



Welcome to the latest issue of Tropical Winds. We will begin by discussing what happened during the 2015 rainy season. After that we will take a look ahead at what the 2015-2016 Dry Season has in store for us as well as a summary of the 2015 Hurricane Season. To close out this edition of Tropical Winds, there have been many staff changes at WFO Miami. We will take the final section to summarize all of the changes.

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Rainy Season Summary



By: Robert Molléda

Dan Gregoria- February 2013

Rainy Season 2015 Summary

Dry East and Wet West

The National Weather Service has determined that the 2015 south Florida rainy season, which started on May 10th, concluded on October 17th as the second in a series of weak cold fronts moved through the area, bringing slightly drier air and an end to the daily pattern of sea-breeze-driven showers and thunderstorms.

The duration of the 2015 rainy season was 161 days, slightly longer than the average of 155 days. The average measured rainfall from 33 observation sites across southern Florida was 33.29 inches, which is about 6 inches less than last year's average of 39.4 inches.

It was significantly drier than normal over southeast Florida, especially during the first half of the rainy season (Figure 1). Fort Lauderdale recorded its 3rd driest summer on record (June-August) with only 9.87 inches of rain. Hollywood Waste Water Plant only recorded 6.81 inches of summer rainfall and other southeast Florida locations failed to reach 10 inches during that time period. This lack of rainfall led to extreme drought conditions across southeast Florida in what is normally a drought-free time of year (Figure 2). A persistent east to southeast wind

flow kept the east coast areas dry while focusing most of the daily showers and thunderstorms over the interior and Gulf coast regions. While drought was affecting the east coast, some interior and western locales were having one of the wettest summers in recent memory. LaBelle, Ortona and Golden Gate each recorded over 30 inches of rain from June through August, with LaBelle and Ortona’s rainfall ranking in the top 10 summer rainfall on record.

Winds became more southwesterly in August and September, which led to daily showers and thunderstorms becoming more numerous and frequent along the east coast. This eventually ended the drought conditions across southeast Florida, but not until late September. Even here, rainfall amounts were mostly normal to slightly below normal for the latter part of the rainy season (Figure 3).

Miami International Airport recorded a total of 33.45 inches of rain between May 1 and October 17, which is 10.28 inches below the normal for that time period.

Fort Lauderdale/Hollywood International Airport recorded a total of 22.23 inches of rain between May 1 and October 17, which is 18.34 inches below the normal for that time period.

Palm Beach International Airport recorded a total of 27.90 inches of rain between May 1 and October 17, which is 9.79 inches below the normal for that time period.

Naples Municipal Airport recorded a total of 29.69 inches of rain between May 1 and October 17, which is 8.13 inches below the normal for that time period.

Below is a list of the top 10 wettest sites for the 2015 rainy season:

Top 10 Rainfall Sites for 2015 Rainy Season	May 1- Oct 17	Departure from Normal
1. Naples East/Golden Gate	51.61	+10.41
2. North Miami Beach	44.25	-0.45
3. Juno Beach (NWS COOP)	42.96	+4.30
4. Ortona (Glades County)	42.04	+2.38
5. LaBelle	41.70	+8.13
6. Muse	40.51	+4.28
7. West Kendall/Miami Executive Airport	38.64	-4.91
8. Sweetwater/NWS Miami	38.45	-7.66
9. Oasis Ranger Station (Collier County)	38.22	-5.20
10. Immokalee	37.65	+3.02

Below is a list of the 10 driest sites for the 2015 rainy season:

Top 10 Driest Sites for 2015 Rainy Season	May 1-Oct 17	Departure from Normal
1. Pompano Beach Airpark	21.89	-16.51
2. Pembroke Pines/North Perry Airport	22.07	-20.95
3. Fort Lauderdale/Hollywood Int'l Airport	22.23	-18.34
4. Fort Lauderdale Dixie Water Plant	24.73	-19.66
5. Cape Florida	25.39	-13.59
6. Hollywood Waste Water Plant	26.24	-16.48
7. Moore Haven	26.71	-5.94
8. Palm Beach International Airport	27.90	-9.79
9. Fort Lauderdale Beach	29.52	-12.08
10. Naples Municipal Airport	29.69	-8.13

Highest rainfall amounts for the duration of the rainy season were mostly across interior and western locations and the lowest amounts were across metro and coastal southeast Florida. For comparison purposes, average wet season rainfall ranges anywhere from 30-35 inches over the far interior and coastal locations to 40-45 inches across the interior suburbs of both the east and west coasts. As is usually the case in the south Florida rainy season, high variability in local rainfall was noted. For instance, in the Naples area rainfall ranged from just under 30 inches at Naples Municipal Airport to over 50 inches in Golden Gate, only a few miles inland. Similarly, North Miami Beach recorded over 44 inches of rain while a few miles to the north at North Perry Airport only 22 inches of rain fell.

Florida: Current 90-Day Departure from Normal Precipitation
 Valid at 8/2/2015 1200 UTC- Created 8/2/15 23:08 UTC

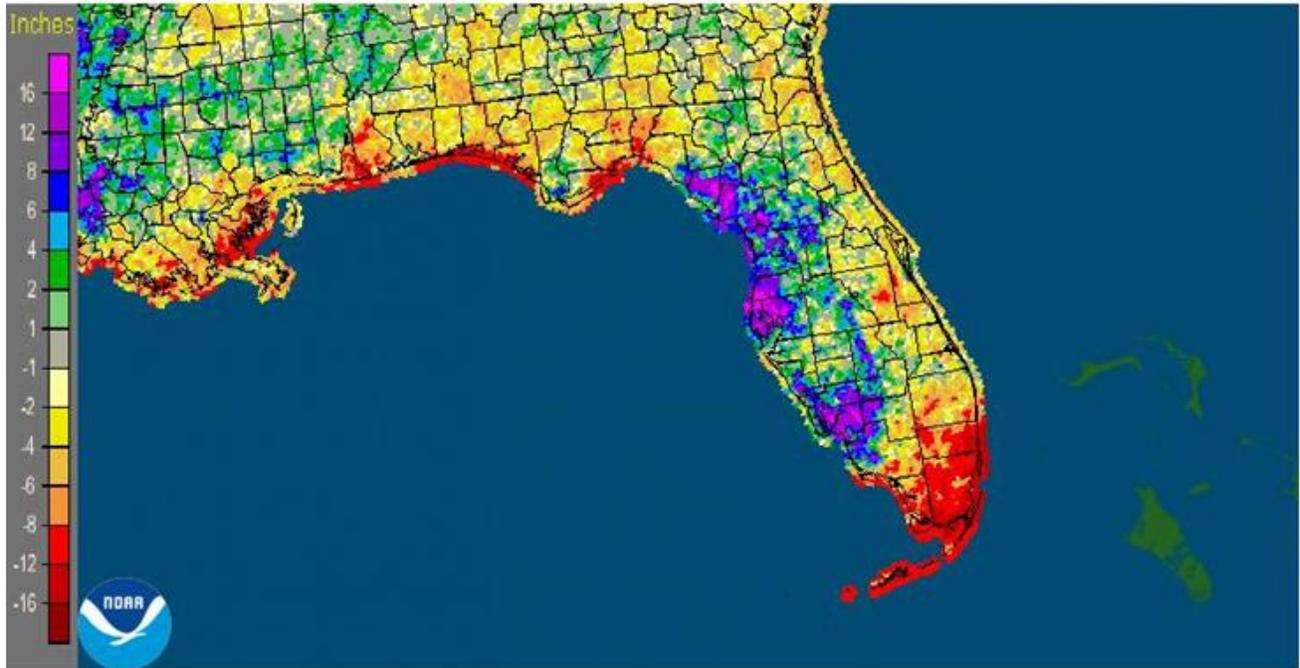
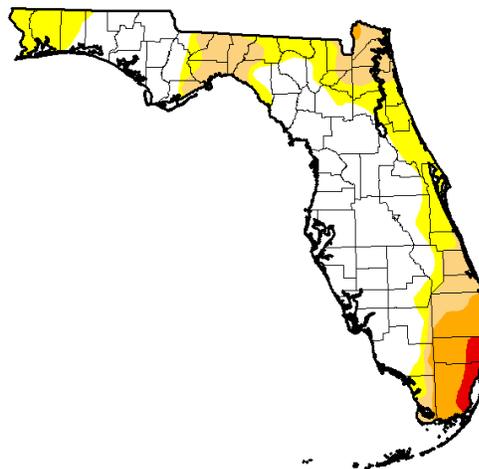


Figure 1: May-July rainfall departure from normal

**U.S. Drought Monitor
 Florida**

July 21, 2015
 (Released Thursday, Jul. 23, 2015)
 Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	54.74	45.26	22.98	8.90	1.84	0.00
Last Week 7/14/2015	55.54	44.46	21.67	9.91	1.84	0.00
3 Months Ago 4/21/2015	85.48	14.52	8.91	5.03	0.00	0.00
Start of Calendar Year 1/20/2014	94.33	5.67	0.99	0.00	0.00	0.00
Start of Water Year 9/30/2014	77.22	22.78	6.61	0.00	0.00	0.00
One Year Ago 7/22/2014	99.99	3.01	0.00	0.00	0.00	0.00

Intensity:
 D0 Abnormally Dry D3 Extreme Drought
 D1 Moderate Drought D4 Exceptional Drought
 D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
 David Simeral
 Western Regional Climate Center



<http://droughtmonitor.unl.edu/>

Figure 2: peak of drought conditions in late July

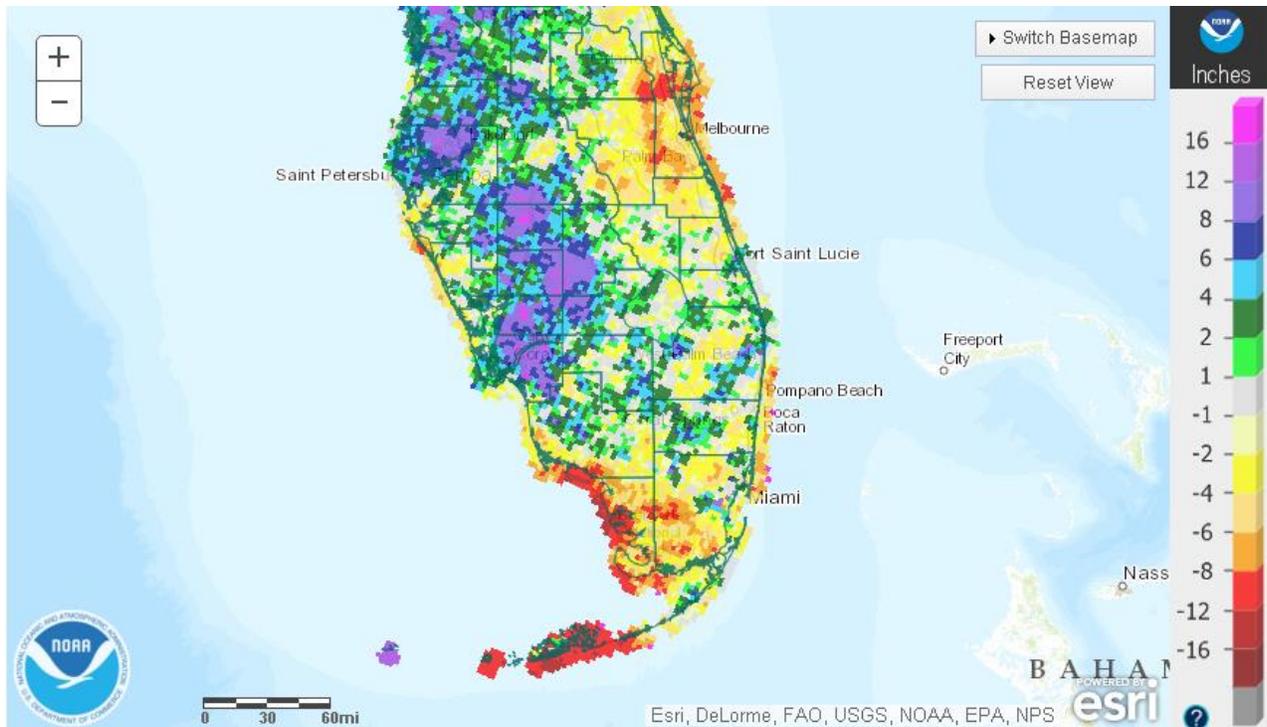


Figure 3: rainfall departure from normal mid-August through mid-October.



Towering Cumulus- Danny Gregoria

By: Robert Molléda

South Florida Dry Season Outlook 2015-2016

Increased Storminess and Risk of Tornadoes

The ongoing El Niño event will contribute to a wetter and stormier dry season across south Florida, most notably an increased risk of tornadoes, according to our dry season outlook. Details on the basis for this outlook follow.

Dry Season Factors

The primary factor influencing Florida weather this dry season is the presence of [El Niño](#) which is the warm phase of the [ENSO \(El Niño/Southern Oscillation\)](#). El Niño winters are usually characterized by a stronger and more active southern jet stream which can lead to occasional

low pressure systems affecting the southern United States and Gulf of Mexico. These systems, in turn, can bring increased episodes of cloudy, wet and stormy weather to Florida. The present El Niño is shaping up to be one of the strongest on record (since 1950) and rival the strong El Niño events of 1997-1998 and 1982-1983. Winter/spring seasons with strong El Niños have a history of severe weather, including damaging and deadly tornadoes.

Other factors include: intra-seasonal cycles such as the North Atlantic Oscillation (NAO), Pacific/North American Pattern (PNA) and Madden-Julian Oscillation (MJO). These intra-seasonal cycles tend to play a lesser role in strong El Niños events, but can still influence local weather patterns on a scale of 2-3 weeks.

Severe Weather Outlook and Public Safety/Preparedness

As noted above, a characteristic of strong El Niño winters in Florida is increased storminess due to a more active southern jet stream (Figure 4 below).

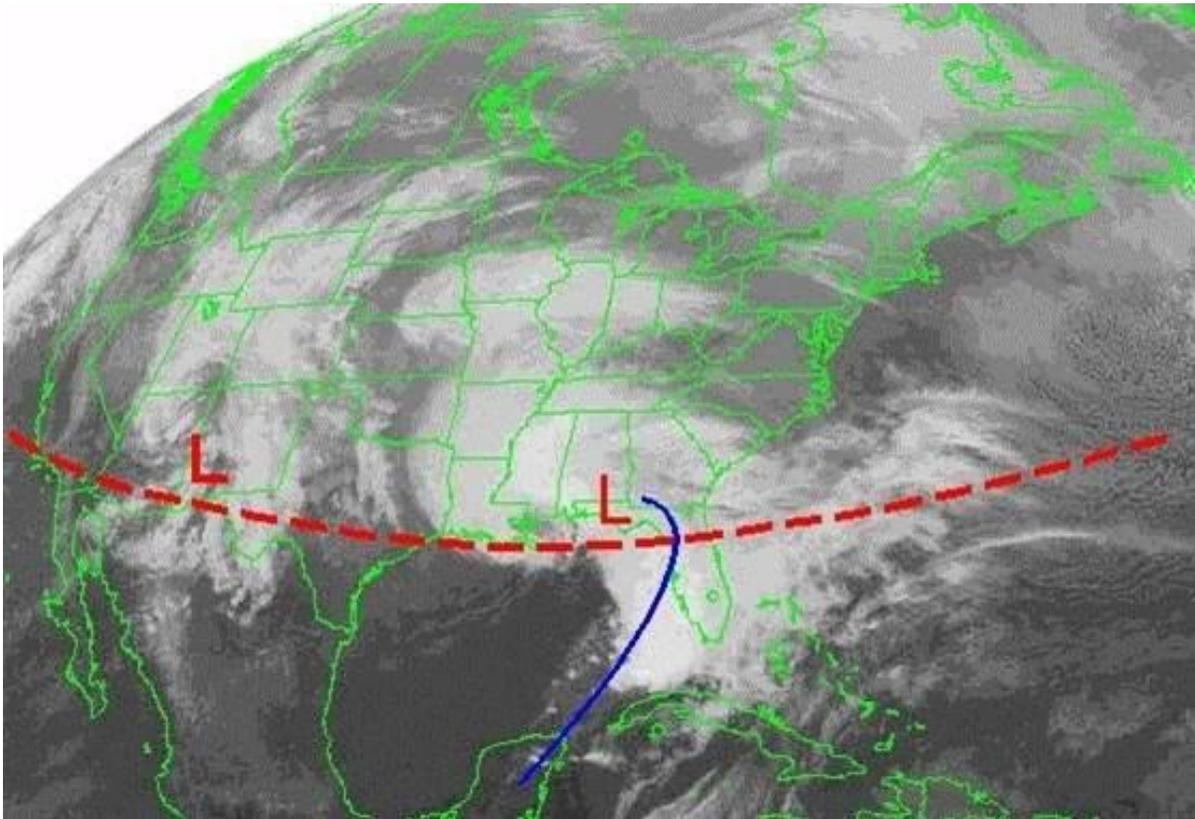


Figure 4: Classic winter/spring storm track during strong El Niño events

It's important to note that El Niño doesn't cause severe weather, but sets the stage. Factors such as the stronger and more southerly jet stream, increased tropical moisture, instability and wind shear come together more frequently across the Florida peninsula during strong El Niños

to create environments favorable for severe thunderstorms, tornadoes and flooding. In the six strongest El Niño events since 1950, the number of dry season F1/EF1 or greater tornadoes in south Florida (winds greater than 85 mph) was more than double the average of all El Niños. (Figure 5 below).

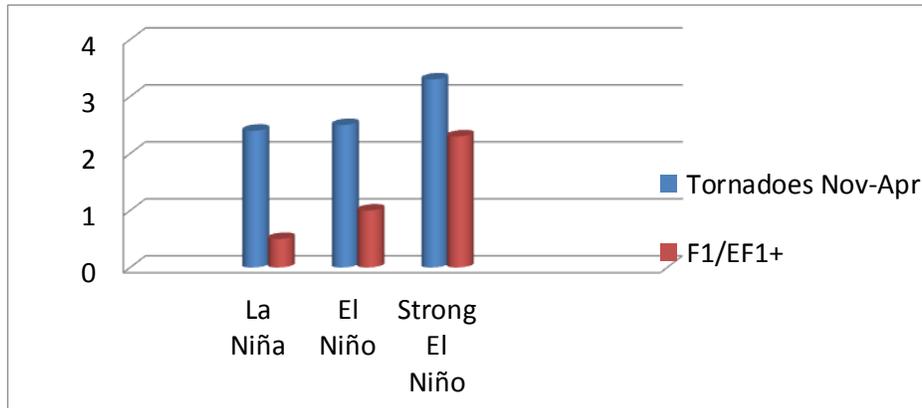


Figure 5: frequency of dry season F1/EF1+ tornadoes in south Florida.

February and March are the two months in which tornadoes have most frequently occurred during strong El Niños. Another noteworthy statistic regarding dry season tornadoes during strong El Niño events is that there's no favored time of day, with an almost equal distribution between the overnight hours and the more typical south Florida afternoon tornado occurrence. This raises concerns about tornadoes striking at night when people have lower awareness and threat perception than at other times of the day.

With this increased risk of tornadoes, severe thunderstorms, and flooding this dry season, the National Weather Service strongly urges everyone to take the following steps to ensure proper awareness and preparedness:

- **Monitor local media for severe weather situations.** Such evolving threats are typically identified a few days in advance, with more specific information about the most likely time(s) and location(s) of impact provided one day in advance.
- **Have the ability to receive timely weather warnings.** This can save lives, especially with dangerous, nighttime tornadoes.
- **Have a dependable alerting feature or device.** Ensure that you have a NOAA Weather Radio (programmed, with fresh batteries) and/or the Wireless Emergency Alert feature on your cell phone (or NWS warnings relayed by text message from Emergency Management or Media, or another reliable app).

- *Have a plan and identify a safe place for you and your family.* If living in a mobile home, RV, or boat, make plans to stay with family or friends. Leave before the severe weather arrives. If you can't leave, identify the closest sturdy shelter such as a clubhouse or laundry room and go there immediately if a warning is issued for your location. Identify your shelter location and "safe place" in advance of a threat (i.e. small interior room on the lowest floor of your home or business, far from windows); ensure everyone is aware of the location.

Precipitation and Temperature Outlook

With an increase in storminess comes a **higher likelihood of wetter-than-normal conditions** during the dry season. These increased periods of wet weather are still the exception in what is generally a sunny and dry time of year, but can provide additional rainfall to alleviate winter and early spring dryness.

Another El Niño characteristic is cooler than normal temperatures during the dry season, especially during the months of January through March. Much of this is caused by more frequent cloudy/rainy episodes interspersed in a mostly dry and mild winter which act to lower daytime temperatures. On the other hand, overnight and early morning low temperatures tend to remain relatively mild due to greater influence of storm systems from the Pacific Ocean which bring air of maritime origin rather than cold, dry continental air masses.

Although this winter is not expected to produce a higher-than-normal number of freeze events to south Florida, these can be influenced by the previously-mentioned intra-seasonal cycles which are extremely difficult to predict more than 2 weeks in advance. Therefore, those particularly sensitive to cold weather impacts should continue to pay close attention to the latest trends and forecasts.

Stay tuned to local media, NOAA Weather Radio and the National Weather Service South Florida website at weather.gov/southflorida for the latest weather information, including outlooks and forecasts of significant storm events. You can also visit our [Facebook](#) and [Twitter](#) pages for the latest weather information.

2015 Hurricane Season Summary



By: Stephen Konarik

Dan Gregoria- February 2013

The 2015 Atlantic Hurricane season was the 3rd consecutive one to have below average activity. Here is a summary (*Table 1*) of the season compared to the 30-year averages (1981-2010):

	30-year average (1981-2010)	2015
Tropical Storms	12	11
Hurricanes	6	4
Major Hurricanes (Category 3 or stronger)	3	2

Table 1 - Number of tropical storms, hurricanes, and major hurricanes; 30-year average versus the 2015 Atlantic Hurricane Season

The closest tropical system to South Florida was the season’s first storm, which actually occurred well before the official start of the season. On May 6th, Subtropical (eventually Tropical) Storm Ana formed between the coast of Palm Beach County and the northwest Bahamas. The system moved northward and eventually hit South Carolina, but had little impact on South Florida. In August, Tropical Storm Erika was on a track toward South Florida, but struck Hispaniola and dissipated before reaching South Florida. Finally, at the start of October, Hurricane Joaquin reached Category 4 strength with sustained winds of 155 mph over the southeast Bahamas. Joaquin was the strongest Atlantic Hurricane since 2010’s Igor. Of the remaining 8 tropical storms and hurricanes, none had impacts on South Florida. Below is a summary of the tracks of tropical storms and hurricanes during the 2015 season:

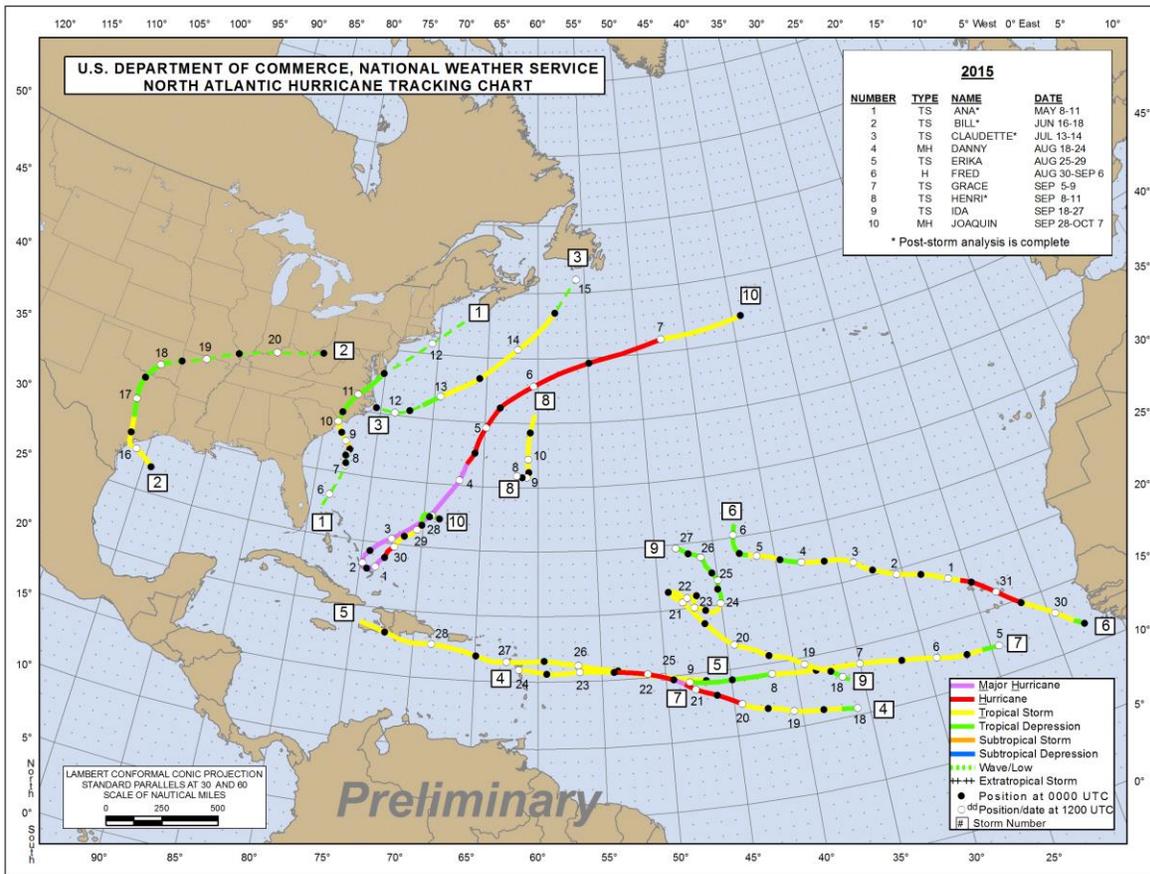


Figure 6 - Storm tracks of the 2015 Atlantic Hurricane Season



Sunset in Doral - Spring 2011 - Dan Gregoria

Our office has undergone many changes in personnel over the past 6 months. Here is a summary of the changes.

Departures:



Dr. Richard Knabb (NHC Director; right) presents Bob Ebaugh (left) and Kim Brabander (middle) with certificates of appreciation during their retirement ceremony.



Dr. Pablo Santos (Meteorologist In Charge NWS Miami; right) presents Bob Ebaugh (left) and Kim Brabander (middle) with certificates of appreciation during their retirement ceremony.

Robert (Bob) Ebaugh Observations Program Leader

Long timer Bob Ebaugh retired after 42 years of federal service. He began his federal service in 1973 when he joined the Army Security Agency and started his weather career taking upper air observations among other weather related tasks. In February of 1977, after being honorably discharged by the Army, he was offered a position at the National Hurricane Center (NHC) as a communications meteorological technician. In the early 1980s NHC and the Weather Service Forecast Office (WSFO) for the state of Florida were administratively separated and Bob became a meteorological technician under the WSFO. In the mid 1990s, the WSFO became the modernized South Florida Weather Forecast Office (WFO) with Bob transitioning into a Hydro-Meteorological Technician (HMT) position. In early 2011 he was promoted to Observations

Program Leader (OPL) at the Miami WFO, a position he held until his retirement on September 30, 2015. Bob left his mark also as a champion of the WFO outreach and education programs. He also served well his colleagues locally and nationwide as a union steward for the NWS Employees Organization. Bob will be greatly missed. Happy Retirement Bob!!

Kim Brabander
General Forecaster

Kim Brabander, general forecaster and long time aviation services focal point, retired on October 30, 2015 after 28 years of federal service. Kim graduated with a Masters degree in Geography specializing in Meteorology and Climatology from the University of Nebraska in Lincoln. He started his federal career with a temporary position at the Department of Forestry from March 1987 until early September. It was then that he started an internship with the Weather Service Office (WSO) in Shreveport, LA, in September 1987. From there he transferred to the NWS office at the Federal Aviation Administration (FAA) Academy in Oklahoma City in May 1989 where he served as an instructor until he transferred to the Center Weather Service Unit (CWSU) in Miami in December 1994. In August of 1998, he transferred to the Weather Forecast Office (WFO) in Miami as a general forecaster, a position he held until his retirement. Kim distinguished himself as the office aviation services focal point responsible for training staff on aviation forecasting techniques and attending to the needs of our aviation customer base. He will be greatly missed. Happy retirement Kim.

Dr. Jeral Estupiñan
Science and Operations Officer

Jeral was promoted to Meteorologist in Charge of the [National Weather Service Office in Phoenix, AZ](#) over the summer. He will be greatly missed and we wish him the best in his new position.

Andrew Kennedy
General Forecaster

Andrew was promoted to lead forecaster at the [National Weather Service Office in Jacksonville, FL](#). We wish him the best in his new position also.

Christopher Duke
General Forecaster

Chris transferred to an aviation forecaster position at the [National Aviation Weather Center](#) in Kansas City, MO. We wish him the best in his new position also.

Arrivals:

Arlena Moses
Lead Forecaster

Arlena reported to WFO Miami as our newest lead forecaster this past August. She comes to us from WFO Melbourne (MLB) where she served as a general forecaster since 2009. At WFO MLB she served as Assistant Hydrology Program Leader, Tropical Weather Program Leader, Social Media Team Member, GIS Program Leader, and Aviation Program Leader. Prior to WFO MLB Arlena served as a forecaster for 2 years at WFO Eureka, CA, and as an intern and at WFO Las Vegas, NV. She started her career as an intern student at WFO MLB from 2004-06. Arlena has a BS in Meteorology from the Florida Institute of Technology. Please join us in welcoming Arlena to our team.

Kevin Scharfenberg
Science and Operations Officer

Kevin was selected behind Dr. Jeral Estupiñan as our new Science and Operations Officer and will be reporting to the office in February. He is an experienced Emergency Response Specialist in the NWS Operations Center (NWSOC), and a co-author of the Weather-Ready Nation Roadmap. Kevin was responsible for the training and technology requirements of the NWSOC as it emerged from a Pilot Project to a permanent decision support center. This gives him unique perspective on the needs of a WFO over the next few years as it transitions to greater provision of decision support. His recent leadership opportunities have included serving as the Acting Meteorologist-in Charge of the NWSOC during a period of significant change; Acting Executive Officer of the Analyze, Forecast, and Support Office, responsible for managing the day to day activities of 11 National Service Programs; Directing the Weather-Ready Nation operational pilot projects from the national level; and National Coordinator of Severe Storm Services in the NWS.

He has also had the opportunity to work on teams at the National Severe Storms Laboratory developing and demonstrating many new technologies that are now reaching WFOs across the country. He was responsible for developing and executing the Joint Polarization Experiment operational demonstration at WFO Norman, including developing first-in-the-world dual-pol training materials for operational experience. He also co-led several operational experiments in the NOAA Hazardous Weather Testbed, including evaluation and forecaster training on MultiRadar/Multi-Sensor (MRMS) algorithms and phased-array radar. His work history shows experience being a leader and catalyst for change in NWS operations, and he is ready to directly bring that experience to WFO Miami. He is either author or co-author of multiple journal and conference papers. He brings a unique mix of Research to Operations and Decision Support Services experience that will serve WFO Miami and the South Florida community it serves extremely well.

Please join us in welcoming Kevin to WFO Miami.

Thanks for Reading!



Butterfly World in Coconut Creek - 2008 - Andrew Tingler

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