

# Role of the Warning Coordination Meteorologist (WCM)

*Robert Molleda*

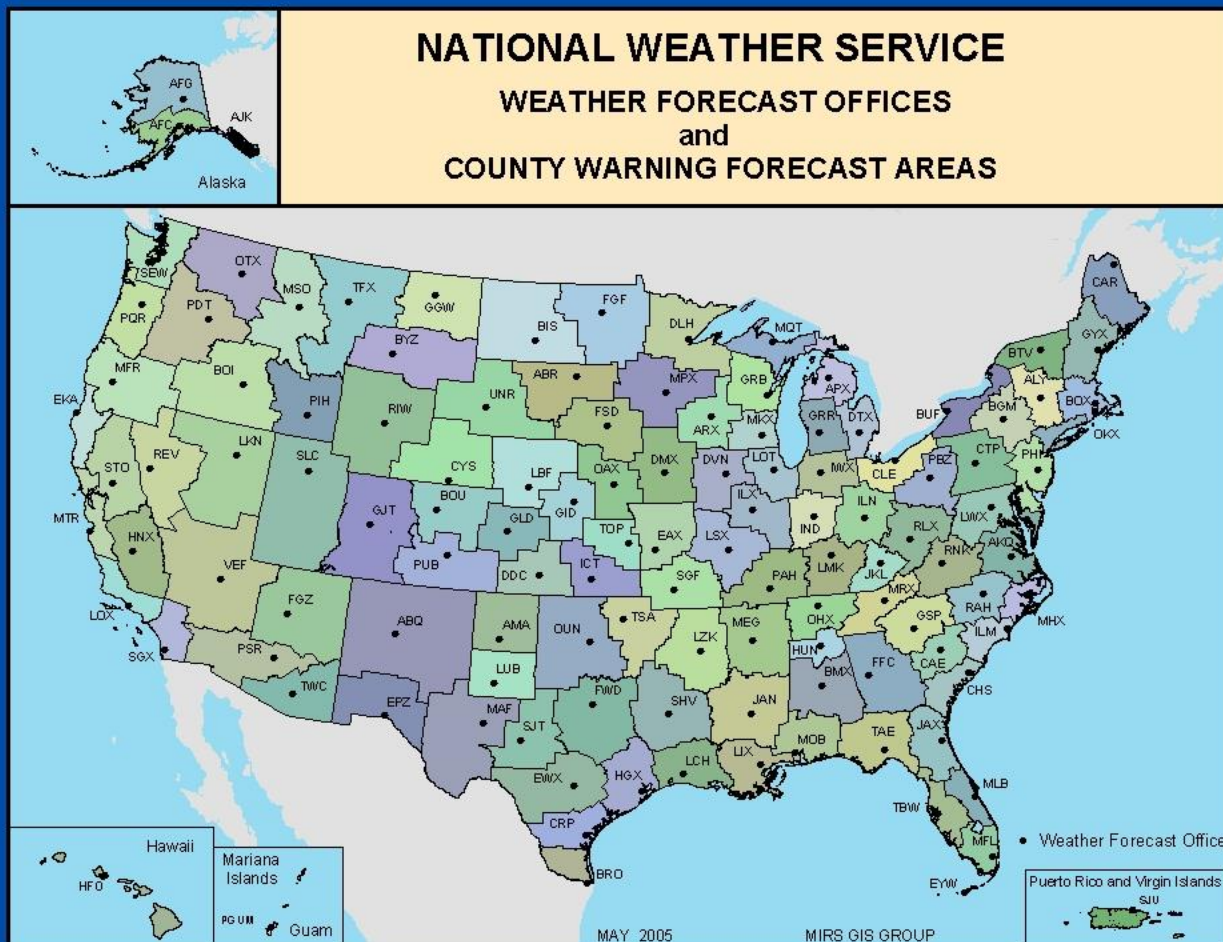
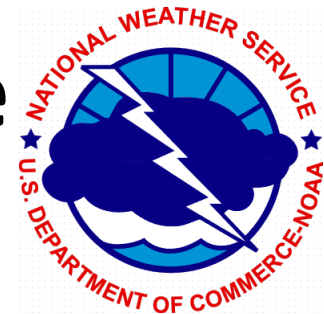
*US National Weather Service*

*Miami/South Florida Forecast Office*



# US National Weather Service

*122 local weather forecast offices*  
*9 National Centers- 3 with WCMs*





# US National Weather Service Weather Forecast Offices (WFOs)



- Issue all Local Forecasts and Warnings
- Build and Maintain Relationships with key partners.
- Coordinate and Provide **Expert Decision Support** to Emergency Operations Centers and other key partners
- Solicit Customer Feedback on Products and Services
- Conduct Community Awareness and Education Programs
- Train Volunteer Observers and Storm Spotters

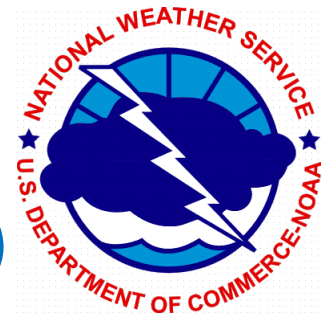


**Warning Coordination Meteorologist serves as the primary interface between WFO and Customers**



# WCM Job Description

## *Local Weather Forecast Office (WFO)*



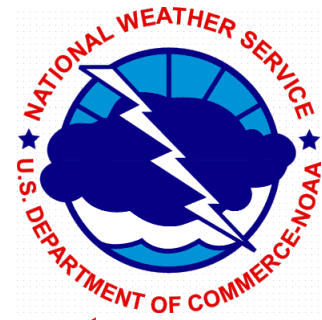
- Principal interface between NWS and users of the products and services
  - Leads product evaluation and improvement
- Responsible for planning, coordinating, and carrying out the public awareness program
  - Educate the public to ensure the mitigation of death, injury and property damage or loss caused by meteorological events







# WCM Job Description



- Coordinates preparedness program with government officials and media
  - Works with media and emergency managers to ensure that preparedness message is consistent and plans are in place well before a weather threat



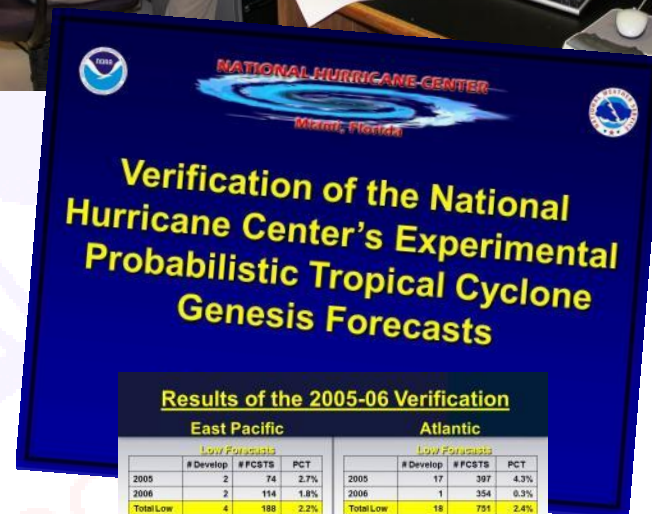


# WCM Job Description

## Other Duties



- **Serves as Senior Forecaster**
  - Performs full range of responsibilities of that position
  - Serves in this role about 25% of the time
- **Leads or participates in meteorological studies and developmental projects**
  - designed to capitalize on or incorporate the benefits of new science/technology/local techniques towards enhancing WFO preparedness

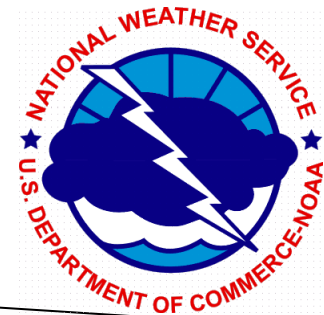


### Results of the 2005-06 Verification

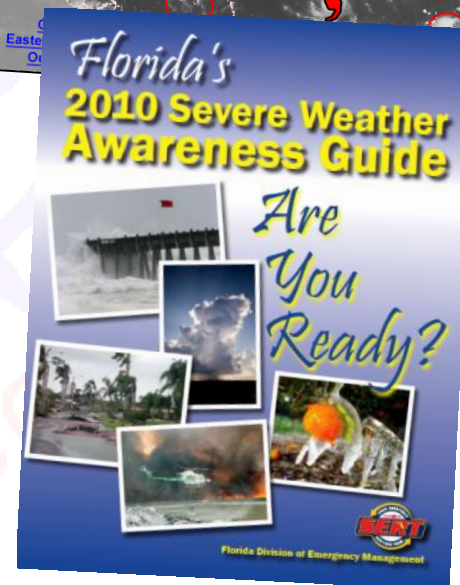
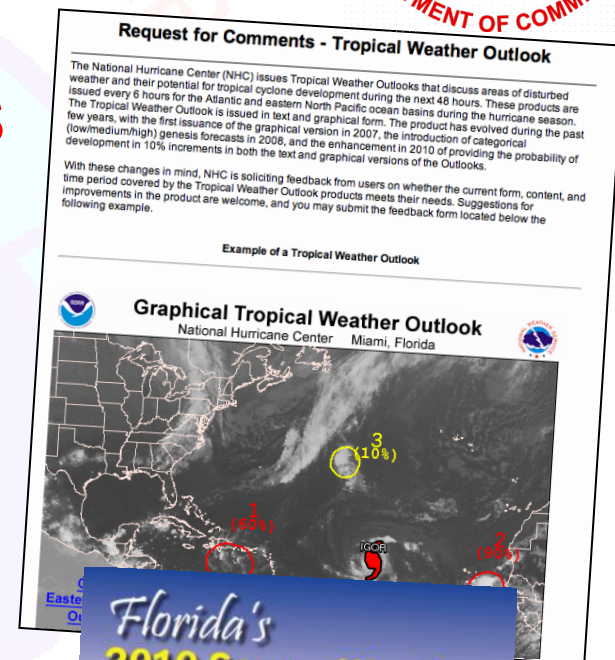
East Pacific				Atlantic			
Low Forecasts				Low Forecasts			
# Develop	# FCSTS	PCT		# Develop	# FCSTS	PCT	
2005	2	74	2.7%	2005	17	397	4.3%
2006	2	114	1.8%	2006	1	354	0.3%
Total Low	4	188	2.2%	Total Low	18	751	2.4%
Medium Forecasts				Medium Forecasts			
# Develop	# FCSTS	PCT		# Develop	# FCSTS	PCT	
2005	40	161	24.8%	2005	86	301	28.6%
2006	68	218	31.2%	2006	25	243	10.6%
Total Med.	108	379	28.0%	Total Med.	111	544	20.4%
High Forecasts				High Forecasts			
# Develop	# FCSTS	PCT		# Develop	# FCSTS	PCT	
2005	66	116	56.9%	2005	97	167	58.1%
2006	83	119	49.7%	2006	32	76	42.1%
Total High	149	235	53.3%	Total High	129	243	52.3%



# Product Evaluation and Promotion



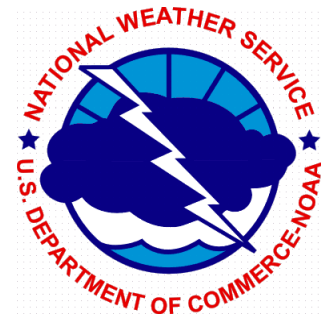
- Leads and conducts evaluations of NWS products
  - Interfaces with all users of NWS products/services to evaluate the adequacy and usefulness of services
  - Collaborates with federal, state, and local agencies in tailoring products to increase usefulness
- Works with government agencies and other key partners to develop plans for promoting more effective use of NWS products and services







# Examples of WCM Roles



- Perform media interviews concerning current weather issues and general NWS-related topics
- Keep partners and general public informed of weather statistics and other pertinent topics







# Decision Support

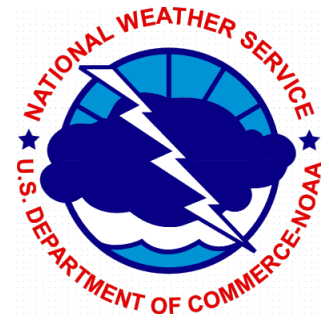


- Provide direct and specific event-based weather support to government officials either on-site or from NWS office
- Focus on providing an expectation of impacts that could affect a large public event or a community's preparation in advance of severe weather
- Examples: severe weather/tropical cyclone events, festivals, sporting events





# Examples of WCM Roles



- Attendance at emergency manager and media conferences, meetings and events is VERY important
- Understanding our partners' roles to better serve them during critical weather situations





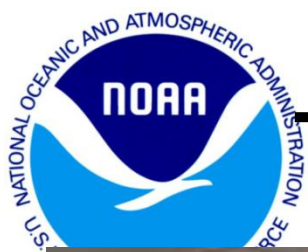
# Examples of WCM Roles



- Yearly hurricane/severe weather expos
- Being accessible to community-at-large
- Office tours/open house
- Speaking to business and civic groups and schools







# Train Weather Spotters

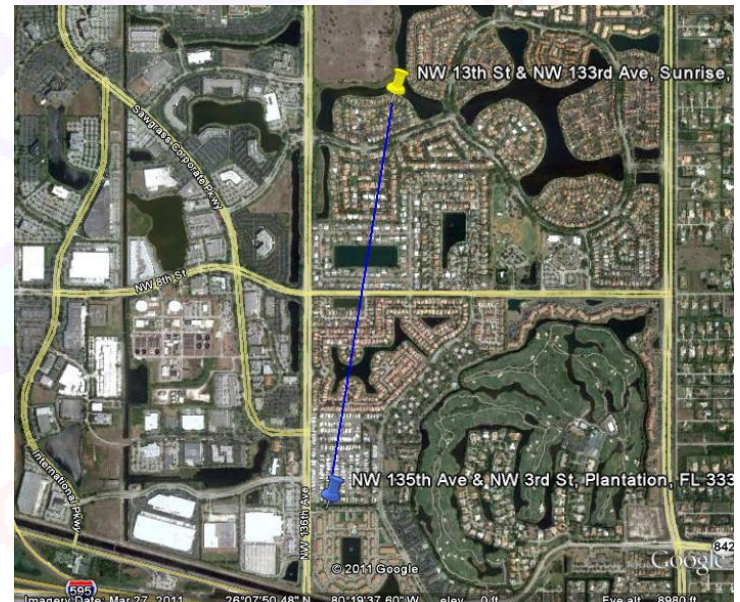




# Storm Surveys



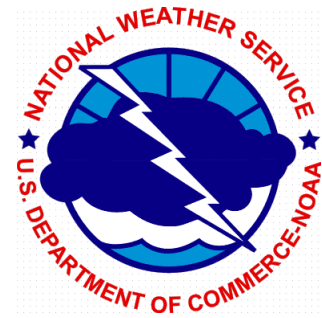
- Coordinates and performs NWS storm surveys to assess damage and rate the intensity and effects of a storm
- Normally done for tornado events but can also be done for flooding and hurricanes







# NHC WCM



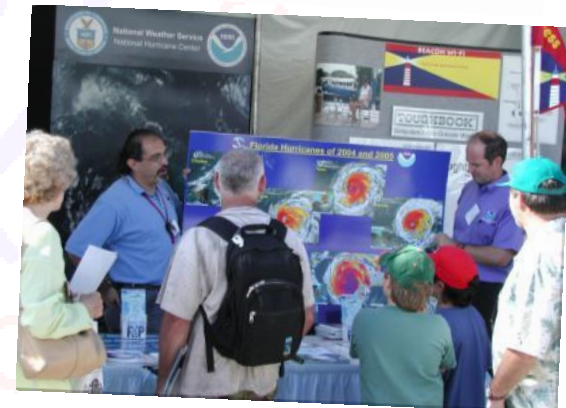
- **Conducts a tropical cyclone preparedness program**
  - Identifies preparedness objectives and projects to meet them
  - Reviews NHC warning efforts and determines adequacy of NHC preparedness activities
  - Coordinates with NWS WCMs to ensure uniformity of effort, collaboration, and compatibility
  - Interacts with NCEP, and regional and NWS headquarters on TC preparedness activities
- **Conducts a marine preparedness program**
  - Coordinates NHC interactions with marine customers
  - Serves as a liaison between NHC TAFB and the marine user community

## Tropical Cyclones



Hurricane Earl, September 1, 2006/NOAA

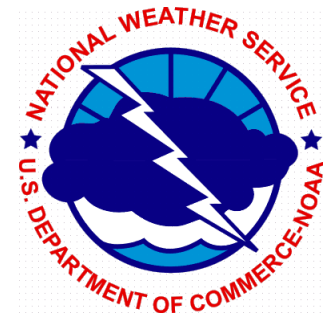
**A PREPAREDNESS GUIDE**  
U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Weather Service  
Revised March 2011







# Key Tasks of NHC WCM



- Works with FEMA Emergency Management Institute (EMI) to conduct 3-one week EM training courses on hurricane preparedness and evacuation decision making
- Develops NHC outreach and training agenda for National Hurricane Conference
- Coordinates NHC participation at state EM or hurricane conferences



DAY AT A GLANCE FOR THURSDAY, APRIL 21, 2011

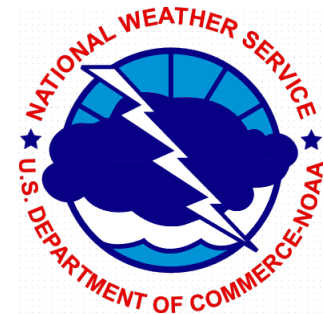
	1 8:30 am to 10:00 am	2 10:30 am to 12:00 pm	3 1:30 pm to 3:00 pm	4 3:30 pm to 5:00 pm
A	<b>Mitigation WS</b> Get More for Your Money: Make the Newly- Revised 406 Hazard Mitigation Policy Work for You	<b>Mitigation WS</b> Integrating Hazard Mitigation and Comprehensive Planning for a Resilient Community	<b>Mitigation/Recovery WS</b> Encouraging Personal Hazard Mitigation Actions Through Risk Communication	<b>Mitigation WS</b> Building Resiliency: Hurricanes Katrina and the Mitigation Measure Best Practices
B	<b>Recovery WS</b> The FEMA Arbitration Process for Hurricane Katrina	<b>Recovery WS</b> Implementation of the New National Disaster Recovery Framework (NDRF)	<b>Recovery WS</b> Disaster Human Services: A Keystone in Hurricane Recovery	<b>Recovery WS</b> FEMA and AD: Federally Funded Disaster Case Management Program
C	<b>Public Education/Media TS</b> ESP-15 External Affairs: It is More Than Public Information	<b>Public Education/Media TS</b> Social Media 101: What is Social Media, What Types are Available and how Do You Sign Up?	<b>Public Education/Media TS</b> Social Media 101: What is Social Media, What Types are Available and how Do You Sign Up?	<b>Public Education/Media TS</b> Social Media 101: What is Social Media, What Types are Available and how Do You Sign Up?
D	<b>Meteorology/Hydrology WS</b> The State of Hurricane Forecasting	<b>Meteorology/Hydrology WS</b> National Hurricane Center Products: What's New?	<b>Meteorology/Hydrology WS</b> Coastal Hurricane Hazards	<b>Meteorology/Hydrology WS</b> Inland Hurricane Hazards and Decision Support
E	<b>Response WS</b> In the Path of the Hurricane	<b>Response WS</b> Public-Private Partnership in Tourism	<b>Response WS</b> HC or Miss: Hurricane Earl, A Category 4 Storm	<b>Response WS</b> The Vital Role of Communication in Public Safety Response
F	<b>Evacuation Planning WS</b> Recent Behavioral Research on Evacuation Planning Issues	<b>Evacuation Planning WS</b> Real-Time and Near Real-Time Evacuation Transportation Modeling	<b>Evacuation Planning WS</b> Evacuation Decision Making Assistance Tools: The Hurricane Risk Profile	<b>Evacuation Planning WS</b> Use of Social Networks and Websites in Evacuations
G	<b>Fire/EMS WS</b> The Haiti US&F Experience: Operating with International Disaster Teams	<b>Fire/EMS WS</b> MABAS Tornado Mutual Aid Validation Exercise	<b>Fire/EMS/Recovery WS</b> Transitioning Damage Assessment from Emergency to Non-Emergency	<b>Fire/EMS WS</b> Gauging a Community's Infrastructure Vulnerability
H	<b>Hurricane History WS</b> Learning from the Past to Mitigate Hurricane Impacts in the Future	<b>Hurricane History WS</b> Back to the Future: Impacts of the Northern Gulf of Mexico's Hurricane Coast Have Been Lost in Time	<b>Insurance WS</b> Dangers of Complacency: Dealing with Insurance Amnesia After Storm-Free Years	<b>Insurance WS</b> Insurance Incentives for Mitigation or Show Me the Money
I	<b>Utilities WS</b> Department of Homeland Security, Protective Security Advisors and Infrastructure Liaison Roles During a Disaster	<b>Utilities WS</b> A Comparison of Hurricane Induced Power Outage Models: Component vs Statistical Models	<b>Healthcare/Accessibility &amp; Functional Needs WS</b> Emergency Planning for the Whole Community - Integrating the Access and Functional Needs of Children and Adults with Disabilities	<b>Recovery/Response/Public Education/Media/Mitigation WS</b> Mississippi Alternative Housing Program: Challenges, Successes and Lessons Learned
J	<b>Mass Care WS</b> Sudden Sheltering/Community Mobilization	<b>Mass Care WS</b> Planning for the Real World	<b>Mass Care WS</b> Planning for the Real World	<b>Mass Care WS</b> Planning for the Real World

**2011 Governor's Hurricane Conference®**  
May 15-20, 2011

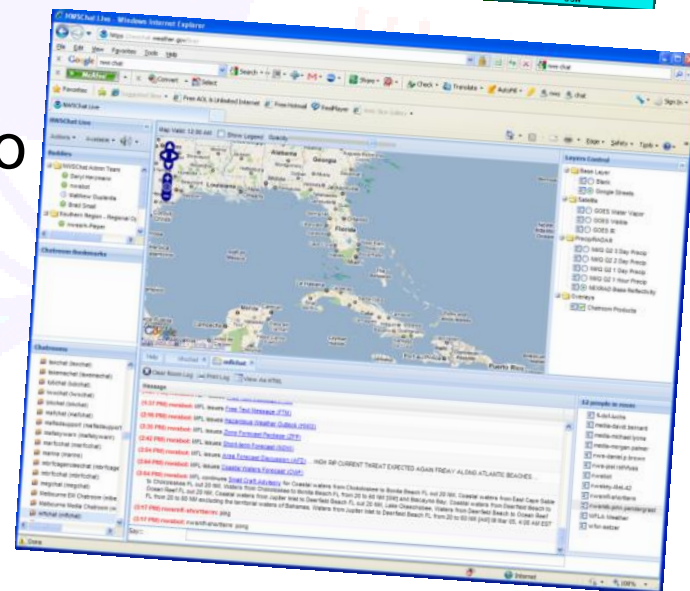
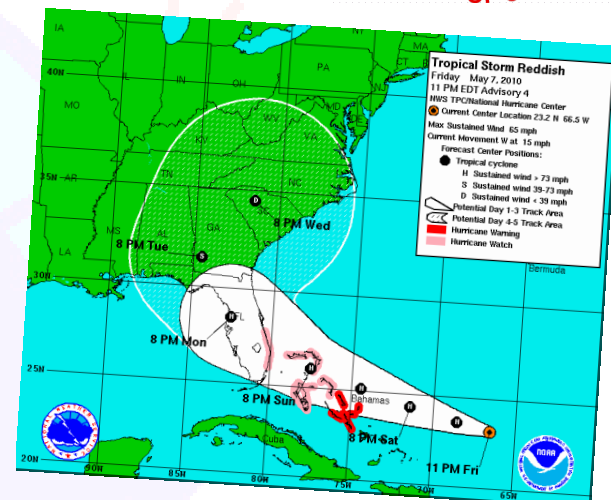




# Key Tasks of NHC WCM

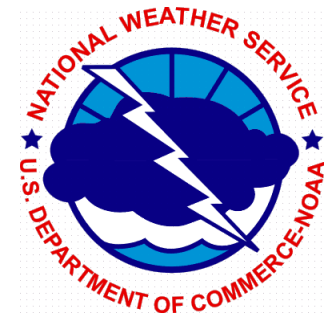


- Develop training plan and course for media
- Coordinates and develops table top hurricane exercise material for state and federal agencies
- Works with NWS WCMs and Regions to improve NHC/WFO Watch/Warning coordination
- Works with international met. services to improve forecast coordination

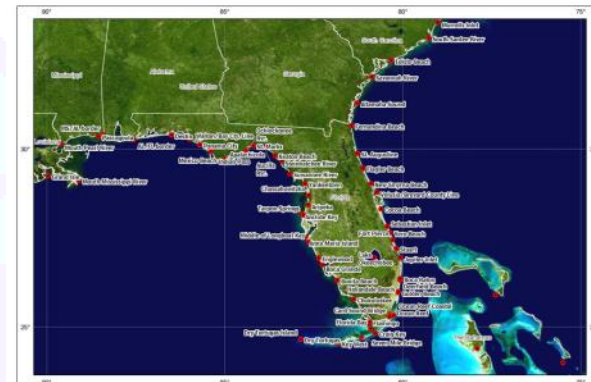




# Other Tasks of NHC WCM



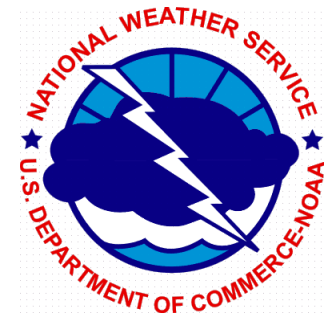
- Serves on team to improve NWS watch and warning collaboration
- Serves on NWS Assessment Teams
- Works with COMET on on-line hurricane preparedness module
- Participates in U.S. Hurricane Awareness Tour
- **WORKS OPERATIONAL FORECAST SHIFTS FROM MAY 15 - NOVEMBER 30!**



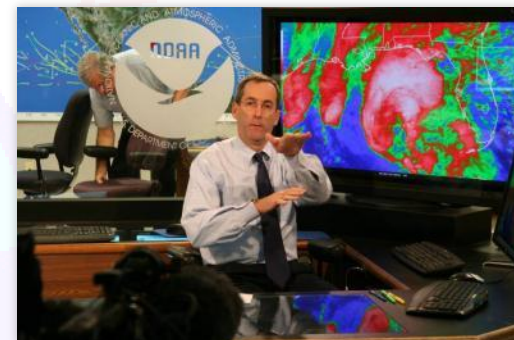




# Difference Between WFO and NHC WCMs



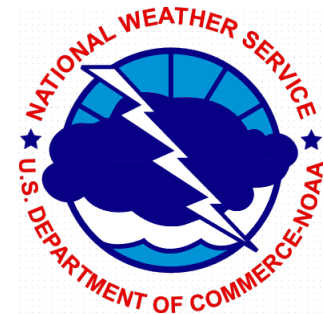
- NHC Director and Deputy Director are the primary spokespersons for the center
  - WFO- WCM and Meteorologist-In-Charge serve that role
- All NHC Hurricane Specialists perform WCM duties
  - Outreach & preparedness activities
  - Training & education presentations
- NHC WCM role is more of an Outreach Coordinator and Planner
- Coordinates with Federal and State partners more than local officials



FEMA



# “Battle is won (or lost) during the off-season...”

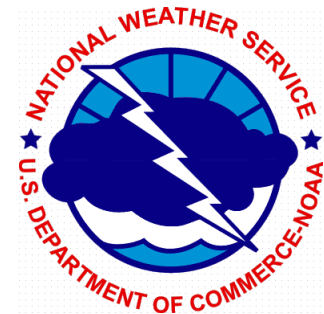


## Highlights of annual NHC involvement:

- FEMA/NWS week-long Introduction to Hurricane Preparedness course for emergency managers (three courses), January-February
- U.S. Interdepartmental Hurricane Conference, March
- National Hurricane Conference, April
- World Meteorological Organization workshop for international meteorologists (2-week course at NHC), April
- Hurricane Awareness Tour (one week, alternating each year between U.S. Gulf and East Coasts), April or May
- Caribbean Hurricane Awareness Tour
- National Hurricane Preparedness Week (late May)
- National media conferences
- State/"Governor's" conferences
- Scientific conferences
  - Transition of new science from research into operations



# “Battle is won (or lost) during the off-season...”



- **Main message:** don't wait until a disaster to get to know the people your serve and work with
- This involves a continuous, year-long effort and engagement with key partners
- Battle is won (or lost) during the “off-season” (Max Mayfield)







# The U.S. National Weather Service Outreach and Education Program



# The Basic NWS Goal: Building A Weather-Ready Nation

- Protect Life And Property Through The Issuance Of Warnings And Advisories For Hazardous Weather
- Promote Commerce And The Economy Through Collection Of Weather Data And Preparation Of Forecasts And Statements



# Is There Really A Need For More Outreach and Education?

Timeliness and Accuracy Of Forecasts and Warnings  
Are Steadily Improving...But Deaths and Injuries  
From Weather Related Events Still Occur... Are We  
Missing Something???

## A Basic Problem:

Even The Most Accurate Forecasts And Warnings  
Are Ineffective If Users Either Do Not Understand  
Them Or Do Not Know What Actions To Take!



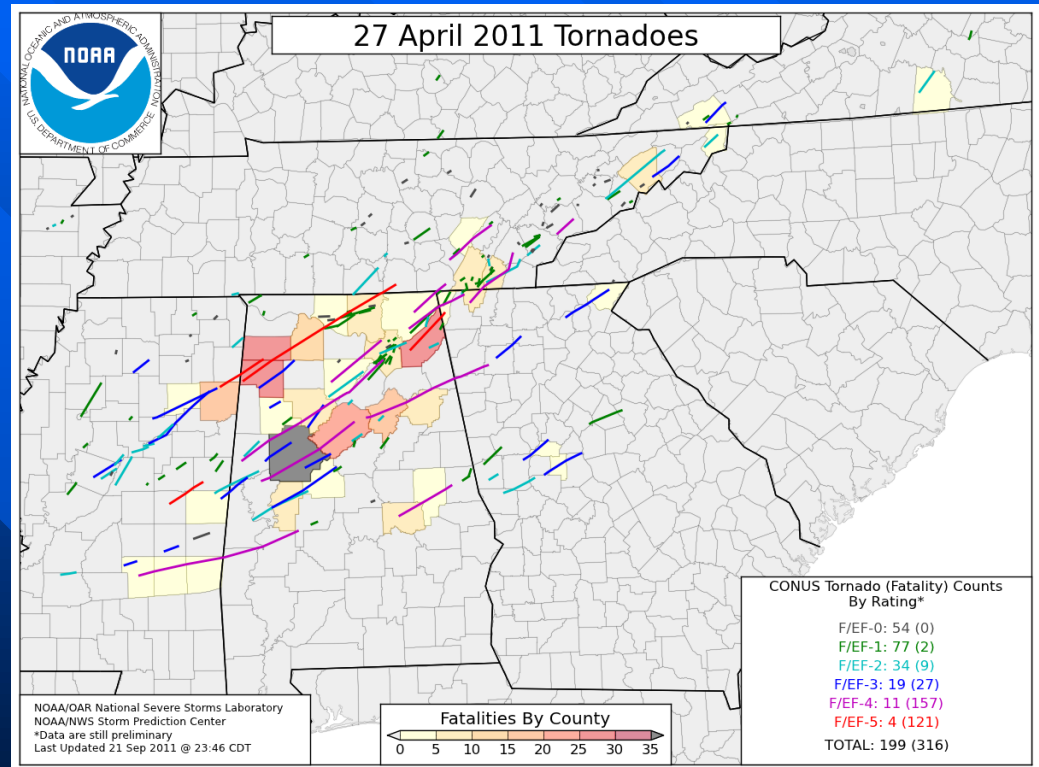
# January 24, 2012: A massive outbreak of strong/violent tornadoes affects the southern United States



Sequence of radar images during Sunday/Monday's tornado outbreak along with paths of strong rotation aloft (colored in red) as indicated by radar. Note these "rotation paths" did not necessarily continuously produce tornadoes on the ground but did in many instances. (Greg Carbin, NOAA Storm Prediction Center)

# The Previous Spring, another tornado outbreak affected the same area...

- 122 Tornadoes
- 31 Rated EF3 or Higher
- 4 EF5 Tornadoes
- Average Path Length 66 Miles
- \$4.2 Billion In Damage



# How Was This Event Handled?

- It Was Anticipated And Forecast Several Days In Advance.
- Tornado Watch Lead Times Ranged From 3 To 6 Hours For The Significant Tornadoes
- Tornado Warning Mean Lead Time Was 22.1 Minutes.
- 89% Of The Tornadoes Were Detected And Warned For.
- Conclusion: From A Forecast And Warning Perspective, The Event Was Very Well Handled.



**However...**

***If The Event Was Indeed So Well  
Handled...***

***Why Were There 316 Deaths????***



# Service Assessment Findings

Despite A Robust Outreach & Education Program,  
There Were Still Numerous Response Issues...

- Myths – “Tornadoes Can’t Cross Rivers” etc.

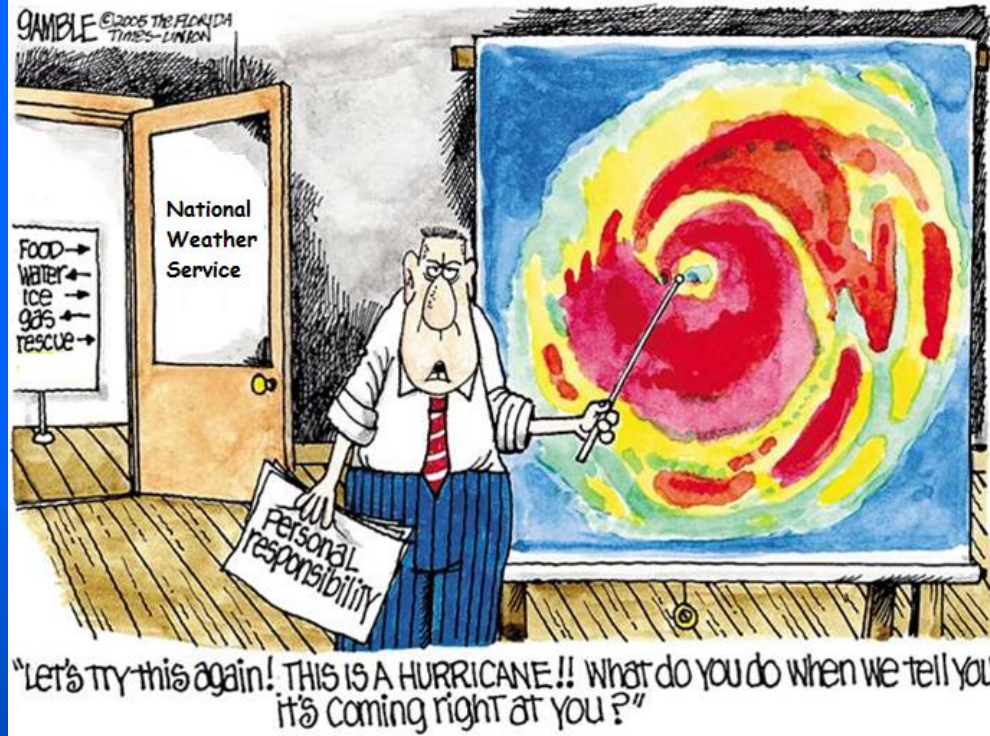
- “False Alarm” or “Cry Wolf” Syndrome

- Waiting For Confirmation

- Multiple Sources Saying The Same Thing
- Actual Visual Confirmation

- Many Who Waited For Confirmation Did Not  
Have Time To Find Safe Shelter.





## What We Do Well:

- Accurate & Timely Watches & Warnings

## What Needs Improvement:

- Ensuring That The Public Knows What They Should Actually Do to Protect Themselves When They Hear Those Warnings!



# Where Do We Start?

- Multi-agency public outreach and education campaigns
- Participation in exercises and drills with Emergency Managers and other local officials
- Community Outreach

# Public Awareness/Education

- Hazardous weather awareness weeks
- Media campaigns
- Partnership with EMs
- Tours of Office
- Talks to student, business, civic groups



# Hazardous Weather Drills

- “Stress test” for communication systems
- Test for personal, school, business safety plans
- Typically part of hazardous weather awareness week





# Media Outreach and Coordination



- Primary disseminators to the public
- Awareness of NWS products and services
- Ensure timely receipt of products
- Ensure all entities speak with one voice

# Social Media... The New Communications Model?

## Social Media Users

As of January 2014



**Facebook**  
1.15 billion + users



**Twitter**  
230 million + users



**LinkedIn**  
238 million + users



**Google+**  
500 million + users



**YouTube**  
1 billion unique  
monthly users



**Pinterest**  
70 million + total users



**Instagram**  
130 million + users



**Pinterest was the fastest growing social network of 2013**

**Over 2.6 million companies have pages on LinkedIn**

**Google+ adds 25,000 new users every day**



# Social Media... The New Communications Model?

- Despite inherent problems, social media has to be acknowledged as a key communications platform]
- Use social media to provide accurate, official information as well as to dispel false information
- Build strong, reliable, trusted social media presence well BEFORE a disaster





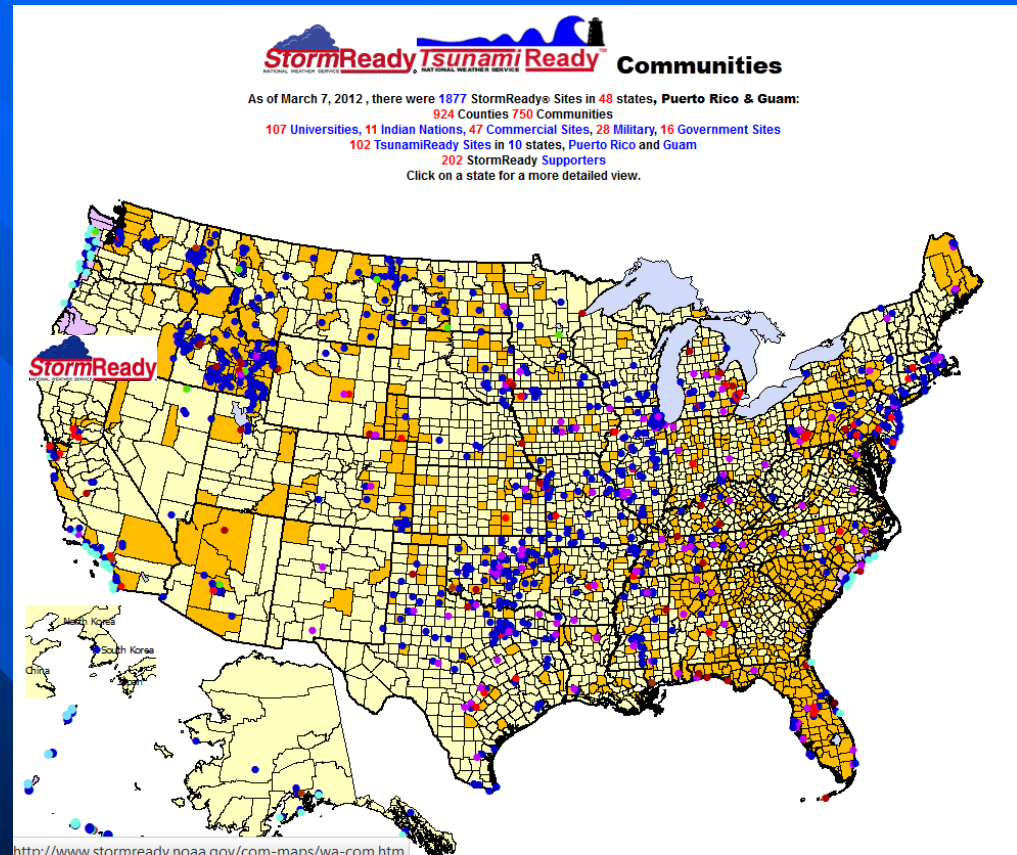
# Integrated Warning Team

- Made up of NWS, media and emergency managers in a local area
- Meet at least once a year to discuss items related to public safety





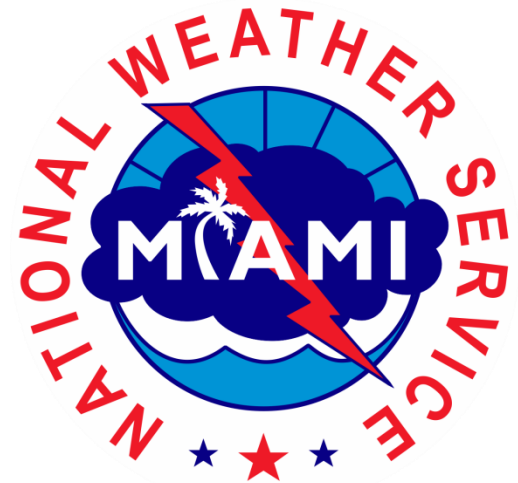
- Designed To Enhance Communication During Hazardous Weather Events.
- County/Community Must Meet Standards Based On Population
- Must Be Renewed Every 3 Years





# It's All About Partnerships

# AMBASSADOR WRN WEATHER-READY NATION™



*Serving ALL of  
Southern Florida  
from Naples to Lake  
Okeechobee to the  
Atlantic beaches!*



**Weather-Ready Nation**





# It's All About Partnerships



Government



Emergency  
Management



Academia



Private Sector



Broadcast  
Media



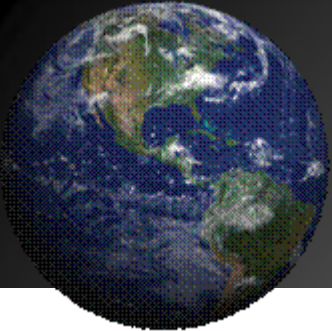
Social  
Science



Building a Weather-Ready Nation



## Weather-Ready Nation



# WRN Ambassadors: Strengthening Relationships

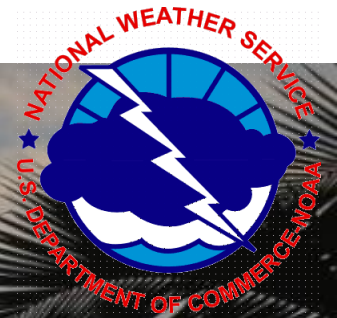
- ✔ WRN Ambassador initiative
  - ✔ Formal recognition of organizations that work with NOAA toward building a Weather-Ready Nation
  - ✔ WRN Ambassadors become “force multipliers”
  - ✔ Making this work consistently across the entire agency
  - ✔ Already being embraced by the external community
  - ✔ Not intended to cross over public/private balance



# Conclusions

- Despite An Ongoing Outreach/Education Effort, More Work Needs To Be Done!
- Forecasts And Warnings Are Improving...The Social Aspect Of Weather Preparedness Must Also Improve
- Technology Provides New Opportunities To Enhance Our Communication And Outreach Efforts.
- Building A Weather-Ready Nation Is A Partnership That Includes Everyone!





# Questions?

*Thank you for your time, and safe  
trip home!*

*National Weather Service  
Miami, Florida USA*