Hazards can be answered at:

http://www.erh.noaa.gov/aly/WxRadio.htm.

Here are additional online resources pertaining to this year's historic severe weather:

- 2011 Tornado Information from NOAA
  http://www.noaanews.noaa.gov/2011_tornado_information.html
- Spring 2011 U.S. Climate Extremes from NOAA and NCDC
  http://www.ncdc.noaa.gov/special-reports/2011-spring-extremes/index.php
- Preliminary severe storm reports and graphic from SPC
  http://www.spc.noaa.gov/wcm/

Preparedness online resources:

- Ready America
  http://www.ready.gov/
- FEMA
  http://www.fema.gov/
- NOAA Weather Radio All Hazards
  http://www.weather.gov/nwr/
- SKYWARN ™
  http://skywarn.org/
- Guide for Developing a Severe Weather Plan for Schools
  http://www.erh.noaa.gov/aly/Special/School%20Weather%20Safety%20Plan.pdf□

DUAL POL RADAR UPGRADE COMING TO ALBANY

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The National Weather Service (NWS) at Albany will have its biggest radar hardware and software upgrade since the inception of the Weather Surveillance Radar (WSR) – 1988 Doppler (88D), in the Spring of 2012. The WSR-88D was deployed to the NWS in Albany in the Fall of 1993. The Albany WSR-88D, otherwise known as KENX, is located in East Berne, New York, near Thatcher Park. The Dual Pol upgrade will take 10 to 14 days, and is scheduled for the late March to mid-May time-frame.

The NWS radars will go from being only horizontally polarized to being both horizontally and vertically polarized, in a Dual Pol system. The vertical polarity being added to the radars will help to better assess hydrometeor type, shape, orientation and size. Dual Pol radar technology will provide better estimates of rainfall and precipitation types. The vertical polarity of potential droplets on the radar will be compared to the horizontal polarity, to see whether the targets have no preferred orientation (i.e. rounder hydrometeors like snowflakes or hail), or if they are somewhat flatter (e.g., plain raindrops). Figure 1 demonstrates how the vertical and horizontal polarity will work with Dual Pol radars to detect the various hydrometeors.

Three new key products will be produced with Dual Pol radars. The three new products are: Differential Reflectivity, Correlation Coefficient and Specific Differential Phase. Several new quantitative precipitation estimation products, and two new algorithms will be utilized. The two new algorithms are the Hydrometeor Classification and the Melting Layer. The Hydrometeor Classification algorithm will try to determine if the following targets are occurring on the radar scope: biological targets, ground clutter, ice crystals, dry snow, wet snow, rain, heavy rain, big drops of rain, hail, graupel, range folding or unknown. Figure 2 is an example of the output from the Hydrometeor Classification algorithm. There are several new applications with the Dual Pol data, including: Winter Weather Precipitation-Type Determination, Hail Detection, Tornadic Debris Signatures, Convective Updraft Detection, and Heavy Rain in terms of droplet size and quantity.

Dual Pol radar technology will provide many benefits to our NWS customers. It will help identify non-meteorological targets more easily, and will differentiate between rain, snow and melting snow. Users will be able to better detect hail in a thunderstorm, and better determine areas of heavy rainfall. The various new products will also assist in determining when debris is lofted by tornadoes (e.g., siding and shingles). Training is available for non-NWS meteorologists, and non-meteorologists who use WSR-88D data, at the following web site: http://www.wdtb.noaa.gov/courses/dualpol/Outreach/index.html. Future Stormbuster articles will get into the details of the new products, and further applications of Dual Pol radar technology.

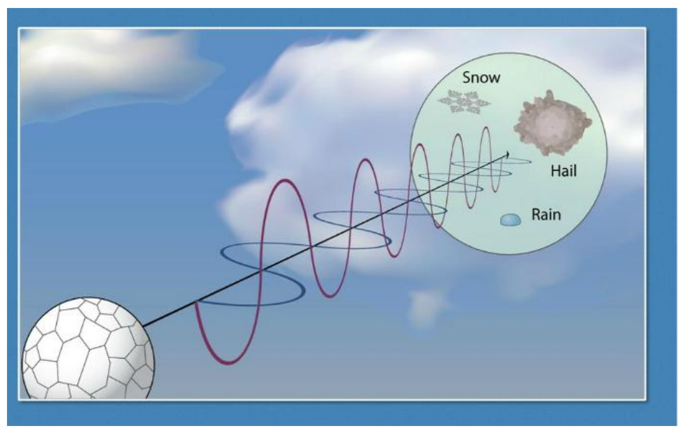

Figure 1: Dual Pol radar picking up different targets based on shape and orientation of the various hydrometeors.
Source: http://www.wdtb.noaa.gov

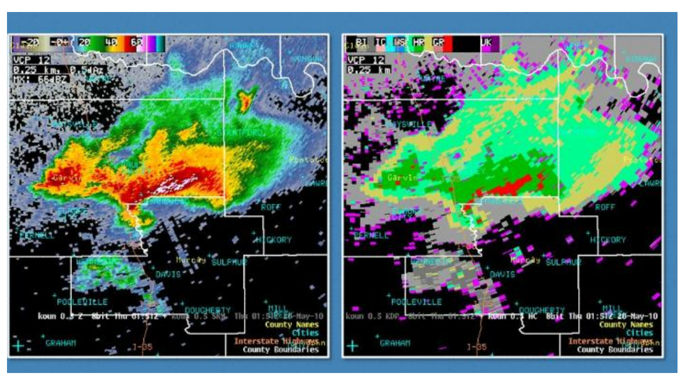

Figure 2: The left image is a traditional base reflectivity product (dBZ), and the right image is the output from the Hydrometeor Classification algorithm with areas in red (hail), dark green (heavy rain), tan (big drops of rain) and light green (rain). Source: http://www.wdtb.noaa.gov□

AAAH-CHOO!!!...SUMMER MEANS POLLEN!

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It's the weather!!! - or so the complaint goes. Actually, it's not the weather itself, but what the weather does to things around us that brings that common summertime upper respiratory nuisance that is often referred to as "hay fever".

Hay Fever is actually an allergic reaction, usually to the pollen of one or more common plants, many of which are very widespread and grow wild throughout our region, and some of which are planted for forage. Plant pollens are not the only things that cause that runny nose and sneezing. Other culprits include pet dander (especially from cats), dust, other particulates, and mold spores. Mold spores, especially mildew, can be a big problem indoors since molds can bear spores year-round, and become concentrated where ventilation is lacking. Pet dander and dust tend to be more persistent, and can trigger a reaction in someone who visits a place where the offending allergens are present in sufficient quantity.

But the big offenders during the spring and summer are the plant pollens. Pollen is one of the ways that plants reproduce. Some pollens are simply carried through the air while others are spread by insects such as bees. The frustrating thing about pollens is that they are often at their worst a day or two after a rainfall, especially when there is significant wind.

Pollen counts are routinely taken throughout the country, mostly by medical outlets, and many of these counts may be examined on the internet by visiting the NAB (National Allergy Bureau). Local pollen counts are frequently reported as part of TV weathercasts. Usually, counts for four categories are included…trees, grasses, weeds and molds.

Certain weather conditions cause high pollen counts. Dry, sunny, windy weather tends to spread pollens. Rain is a mixed blessing, especially during the summer. Rain cleans the pollen out of the air so that after a rainfall, there is relatively little pollen remaining. But rain also waters the grasses and weeds, which then bloom…making more pollen! Wind is a big factor, blowing pollen off plants and flowers, and into the air. Most pollens are fine particles that can be carried for miles by the wind. During periods of prolonged dry and breezy weather, the pollen counts can get quite high even though the air may appear clean.

If you are affected in the springtime, it's most likely that you are allergic to the pollen of one or more tree varieties. Many trees flower and pollinate before they leaf out by late spring. Early summer reactions are usually from grasses, and a late summer/early fall reaction will usually be due to weeds. Ragweed is one of the most common and notorious allergy-inducing weeds. Molds tend to be associated with prolonged damp and wet weather. They, as well as dust and pet dander, are more likely to affect people indoors.

What can one do? One thing is to make sure to get plenty of sleep and nutrition, to build up resistance, and lessen either a reaction or subsequent infection. Another option is to stay indoors as much as possible on days when the weather forecast suggests the pollen count will be high. While the NWS does not do pollen forecasting, information and forecasts are available from other sources. When pollen counts are high, one can maximize his or her time in an air-conditioned environment, such as inside a motor vehicle, or commercial area such as a shopping mall, library, etc. Place a portable air conditioner in the bedroom if central air conditioning is not available. Most room air conditioners can be set to re-circulate the air in the room.

There are some over-the-counter medications available which can relieve allergy symptoms. For people who are more severely affected, an allergist can determine exactly what they are allergic to, and can prescribe appropriate medication.□

THE RAINY SPRING OF 2011

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March Started off near normal for temperatures (Table 1), with no records set. Precipitation was just a little over an inch above normal. 8.8 inches of snow fell…most of it on the 7th. The only record established in Albany for the month was a daily precipitation record, when 1.33" fell on the 6th, breaking the previous record for that date of 1.26", established way back in 1887 (Table 3a).

April began the trend of noticeably warmer than normal temperatures. Heat arrived early, with 80-degree temperatures in Albany on the 11th. The average monthly temperature of 48.7° was 2.3° above normal (Table 1). This was reflected in two daily temperature records, both ties with the previous records (Table 3b). The first was a high temperature of 82° on the 11th, and the second was a high minimum temperature of 62° on the 27th. Precipitation for April at Albany was slightly more above normal than March (Table 1), but no precipitation records were set.

May was wetter than April by only 0.02" (Table 1), but nearly twice above normal than April for temperatures. Rain fell on about two-thirds of the days of each month (Table 2a). May 6th marked the last date with low temperatures of 32° or lower, and thus, the official start of the growing season in Albany. Records for May included two daily high minimum temperatures (Table 3c), the first on the 29th when the mercury got down to only 69°, and the 2nd the very next day when the mercury dipped to only 68° to tie the 1915 record. The third and final record for the month was for Top Ten Warmest Mean Minimum May. The 52.1° average low temperature for the month placed 2011 alone at number 7.

The thunderstorm season seemed to get off to an early start. The first date Albany recorded thunder was April 20th, with a total of 5 thunderstorm dates in April, and 7 in May (Tables 4b and 4c).

Summing up (Table 1), Spring of 2011 averaged just 2.3° above normal, while the over a foot of precipitation received was more than 4 inches above normal. The 13.54" precipitation total makes Albany's Spring of 2011 the 9th wettest of all-time (Table 3d). The 9.7" total snowfall for the 3-month season was short of normal by about 4 inches. The final snowfall for the snow season occurred on April 21st when some flurries fell at Albany. The final measureable snowfall was 0.9" on April 1st.

STATS

	MAR	APR	MAY	SEASON
Avg. High/Dep. From Norm.	43.0°/-1.0°	58.2°/+0.7°	72.0°/+2.3°	57.7°/+0.6°
Avg. Low/Dep. From Norm.	25.8°/+1.3°	39.2°/+4.1°	52.1°/+6.7°	39.0°/+4.0°
Mean/ Dep. From Norm.	34.4°/+0.1°	48.7°/+2.3°	62.0°/+4.4°	48.4°/+2.3°
High Daily Mean/date	53.0°/18th	71.5°/27th	78.0°/30th	
Low Daily Mean/date	14.5°/3rd	37.0°/15th	47.0°/5th	
Highest reading/date	62°/17th & 18th	84°/26th	89°/31st	
Lowest reading/date	5°/3rd	27°/22nd	37°/1st & 5th	
Lowest Max reading/date	24°/3rd	41°/1st	56°/16th	
Highest Min reading/date	44°/18th	62°/27th	69°/29th	
Ttl. Precip./Dep. Fm. Norm.	4.20"/+1.27"	4.66"/+1.67"	4.68"/+1.27"	13.54"/+4.21"
Ttl. Snowfall/Dep. Fm.Nrm.	8.8"/+5.9"	0.9"/+0.8"	0"/+/-0"	9.7"/-4.2"
Maximum Precip./date	1.33"/6th	0.71"/26th	1.26"/16th	
Maximum Snowfall/date	5.5"/7th	0.9"/1st	-/-	

Table 1

NORMALS, OBSERVED DAYS & DATES

NORMALS & OBS. DAYS	MAR	APR	MAY	SEASON
NORMALS				
High	44.0°	57.5°	69.7°	57.1°
Low	24.5°	35.1°	45.4°	35.0°
Mean	34.3°	46.4°	57.6°	46.1°
Precipitation	2.93"	2.99"	3.41"	9.33"
Snow	2.9"	0.1"	0"	3.0"
OBS TEMP. DAYS				
High 90° or above	0	0	0	0/92
Low 70° or above	0	0	0	0/92
High 32° or below	3	0	0	3/92
Low 32° or below	22	6	1	29/92
Low 0° or below	0	0	0	0/92
OBS. PRECIP DAYS				
Days T+	21	21	20	62/92/67%
Days 0.01"+	10	15	11	36/92/39%
Days 0.10"+	6	12	8	26/92/28%
Days 0.25"+	5	8	4	17/92/18%
Days 0.50"+	4	4	4	12/92/13%
Days 1.00"+	1	0	2	3/92/3%

Table 2a

NOTABLE PRECIP & SNOW DATES	MAR	APR	MAY
1.00"+ value/date	1.33"/6th	-	1.07/15th
1.00"+ value/date	-	-	1.26"/16th
3.5"+ snow value/date	5.5"/7th	-	-

Table 2b

RECORDS

ELEMENT	MARCH	
Precipitation/Date|Previous Record/Year	1.33"/6th	1.26"/1887

Table 3a

ELEMENT	APRIL	
Maximum/Date|Previous Record/Year	82°/11th (tie)	82°/1945
High Minimum/Date|Previous Record/Year	62°/27th (tie)	62°/1915

Table 3b

ELEMENT	MAY	
High Minimum/Date|Previous Record/Year	69°/29th	67°/1929
High Minimum/Date|Previous Record/Year	68°/30th (tie)	68°/1881
Top Ten Warmest Mean Min. May Month Value/Rank|Remarks	52.1°/#7	-

Table 3c

ELEMENT	SPRING	
Top 10 Wettest Spring Value/Rank|Remarks	13.54"/#9	-

Table 3d

MISCELLANEOUS

MARCH

Avg. wind speed/Dep. Fm. Norm.	8.9 mph/-0.8 mph
Peak wind/direction/date	47 mph/WNW/18th
Windiest day avg. value/date	16.9 mph/28th
Calmest day avg. value/date	1.8 mph/20th
# Clear days	5
# Partly Cloudy days	15
# Cloudy days	11
Dense fog dates (code 2)	7th & 21st
Thunder dates (code 3)	-
Sleet dates (code 4)	6th, 7th, 10th, 16th, 19th, 21st & 23rd
Hail dates (code 5)	-
Freezing rain dates (code 6)	6th

Table 4a

APRIL

Avg. wind speed/Dep. Fm Norm.	9.0 mph/-0.3 mph
Peak wind/direction/date	49 mph/WSW/17th
Windiest day avg. value/date	15.5 mph/11th
Calmest day avg. value/date	1.6 mph/8th
# Clear days	0
# Partly Cloudy days	17
# Cloudy days	13
Dense fog dates (code 2)	-
Thunder dates (code 3)	20th, 25th, 26th, 27th & 28th
Sleet dates (code 4)	1st, 5th, 19th & 23rd
Hail dates (code 5)	-
Freezing rain dates (code 6)	-

Table 4b

MAY

Avg. wind speed/Dep. Fm Norm.	7.3 mph/-0.8 mph
Peak wind/direction/date	49 mph/SSW/26th
Windiest day avg. value/date	15.0 mph/26th
Calmest day avg. value/date	2.0 mph/18th
# Clear days	3
# Partly Cloudy days	17
# Cloudy days	11
Dense fog dates (code 2)	20th & 21st
Thunder dates (code 3)	7th, 16th, 19th, 20th, 26th, 27th & 28th
Sleet dates (code 4)	-
Hail dates (code 5)	-
Freezing rain dates (code 6)	-

Table 4c□

2011 ARCTIC SEA ICE EXTENT

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Trends in Arctic sea ice extent are frequently used as a measure of climate change, especially the summer minimum extent. While changes in weather patterns and ocean currents from one season to the next can cause large variations from year to year, a multi-year trend of increasing sea ice extent is seen as evidence of a cooling climate, while a trend of decreasing sea ice extent is taken as evidence of a warming climate. This article will present the latest maximum Arctic sea ice extent statistics for this past winter, as provided by the National Snow and Ice Data Center. Although winter ice extent variations over the past decade have not been as dramatic as summer ice extent variations, the maximum winter ice extent can provide clues as to what will occur in the summer. For example, the record low maximum ice extents during the 2005-06 and 2006-07 winter seasons eventually led to the record low minimum ice extent during the summer of 2007. After that, winter maximum ice extents increased during the 2007-08 and 2008-09 winter seasons, and the summer minimum ice extents during the following summers were considerably higher than in 2007.

Arctic sea ice extent is defined as an area of sea water where ice covers 15 percent or more of that area. Thus, for any square mile of sea water to be included in the ice extent total, at least 15 percent of that square mile must be covered with ice.

The maximum Arctic sea ice extent during the 2010-11 winter season was reached on March 7, 2011, which is close to the normal time that the maximum extent occurs. The maximum ice extent on that day was 5.65 million square miles, which was only 11,000 square miles higher than the record low maximum ice extent that occurred during the 2006-2007 winter season, and 249,000 square miles less than the maximum extent that occurred during the previous winter season (2009-2010).

During the previous three winter seasons, it appeared that winter ice was slowly recovering from the record low levels reached during the 2005-06 and 2006-07 winter seasons, but the 2010-11 winter season level has once again returned to near record low levels. Although the near record low winter season level suggests that the summer minimum ice extent may also be near record low levels, the National Snow and Ice Data Center estimates that there is more multi-year ice in the Arctic than during the past few years. Multi-year ice is ice that has survived more than one melt season, and it is usually much thicker than single season ice. Thus, it is harder to melt the multi-year (thicker) ice, making it difficult to conclude as of now that the minimum ice extent this summer will be near the record low levels of 2007.□

From the Editor's Desk

It's hard to believe summer has only just begun, what with all the heat and severe weather we've already had. We have an unusually packed summer issue for you this year; seven very diverse topics covering various aspects of meteorology, hydrology and climatology. We open with the subject of tropical meteorology and the hurricane forecast, followed by the debut article from our new Service Hydrologist, covering the subject of flood forecasting. Then we have severe weather resources to keep you abreast this summer. This is followed by articles on the subjects of radar meteorology, air quality and allergies, and the local climatology. Finally, we have a 2011 update on the arctic sea ice. A special thanks to all our contributors! Enjoy the reading…and stay cool!□

WCM Words

Steve DiRienzo
Warning Coordination Meteorologist, NWS Albany

Summer 2011 officially began at 1:16 PM EDT on June 21. Hopefully the change in season will bring a change in the weather. Record floods, tornadoes and possible record size hailstones made their mark this spring. We'll be happy to have the severe weather of spring be a memory.

We can't rest though. Summer always brings its own severe weather challenges; from severe thunderstorms to flash floods, and the threat of an Atlantic Basin tropical storm passing through or near the region.

Because we can't stop severe weather, we must plan for it. Everyone should have a severe weather plan. We should also practice the plan so we know what to do when severe weather threatens. We must also take safety precautions when severe weather threatens. Lightning Safety Awareness Week (June 19-25) safety tips are a lesson in how to reduce risk from hazards.

Remember, we're here to answer your weather and water questions 24 hours a day, 7 days a week. If you have concerns, please call us. If you have comments on StormBuster, or any of the operations of the National Weather Service, please let me know at Stephen.Dirienzo@noaa.gov.□

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