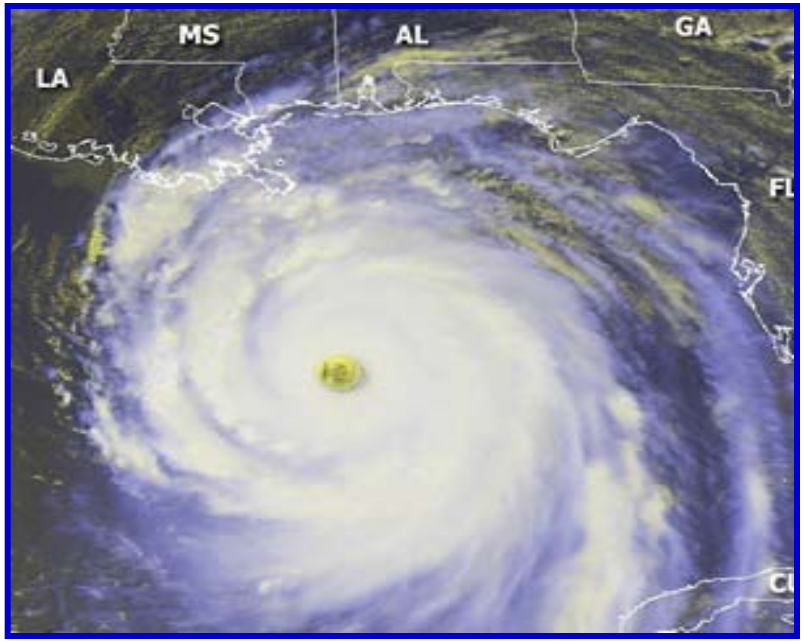
WG/TCR

2011 Update



Dr. Frank Marks (NOAA) and Dr. Ron Ferek (Navy)

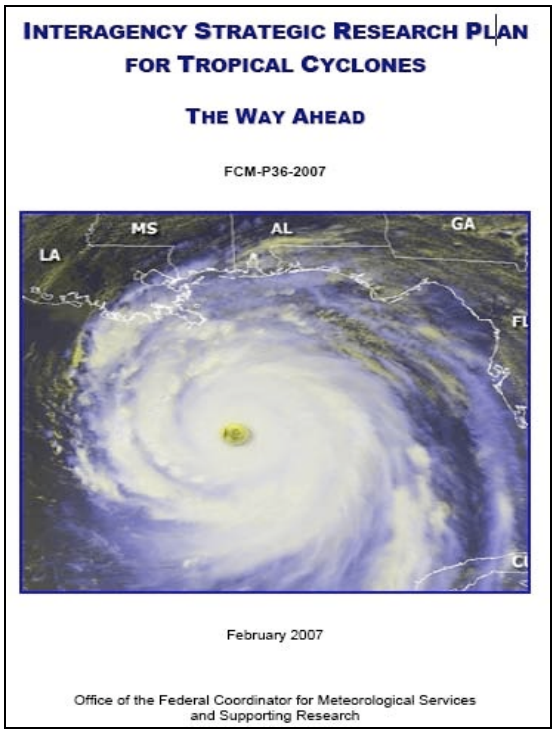
Co-Chairs, Working Group for Tropical Cyclone Research (WG/TCR)

Overview

- **Background**
- **History**
- **Objectives/Tasks**
- **Review**
- **Discussion**

History of WG/TCR

- **February 2005:** Federal Coordinator formed Joint Action Group for Tropical Cyclone Research (JAG/TCR)
- **February 2007:** Publication of *Interagency Strategic Research Plan for Tropical Cyclones: The Way Ahead*



Key Elements:

- Table 4-1: Operational Priorities of the TC Forecasting & Warning Centers
- Table 5-1: Research Needs in Atmospheric and Ocean Science

- **July 2008:** NOAA's Hurricane Forecast Improvement Project Plan
- **October 2008:** First meeting of the WG/TCR

WG/TCR Objectives / Tasks

- **Maintain currency of Operational Priorities and Research Needs (Table 1 and Table 2, respectively)**
- **Map agency meteorological research efforts against TC <u>research needs</u> and <u>operational priorities</u>**
- **Analyze and update information every two years and present at IHC**
- **2012 Key Goals:**
  - **Conduct analysis and update information for 67th IHC**
  - **Enhance HFIP partnership (provide focus), promote collaboration, and address near-term opportunities**

Review of 2011 Analysis Effort on Comparison of 2008 Snapshot with 2010 Snapshot

Operational Priorities

Table 1 Top 10-12

- Ops priorities extracted from FY09 JHT Announcement of Federal Funding Opportunity (AFFO)
- Ops priorities from FY11 JHT AFFO

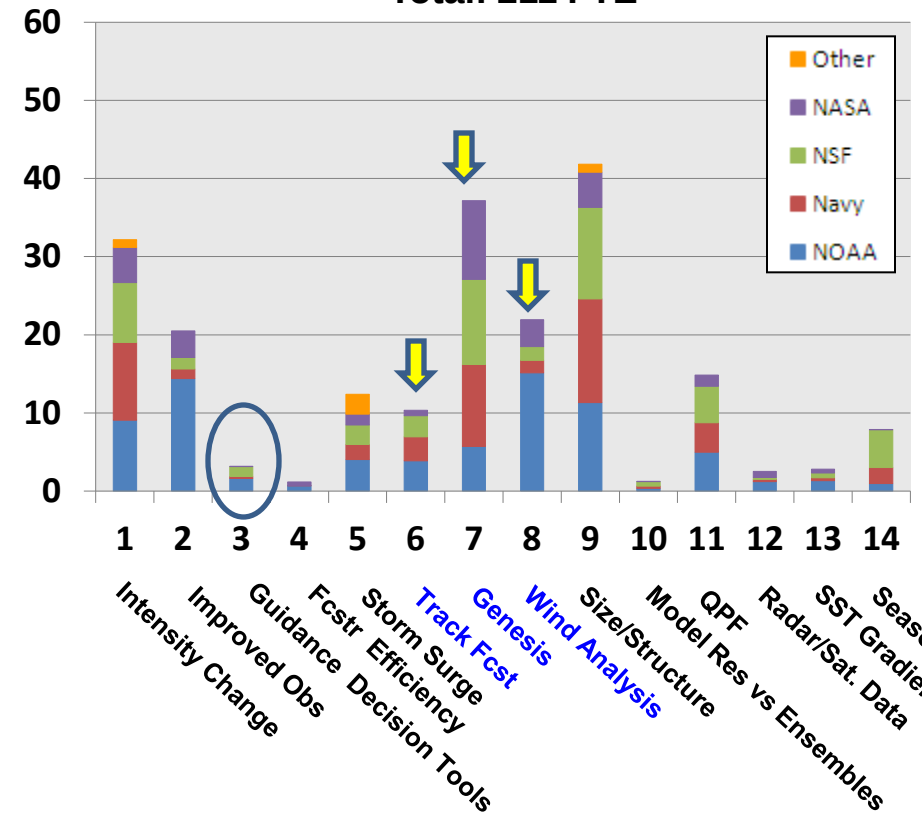
NHC & CPHC Priority	JTWC Priority	Operational Need	Linkage to Research Needs (From Table 2)
1	1	Intensity Change	A1a-f, B1-B3, B6, B7, B8
2	2	Improved Observations	B1, C1-C3
3	5	Guidance Decision Tools	B5, B6
4 ⇧	10 ⇩	Forecaster Efficiency	A4, A5, B2, B3, B6
5 ⇧	6 ⇩	Storm Surge	A2, B1-B3, B5-B6
6 ⇩	4 ⇧	Track Forecast	C1c
7	3	Genesis	A3, B1-B3, B5-B7, B8
8	15	Wind Analysis	B8
9	9	Size/Structure	B1, B2, C1-C3
10	8 ⇩	Model Res vs Ensembles	A1a-g, B1-B7, B8
11	11	QPF	B6, B7
12	7 ⇧	Radar/Satellite Data	B1, C1c

Research Needs Mapped onto Ops Priorities

NHC / CPHC

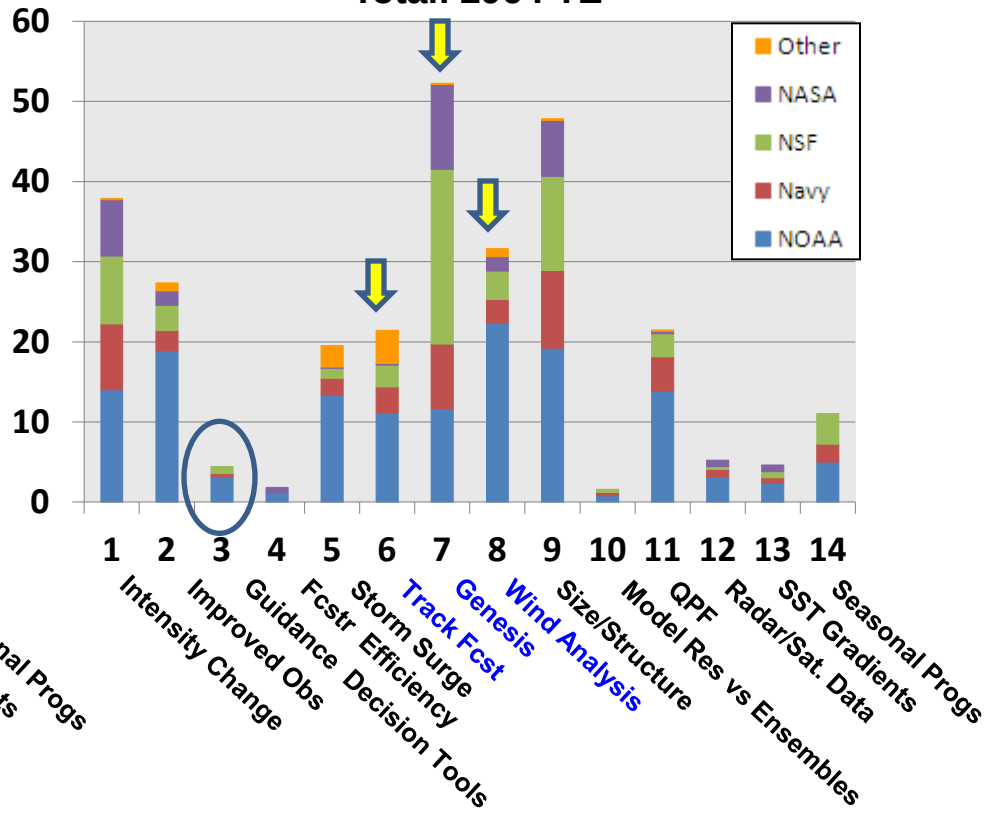
2008 Snapshot
(FY09 JHT AFFO)

Total: 211 FTE



2010 Snapshot
(FY09 JHT AFFO)

Total: 296 FTE



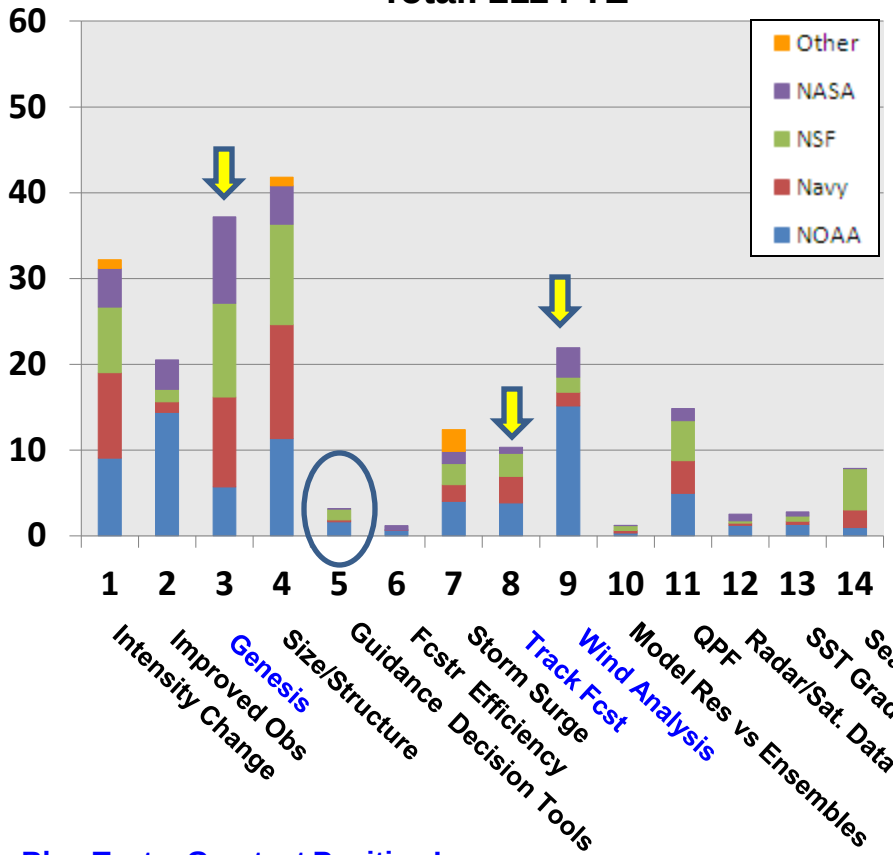
Blue Text = Greatest Positive Increase

Research Needs Mapped onto Ops Priorities

JTWC

2008 Snapshot
(FY09 JHT AFFO)

Total: 211 FTE



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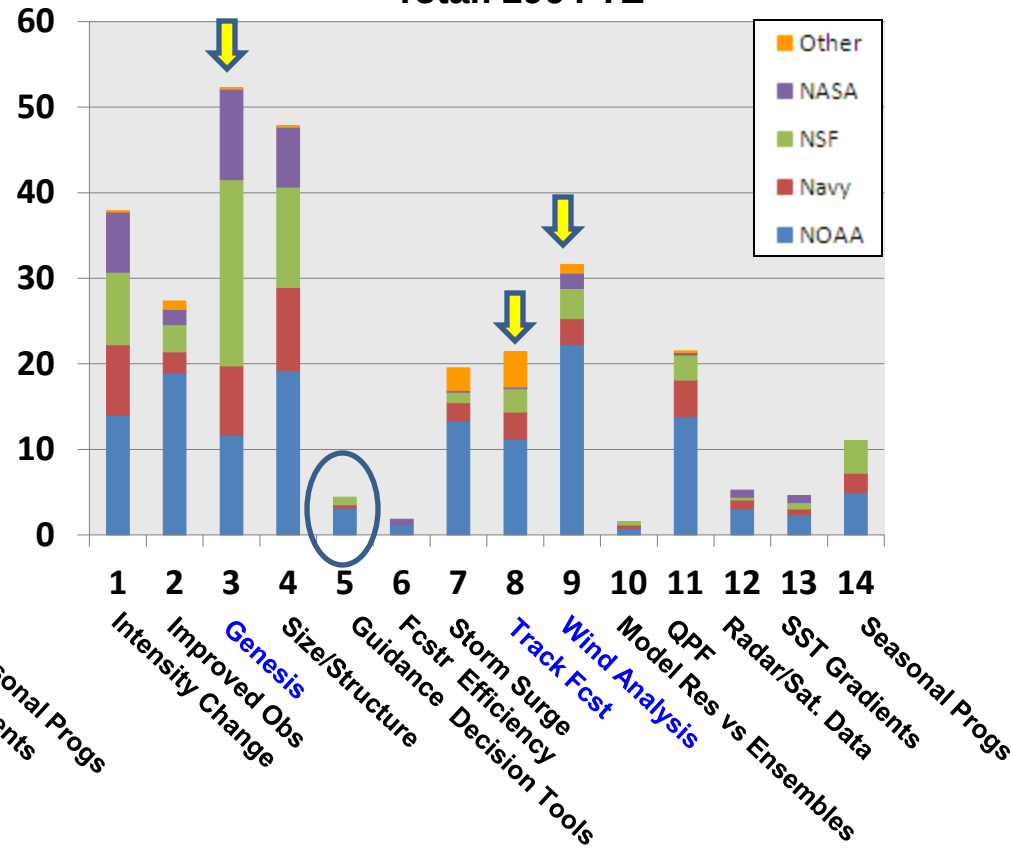

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Review of Analysis of Tropical Cyclone R&D (2011)

- **With HFIP and four major field experiments (ITOP, GRIP, PREDICT, IFEX), R&D increased markedly from 2008-2010**
- **Research influenced by operational priorities**
  - **Provides mechanism for essential feedback and focus**
- **Intensity change #1 operational priority**
  - ***Increased activity on <u>modeling</u> and <u>DA</u> by HFIP was a direct response to this prioritization***
    - ***Also addressed several other operational priorities***
  - **Research (basic and applied) is still required, as this is a very difficult and complex problem**
- **Users would like research community to take more of an interest in <u>guidance decision tools</u>**

Discussion

- **WG/TCR -- Framework and process to:**
  - **Keep the operational priorities updated and communicated to the research community**
  - **Assess and evaluate research contribution to those priorities**
    - **Allows research managers to make informed decisions for future investments and initiatives**
    - **Facilitates interagency collaboration and coordination**
  - **Work to identify R&D opportunities and areas of near-term emphasis (applied research) to facilitate progress and address areas of incomplete understanding (basic research)**
  - **Conduct outreach; promote interagency partnerships (e.g. HFIP)**
- **HFIP -- <u>Success story</u> going on fourth year**
  - **Recognized by WG/TCR for successfully aligning and focusing research efforts within NOAA and its interagency partners, and accelerating progress**

Opportunities Where the Research Community Can Help

- **HFIP identified issues with storm physics, data assimilation, advanced physics parameterization, model initialization, etc.**
  - **Continue to improve data assimilation techniques/systems for global/regional models (Hybrid, EnKF, 4DVAR)**
  - **Exploit and improve assimilation of satellite data**
  - **Ensure enough qualified and trained personnel in data assimilation skills**
  - **Development and use of high resolution ensembles (global & regional)**
  - **Continue testing various storm physics options in global and regional models (develop physics packages applicable at 1-3 km resolution)**
  - **Exploit UAS (e.g., military and NASA) platforms to sample storm structure and the surrounding environment**
- **HFIP infrastructure allows for rapid T&E of new discoveries and obs for potential transition into operational hurricane forecast systems**
- **Enhance HFIP partnership in 2012 through outreach during IHC and AMS Conference on Hurricanes and Tropical Meteorology**

WG/TCR

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QUESTIONS?