

## NHC/HSS 5<sup>th</sup> Grade Webinars Gulf Coast Questions

### March 18, 2013 Webinar

#### Questions asked, and answered, during the March 18, 2013, Gulf Coast Regional webinar:

*Q: Why is the hurricane center located in S. Florida?*

A: There has always been a weather office here in Miami as part of the national weather service and many years ago because the south Florida area had been impacted by several hurricanes, part of the office became known as the National Hurricane Center back in 1950s and since that time the hurricane center continues to be dedicated to trying to predict where the storms will go and how strong they will be. We are still located with National Weather Service here. This is a picture of our office. We are located in Miami Florida and thankfully we are about 20 miles away from the actual beach, so we are located inland away from that storm surge threat that you heard John talk about earlier.

*Q: How far can hurricanes travel?*

A: Hurricanes can travel very far; we sometimes have hurricanes that will last several days to a week through their entire life cycle. Hurricanes can travel hundreds or even thousands of miles as they form off the coast of Africa and move across the Atlantic Ocean.

*Q: How large is an average eye of a hurricane?*

A: The average size of an eye is about 20 to 30 miles across; we have seen few that have very small eyes and sometimes those storms are very strong. We can have eyes that are as small as 5 to 10 miles across and sometimes as big as 40 to 50 miles across but on average they are about 20 to 30 miles across.

*Q: My students want to know if any of the NOAA aircraft have crashed in a hurricane? Another related question- for those who fly into the storms, have any planes been lost while flying a mission?*

A: (Richard Henning, AOC) We have a good safety record here at AOC. We have never lost any aircraft. We are constantly looking at ways to reduce the risk of flying through hurricanes and re-evaluating our procedures. The Navy did lose a plane way back in 1953 flying through Hurricane Janet in the Caribbean Sea.

*Q: Do the hurricane hunters pick up the dropsondes after they have landed in the water?*

A: (Richard Henning, AOC) Our dropsondes are expendable. After they are dropped they just land in the ocean and unfortunately are not recovered. They just sink to the bottom.

*Q: Why did you name the Hurricane Hunter planes after the Muppets?*

A: (Richard Henning, AOC) The entire story may be a bit long to explain here but the short version is that when we took the airplanes on public displays the kids really identified with the Muppet characters and ended up carrying over to nicknames.

*Q: As a pilot, are you even scared to fly into a storm?*

A: (Richard Henning, AOC) Typically, no we are not scared flying through the hurricanes. Although there can be moments where it tests your nerves especially when flying through the eyewall

*Q: When flying a mission, is equipment ever damaged?*

A: most of the time the answer is no but occasionally if you get a very very intense hurricane for example hurricane Hugo in 1989, caused some damage to our P3 aircraft. Every once in a while we will get struck by lightening flying through storms, that can damage some of the equipment in our airplane. In general the planes are designed to take a licking, they are very well put together and most of the time even in a very bad hurricane, we don't get damaged by flying through the storm.

**Unanswered questions from the March 18, 2013, Gulf Coast webinar (questions were asked during the webinar but answered by NHC forecasters and AOC personnel after the webinar):**

*Q: Has there ever been a hurricane that has split in two?*

A: No. There has never been a case where a tropical cyclone has split in two. However, there have been cases where hurricanes have merged with one another. For example, small Tropical Storm Karen in 1995 was absorbed by larger Hurricane Iris. Typically, the bigger storm will absorb a small system regardless of which of the two is more intense.

*Q: Can you predict hurricanes?*

A: Yes. The National Hurricane Center predicts the track and intensity of hurricanes out to 5 days using computer simulations of the atmosphere. These predictions are not perfect but have increased in skill during the past couple of decades.

*Q: Have any of the centers been affected by a hurricane?*

A: The National Hurricane Center was affected by two hurricanes in one year. The eye of category 1 Hurricane Katrina passed over the building in late August 2005. Two months later category 2 Hurricane Wilma passed just north of the National Hurricane Center. In both cases, hurricane-force winds occurred at the building, but overall damage was not too severe. At the previous site of the National Hurricane Center in 1992, the powerful winds of Hurricane Andrew – with a gust to 164 mph – toppled the radar from the roof of the building.

*Q: Why is the eye of the storm calm?*

A: As with most low pressure areas, the winds at the center are relatively calm. Stronger winds blow counter-clockwise around the eye or center of the low pressure area. In a hurricane, the eye forms in response to sinking and drying of air occurs within the eye, leading to the eye's typical clear and calm state.

*Q: What is the weather like above the hurricane?*

A: The winds in the hurricane typically weaken with height and reverse to a clockwise flow at a very high level (e.g., 40,000 ft.). There still will be clouds and precipitations at greater altitudes within the storm, but the weather is not as severe as it is at the surface.

The GulfStream IV-SP two-engine jet has been able to fly above some tropical storms and weak hurricanes at altitudes greater than 40,000 feet. The sky is clear since the jet is above all the clouds but can experience some light turbulence as it flies over the storm. The WP-3D four engine turbo-prop aircraft cannot fly above the hurricane since it was not built to fly as high as the jet does.

*Q: How can we prepare for hurricane season?*

A: The best way is to always have a preparedness plan ready to implement at a moment's notice, should a hurricane warning be issued for your area. Know if your house is in an evacuation zone and where you might go if you need to seek shelter. To be on the safe side, you should prepare for several days without electricity by stocking up on canned goods (non-perishable), batteries for a radio, and bottled water.

*Q: How long can a hurricane last?*

A: Hurricane typically last from several days to a week or so. On occasion, they can last as long as a couple or even several weeks. The longest-lived hurricane was Hurricane Ginger in 1971 that lasted an entire month.

*Q: Does earth's rotation or revolution affect hurricanes?*

A: The Earth's rotation causes a force called Coriolis which is an important factor in allowing tropical disturbances to begin to spin and ultimately to strengthen into powerful storms called hurricanes. The Coriolis Force is minimal at the Equator, making hurricane formation less likely at distances very close to the Equator.

*Q: If one of the aircraft gets damaged, do they get a new one, or can it be repaired to use again?*

A: Depending on the damage that occurred during a hurricane mission, we will either immediately end the mission and return to the airport or continue the mission if the damage has not adversely impacted the airworthiness of the aircraft. After landing we will repair the plane which may take one day or several days depending on the extent and severity of the damage. We do not have the funding to get a new plane.

*Q: Do you ever send experiments up in the aircraft?*

A: The plane is a flying laboratory with a variety of scientific equipment onboard the aircraft, so a number of experiments related to atmospheric research are conducted during the missions.

*Q: How often do you [AOC staff/Hurricane Hunters] fly through each storm?*

A: This all depends on how far the plane has to travel to get to the storm; the scientific objectives the scientists want to achieve for a given storm; or if the storm is threatening the United States. We have had flights where the plane made only one pass through a hurricane or other missions where we made 21 passes through the hurricane.

Also, we may fly only a single mission for a hurricane or we may fly two missions per day for 3 or 4 days in a row. Ivan (2004), Katrina (2005) and Georges (1998) are hurricanes we flew twice a day for several days. We also do not fly every named storm that occurs during the hurricane season for the reasons mentioned above.