

A note from the Editor...

You may have been asking, "What happened to the Summer Issue?" In two words...it was hurricane slammed. Just as we were heading to press, four troublemakers named Charley, Frances, Ivan, and Jeanne snapped us back to our primary mission of hazardous weather forecasting. By the time the storms got through with us, it was October - too late for a "summer" edition. But, the activity provided a wealth of news fit to print, much of which you'll find here. Better late than never...

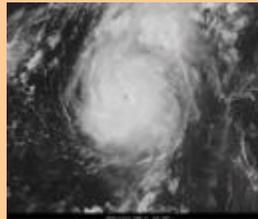
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Special Feature: Hurricane Heroism

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Special Feature

Hurricane Heroics at NWS Tampa Bay



Six Weeks That Changed Everything

We're Due. These words, heard every year beginning with Hazardous Weather Awareness Week and amplified at the Florida Governor's Hurricane Conference each May, finally bore fruit in 2004. Florida was overrun by a record-tying five tropical cyclones between August 12th and September 26th. The Suncoast received the strongest blow on August 13th as Charley ravaged the Lee County barrier islands before rampaging across Charlotte, Desoto, and Hardee Counties.

Charley was followed in succession by Frances, Ivan, and Jeanne - each landfalling in or near Florida within about 10 days of each other. Despite this constant drumbeat, NWS Tampa Bay was up to the task. Despite long hours, few days off, and emergency staffing and assignments, not to mention concern for family and personal property, the office functioned to its maximum ability. Despite dollar damage in the tens of billions, direct fatalities and injuries were minimal - a tribute to

our dedication to public service and safety.

This special feature provides a window into how we accomplished our mission - before, during, and after the storm. We hope you enjoy it!

Cool Under Pressure

Teamwork Key to Successful Service

For long stretches of time each year, weather on the Suncoast is benign. Aside from daily summer thunderstorms, the occasional heavy rain episode, and periodic wildfire danger, much of the year features hazard-free weather. That all changed in just two days in August.

Never has there been a busier day at NWS Tampa Bay than August 12, 2004. The combination of a landfalling Tropical Storm Bonnie in Florida's Big Bend, with an encroaching and much more ominous Hurricane Charley, resulted in a non-stop 18 hour period of customer service. Nearly every staff member was involved, from the facilities supervisor to the office manager.

The action began just before midnight on the 12th, when a Hurricane Watch was posted along the Suncoast south of Tampa Bay for Charley. At this point, a 12 hour contingency schedule was invoked for operational staff, in anticipation of the heavy lifting ahead. Media and emergency management coordination began immediately. At 4 AM, two local network affiliates were in house, setting up for live remotes during their morning programming. Over a dozen brief broadcasts were conducted until 9 AM.

But the fun was just beginning. Fringe bands from Bonnie were producing marine hazards off the Nature Coast. Charley was gradually strengthening to a strong Category 2 as it moved through the Cayman Islands. Phones rang continuously as customers and partners inquired about Charley's local affects. Newspaper reporters roamed the office, shadowing staff members and giving interviews. Dozens of non-routine forecast and warning products were issued, both from Bonnie's decaying squall line to Charley's potential devastation. Perhaps most importantly, yeoman efforts were provided by the electronic technician staff, who discovered a potentially crippling radar problem, and were able to temporarily fix it in order to keep the system running through the weekend.

Early on the 13th, there was no longer any doubt that Charley would rake the Suncoast later that day. But where? NHC forecasts had consistently targeted the Tampa Bay region.

Lending a Helping Hand

Ruskin Forecasters Make Difference in Lee County



Dan Noah (navy blue shirt, bending) discusses Hurricane Charley with Lee County EOC.

When the local NWS office closed in Fort Myers back in 1985, the larger office in Tampa Bay agreed to send at least one staff member to the Lee County Emergency Operations Center (EOC) to assist in local decisionmaking. Such decisions include positioning of personnel, such as police and fire/rescue, as well as equipment and supplies. Successful decisions improve rapid response efforts to damaged communities after a storm has passed.

The process proved crucial during Hurricane Charley. Warning Coordination Meteorologist Dan Noah drew the assignment, and his critical assessment of the rapidly changing situation

Staffers with residences near the coast evacuated, adding a layer of concern. At this point, the media had left and the phones quieted down. However, the staff performed admirably, issuing dozens of hazardous weather products, many emphasizing the devastating impacts from Charley's winds.

In Charley's aftermath, the dedicated crew forged on. Office survey teams fanned out across the damage path on the 14th and 15th, analyzing damage and capturing over 200 still photographs, which, along with a preliminary report, would be posted on the office webpage just 2 1/2 days after the event. Back at the office, tornado and torrential rain producing thunderstorms kept things hopping on the 14th.

Charley proved a mere warm-up for a non-stop September. Preparation for slow-moving Frances began at the beginning of the month, and operations and aftermath consumed five days (September 4 - 9), with the latter dealing with rapid, major flooding of many rivers in west central Florida. Though Ivan largely spared the Suncoast, its intensity, size, and potential threat kept everyone on their toes from the 10th through the 16th. By the time Jeanne made tracks for the peninsula, the mood of the office matched that of the state; "Enough!". But, the staff soldiered on, knowing that they had done their best to protect the Suncoast's communities - and that drier Autumn weather was on the way.

Through it all, the members of "NWS Team Tampa Bay" never flinched. For an office that was rarely challenged by hazardous weather episodes, Hurricane Season 2004 made up for it - in spades. Rising to the challenge, the staff lived up to the NWS core value of service over self.

may very well have saved lives. Upon arrival August 12th, Lee County was expecting a glancing blow as forecasts were converging on a landfall about 90 miles north. However, Dan correctly pointed out that slight changes in the track could put any location in southwest Florida at risk, and for the EOC to stand ready.

By morning of the 13th, satellite trends were showing the initial signs of a rightward shift in Charley's track. Dan provided this information as a "heads up" for the EOC staff. The threat was now much more serious for Lee (and Charlotte) County, and plans were ratcheted up for a worst case scenario. At the end of the day, Dan received a standing ovation from the nearly 100 persons who attended the final briefing!

NWS Tampa Bay forecasters Rick Davis (Frances) and Barry Goldsmith (Jeanne) assisted Lee County in September.

Special Feature

Incident Meteorologist Aids Oil Cleanup Efforts after Ivan

By Rick Davis

On September 28th, 2004, I was dispatched to the MP 69 oil pipeline leak and spill, at the mouth of the Mississippi River, in Southeast Louisiana.

Nearly two weeks prior to my arrival as an incident meteorologist (IMET), powerful



Source of the oil leak off the

- 1) Repair broken pipelines.
- 2) Control and containment of leaking oil.
- 3) Protection of wildlife areas.

The weak flow pattern lasted nearly a week before a more dominant southeast to east flow was

Hurricane Ivan moved 50 miles east of the affected area, producing waves greater than 50 feet high. These enormous waves damaged several oil pipelines in the North Central Gulf of Mexico. When the oil companies began reactivating the pipeline system, several leaks were found. The slicks threatened the wetland habitats of the Mississippi River delta, which is home to the Delta National Wildlife Refuge and Pass a Loutre State Wildlife Management Area.

Toward the end of September, a stationary front was draped across the northern Gulf, generating light and variable winds. This pattern was making it difficult for NOAA HAZMAT oil trajectory models to forecast the expected movement of the oil slick.



The author, in flight above the oil slick.

Louisiana Coast.

I arrived at the Incident Command Post in Fort Jackson, Louisiana on the morning of Sept 29th and quickly began setting up the All-Hazards Meteorological Response System (AMRS) to provide on site weather information to the NOAA HAZMAT team, the Coast Guard, and the incident operations personnel.

After a complete look at all the weather variables using FX-Net and all other IMET tools at hand, a coordination call ensued with the marine and public forecasters at NWS New Orleans. I issued two site specific forecast daily and briefed all branches of the incident command team several times a day.

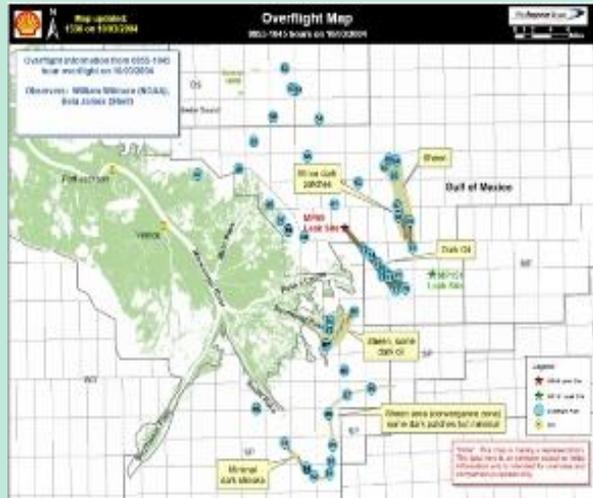
The site-specific forecasts added a great deal of accuracy to the NOAA HAZMAT trajectory models, and helped to accomplish the goals of the Incident Operations Team, which were:

accurately forecast.

The dispatch was challenging and educational. IMET responsibilities included forecasting for operations on land, water, air, and 45 feet below the water's surface. The IMET forecast was used daily by over 200 people on the team, and provided value-added information to the general forecast (from New Orleans) which enhanced response operations. There was excellent teamwork between different NOAA branches and the entire response team. This was a very positive experience and useful endeavor that I believe should continue to expand in the future.



Oil slick in the lower Mississippi Delta of southeast Louisiana.



Overview map used to depict areas of oil leak spread and intensity, from October 3, 2004

Special Feature

Up Close and Personal with the Experts

Forecaster Gets Insider's View of NHC Operations



At left: NWS Tampa Bay Forecaster Barry Goldsmith setting initial points for Hurricane Frank. **At right:** TPC Science and Operations Officer Rick Knabb with the daily lunchtime map briefing.

Just two weeks after Hurricane Charley ripped across the Florida peninsula, forecaster Barry Goldsmith was invited to visit the Tropical Prediction Center (TPC). The three day excursion provided an in depth view into the operations of the Center in order to gain a deeper understanding of their forecast process. This article will summarize the process, without giving away too many secrets!

These data are then passed to the Hurricane Specialist, who then reconciles the fixes and extrapolates a new starting point for the upcoming advisory based on up-to-the-minute satellite data. Protractors, pencils, and paper are used to pinpoint the location to fractions of a degree! Fixes, both intensity and position, are more accurate for well defined and well sampled (by aircraft) cyclones. However, determining a storm's location and intensity during the

The Forecast Process

Once a system (including a depression) is born, prediction begins. First, the initial data are input into the Automated Tropical Cyclone Forecast (ATCF) system. Meanwhile, computer models, initialized with the storm's intensity and movement, swing into action. Models from around the world attempt to synthesize the storm's environment with the larger (synoptic) scale environment to forecast future movement and

A Starting Point...Precisely

Without an accurate initial location, a forecast can go awry. The process to determine an initial position of a tropical cyclone involves several entities, including both sides of the TPC house: the Tropical Analysis and Forecast Branch (TAFB), and the Hurricane Specialist area. A satellite specialist at TAFB provides a "fix" from a series of detailed photographs from multiple weather satellites, and receives supplemental fixes from outside sources, including the Satellite Analysis Branch (SAB) in Camp Springs, MD, and the U.S. Air Force Weather Agency (AFWA) group. The fixes not only include location, but more importantly, intensity estimates.

formative stage, especially in data sparse areas, is critical to forecasting a cyclone's initial development and track.

A Storm is Born!

During the afternoon of August 25, Goldsmith was invited to observe the satellite classification process. A wave moving west of the Cape Verde Islands was beginning to show banded cloud features, a sign of development. Using a log 10 square chart and the Dvorak technique, Goldsmith, along with the duty Satellite specialist, found enough evidence to name Frances! Little did we know that, in 10 days, she would become Florida's second landfalling hurricane in 2004.

intensification (or weakening). Models, such as the Geophysical Fluid Dynamics Laboratory (GFDL) model, are scheduled by the Hurricane Specialist through coordination with the National Centers for Environmental Prediction.

After the models finish, the Hurricane Specialist will access a "spaghetti chart" similar to this one, which provides a quick look at whether there is any consensus. The Specialist will then adjust the track, intensity, and wind radii in ATCF based on a mix of forecast consistency, analysis of large- and storm-scale trends, and model data. When complete, the forecast is saved in ATCF, and the Specialist prepares for the coordination teleconference.

Special Feature

The View From 40 Thousand Feet

NWS Tampa Bay Assists Hurricane Data Collectors



The NOAA Gulfstream-IV jet, ready for takeoff to investigate Hurricane Ivan.

As Hurricane Ivan churned in the Gulf, three staff members had the privilege of assisting NOAA's Aircraft Operations Center in acquiring data from the large scale environment surrounding the storm. Hydrometeorological Technician Tom Dougherty (September 12), Meteorologist-in-Charge Shawn Bennett (September 14), and forecaster Barry Goldsmith (September 15) each took an eight-hour "spin" in the NOAA Gulfstream-IV (G-IV) jet. These guests were able to witness how crucial these data become to the short term forecast of a major hurricane.

Each mission includes a crew of around a dozen men and women, including two pilots, a flight director, a data quality control specialist, at least two sonde specialists, and up to three visitors. The mission begins with a detailed flight plan, based on the location, intensity, girth, and expected track of the storm. Unlike the NOAA P-3 aircraft, which fly directly

The goal of the mission was to answer two big questions: Were there west or southwest winds above 15,000 feet sufficient to steer the storm farther east than current forecast? Would dry air entrain into the system before landfall, causing the storm to weaken? To get answers, dropsondes (see photo at left) were launched over a six hour period. Each sonde is launched at the scheduled latitude/longitude location, measured precisely by an on-board Global Positioning System (GPS) and timed by the Flight Director.

After a sonde is launched, a GPS device must find at least 5 satellites ("receivers") before all data can process. Wind, temperature, humidity, and pressure data are then transmitted back to the aircraft in real time (below).

into the storm at varying altitudes, the G-IV samples the steering currents around the storm from very high altitudes.

The flight on September 15th was particularly critical. Ivan was moving steadily toward the northern Gulf coast, and maintaining Category 4 strength after weakening a bit the previous day. The flight plan included 27 scheduled "drops" around the periphery of the storm, and as far west as the northeast Texas Coast, as far south as the Yucatan channel, and as far east as the central Bahamas.



When a flight is complete, the quality control process begins. Quality control requires a general understanding of the meteorological environment. After each sonde is checked, the measured parameters are coded and transmitted back to earth via satellite.

Near the end of the flight, the entire suite of observations is transmitted for use by Hurricane Specialists and as input to tropical cyclone prediction models. A wrap up satellite cell phone call with a Hurricane Specialist may also be completed.

As Ivan approached the coast, the answers to the questions above were: Only a slight shift to the right may occur, and little or no dry air would entrain before landfall. In short, Ivan would indeed be terrible for the Alabama and extreme western Florida Gulf Coast.

Observations

Surf Zone Forecasts Aided by Surf Shop Owner



Rocky Von Hahmann (right), after receiving plaque for service to NWS Tampa Bay, and Charlie Paxton discuss local surf conditions.

By Rick Davis

Rocky von Hahmann, owner of Surfing World surf shop in Cortez, Florida, was awarded a plaque in recognition of his many years of dedicated service to NWS Tampa Bay. He has tirelessly provided timely and accurate surf reports and marine observations from Bradenton Beach nearly every day, including weekends,

for five years.

His reports have helped solidify nearshore marine and surf zone forecasts and advisories. His accurate visual reading of surf zone wave height helped verify many high surf advisories along area beaches, and his wind estimates help decisionmaking for nearshore headlines in coastal waters forecasts. Not to mention the sometimes risky venture in retrieving surf temperature!

Rocky toured the office on his recent visit after receiving his award, and observed the many aspects of NWS operations in action. Rocky's daily reports can be heard on NOAA Weather Radio stations in the Tampa Bay area, and can be viewed on the web on our Local Beaches page by clicking on the "Latest Beach and Surf Report".

Thanks, Rocky for all your past, present, and future efforts!

News Briefs

Hail...and Farewell

NWS Tampa Bay Welcomes two new members to the office family. **Nick Petro** is the most recent hire, taking over for departed Senior Forecaster **Ron Morales**, and **Lew Harrington** replaced departed Electronics Technician **Ernie Duxbury**.



Nick Petro

Nick arrived from the NWS office in Newport/Morehead City, NC after a seven year stint. Nick, a Penn State graduate, offers expertise in mesoscale modeling and the Interactive Forecast and Processing System. Lew arrived in mid summer and was immediately greeted by five tropical cyclones! Coming from the private sector, he has quickly adapted to life at NWS Tampa Bay. Welcome aboard!



Ron Morales and Family

Ron and Ernie have staked their claim out west. Ron became the Science and Operations Officer at the NWS office in Corpus Christi, TX, while Ernie went to the NWS office in the San Joaquin Valley in Hanford, CA. Best of luck to each of them!

CFC Draws a Record!

Combined Federal Campaign donations exceeded \$11,400 for the upcoming calendar year, shattering last year's record by nearly \$2 thousand! Look for more local holiday cheer in the Winter 2005 Suncoast Weather Quarterly.