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# GRIP Science Team Meeting

May 9, 2012

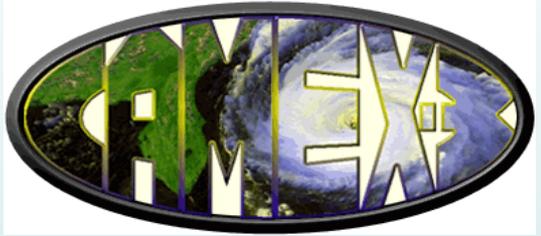
Ramesh Kakar  
NASA Headquarters



# NASA Hurricane Field Experiments

Field programs coordinated with other Federal Agencies

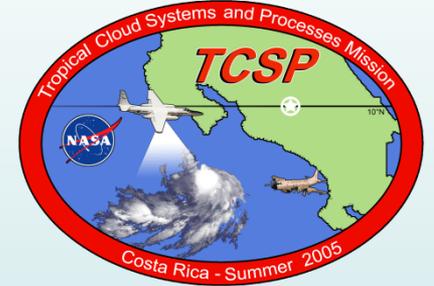
1998



2001



2005



2006



2010 GRIP



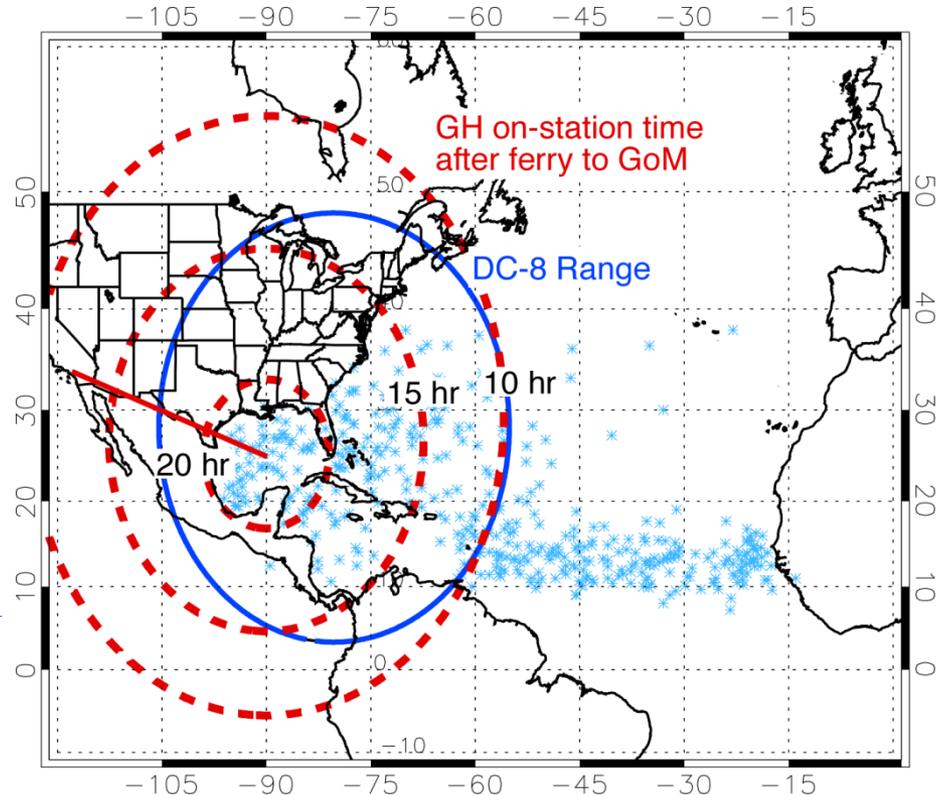
- NASA sponsored field campaigns have helped us develop a better understanding of many hurricane properties including inner core dynamics, rapid intensification and genesis



# GRIP: (Hurricane) Genesis and Rapid Intensification Processes Field Experiment

- Global Hawk (UAV) (240 hours)
- Radar (Heymsfield/GSFC), Microwave Radiometers (Lambrigtsen/JPL), Dropsondes (NOAA), Electric Field (Blakeslee/MSFC)
- Geosynchronous Orbit Simulation
- DC-8 four engine jet (120 hours)
  - Dual frequency precipitation radar (Durden/JPL)
  - Dropsondes (Halverson/UMBC), Variety of microphysics probes (Heymsfield/NCAR)
  - Lidars for 3-D Winds (Kavaya/LaRC) and for high vertical resolution measurements of aerosols and water vapor (Ismail/LaRC)
  - In-situ measurements of temperature, moisture and aerosols (Bui/ARC)
- WB-57 (60 hours, partially funded by NOAA)
  - Advanced Microwave Precipitation Radiometer
  - Hurricane Imaging Radiometer
- Six week deployment during the 2010 HS

RED= IIP, GREEN= IIP+AITT



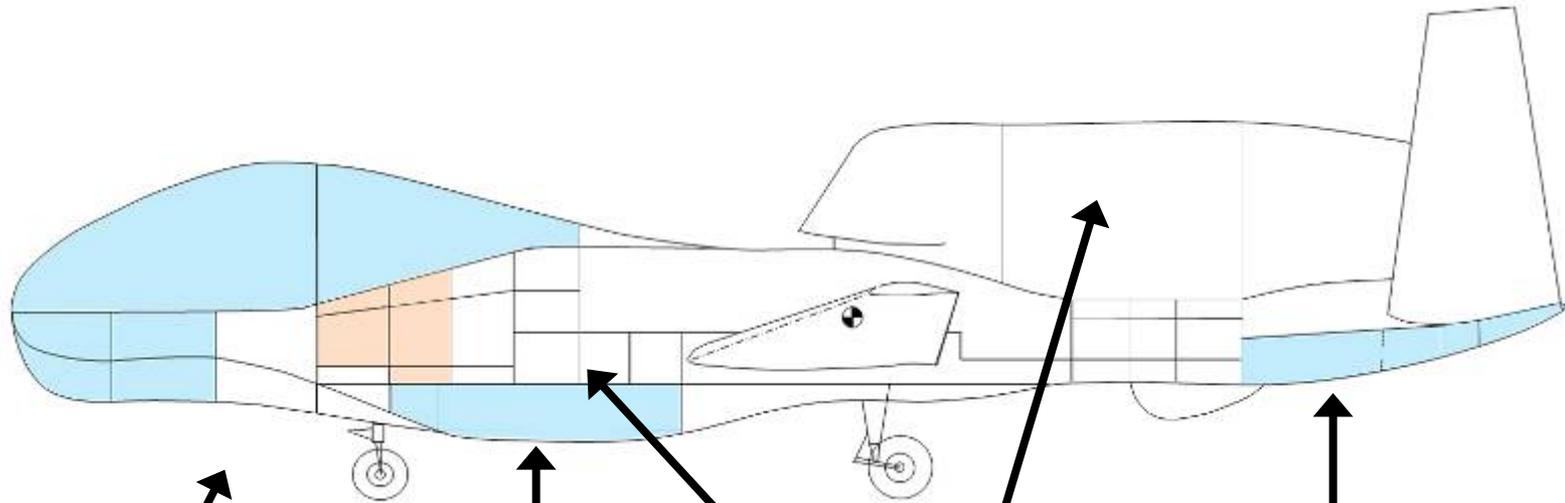
Blue line: DC-8 range for 12-h flight, 6 h on station

Red lines: GH range for 30-h flight with 10, 15 and 20 h on station

Light blue X: Genesis locations for 1940-2006



# GRIP GH Payload



**HAMSR**  
High Altitude MMIC  
Sounding Radiometer  
(Temp, H<sub>2</sub>O<sub>v</sub>, Cloud liquid  
& ice distribution)

**HIWRAP**  
High Altitude Imaging  
Wind and Rain Profiler  
(Horizontal wind  
vectors and ocean  
surface winds)

**LIP**  
Lightning Instrument  
Package  
(Lightning and  
Electrical Storm  
observation)

**Driftsondes**  
High Altitude Lightweight  
Dropsonde  
(Vertical profiles of temp,  
humidity, pressure &  
winds)



# GRIP DC-8 Payload



**Dropsondes**  
(Vertical Profiles of  
Temp, Press,  
Humidity and Winds)

**CAPS, CVI, PIP**  
(Cloud Particle Size  
distributions, Precip  
Rate, Rain & Ice water  
content)

**LASE**  
Lidar Atmospheric  
Sensing  
Experiment  
(H<sub>2</sub>O<sub>v</sub>, Aerosol  
profiles and Cloud  
distributions)

**DAWN**  
Doppler Aerosol  
Wind Lidar  
(Vertical Profiles of  
Vectored Horizontal  
Winds)

**APR-2**  
Airborne Precipitation  
Radar Dual Frequency  
(Vertical Structure Rain  
Reflectivity and Cross  
Winds)

**MMS**  
Meteorological  
Measurement System  
(Insitu Press, Temp, 3D  
Winds and Turbulence)

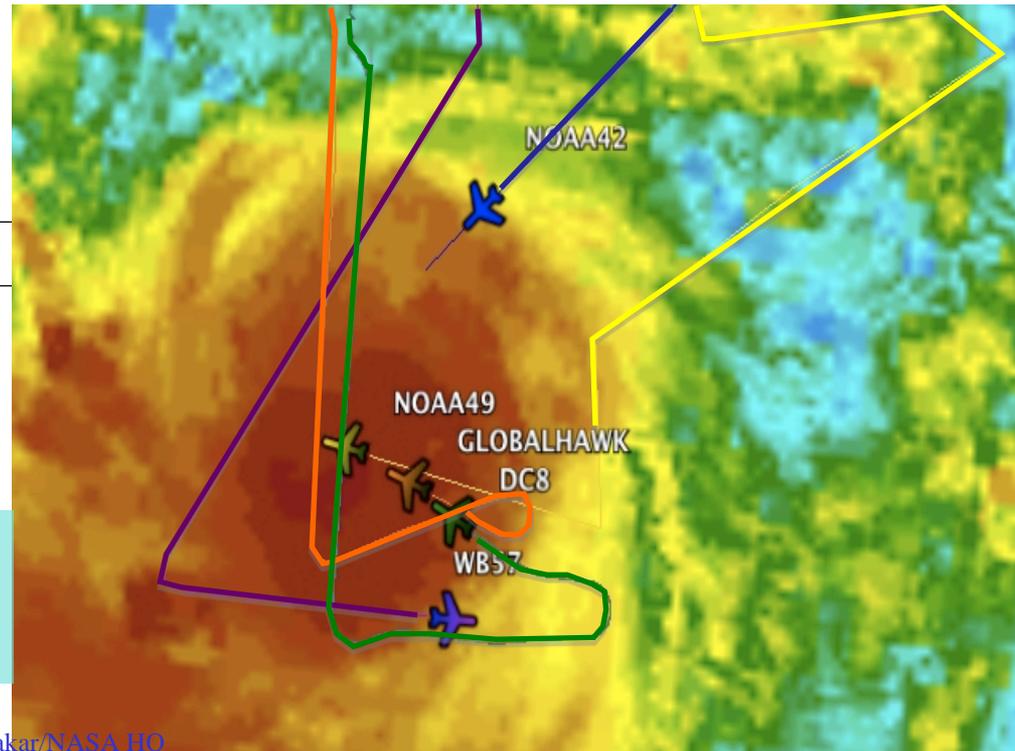


# NASA Aircraft Hours and GRIP Coordination



## WB-

Storm	GH	DC-8	57	NOAA	NSF	AF
Frank	15.3	0	0	N	N	N
Earl	24.2	39.3	10.9	Y	Y	Y
Gaston	0	14.5	0	N	Y	N
Karl	48.5	40.2	17.5	Y	Y	Y
Matthew	25.1	17.8	0	Y	Y	Y
Other Sci	0	12.2	0			
Transit/test flights	8.6	14.9	0			
<b>TOTAL</b>	<b>121.7</b>	<b>138.9</b>	<b>28.4</b>			



Coordination of a combined 5 NASA and NOAA aircraft in Hurricane Karl on 16 September 2010 at ~1955 UTC



# Summary Slide from last ST Meeting

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- NASA sponsored field campaigns have helped us develop a better understanding of many hurricane properties including inner core dynamics, rapid intensification and genesis
- HS3 (PI: Scott Braun) is the future of NASA hurricane research field experiments and has been called the GRIP experiment on steroids
- NASA satellite and field experiment sensor data is being under utilized in hurricane research (assimilation of satellite and/or field experiment data, probably, has a much greater potential impact on the track and intensity forecasts)
- A ROSES call may be needed to keep the NASA hurricane research momentum alive if the present team is able to show significant progress in utilizing satellites and field experiment data for hurricane research

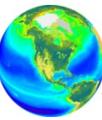
# Message sent to everyone who submitted a NOI (and also posted on NSPIRES)

NASA wants to emphasize that this is a very focused opportunity. Paragraph 1.2 of the ROSES element states that, "This opportunity relates to the use of GRIP and HS3 airborne data, in conjunction with satellite data and numerical models, to better understand tropical cyclone genesis and intensification processes." Any proposal that does not establish a linkage with the use of satellite data or NASA field experiment data is likely to be ranked low and, due to the limited budget for this opportunity, unlikely to be selected for funding.





## A. 44: Schedule & Terms



**Release Date:** October 2011

**Estimated Budget Available:** \$1.2M per year for three years

**Maximum Award Duration:** Three years

**Proposals Due:** January 6, 2012

**Proposals Received:** 50

**Proposals Selected:** 11

**Selection Announcement:** imminent

**Potential Start Date for Awards:** ASAP