NASA's Hurricane & Severe Storm Sentinel

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Wallops Role Supporting UAS

- Carriers
  - Aircraft & ground systems
  - Mission management and payload integration
  - Airworthiness certification

- Mission Operations
  - Facilities
  - Instrumentation
  - Safety
  - Project management
  - Logistical services

- Technology Development
  - Examples: Satellite communications, science payload development power/data system miniaturization

Operations - Recent/Current Projects




- NASA airliner flight control research
- NASA Earth Science sensor demos
- USCG shipboard evaluation
- Navy mine detection
- Navy radar detection testing
- Navy abort site for UCAS & Global Hawk
- DHS port & maritime security demos
- Commercial aircraft development demos

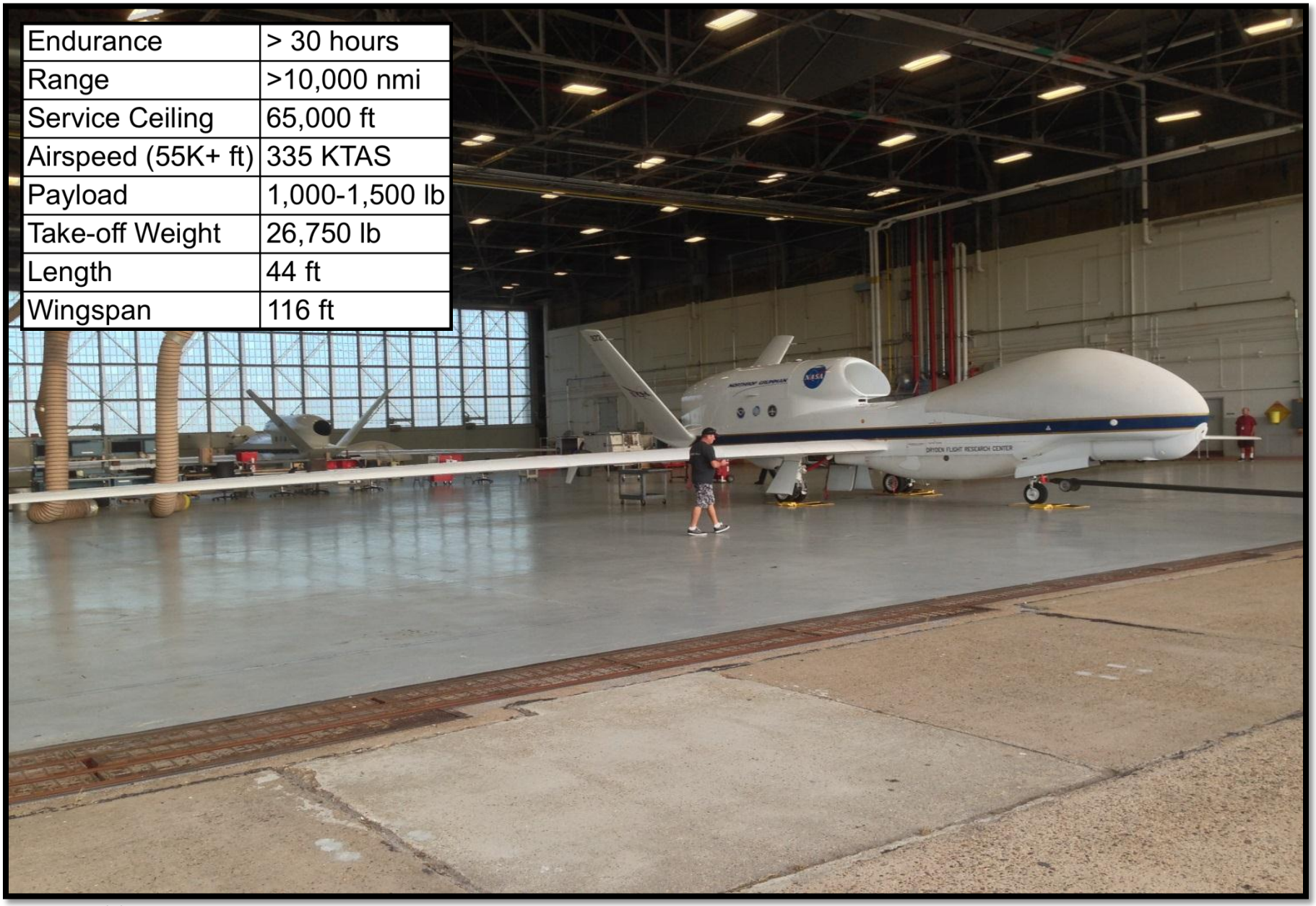




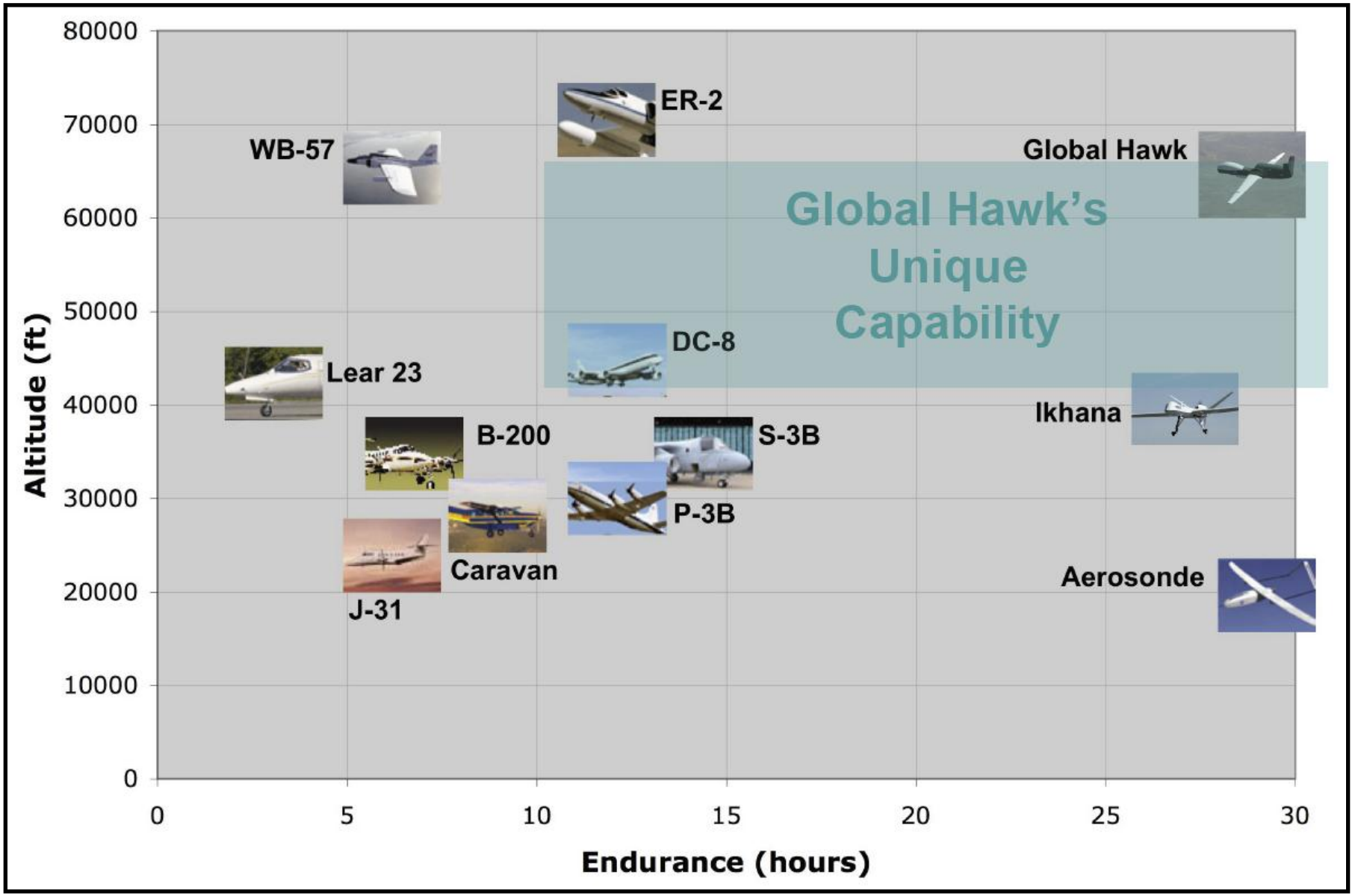

Global Hawk Overview

Goddard Space Flight Center

Endurance	> 30 hours
Range	>10,000 nmi
Service Ceiling	65,000 ft
Airspeed (55K+ ft)	335 KTAS
Payload	1,000-1,500 lb
Take-off Weight	26,750 lb
Length	44 ft
Wingspan	116 ft

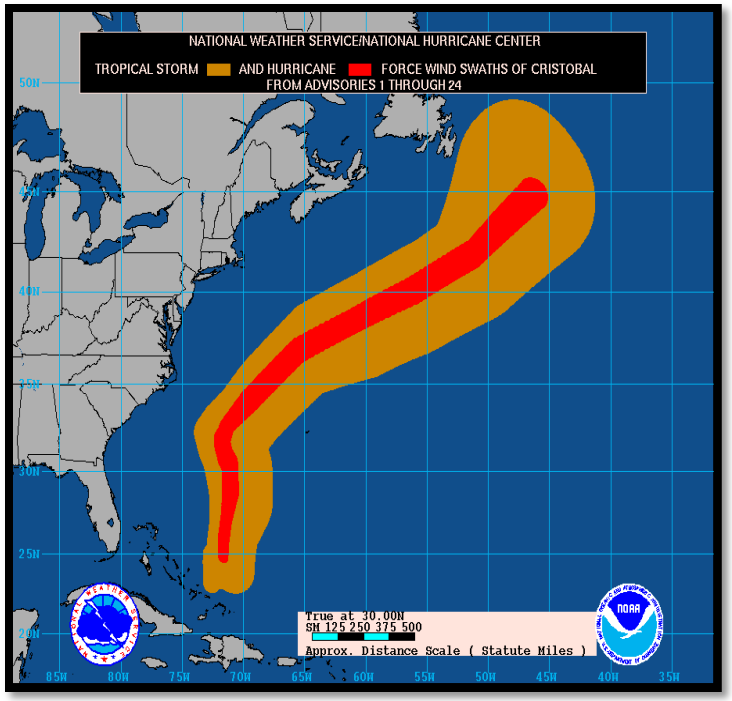


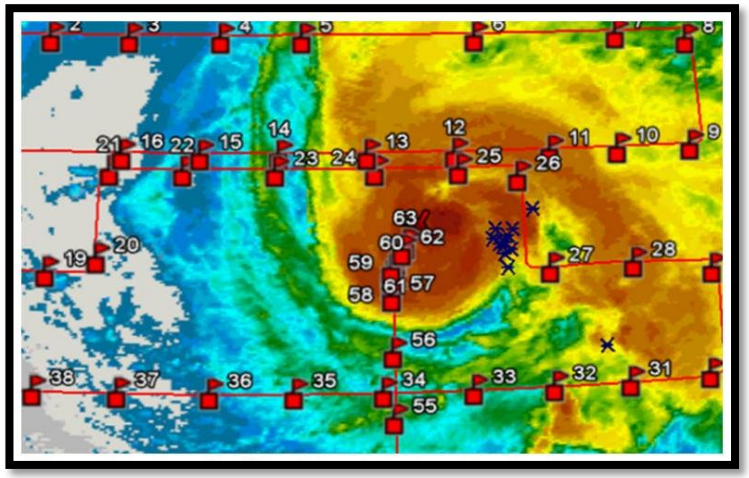
Why NASA Uses Global Hawks



Hurricane Sandy

The HS-3 Science Mission





HS3 is a five-year mission specifically targeted to enhance our understanding of the processes that underlie **<u>hurricane intensity change in the Atlantic Ocean basin</u>**.

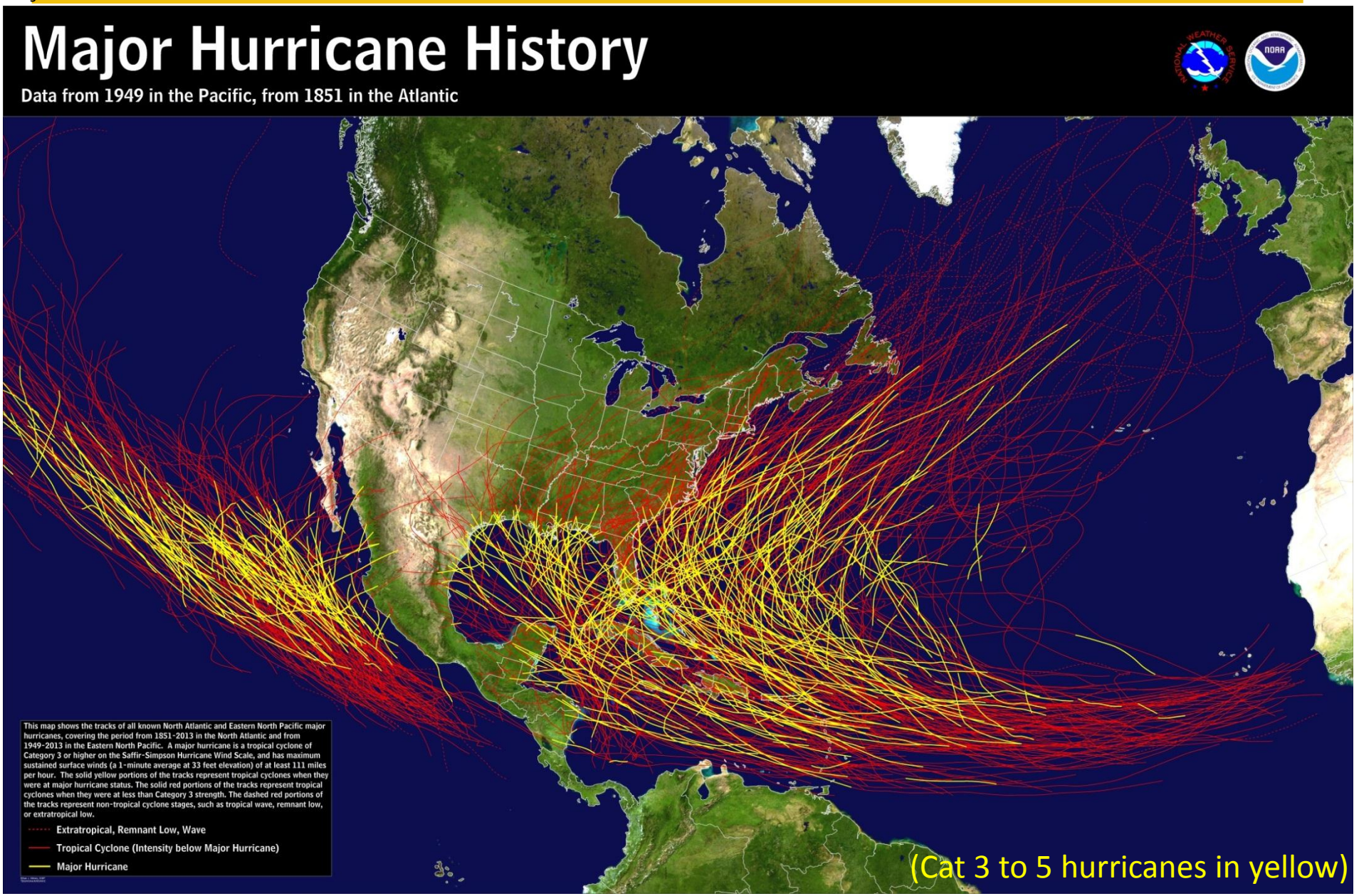
The HS3 science question:

Is storm formation and intensification mainly a result of:

- The Large-Scale Environment, or
- Internal Processes?

The Birthplaces of Hurricanes

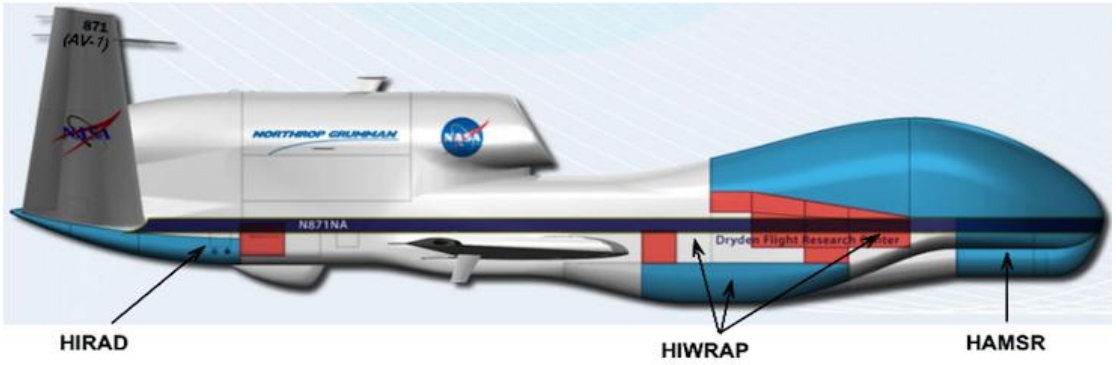
Goddard Space Flight Center



HS-3 Science Instruments

Goddard Space Flight Center

Tail 871
Over the Storm

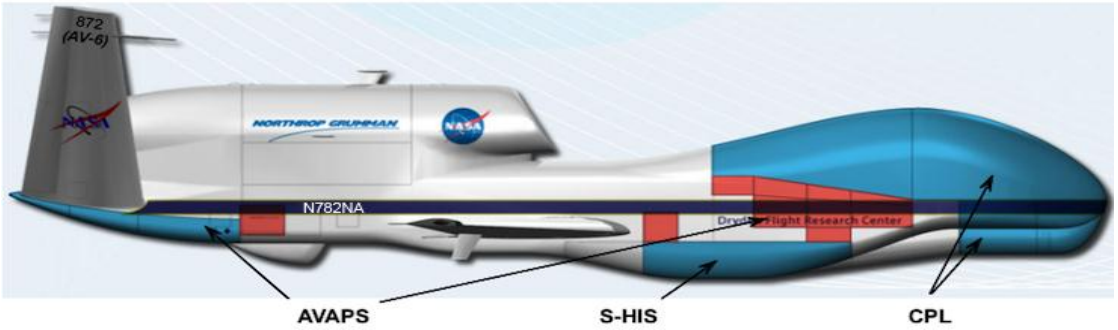


HIRAD Radiometer (MSFC)

HIWRAP Ku/Ka radar (GSFC)

HAMSR 60/119/183 GHz radiometer (JPL)

Tail 872
Around the Storm



AVAPS dropsonde (NOAA)

S-HIS interferometer U. of Wisconsin

CPL lidar (GSFC)

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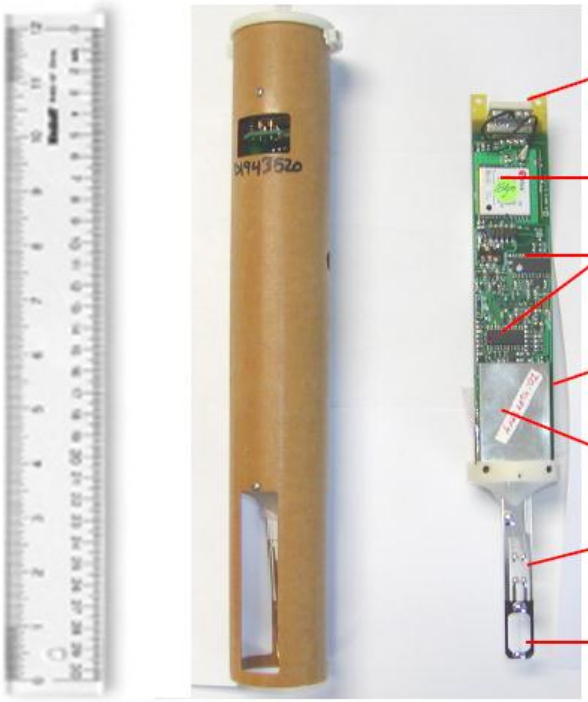
Dropsondes



GPS Antenna

GPS Receiver

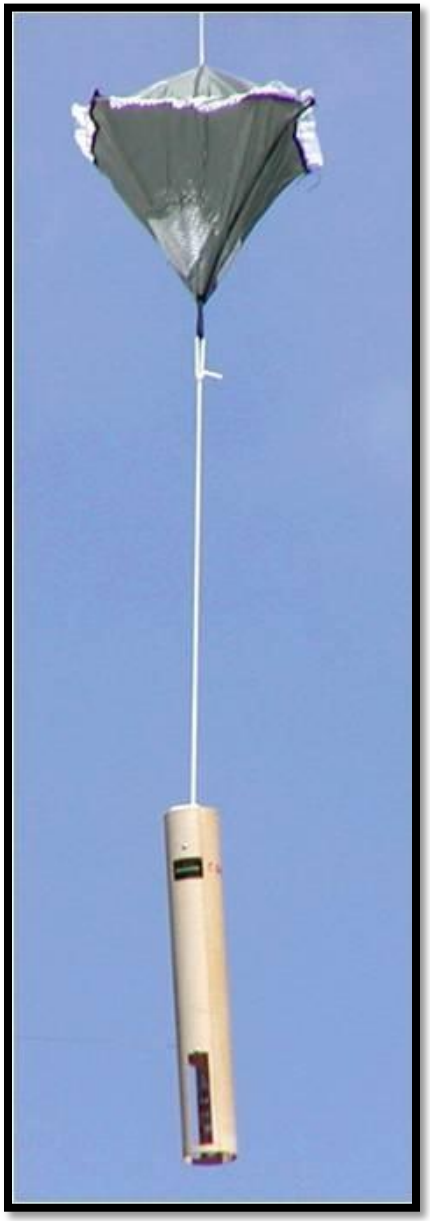
Microcontroller (qty=2)

Vaisala Pressure sensor (backside)

400 MHz Transmitter

Vaisala RH Sensors

Vaisala Temperature Sensors



Global Hawk Flight Timeline

SUN	MON	TUE	WED	THR	FRI	SAT
		COB Prior to T-1 Day Submit Flight Zones to FAA	***T-1 Day***	***T-2 hrs*** Submit IFR Flight Plan (*2-4hr prior*) ***T-0*** **Takeoff**	***T+25*** **Landing**	

25 Hour Flight

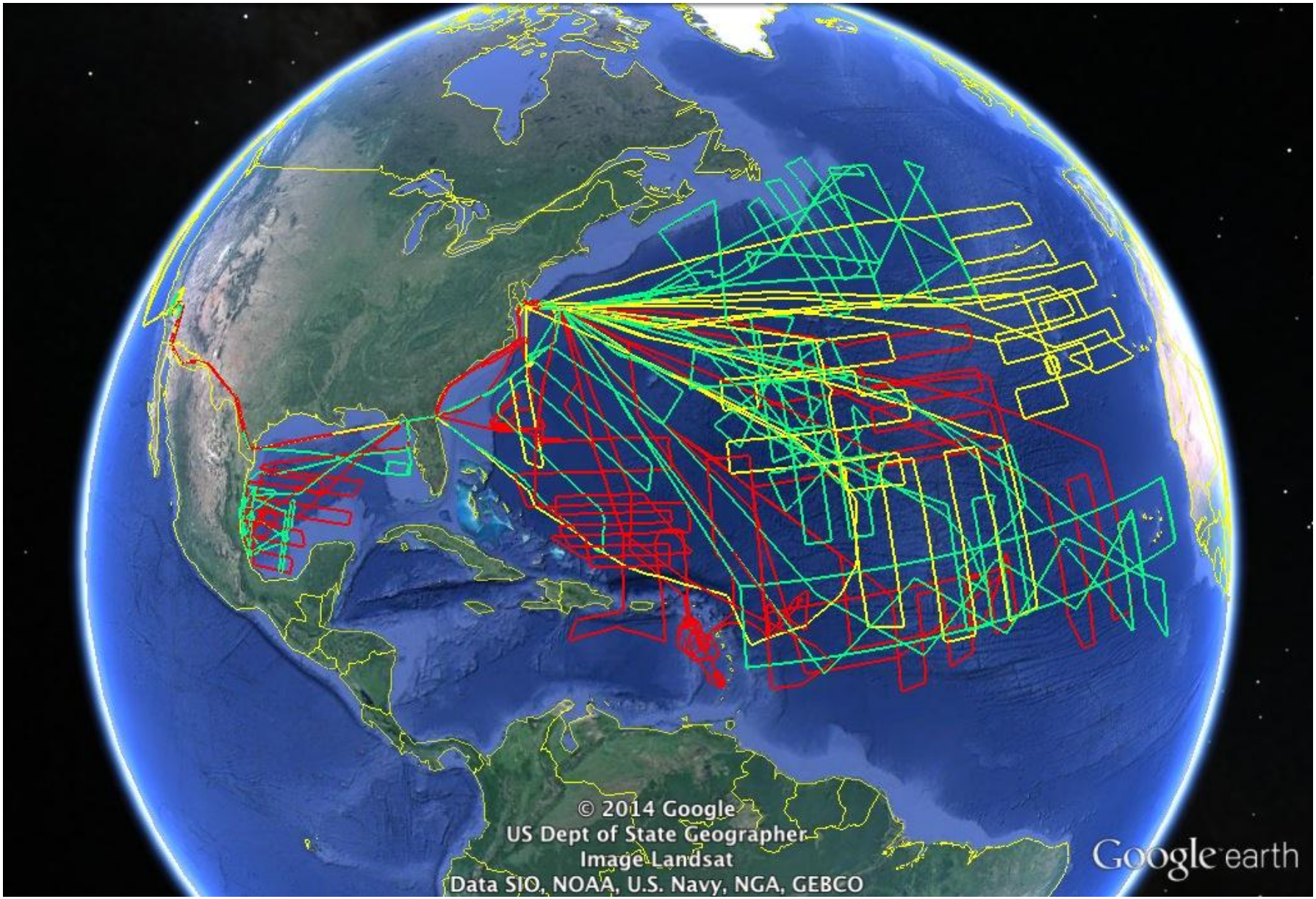
NASA T-34 Chase Aircraft

Global Hawk Ops Center (GHOC-E)

4.9-Meter Ku-Band Satcom Terminal

Global Hawk Landing at Wallops

2012-2014 Flight Trajectories



2012-2014 HS-3 Flight Summary

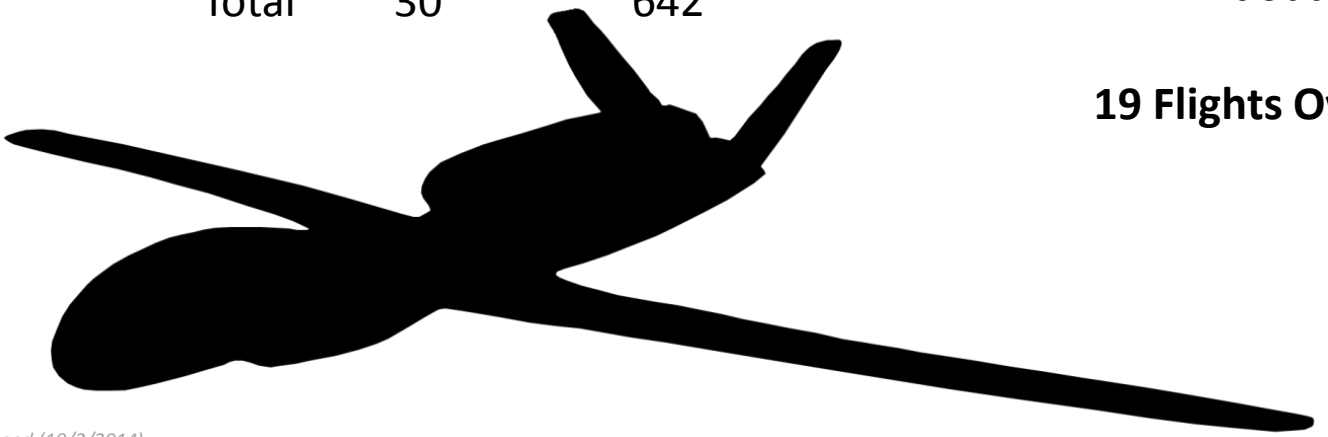
Goddard Space Flight Center

Overall Data

68% of all flights (30/44) and 87% of all hours flown (642/739) dedicated to science.

Year	Flights	Hours	Sondes	Named Storms
2012	8	174	343	2
2013	12	232	433	3
2014	10	236	649	3
Total	30	642	1425	8

	Flights	Hours Flown
TN871	6	94
TN872	24	548
Total	30	642



2012

Leslie – 1 Flight
Nadine – 5 Flights

2013

Gabrielle – 4 Flights
Ingrid – 1 Flight
Humberto – 1 Flight

2014

Cristobal – 2 Flights
Dolly – 1 Flight
Edouard – 4 Flights

19 Flights Over Named Storms


NASA WALLOPS FLIGHT FACILITY GSFC
WFF