**Data User Guide**

# Hurricane and Severe Storm Sentinel (HS3) Flight Reports

## Introduction

The HS3 Flight Reports dataset provides pertinent information about flights flown by the Global Hawk or WB-57 aircrafts during the Hurricane and Severe Storm Sentinel (HS3) campaign from 2012 to 2014. The reports include information regarding flight number, flight time (beginning and end), location of the flight (flight segments), flight purpose, and comments regarding the flight and mission. In addition, some reports include corresponding satellite imagery, maps of flight tracks and dropsonde locations, and plotted instrument retrievals.   The report contains a section labeled Flight Reports listed byLog number (e.g., 13H008). This report section has links to the reports for associated flights. The log number contains H or W, where the  H represents the  Global Hawk, and W represents the WB-57 aircraft. The files for this dataset are available in PDF and tarred format.

## Citation

Braun, Scott. 2016. Hurricane and Severe Storm Sentinel Flight Reports HS3 [indicate subset used]. Dataset available online [ftp://hs3.nsstc.nasa.gov/pub/hs3/Flight_Reports/] from the NASA EOSDIS Global Hydrology Resource Center Distributed Active Archive Center, Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/HS3/REPORTS/DATA101

## Keywords:

HS3, NASA, GHRC; aircraft observations, WB-57, Global Hawk; flight reports; cyclones, hurricanes

## Campaign

The Hurricane and Severe Storm Sentinel (HS3) was a five-year NASA mission specifically targeted to investigate the processes that underlie hurricane formation and intensity change in the Atlantic Ocean basin. Goals for HS3 included: assessing the relative roles of large-scale environment and storm-scale internal processes; and addressing the controversial role of the Saharan Air Layer (SAL) in tropical storm formation and intensification as well as the role of deep convection in the inner-core region of storms. To achieve these goals, sustained measurements over several years was needed to get a large enough sample of storms. Therefore, field measurements took place from 2012 through 2014 for one month during each hurricane season. The HS3 campaign utilized two Global Hawks, one with instruments geared toward measurement of the environment and the other with instruments suited to inner-core structure and processes. The environmental payload included the scanning High-resolution Interferometer Sounder (S-HIS) and the AVAPS dropsonde system; the over-storm payload included the HIWRAP conically scanning Doppler radar, the HIRAD multi-frequency interferometric radiometer, and the HAMSR microwave sounder. More information about the HS3 campaign can be found at https://hs3.nsstc.nasa.gov/.

## Instrument Description

The two aircrafts included in this dataset are the WB-57 and Global Hawk aircrafts. The WB-57 is a mid-wing, long-range aircraft capable of operation for extended periods of time from sea level to altitudes in excess of 60,000 feet. The WB-57 can fly for approximately 6.5 hours, has a range of approximately 2500 miles, and can carry up to 8,800 pounds of payload (NASA 2016). The Global Hawk is 44 feet long and has a wingspan of more than 116 feet, a height of 15 feet, and a gross takeoff weight of 26,750 pounds, and a 1,500-pound payload capability.  It is able to autonomously fly long distances, remain aloft for extended periods of time and carry large payloads brings a new capability to the science community for measuring, monitoring and observing remote locations of Earth not feasible or practical with piloted aircraft, most other robotic or remotely operated aircraft, or space satellites. The aircraft's 8,500-nautical-mile range and 24-hour endurance, together with satellite and line-of-site communication links to the ground control station, allow for worldwide operation (NASA 2014).

## Investigators

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## File Naming Convention

The Flight Reports files are named with the following convention:

hs3fltrep_ [start time]_[end time] aircraft_nnn.ext

where,
[start time] = YYYYMMDD-HHSS  [end time] = YYYYMMDD-HHSS aircraft =
Global_Hawk or WB nnn =  aircraft number:  928 for WB-57, and either 871or 872
for Global Hawk ext = pdf, tar;  tar files contain additional report (usually pdf)
and/or image files.


## Data Format Description

HS3 Flight Reports are available in PDF and tarred file format.  Included within
some of the tarred files are satellite imagery, instrument retrieval plots, and maps of
flight tracks and dropsonde locations.  The flight reports are data processing level 1
dataset. More information about NASA data processing levels can be found at
http://science.nasa.gov/earth-science/earth-science-data/data-processing-
levelsfor-eosdis-data-products/.


## References

NASA Airborne Science Program. 2016.
https://airbornescience.nasa.gov/aircraft/WB-57

NASA Armstrong Fact Sheet: Global Hawk High-altitude, long-endurance science
aircraft. 2014. http://www.nasa.gov/centers/armstrong/news/FactSheets/FS-
098DFRC.html.


## Contact Information

To order these data or for further information, please contact:
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