Hunting Hurricanes: Heading Straight into the Eye of the Storm

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A Quick (Virtual) Survey to Get Us Started
Have you ever...
...traveled on an airplane?
...gone through a car wash?
...taken a ride on a roller coaster?
How many of you have done all three at the same time?
Q: Where do you work?
A: Inside the eye of a hurricane

• How it all started
• Aircraft through the years
• Today’s squadrons
• The mission
• There I was...
• Final Thoughts
“Bet you can’t fly into that hurricane...”

Colonel Joseph Duckworth

1st Lieutenant William Jones-Burdick

2nd Lieutenant Ralph O’Hair

July 27, 1943

AT-6 Texan
Different Aircraft, Same Mission
Today’s Aircraft

WC-130J  WP-3D  Gulfstream IV
Aircraft Then and Now
Based at Keesler AFB Mississippi
United States Air Force Reserve
10 WC-130J Hercules
20 crews (split between full-time and traditional reservists)
Primary Mission: Tropical Weather Reconnaissance
Based at Lakeland Linder Regional Airport, Lakeland Florida
Part of the National Oceanic and Atmospheric Administration
2 WP-3D & 1 Gulfstream IV
Crews are members of the NOAA Corps
Primary Mission: Science & Research into Tropical Systems
CARCAH

• 3 person Air Force unit, part of the 53 WRS
• Located inside the National Hurricane Center
• Responsible for coordinating all flights with NHC
• Receives all aircraft data, performs quality checks on it
• Provides data to NHC forecasters and rest of the world
A Brief Picture Interlude
A Brief Picture Interlude
The Mission
I. ATLANTIC REQUIREMENTS

1. HURRICANE GONZALO

   FLIGHT ONE -- TEAL 75
   - A. 15/2330Z
   - B. AFXXX 0808A GONZALO
   - C. 15/2100Z
   - D. 24.6N 68.6W
   - E. 15/2300Z TO 16/0230Z
   - F. SFC TO 10,000 FT

   FLIGHT TWO -- TEAL 74
   - A. 16/1130Z
   - B. AFXXX 0908A GONZALO
   - C. 16/0915Z
   - D. 26.1N 68.6W
   - E. 16/1100Z TO 16/1430Z
   - F. SFC TO 10,000 FT

2. OUTLOOK FOR SUCCEEDING DAY: CONTINUE 12-HRLY FIXES.

II. PACIFIC REQUIREMENTS

1. TROPICAL STORM ANA

   FLIGHT ONE -- NOAA 49
   - A. 16/0000Z
   - B. NOAA9 0102C ANA
   - C. 15/1730Z
   - D. NA
   - E. NA
   - F. 41,000 TO 45,000 FT

2. SUCCEEDING DAY OUTLOOK: A G-IV FLIGHT DEPARTING AT 16/1730Z FOR 17/0000Z.
3. ADDITIONAL DAY OUTLOOK: FIX TS ANA AT 17/1200Z NEAR 15.6N 150.0W. 6-HRLY FIXES BEGIN 18/0000Z.
Area of Responsibility
Typical WC-130J Track

HURRICANE IKE  5 SEPTEMBER 2008

"Alpha" Pattern
Typical WP-3D Track

HURRICANE DANNY
23 SEPTEMBER 2015

“Butterfly” Pattern
(60° wedges)
Typical G-IV Track

NOAA G-IV Flight Track Drop Locations for ANA (CP022014)

On 2014101700 the storm was centered at 15.5°-151
Data Collected: Aircraft

- Storm Position
- Winds at Flight Level
- Winds at Surface
- Temperature
- Humidity
- Rain Rate
- Extrapolated Sea Level Pressure
- Radar
- Human Observations (Turbulence, Lightning, etc)
Data Collected:
Surface Winds
Data Collected:
SFMR
Data Collected: Dropsonde

- Winds
- Temperature
- Humidity
- Barometric Pressure
There I Was...
Q: What is the only US military aircraft allowed to fly over Cuba?
A: An Air Force Hurricane Hunter (with approved clearance)

Q: What Hollywood star has flown through a Category 5 hurricane?
A: John Cusack
Hurricane Rita
2005
Typhoon Megi
2010
Tropical Storm Gabrielle
2001
Final Thoughts

- When? (did we start flying into hurricanes)
- What? (planes have been used)
- Who? (the 53rd WRS and NOAA AOC)
- How? (is the mission coordinated and flown)
- Where? (the Atlantic and Pacific oceans)
Final Thoughts

Why?
Why We Fly

• Some data can only be obtained from inside the storm
• Hurricane Hunter data improves forecasts
• Research inside storms increases scientific knowledge
• Hurricane Hunter data saves lives
Hurricane Ike 2008
Hurricane Michael
2018
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CARCAH data: https://www.nhc.noaa.gov/recon.php