Suncoast Weather Quarterly

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Inside This Issue...

From the WCM

Welcome to Our Neighborhood!

Daniel Noah, our new Warning Coordination Meteorologist, arrived in early June. Dan will provide an infusion of high-tech knowledge to the position, which will increase the efficiency of the various programs under the hazardous weather umbrella. He will be working closely with emergency management personnel, the media, Skywarn™ spotters, and amateur radio operators (HAM's), among others, to further improve the severe weather warning process in west central and southwest Florida.

Dan hails from the opposite end of the lower

His career with NWS began in 1989 at the Madison, Wisconsin office. In 1993 Dan moved to the Bismarck office as a forecaster, and was promoted to Warning Coordination Meteorologist in 1996. Dan says the main difference in forecasting weather in North Dakota versus Florida is "in North Dakota you have to find reasons why it will rain, in Florida you have to find reasons why it won't rain".

Dan was born in Crookston, Minnesota, but has several relatives in Florida. One of Dan's favorite hobbies is "HAMming it up", which will

48 - literally - having transferred from the NWS office in Bismarck, North Dakota! He is a 1987 graduate of the University of North Dakota with a Bachelor of Science in Meteorology. He worked for the University in 1987 collecting research data on gust fronts in the back of a Cessna Citation II aircraft. In 1988, he was employed by R-SCAN Corporation, whose primary focus was real-time lightning detection across the United States. R-SCAN provided specific forecasts and real-time lightning data via pager to golf courses, electric companies, and outdoor enthusiasts.

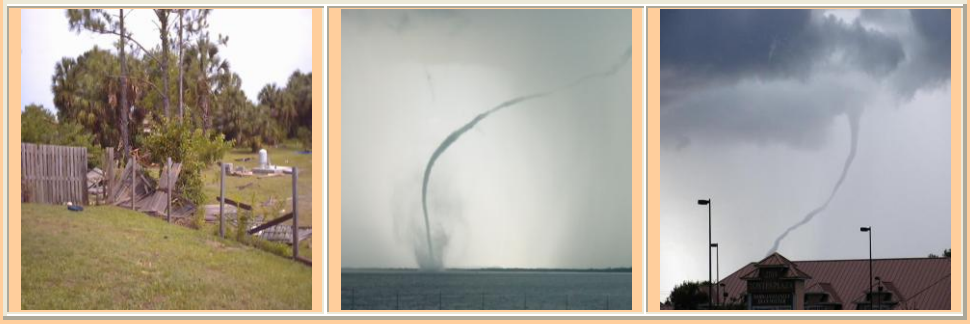
be a boon to our growing Skywarn™ amateur radio network! Florida HAM's may hear him, on the air, as he passes through to one of many planned Skywarn™ training courses. Dan's other hobbies include storm chasing, and many things "computer", including web design, networking, programming, and PC building.

Dan, wife Janet, and their Maltese, Teddy, reside locally. Dan promises to keep Teddy away from alligators while surfing the Internet!

Featured Weather

Waterspouts and Small Tornadoes

Menacing Nuisances on the Suncoast



From left to right: Damage to fence and gym set in Town 'N' Country, from June 5th 2002 F-0 Tornado (left); Spotter photographs of waterspout in Charlotte Harbor, June 14, 2003

Waterspouts and small tornadoes are frequent visitors to Florida's Suncoast during the rainy season. The 2002 season is no exception; in fact, this year is shaping up to be one of the more active on record. As of this writing (July 29), preliminary data show a total of 12 tornadoes and 15 spouts since June 1! Remember, these are reported spouts; as Table 1 shows, most of them were seen in well populated locations.

There have been eleven small tornadoes thus far, nine which have been observed over the coastal counties. Three of these were waterspouts which continued onto land. Table 2 shows the preliminary statistics.

What Causes Them?

Simply stated, the recipe which fuels the daily outbreak of thunderstorms provides the necessary by-products to produce small tornadoes and waterspouts. In other words, a typical summer thunderstorm will not produce a small twister on it's own; yet, when combined with other forces, such as

interaction with bay/sea breezes or outflows from nearby storms, the threat increases markedly.

Here's one example: Imagine two small thunderstorms, one moving south toward Tampa Bay from MacDill AFB, another moving west from Apollo Beach. Each storm contains an outflow, say 15 mph. The southward moving storm has an outflow wind from the north; the westward moving storm a wind from the east.

Winds in the middle of the Bay, ahead of the storm, are from the west at 5 to 10 mph.

Imagine each outflow as a horizontal "roll"; that is, the air is propagating forward as it does downward, striking the surface and "rolling" back up again.

Table 1. Preliminary rainy season tornadoes, 2002.
(WS) = event began as a waterspout and moved ashore.

#	Date	Location
1	Jun 5	Hillsborough/Town 'N' Country
2	Jun 5	Pinellas/Near Oldsmar
3	Jun 5	Pasco/Near Odessa (continue #1)
4	Jun 8	Pinellas/St. Pete Beach (WS)
5	Jun 10	Charlotte/Punta Gorda
6	Jun 11	Charlotte/Port Charlotte
7	Jul 11	Pinellas/Treasure Island (WS)
8	Jul 12	Pinellas/Largo
9	Jul13	Charlotte County (WS)
10	Jul 25	Polk/Highland City
11	Jul 27	Sumter/Webster
12	Jul 29	Manatee/Lakewood Ranch

At the point where these "rolls" collide, or encounter a developing updraft, they will be tilted into a vertical column. If conditions in the now-rotating column remain undisturbed, there is a decent chance that a waterspout will develop.

A similar phenomenon occurs over land. While sea breeze or sea and land breeze collisions initiate daily thunderstorms, it often requires the combination of existing boundaries, including any remaining sea breezes, with an existing or new updraft to generate column rotation. Small tornadoes that form by this process are known as "landspouts".

Table 2. Preliminary rainy season waterspouts, 2002.
(T) = event began as a tornado and moved offshore.

#	Date	Location
1	Jun 8	Boca Ciega Bay, Pinellas (T)
2	Jun 11	Charlotte Harbor
3	Jul 2	Old Tampa Bay
4	Jul 4	Tampa Bay
5	Jul 6	Old Tampa Bay
6	Jul 7	Sanibel Island (Lee Co Coast)
7	Jul 9	Tampa Bay
8	Jul 9	Pinellas/John's Pass to Treasure Island
9	Jul 11	Pinellas/Egmont to John's Pass (T)
10	Jul 12	Tampa Bay
11	Jul 13	Peace River/Charlotte Harbor (T)
12	Jul 19	Charlotte Harbor/Cape Haze
13	Jul 20	Tampa Bay
14	Jul 25	Peace River/Charlotte Harbor
15	Jul 26	Peace River/Charlotte Harbor

Why So Many in 2002?

Since June, the weather pattern across the peninsula has been anything but typical. The typical early to mid summer pattern would feature high pressure from the surface to 25,000 feet or so, either across the peninsula or from the Southeastern U.S. to Bermuda.

Such a pattern favors isolated small tornadoes and the rare waterspout. Though tornado occurrences would be similar to the numbers of this year, the numbers of observed spouts would be much less - perhaps one third of those observed in 2002.

This year's pattern has been disrupted by frequent upper level disturbances across the peninsula and the Southeast U.S., and more frequent frontal systems farther north. Prevailing low level winds have often been from the west or southwest, a very favorable pattern for waterspout development, especially near bodies of water that produce countering flow, such as Tampa Bay and Charlotte Harbor.

West to southwest flow also changes the prevailing time of thunderstorms, favoring the late night through early afternoon hours.

What's To Come?

More spouts, it appears. As the eastern Gulf of Mexico reaches it's peak

temperature, the threat of early morning thunderstorms reaches it's maximum during August and early September. Even weak southwesterly flow can produce small cells capable of producing a waterspout.

Isolated small tornadoes are a possibility in any flow pattern, as long as the atmosphere is unstable and rich with moisture. Deep tropical moisture tends to peak in August, so expect more small tornadoes and "landspouts".

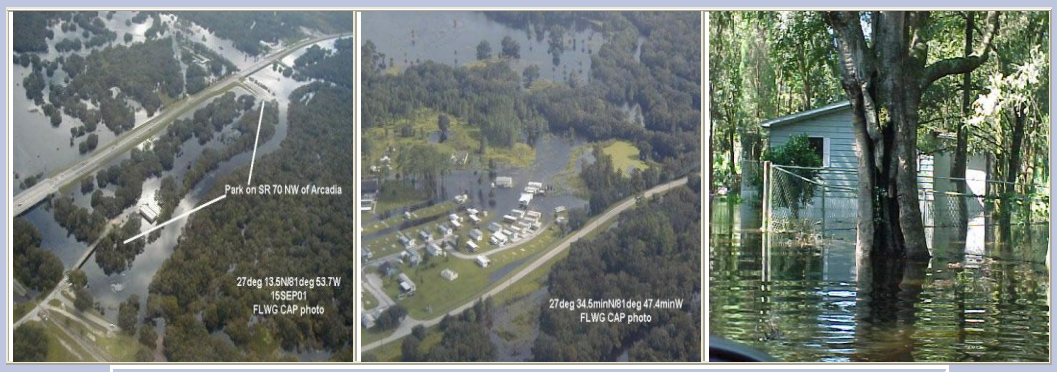
Stay Safe!

If you spot a small tornado or waterspout, be sure to seek safety immediately. Once you've reached a safe location, report the event to your nearest law enforcement agency; if a Skywarn™ Spotter, report to the NWS as well. Remember, these storms are known to behave erratically, and can change motion anytime. Don't tempt fate!

Weather Capsule

Enhancing your Storm Reports

Freshwater, River, and Coastal Floods



Different aspects of flooding in West Central Florida: From left, River flooding in Desoto County; Lowland flooding in Desoto County; at right, freshwater flooding exacerbated by poor drainage in Hillsborough County.

Flood forecasting remains one of the more difficult endeavors in operational meteorology. In Florida, flood potential is fraught with uncertainty. Coastal floods are highly dependent on the expected rise of the sea, strength of onshore flow, and the shape of the shoreline. Freshwater and river floods depend on soil moisture, urban development, and the atmosphere's potential to produce long duration heavy rain.

The National Weather Service issues many flood products. These include: freshwater flood warnings, urban flood advisories, coastal flood warnings, and river flood warnings. Differentiating among the types of flooding is crucial to forecasters, since the level of alert can range from nuisance to life-threatening. For all but coastal flooding, real-time spotter rainfall reports, combined with automated rain gage reports, provide valuable ground truth to forecasters faced with warning decisions.

Equally important are flood reports. How does one determine the difference between a nuisance urban flood and the potentially life-threatening freshwater flood? Or, coastal flooding compared with tidal overwash? The following examples provide basic guidance on what constitutes each type of flooding.

Urban Flood:

Minor flooding of streets, parking lots, underpasses, and low lying areas; especially those with poor drainage. For example, poor drainage locations should have water levels of at least 1 foot before classifying the event as an urban flood. Known intersections with very poor drainage may have water levels up to 3 feet. Observed rain totals of 2 inches in one hour, or 4 inches in 3 hours, usually from slow-moving or stationary thunderstorms, will produce urban floods.

Flash Flood:

In Urban Areas: Widespread flooding is observed, and property damage is likely in poor drainage areas. Normally well-drained areas will have minimum water levels of 1 foot. Poor drainage areas, such as underpasses and other low lying areas, may have minimum water levels of 3 feet. Known intersections with very poor drainage may have minimum water levels of 5 feet.

In Rural Areas: Most small streams and creeks will exceed their banks for up to 3 hours.

In all areas: Observed rainfall should be approximately: 3 inches in one hour; 5 inches in 2 hours, 6 inches in 3 hours, or 7 or more inches in 4 hours. Rainfall rates should be at least 1 ½ inches per half hour.

River Flood:

Persistent heavy rains eventually run off into the river system of West Central and Southwest Florida. By simple definition, river flooding begins when a river overspills it's banks, allowing high water to gradually inundate property. Flood stages at various gaging points along each river signify the level at which flooding begins.

Coastal Flood:

Rising tides breach the shoreline sufficient to cause some property damage. Overwash occurs when above normal tides cause water to "wash" over shoreline benchmarks (such as boardwalks or low sea walls), with no discernable property damage. No single value of above normal tide can be used to determine coastal flooding, due to the varying nature of the coastline. However, in general, coastal flooding begins when tides are 3 to 5 feet above normal.

Spotter Reporting Tips

What to Report

Tornadoes...Waterspouts...Funnel Clouds
Hail of any size
Damaging Winds 50 knots/58 MPH or greater
Flooding Rains 2" per hour or 4" per day
Damage that is directly weather related

How to Report
Call the 1-800 Unlisted Number
Identify yourself with Spotter ID number
Report the Phenomena and Time Observed
Please report *only* event criteria that are listed above.

Tropical Cyclone Season Nearing It's Peak!

At the end of July, only one storm (Arthur) had been named, a fast-moving Tropical Storm well off the east coast of the United States. However, the height of the season arrives in September, and Gulf of Mexico storms during the early 19th century brought their wrath largely in October. How will this season fare? Perhaps El Nino will play a role. See our El Nino Page for more details. The following is a list of this season's cyclone names.

Arthur (July 14 - 16)	Hanna	Omar
Bertha	Isidore	Paloma
Cristobal	Josephine	Rene
Dolly	Kyle	Sally
Edouard	Lili	Teddy
Fay	Marco	Vicky
Gustav	Nana	Wilfred