



Southernmost Weather Reporter



National Weather Service
Weather Forecast Office
Key West, FL



Southernmost Weather Reporter



National Weather Service ~ Key West, FL

Welcome to 2017 Winter Report

Farewell letter from Matt Moreland, Meteorologist-in-Charge (MIC) at NWS San Diego.

By: Matt Moreland

For my final letter for the “Southernmost Weather Reporter”, I wanted to share a few thoughts on Hurricane Irma. I never could have imagined that during the last four weeks of my time at the Florida Keys National Weather Service (NWS), that I would work the biggest event of my career. I am so proud of how our team came together and handled this event. We sent our first text notifications to emergency management on Aug. 30, and sent our first official briefing on the storm out on Friday, Sep. 1 – eight days before the storm impacted the Keys. Jon Rizzo, the Warning Coordination Meteorologist (and current Acting Meteorologist-in-Charge), deployed on-site with Monroe County Emergency Management (MCEM) for nine days beginning Thursday, Sep. 7. This on-site deployment for a tropical cyclone was a first for the office – a practice that will continue in the future. The NWS worked to support many of the critical decisions in the Keys: for example MCEM’s decision to initiate evacuation a day earlier than the normal time frame, and the decision to relocate the Emergency Operations Center to a more secure facility in Ocean Reef during the storm.

Thanks to the leadership efforts of Forecaster Bill South, the Florida Keys NWS participated in a wide scale of local, national, and international interviews. These interviews included all the major national networks, WGN, TMZ, and from countries as far ranging as Canada, Ireland, the UK, and New Zealand. In social media, the audience impressions on the Florida Keys NWS Twitter account increased from 477,000 in Aug. to 47.6 *million* in Sep. A single tweet issued by the office on Sep. 8 garnered an audience impression of 13.2 million, and was shared by Chelsea Clinton.

We had 17 employees from the Florida Keys NWS and three visiting from other offices, who hunkered down during the storm in our facility on White Street in Key West. This group continued to issue forecasts and warnings and stay in constant contact with media and emergency management as the storm crossed the Keys. On the morning of the 10th, several of the the Florida Keys NWS team watched radar knowing that the eyewall of Irma was impacting their properties, and persevered anyway. With power out across the Keys, most of our group remained at the office for five days, working hard with little sleep. One of our forecasters, Krizia Negron, provided support for our office from NWS Tampa and NWS Miami through Continuity of Operations (COOP). Our administrative assistant, Laura Kasper, did the same from Miami, ensuring that employees and their families were reimbursed for evacuations and hotel stays.

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Happy Holidays!

DEC 2017

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Welcome to 2017 Winter Report cont.

Many from the Florida Keys NWS office sustained damage to their properties from the hurricane, and had extended stays in hotel rooms after the storm. The meteorologists whose homes were damaged banded together and dubbed themselves the "Insertion Team". This group spent the days following the storm going house to house, helping each other do cleanup and make critical repairs. This teamwork was an example for our whole agency to follow!

The day of Irma's impact (Sep. 10), our communications slowly went down as they did with other agencies/offices in the area. However, we soon discovered that our older, rarely used, analog phone lines stayed up through and after the storm: our NOAA weather radio alarm line and our spotter and conference room phones. The NWS facility on White Street became a critical hub for decision making in the days to come. We provided hosting space for meetings for the City of Key West, the FAA, airports, FEMA, and other partners, and the twice daily county calls as well (as pictured on the right). A lot of key decisions were made during this period, including when to open the Lower Keys back to residents. We also provided decision support on the other storms that had formed in the wake of Irma (namely Jose and Maria). The Florida Keys NWS was very proud to have supported our partners in this way.



I want to give a special thanks to some other folks in the NWS that voluntarily came down for a period to help our office either to work operations for the storm itself, or afterwards to support recovery efforts: Monty Davis (Electronic Technician, NWS Oklahoma City), Keith DeArmas (Facilities Engineering Technician, NWS New Orleans/Baton Rouge), Ken Graham (Meteorologist-In-Charge, NWS New Orleans/Baton Rouge), Greg Heavener (Forecaster, NWS Corpus Christi), William Hill (Electronic Technician, NWS Dallas/Fort Worth), Heath Jordan (Facilities Engineering Technician, NWS Southern Region HQ), Jonathan Kurtz (Forecaster, NWS Oklahoma City), Mike Samuelson (Electronic Technician, NWS Lubbock), and Paul Schaafsma (Electronic Systems Analyst, NWS Brownsville). Also, a special thanks to NWS Austin/San Antonio, NWS Miami, and NWS Melbourne who each provided service backup for our office for a period following Irma's landfall as critical restoration work was done at our office. Thanks to the teamwork of those listed above, the Florida Keys NWS office was able to take back full operations on Sep. 19, only nine days after Irma had struck the area, and ensured a smooth transition in leadership once I departed for San Diego on Sep. 28.

I will forever be proud of the work that the Florida Keys NWS did in support of our decision makers, residents, and



tourists of the Keys, keeping them informed on Hurricane Irma. You all were like family – and I will miss working with you. I completed my move out to California in mid-Oct., and am settling into my new position in NWS San Diego. In the final days that I was down there, it broke my heart to see the devastation that the hurricane had wrought on portions of the Keys. But I know that the Keys are recovering fast, and will come back stronger than ever. I'm going to miss a lot of things: the sunsets, the food, the festivals, and most importantly, the people – and promise to be back to visit!

Florida Keys NWS Provides On-Site Weather Support for the NOAA Research Vessel *Nancy Foster*

By: Christopher Rothwell

Before Hurricane Irma impacted the Florida Keys in early September, and before a deployment to the NWS Corpus Christi for Hurricane Harvey in late Aug., Forecaster Chris Rothwell deployed in early Aug. to the NOAA Research Vessel (R/V) *Nancy Foster* for its annual survey of the Florida Keys National Marine Sanctuary. Rothwell gave daily shipboard marine weather briefings to support safety of life at sea and weather-sensitive decision making, pertaining to ship and small boat voyage planning and execution, and dive operations. This is the second year in a row the

Florida Keys NWS supported the *Foster's* research team, which carried out scuba and small-boat operations, and a variety of research missions, collecting data necessary for management decisions within the Sanctuary.

After the 10 day cruise, Rothwell provided a guided tour of the Florida Keys NWS office to portions of the *Foster's* crew. In the same vein as one NOAA, Florida Keys NWS plan to support the *Foster* next year during its 2018 research cruise in the Sanctuary.



From left: Survey Technician Sam Martin and Electronics Technician Keith Martin, both from the NOAA Research Vessel *Nancy Foster*, and Forecaster Chris Rothwell, from the Florida Keys NWS.

Florida Keys NWS Recognized at Regional and National Level

By: Krizia Negrón

In our last edition, we highlighted a group of our staff that was recognized for their work and efforts with a local Isaac M. Cline Award. The winners were then forwarded to region and national level for consideration. In total, four forecasters received recognition with a 2016 Isaac M. Cline Award and are listed below with the award description. Congratulations to all four!

Brandon Fling - Data Acquisition (regional) for leadership of the COOP, upper air, and climate programs and the WFO Observation Team, developing innovations in production and quality control to benefit multiple offices.

Kennard Kasper and Christopher Rothwell - Leadership (regional and national) for advancement of the NWS marine program through mission-critical customer service, developing a whole-office approach to DSS, and the completion of projects and research.

Krizia Negrón Hernández - EEO and Diversity Management (regional and national) for Spanish translation of warning/preparedness information for offices throughout the NWS which has furthered the mission and provided improvements in customer support.

Meet One of Our Meteorologists, Stephen Chesser

By: Christopher Rothwell

Q&A with Stephen Chesser, Meteorologist (pictured on the right)

You work the Data Acquisition Desk at the Florida Keys NWS. So, your only duties are to gather data?

No, I also quality control the immense quantities of data I acquire via the weather instruments aboard launched balloons. This means I selectively edit the data that is beyond proven scientific tolerances. Data entry duties include: monitoring various websites tracking daily rainfall and temperatures; emailing daily high and low temperatures and rainfall totals for compilation into statewide products; radar checklists for tracking technical aspects of the radar performance data; proofreading and editing routine text products; performing weekly tests of the NOAA weather radio; posting and monitoring social media platforms (Facebook and Twitter); and during tropical season, update advisories and outlooks.

Your career is in meteorology? Have you always been a meteorologist?

No, I have had several other jobs before I was a meteorologist. After I left the USAF, I worked as a part-time adjunct professor at a local junior college. Later, I worked as an over the road commercial truck driver, delivering cargo all over the continental U. S.

So, you spent some time in the military as a meteorologist. What countries have you worked in, that you can tell us?

While in the USAF, I was either temporarily stationed or stationed long term in the following countries: the Republic of Korea, the United Kingdom, Kingdom of Saudi Arabia, Islamic Republic of Afghanistan, Emirate of Kuwait, the Republic of Djibouti, Republic of Honduras and Republic of Colombia.

How is meteorology different in the military vs the National Weather Service?

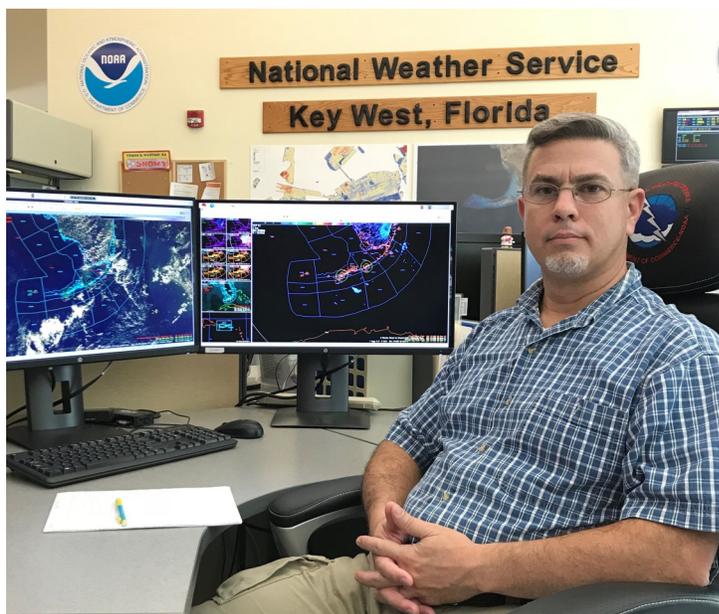
Military meteorology is either associated with synoptic scale weather for logistical and staff briefing purposes, or very local for the five mile terminal radius surrounding airbases around the world. I've forecasted for airbases thousands of miles away using only satellite and scant surface data.

What types of Decision Support Services (DSS) have you provided during your time in the military?

As a recently commissioned USAF weather officer, I was assigned to the Southwest Asia Weather Cell, just before the invasion of Iraq. I was working the overnight shift and suddenly the classified phone rang. It was a soldier calling my office for an update for their planned jump into northern Iraq the night of the invasion. I wasn't too sure what he needed, so I asked my closest Master Sergeant, who calmly instructed me to look for the thresholds that the soldier needed for his jump to be successful. I looked over the data and briefed the soldier that all weather factors were good to go. He gave me his initials and I gave him mine, just as if it was any other casual weather briefing.

Later, I dwelled on the immense importance of what had transpired that night. I had literally the fate of over a 100 lives hanging in the balance of my judgement call. But, this is just one example of the kind of DSS we performed regularly during my 12 years as a weather officer in the USAF. Whether it was in a Joint service weather cell, forecasting for the invasion of Iraq all the way over in South Carolina, embedded with special operations forces in the remote mountains of Afghanistan, Command Staff briefings for Combined Forces in Kuwait, or planning weather for

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Meet One of Our Meteorologists, Stephen Chesser *cont.*

the surge out of Iraq and into Afghanistan, DSS is just another day at the job for a commissioned USAF weather officer.

Where do you want to be in 10 years?

Not sure, I could either be a lead forecaster somewhere else in the NWS, or move over to work at either NHC or TAFB using my MS in tropical meteorology. I still have aspirations for a PhD.

Florida Keys NWS Forecaster Deploys to NWS Corpus Christi to Assist During Hurricane Harvey

By: Christopher Rothwell

On Aug. 23, Forecaster Chris Rothwell deployed to the NWS Corpus Christi, Texas, to support their office during tropical operations. At the time of Rothwell's flight out of Key West on the morning of the 23rd, Harvey had just emerged into the Bay of Campeche and was only classified as a tropical depression. The official National Hurricane Center forecast expected Harvey to make landfall somewhere along the Texas coastline, and based on the favorable conditions across the western Gulf of Mexico, hurricane watches were issued for much of the Texas coast, including all of NWS Corpus Christi's coastline. Harvey would end up rapidly intensifying into a Category 4 hurricane, making landfall near Port Aransas, Texas, just northeast of Corpus Christi. Just like the Florida Keys NWS during Hurricane Irma, NWS Corpus Christi needed all hands on deck to support their partners in southeastern Texas.

It is common for offices across the NWS to use personnel from neighboring offices to supplement the labor force during tropical operations. Rothwell was joined by two other deployed forecasters from across the region, and they were tasked with radar, aviation, social media, and EM partner briefings during their five day deployment at NWS Corpus Christi. Rothwell's experience during Harvey's landfall included the issuance of two Extreme Wind Warnings, support of first responders during the eye's passage over Rockport, a fire alarm evacuation during hurricane-force winds, and emergency Shop-Vac duties to prevent water from damaging the server room. Rothwell returned to Key West on Aug. 28th, just two weeks before an almost unbelievable landfall from another Category 4 hurricane, Irma.

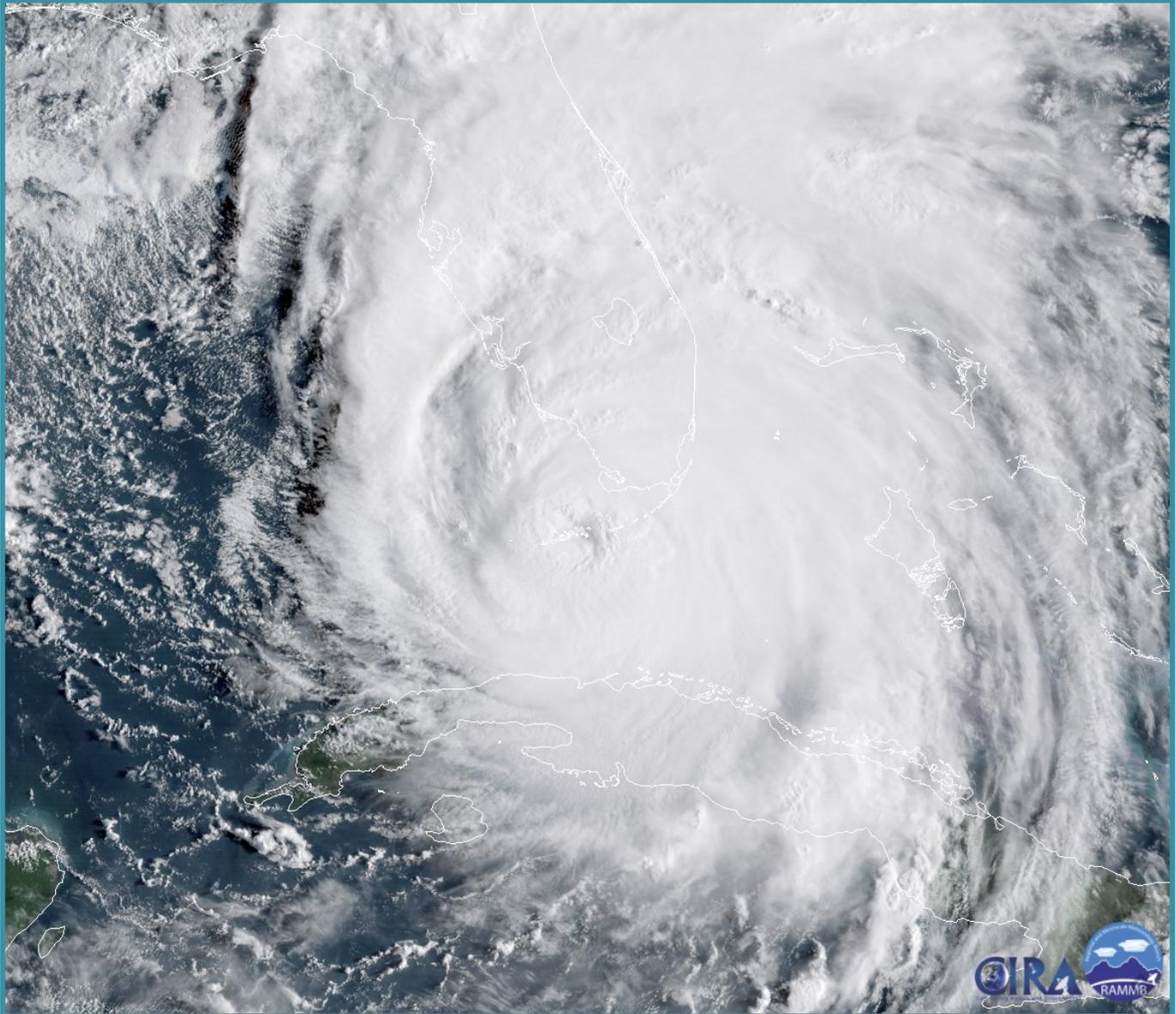


Panoramic view of the operational floor at NWS Corpus Christi before Hurricane Harvey's landfall.

Major Hurricane Irma

On Sunday, Sep. 10, 2017, Major Hurricane Irma made landfall over Cudjoe Key, in the Florida Keys at 9:10 am EDT.

Next, you'll find a summary of the storm's history, reports, and some of the stories as told by the staff that stayed and worked this event from the Florida Keys NWS building in Key West, FL.

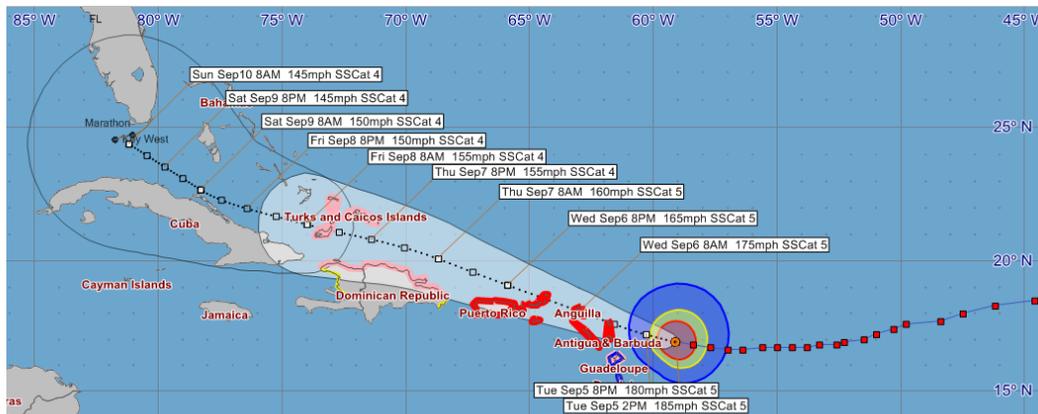


GOES-16 visible imagery (GeoColor) of Major Hurricane Irma on Sep. 10, 2017 approaching the Florida Keys. Image from CIRA. Disclaimer: NOAA's GOES-16 satellite imagery is non-operational and preliminary.

The History of Irma

By: Bill South

At 8 pm EDT, Sunday, Aug. 27, 2017, a tropical wave was located near the west coast of Africa. This tropical wave was producing a large area of disorganized showers and thunderstorms. The National Hurricane Center pronounced that environmental conditions were favorable for the tropical wave to gradually develop during the next five days as it moved to the west. This tropical wave developed into Tropical Storm Irma at 11 am, Aug. 30 about 420 miles west of the Cabo Verde Islands. Tropical Storm Irma rapidly intensified into a Category 2 hurricane, with maximum sustained winds near 100 mph, in just 24 hours. At 5 pm, Aug. 31, 2017, Hurricane Irma strengthened into a major hurricane of Category 3 intensity about 720 miles west of the Cabo Verde Islands. Irma fluctuated in intensity from a Category 2 to a Category 3 for the next several days as it progressed to the west-northwest.



On Sep. 4, Hurricane Irma began to steadily strengthen and at 5 pm, Irma reached Category 4 intensity about 490 miles east of the Leeward Islands. Irma strengthened into a Category 5, with maximum sustained winds near 175 mph, about 270 miles east of Antigua at 7:45 am on Sep. 5. At that point, Irma

Track of Hurricane Irma as of Sep. 5, 2 pm (red squares) and official forecast track (clear squares) from National Hurricane Center. Image from Hurrevac.

was the most intense easternmost Atlantic basin hurricane on record, surpassing Hurricane David in 1979. At 2 am on Sep. 6, Hurricane Irma reached its peak

intensity, with maximum sustained winds near 185 mph and a minimum central pressure of 914 millibars. At that point, Irma was tied as the second strongest Atlantic basin hurricane on record by maximum sustained winds, surpassed by only Hurricane Allen in 1980, which produced maximum sustained winds near 190 mph. Shortly thereafter, Hurricane Irma made landfall on the islands of Barbuda, Saint Martin, Ginger Island, and Tortola at peak intensity. Irma is the first recorded Category 5 to impact the northern Leeward Islands. Hurricane Irma retained maximum sustained winds near 185 mph for about 37 hours. Irma is the only tropical cyclone worldwide to produce maximum sustained winds that high for so long, surpassing the previous record of 24 hours set by Typhoon Haiyan in 2013.

Irma continued to move to the west-northwest and made landfall in Cuba as a Category 5 on Sep. 9. Land interaction with Cuba caused Hurricane Irma to weaken to a Category 3 later that day. Irma strengthened into a Category 4 at 3 am on Sep. 10 about 65 miles southeast of Key West, Florida. Hurricane Irma wobbled to the north and made landfall on Cudjoe Key at 9:10 am on Sunday, Sep. 10 as a Category 4, with maximum sustained winds near 130 mph and a minimum central pressure of 929 millibars. Irma is tied as the seventh most intense hurricane, by lowest central pressure, to make landfall in the United States since reliable records began in 1851. Four of the 10 most intense hurricanes, by lowest central pressure, to make landfall in the United States struck the Florida Keys: The Labor Day Hurricane in 1935, The Florida Keys Hurricane in 1919, Hurricane Donna in 1960, and Hurricane Irma in 2017.

Irma weakened to a Category 3 prior to making its second United States landfall in Marco Island, Florida, at 3:35 pm on Sep. 10. Later that afternoon, Hurricane Irma weakened to a Category 2 near Naples, Florida, and weakened to a tropical depression about 95 miles south-southwest of Atlanta, Georgia, the evening of Sep. 11., before eventually dissipating.

“I’m a meteorologist. I’m staying behind in the Florida Keys to help save lives”

Before and during Hurricane Irma’s landfall over the Florida Keys, our office conducted many phone, TV and radio interviews with local, regional, and national media. After one of the interviews, one of our forecasters, Bill South, was reached to share his thoughts with the Washington Post. You can read his article at <https://www.washingtonpost.com/news/posteverything/wp/2017/09/09/im-a-scientist-im-staying-behind-in-the-florida-keys-to-help-save-lives/>.

This article was originally published on Sep. 9, 2017, a day before Hurricane Irma’s landfall. Bill South is the Tropical Weather Program and Social Media manager at our office.



Left: CNN’s Anderson Cooper interviews Forecaster Bill South the night before Irma’s landfall over the Florida Keys.



Right: Forecaster Chip Kasper during a live phone interview with The Weather Channel.



Left: Forecaster Chris Rothwell (in blue shirt) broadcasts hourly observations through the VHF marine radio during the peak of the hurricane.



Insertion Team

By: Sean Daida

In the day following the landfall of Major Hurricane Irma in the Lower Florida Keys, one of our forecasters, Chris Rothwell, came up with the idea to band together and do what we can for our coworkers' homes as a team, the Insertion Team. The idea was everyone together, focusing on one house at a time, will be much more efficient and encouraging than everyone individually hauling out one branch at a time at their own separate homes. The communications at the Florida Keys NWS office were down so we were operating in a limited capacity, allowing most of our staff time to tackle household cleanup. It's been awhile since many of us have had to endure anything resembling hard labor, but we were all game. In the weeks following Irma's landfall, we visited at least seven residences and aided in whatever capacity was needed. We cleared storm debris, opened driveways, cut down and hauled trees, shoveled mud, tarped three roofs, hauled out shattered fences, cleared out drywall, took down storm shutters, jury rigged a window A/C, and even mopped flooded floors and baseboards. One person even helped me clean out a week old, warmed over fridge. We are all now in a little better shape, with a few callouses on our hands.

Four days after the storm, we ran into an individual on Big Pine Key who was without water, electricity, radio, or communication. He was covered in a number of bloodied bandages. Outside of a neighbor "way over there", and another one "way the other way", he said he's seen nobody and that it was nice to talk to someone. He said he felt he was going crazy talking to himself. He said his door exploded during the storm and things started flying everywhere, hence the superficial nicks and scratches. He said he was ok and had supplies, but still looked shell shocked. At that time, there was not much we could do except give him the news we have heard so far about the storm, where it hit, what the broader damage was like, and most importantly, what the broader damage wasn't. We gave him a cold bottle of water, a promise that the cavalry is on its way, and took down and relayed a message to his loved ones that he was alive and well.



Part of the Insertion Team helping in the cleanup at a staff's house.

Truth be told, we knew going in that the Insertion Team was little more than a quick shot of first responder aid and encouragement for every colleague whose homes were significantly impacted by the storm. We knew we didn't have the skills, endurance, nor the equipment to do even close to what we wanted or needed to be done, in the short time allowed. However, the Insertion Team kick start helped usher everyone onward towards recovery. A long road remains ahead for those, like me, who require significant rebuilding, which involves insurance agencies, contractors and adjusters. But, in the immediate aftermath, the Insertion Team helped individuals keep their spirits and energy up.

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Insertion Team *cont.*

Not everyone in the office could be a part of the team. But, I have no doubt everyone that was physically able, volunteered their time where and when able. In total, 12 staff members were involved, two of whom were on loan to help work the storm. It was a tiring and inspiring operation, one we hope to pass along to other offices in the NWS with similar disaster circumstances.

Below: A staff's house in the Keys. Right and bottom: More cleanups at two other staff's yard in Key West and Big Pine Key, FL.



You're Welcome, Florida Keys

We want to thank those of you whom have taken the time to thank our staff either via email, social media, and even post cards. Here are a few of your messages...

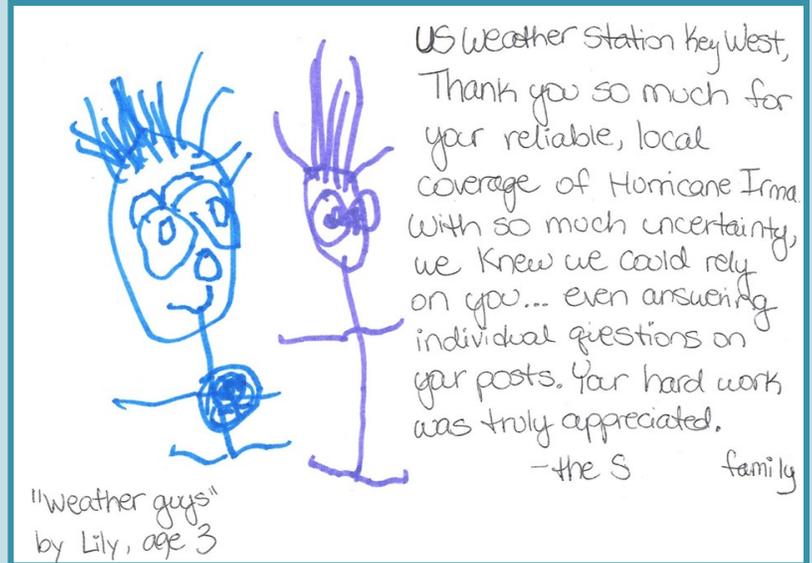
"Dear NWS Key West, Thanks for staying on the air and providing updates during the storm. You are rock stars!" ~ Lisa D. and Rob B.

"Be safe and thank you for your service."
~ Peggy J.

"Good job on much clearer communication. Thank you way to go..."
~ Nicole V.

"Thank you for hanging in there and providing great updates. Much appreciated" ~ Carlo A.

"Thank you so much for your fantastic work and your courage. So comforting to know you are all there, in KW, to see the picture of the night shift, and to read your tweets...I'll keep reading your tweets. Such a long night..." ~ Christiane T.



Hurricane Flags at Florida Keys NWS



By: Laura Kasper

Dating back to a Signal Corp tradition from 1875, the Florida Keys NWS flew hurricane flags from their flagpole during Hurricane Irma. This is the second time hurricane flags have been flown at the building since it was completed in Sep. 2005. All the dedicated forecasters, meteorologists, and support staff signed the flags, which are now on display in the lobby of the building.

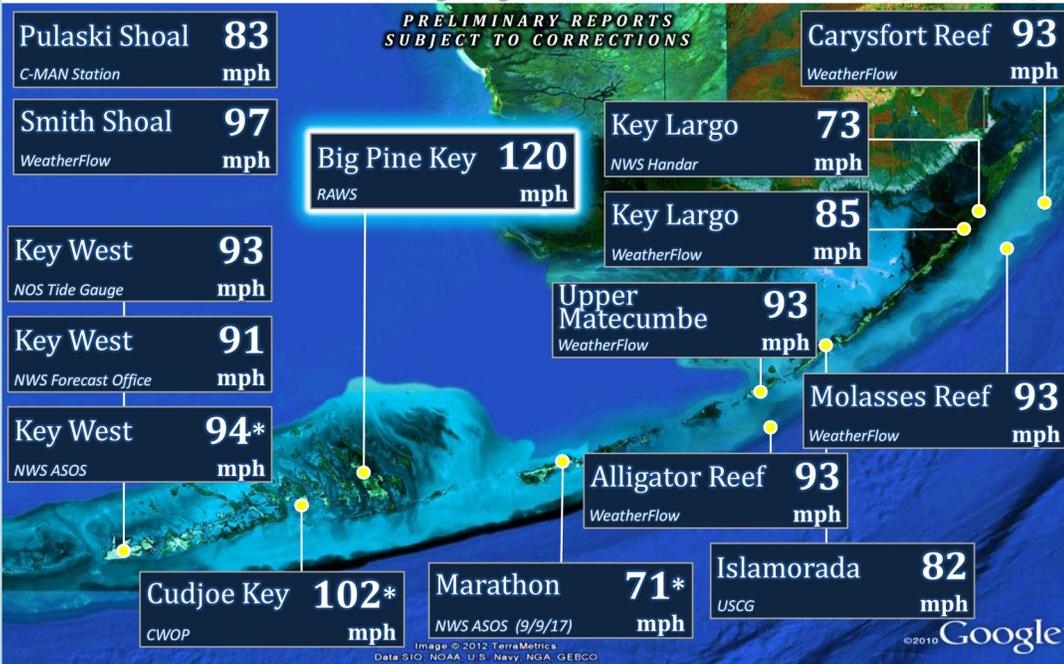


Preliminary Observations from Hurricane Irma

Preliminary observations for Hurricane Irma across the Florida Keys. For more information, visit http://www.weather.gov/media/key/Tropical/PSH_Irma2017.pdf. Graphics created by Dave Ross.

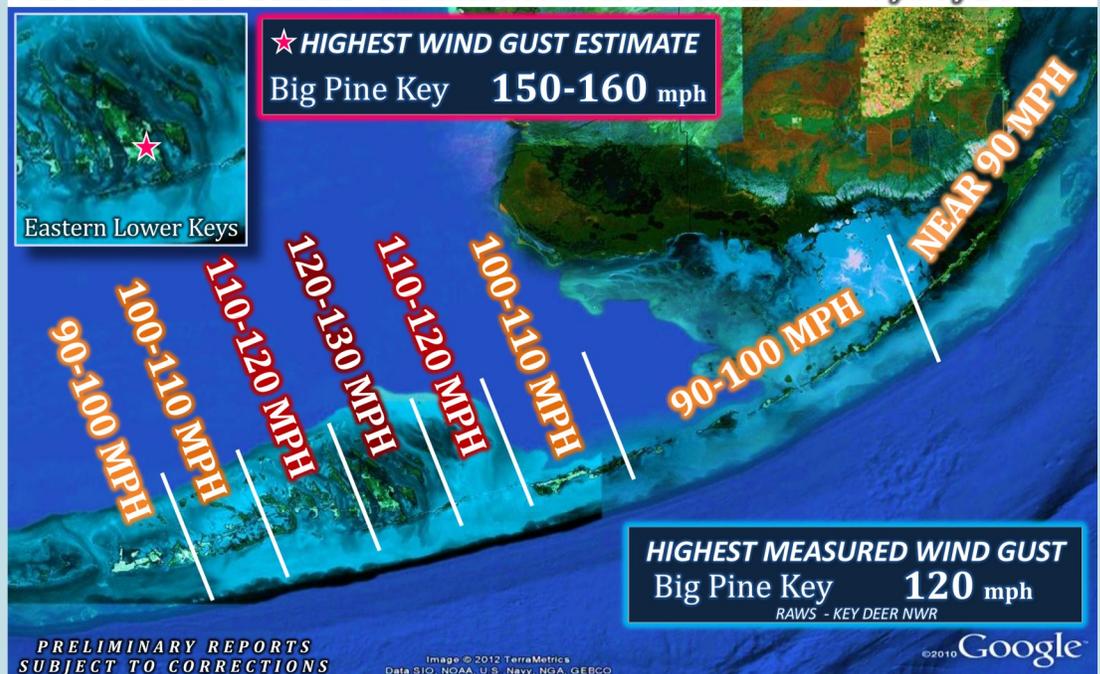
HURRICANE IRMA WIND GUST REPORTS

OBSERVED VALUES ON 9/10/2017 (* indicates incomplete data)



HURRICANE IRMA PEAK WIND GUSTS

ESTIMATED BASED ON DAMAGE ASSESSMENTS 9/10/2017



Preliminary Observations from Hurricane Irma cont.

Preliminary observations for Hurricane Irma across the Florida Keys. For more information, visit http://www.weather.gov/media/key/Tropical/PSH_Irma2017.pdf. Graphics created by Dave Ross.

HURRICANE IRMA HIGH WATER MARKS

DATA COURTESY OF THE USGS (FEET ABOVE GROUND LEVEL)



HURRICANE IRMA RAINFALL REPORTS

OBSERVED STORM VALUES (MULTI-DAY ACCUMULATIONS)

Location	SOURCE	PRELIMINARY REPORTS SUBJECT TO CORRECTIONS	Rainfall INCHES
BIG PINE KEY	RAWS – KEY DEER NWR		12.54
KEY LARGO (5.3 SW)	COCORAHS		9.98
CUDJOE KEY (0.9 SSW)	COCORAHS		9.76
MARATHON (6.8 ENE)	COCORAHS		9.42
KEY WEST (1.3 NE)	COCORAHS		9.03
BAHIA HONDA STATE PARK	COOP		7.58
KEY LARGO (N)	NWS HANDAR		7.16
KEY LARGO (6.2 NE)	COCORAHS		6.93
KEY WEST	NWS FORECAST OFFICE		5.70

From Harvey to Irma: My Experience at Florida Keys NWS

Greg Heavener is a forecaster at NWS Corpus Christi. He was deployed to the Florida Keys NWS office before Hurricane Irma to provide assistance to the office and staff.

By: Greg Heavener

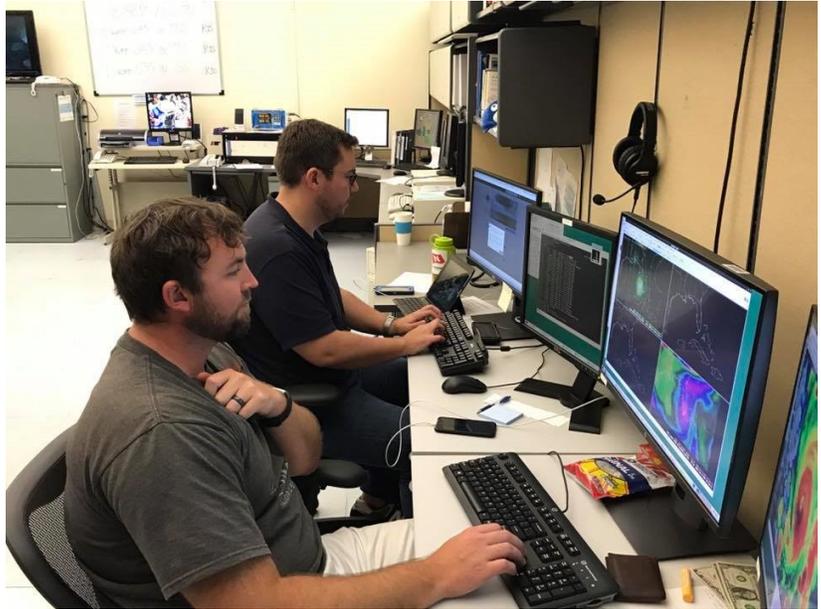
When I volunteered to deploy to help one of the Florida offices before Hurricane Irma would wreak havoc, I never thought in my wildest dreams I would head to Key West, FL. I had never been to the Keys and knew very little about the area. What I did know however, a landfall somewhere in the Keys could lead to weeks of no electricity and running water, or being cut-off from the mainland for weeks to months.

Living in Corpus Christi, TX and having just gone through Hurricane Harvey two weeks prior, I had a very unique perspective. I could easily relate to the staff who live and work in the Keys, I knew what was going through their minds, and could empathize. I was sent to Key West with one goal in mind: to make the situation just a little more bearable and do whatever I was asked to do to help.

While deployed to the Key West office, I mostly worked on the Social Media side, Twitter and Facebook, but also helped to generate several of the hurricane text products. Generating the content was rather easy in that the hurricane spoke for itself. What was tougher to do was to simplify the messaging so that people clearly understood the dangers of Irma and heed the warnings. I saw first-hand how using a personal plea/connection with the public can cause a post to go viral.

The office staff was very inviting and appreciative of the extra help with everyone working 12-hour shifts, while constantly coordinating the forecast and messaging with NWS Miami and the National Hurricane Center. I spent a total of eight days working in the office, five of the nights were spent on an air mattress in the conference room. Being in close quarters for a lengthy period of time allowed me to bond with the local staff and we tried to make the best of the situation as possible.

I will definitely never forget the friends I made while at the office and the fantastic work done by all. Key West and the staff of the NWS office will always have a special place in my heart. I wish them all well during the lengthy recovery process.



From left, Forecasters Greg Heavener from NWS Corpus Christi and Jon Kurtz from NWS Norman, which were deployed to Florida Keys NWS ahead of Hurricane Irma's landfall to assist the office.

Photos Along the Florida Keys After Hurricane Irma



Clockwise from top left (credit in parenthesis)
Uprooted tree in Key West (NWS Key West); aerial assessment of Bahia Honda State Park (Florida Keys Mosquito Control District), Key Deer taking refuge inside a destroyed house in Big Pine Key (Mike Brennan/NHC); car pushed into a driveway in Big Pine Key (NWS Key West); and aerial assessment over the Lower Keys (Monroe County).



Photos Along the Florida Keys After Hurricane Irma *cont.*



Clockwise from top left (credit in parenthesis): Forecaster Chip Kasper (on the right) providing after-storm updates at the US-1 Radio station in Sugarloaf Key (NWS Key West); observation of 72 inches, or 6 feet, of storm surge in Big Pine Key (Mike Brennan/NHC); total loss of a house in Big Pine Key (NWS Key West); debris in the middle of US-1 road; and storm surge mark on the wall at a house in Big Pine Key (Mike Brennan/NHC).



2017 Hurricane Preliminary Season Summary

By: Melody Lovin

The 2017 hurricane season will be one for the record books, as the Atlantic Basin was quite active, and several major hurricanes made landfall. As of Dec. 1, 17 named tropical cyclones formed, and 10 of those became hurricanes. Of those 10, six became major hurricanes (Category 3 or higher). Three of these major hurricanes reached Category 5 strength – the highest wind speed classification possible of a tropical cyclone, requiring sustained winds of at least 155 mph on the Saffir-Simpson Hurricane Wind Scale.

This amount of activity was well above average. See the table below for comparison.

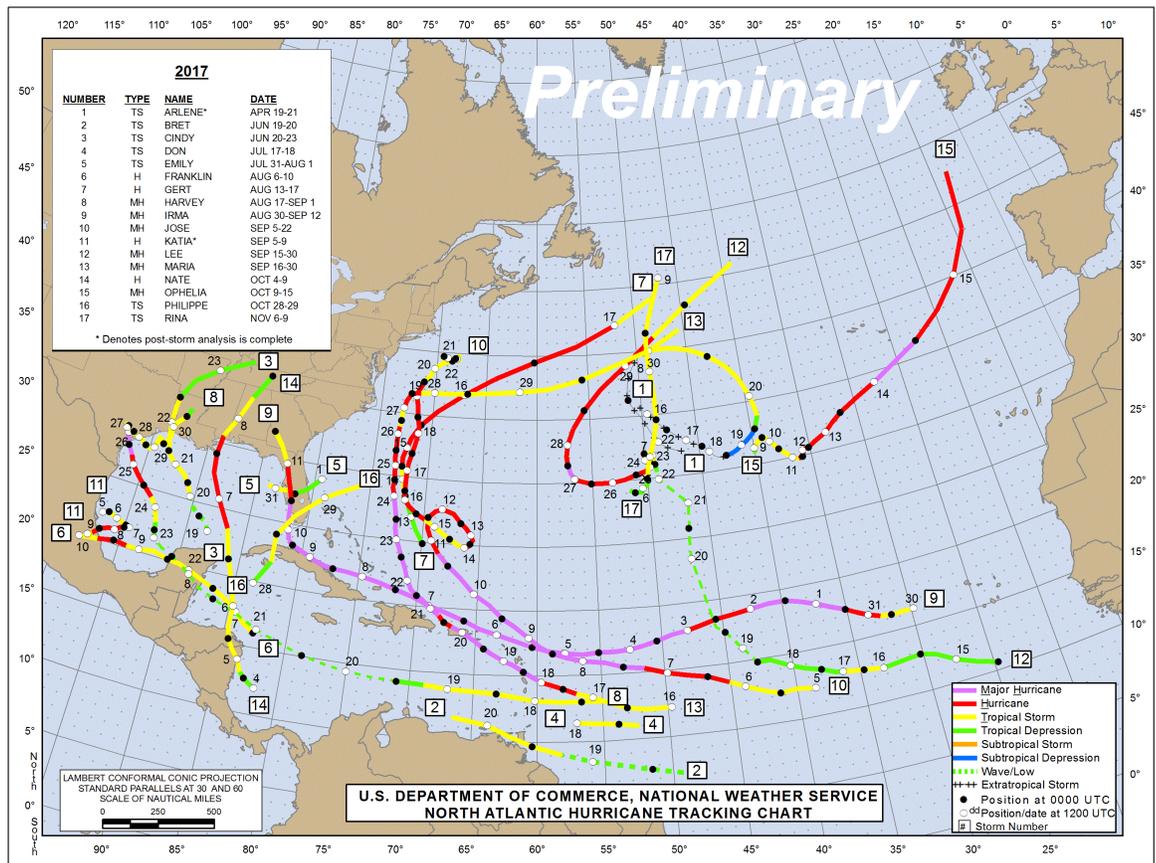
	2017 Hurricane Season	Average (1966-2009)	2017 Number Above Normal	2017 Percentage Above Normal
Named Storms	17	11.3	~6	+50%
Hurricanes	10	6.2	~4	+61%
Major Hurricanes	6	2.3	~4	+161%

In terms of ACE (Accumulated Cyclone Energy), which, according to the National Hurricane Center, measures the combined strength and duration of tropical storms and hurricanes, the 2017 season is the 7th most active on record to date.

Those in the United States, Puerto Rico and the US Virgin Islands will best remember three storms – Harvey, Irma, and Maria, which all made landfall in US territory as major hurricanes during Aug. and Sep. Harvey hit Rockport, TX head-on with wind speeds of 130 mph, and the lingering cyclone produced life-threatening flash flooding across the metropolis of Houston, TX. Irma made landfall near Cudjoe Key in the Florida Keys near 130 mph, and in Marco Island, FL hours later with winds near 115 mph, and

continued to shift northward up the Florida peninsula affecting most of the state. Maria made landfall near Yabucoa, Puerto Rico with winds near 155 mph, with widespread flooding affecting much of the island, and destroying 95% of the power grid.

Preliminary tracks of all named storms of the 2017 Atlantic Hurricane Season.



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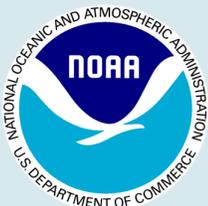
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*Cover photo:
Stranded boat on Smathers Beach, Key West, FL,
taken Nov., 2017 by Krizia Negrón.*

