Suncoast Weather Quarterly

Summer 2003 Issue 3, Volume 8

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Feature Article

Why Has It Been So Wet?

"Rain, rain, go away." Such was the sentiment for many during the first full weekend in August along the Suncoast. However, this could be said for the entire summer of 2003, as the weather pattern has been anything but typical, with clouds and precipitation more prevalent.

The main culprit has been the persistent upper level low pressure system across eastern North America. But why has it remained so persistent, not only through the summer, but for much of 2003? Read on to find out more.

Pattern Matters

Steady-state atmospheric patterns create long term weather trends. Long periods of drought, heavy rains, heat, and cold are directly related to these patterns. The most well-known and highly researched is El Nino. However, there are many other large scale patterns, known as teleconnections, which affect long term weather trends. Two of these, the Pacific-North American (PNA), and the North Atlantic Oscillation (NAO), are discussed here.

The NAO

This pattern is perhaps the most prominent of all teleconnections, occurring in all seasons and

In general, only the most pronounced PNA phases affect long term weather patterns. A very strong positive phase dominated the autumn and winter of 1976 and 1977, leading to prolonged and often record cold in the eastern United States. A strong negative PNA developed at the end of 1989, reversing a cold December into a well above normal January through March in 1990.

In late 2002, a strong positive phase PNA developed, continuing through January 2003 before gradually becoming negative by March and April 2003. The high index values between November and January may have contributed to the very cool January in Florida.

The Result: Wetter and Cloudier

Through August 2003, Suncoast precipitation was rather frequent, with most areas some 10 to 20 inches above normal. Temperatures for the year have averaged close to normal; however, increased surface moisture has kept minimum temperatures at or above normal since Spring.

The unusually cool and wet summer in the northeast United States was the result of a persistent atmospheric trough, which occasionally dropped deep into the southeast U.S., including the eastern Gulf.

sometimes "assisting" the development of other teleconnections. As with all patterns, there exist positive and negative phases of the NAO. The positive phase generally leads to above normal temperatures across the eastern United States; the reverse is true for the negative phase. Though there is no direct statistical correlation between NAO phase and precipitation trends in the eastern United States, there is some evidence that a relatively strong negative phase of the NAO will increase precipitation, as lift increases in the low and mid levels of the atmosphere in response to an increased number of upper level disturbances.

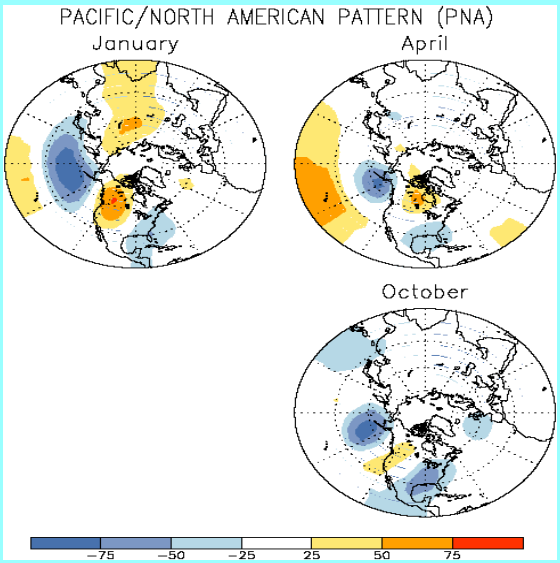
A short lived but fairly potent negative phase of the NAO developed to close out 2002. A slight positive phase ensued by March of 2003. However, the strength of the negative phase, combined with some lag time recovery and the concurrent El Nino, may have contributed to the generally cool and wet winter of 2002/03 across the eastern United States.

The PNA

Another prominent teleconnection that directly affects North American weather conditions is the PNA. A PNA is most expansive in pronouced in the winter, and dissipates in June and July . The positive phase of the PNA features a deeper than normal low pressure system near Alaska's Aleutian Islands, with a strong high pressure ridge generally from southwest Canada extending southward into the Great Basin and eastward towards the Great Plains, then lower atmospheric pressures over the eastern U.S. (Figure 1). The negative phase is the reverse.

Resulting wind flow patterns in Florida were dominated by south to southwest flow, reducing the number of late afternoon and evening precipitation events but increasing the number of cloudy days, which often began soon after sunrise. The persistence of the trough may be correlated to a remnant positive phase of the PNA as well as a weak negative phase of the NAO.

One thing's for sure: The summer of 2003 will be remembered for clouds, rain, and river and overland flooding.



PNA 500 mb height anomalies. Blue areas are below normal heights; yellow and red areas are above normal. Upper left image shows January; upper right, April; bottom right, October.

New Technology

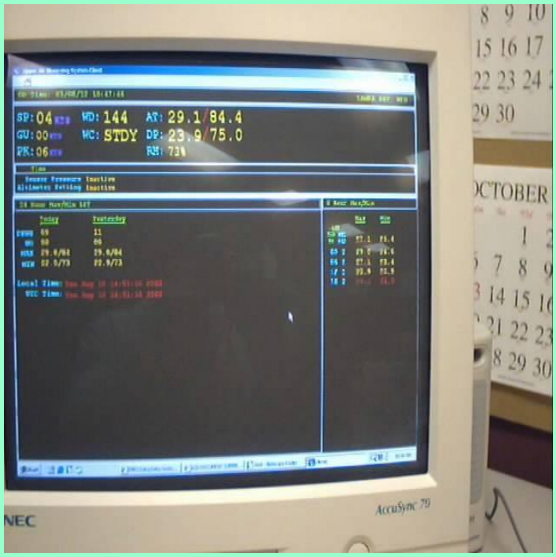
by David Chaffin, Electronics Technician

Radiosonde Surface Observing Instrumentation System
mast and attached sensors, at NWS Tampa Bay Area in Ruskin.

A Radiosonde Surface Observing Instrumentation System (RSOIS) was installed at NWS Tampa Bay in June 2003. The new, state-of-the-art system is designed to give meteorologists and technicians a desktop display of conditions at the office site so radiosondes can be set up much more efficiently for upper air balloon launches. Now, rather than taking precious time to manually record observations needed to initialize launch data, the radiosonde operators can quickly determine initial conditions at a glance, allowing them more time to concentrate on other important launch sequence activities.

RSOIS has three sensors mounted on a 30-foot mast. One sensor is for wind direction and speed, one for temperature, and the other for relative humidity. These sensors acquire and process the data, then transmit it to the office Local Area Network, where it is displayed in color on each connected personal computer. Parameters such as total wind, wind gusts, temperature, and dewpoint can be monitored continuously.

There are plans to add more sensors in the future. This system is a welcome addition for each radiosonde release team, facilitating the twice-daily task of weather balloon launching and providing critical data to make each flight successful.



At left: RSOIS temperature and dewpoint sensors. At right: Display of temperature, dewpoint, wind, and humidity at an office workstation personal computer.

Hazards

Mobile Homes and Tornadoes: Deadly Mix

by Daniel Noah, Warning Coordination Meteorologist

Destroyed mobile home in Hardee County. Photograph courtesy of Hardee County Emergency Management, 2003.

Half of the tornado fatalities in the United States now occur in mobile homes, a substantial increase from the approximately 25 percent noted in the late 1970's, when information on fatality location was first collected. In 2002, 37 of the 55 direct tornado fatalities occurred in mobile homes, even though only about 7 percent of the U.S. population reside in them. Using information from the United States Census on the fraction of mobile homes in each state, combined with the number of reported tornadoes since 1985, Dr. Harold of the National Severe Storms Laboratory has estimated that mobile home residents were killed at a rate 15 times higher than permanent home residents.

The potential exists for the fraction to continue increasing. Mobile home residency has risen steadily over the past 30 years, particularly in the southeastern U.S. According to the 2000 Census, there were 849,304 mobile homes in Florida, or 11.6 percent of the total housing units.

Mobile home residents tend to have less access to important hazards information, including fewer shared information systems (e.g., warning sirens). This was evident during the February 1998 Central Florida tornado outbreak.

The problem of warning dissemination to mobile home communities, as well as sheltering concerns, has become a large obstacle in the effort to reduce death tolls from tornadoes. However, the National Weather Service and it's emergency management partners have teamed up to improve hazards communication to all citizens through the Storm Ready® program.

Mobile home damage: It doesn't take much! All of these were from F0 tornadoes. Leftmost photo: Roof damage, Wauchula, Hardee County, from August, 2003;
Center photo: Roof and siding debris, Zolfo Springs, Hardee County, May 2003;
Rightmost picture: Roof off of a mobile home in Citrus County, March, 2001.

Skywarn™ Corner

Skywarn™ Training... Only a Mouse Click Away!

If you've ever wanted to become a certified NWS Skywarn™ Spotter, or need to be recertified, but do not have the time to attend a class...well, have we got a deal for you! All you need is a personal computer with internet access. In a couple of hours, spent at your leisure, you can join the thousands of dedicated citizens who become the eyes and ears of weather hazards for the Suncoast.

Here's how it works: First, be sure that your browser is set to accept javascript. This will allow your end-of-course quiz to process correctly upon submission. Then, click the icon below (or the link in the index at right) to access the course. Follow the instructions to work through the 76 slides that make up the training.

When completed, click on the Online Spotter Quiz link in the index (at right). Similar to the "live" course, the quiz is open "book". That is, you may have a separate browser open to the slides for reference while taking the quiz. Upon successful completion of the quiz, you will be notified. Within about two weeks, you'll receive a certificate of training, and ID card.

Have fun! We hope you enjoy this virtual classroom. Advanced training is planned in the future.

Tropical Update

The Season so Far...

It's been a moderately active tropical cyclone season thus far, with seven named storms. At the time of this writing, there had only been two hurricanes (Claudette and Fabian). Claudette intensified rapidly before slamming into the south Texas coast in mid July. Fabian was in the central Atlantic at the time of this writing. The following table updates that from the Spring Newsletter.

A full wrap up of this season in Florida will be available in the Autumn issue of the Suncoast Weather quarterly.

Table 1. Tropical Cyclone Names, 2003

TS Ana (Apr. 22-23)	Henri	Odette
TS Bill (Jun 29 - Jul 1)	Isabel	Peter
H Claudette (Jul 8 - 17)	Juan	Rose
TS Danny (Jul 16 - 20)	Kate	Sam
TS Erika (Aug 14 - 16)	Larry	Teresa
H Fabian (Aug 29 -)	Mindy	Victor
TS Grace (Aug 30 - 31)	Nicolas	Wanda