

# Briefing

# Emergency Management

## *Understanding Customer Thresholds to Best Convey Tropical Cyclone Impacts*

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# Questions to Address

- What are Thresholds?
- How are thresholds determined/found?
- Use of Operational Significance?
- Use of Operational/planning Cycles?

# UNDERSTANDING PERSPECTIVES

## *a good place to start*

<b>Meteorologist</b> <i>Focus on</i> <b>Conditions</b>	<b>General Public</b> <i>Focus on</i> <b>Personal Protection</b>	<b>Decision Makers</b> <i>Focus on</i> <b>Impacts</b>
<b>What is expected storm surge, flooding, wind, etc?</b>	<b>Am I safe? What is going to happen to me?</b>	<b>What protective actions need be taken? <i>(what might break?)</i></b>
<b>What is timing and duration of event?</b>	<b>Do I leave or Stay?</b>	<b>Where will we need to respond?</b>
<b>How to communicate weather hazards?</b>	<b>What do I do? <i>(needs instruction)</i></b>	<b>What type of recovery will be needed?</b>

*7 ft Storm Tide -> flooding of coast -> Evacuation of coastal communities*  
*10 to 20 inches rainfall -> flash flooding/mudslides -> Evacuation/SAR*  
*planning/long-term sheltering*

# What are Thresholds?

- Thresholds are critical values ( time, space, impact-condition) which represent decision points where customers will take action.
- Threshold values represent coordinated information.
  - They do not come from us.
  - Local Mitigation Studies/Traffic Studies
- Some thresholds are hard wired/some not.
  - Examples of hard wired vs soft wired??

# Critical Thresholds Values

## *Timing*

- C130 to evacuate special needs – 84hrs
- National Guard activation – 54hrs
- Multiphase evacuation, tourists – 48hrs
- Mobile home residents – 30hrs
- All residents – 24hrs
- Arrival of TS winds – Evacuation terminates
  - Refuges of last resort open

# Customer Thresholds Exceedence

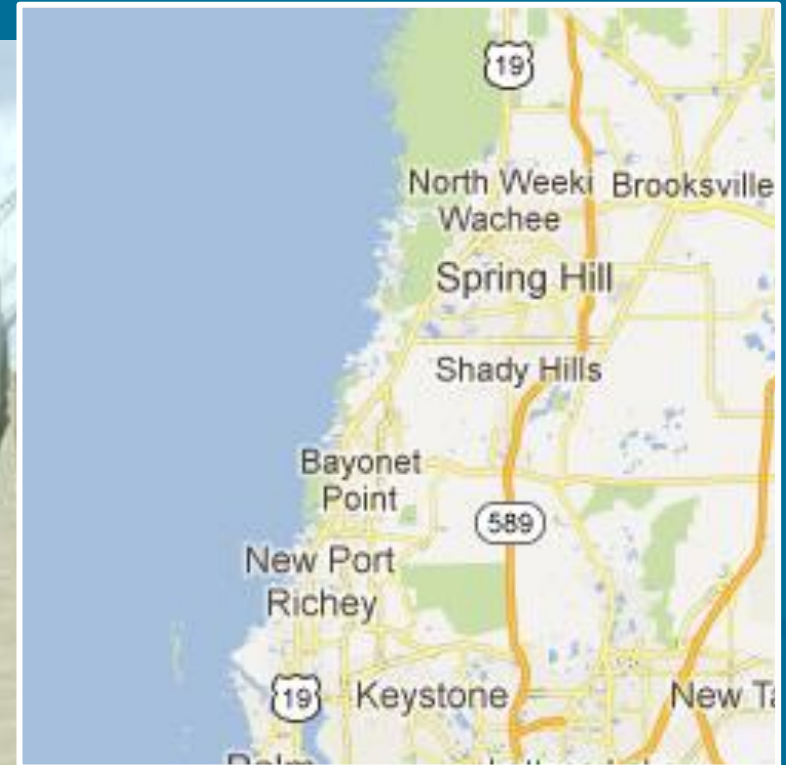
## *Conditions -> Impacts*

- 35mph – School buses cannot cross bridges
- 35mph – Electrical bucket boom trucks
- 40mph – Law enforcement, public works, Aqueduct authority cease operations
- 45mph – All Electrical, Public Works, and Routine emergency/fire rescue response ceases
- Critical services may occur on case by case up to 60mph



# Pinellas County

72hr Clearance Time



# Sunshine Skyway Bridge Closed!

winds greater than 34kt/39 mph





# Decision Threshold Examples

## *Conditions -> Impacts*

- Wood utility poles – rated 100 to 110 mph
- Hollow concrete poles – 120 mph
- Solid concrete poles – 150mph
- Port of Key West wooden poles – 90 to 100 mph
- Ductile iron poles – >150mph

# Decision Threshold Examples

## *Conditions -> Impacts*

- **3.5 -4 ft storm tide (above MSL)**
  - South Roosevelt Blvd under water – major artery
  - Overseas Highway near Mile Marker 74 under water – divides the Florida Keys in half.
- **5 ft of storm tide (above MSL)**
  - Multiple roads underwater
  - Water entering homes
- **7ft of storm tide (above MSL)**
  - Potential loss of life
  - Multiple homes inundated
  - Cars/trucks floating/most roads impassable

# Coordinated Program Examples

- **Fire Weather**
  - Meteorological thresholds: winds, RH, indices
  - Incident Meteorologist (IMET) – direct support
- **Aviation**
  - Meteorological thresholds: ceiling, visibility, wind shear
  - Center Weather Service Unit (CWSU) – talk directly to controllers
  - Aviation Weather Center (AWC) – provides products used by Flight Services
  - Flight Service Stations – direct support, brief pilots
  - Commercial Airlines – some have their own meteorologists

# Coordinated Threshold Examples

- Hydrology

- Confusing suite of watch/warning/advisory products
- Rivers can be in flood with no impacts
- No flood inundation mapping (what will flood)
- Think of perspectives

- Tropical ???

- Improving on both the Meteorologist and Emergency Management sectors
  - Hurricanes Andrew, Matthew, Irma, Michael...

# Determining Thresholds

- Ask
- Participate
- Anticipate
- Coordinate



# Operational Significance

Operational significance can be defined where similar protective and precautionary actions will be necessary based on the impact of meteorological events.

# Operational Significance Example

Area 1

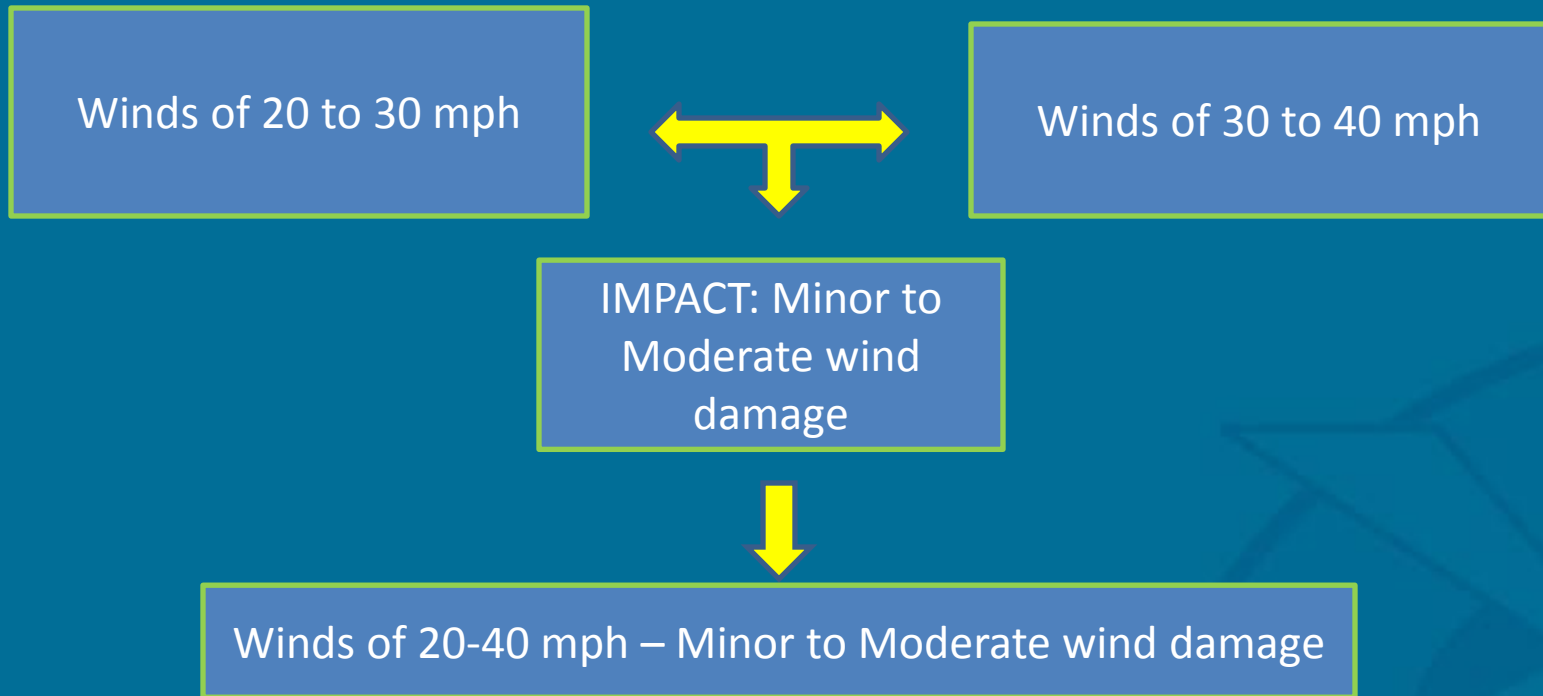
Winds of 20 to 30 mph

Area 2

Winds of 30 to 40 mph

IMPACT: Minor to  
Moderate wind  
damage

Winds of 20-40 mph – Minor to Moderate wind damage



# Operational Significance

- Use to avoid thin slicing.
- Use to avoid broad brushing.
- Use to avoid over-briefing (operational cycles).
- Use to temper condition ranges.
- Use to focus on the what, not the why.

# Operational Cycles

## *Planning Cycles*

- What are the customer planning cycles?
  - When (how often) is IAP written/updated.
- What determines planning cycles?
- Stay in phase with planning cycles.
  - Briefings, emails, conference calls.
- Flash updates (briefings) outside of PC should ONLY be for significant changes.
- Their planning cycles = their decision cycles.

# Example:

- NHC operational cycle is every 6 hrs.
- EMs in your region are running Alpha/Bravo shifts, doing one IAP per day with mid-day update.
- *You sent out an email to EMs stating you'll do a briefing every 4 hrs.*



# Impact Based Decision Support

## It's all about decision points

- What is the customer role?
  - What is the difference between state, local, federal?
- What is the customers planning cycle?
  - What are temporal and spatial needs?
- What is operationally significant? (thresholds)
  - What matters, and what doesn't?

# Bayshore Blvd

Tampa, FL



# Meet with Emergency Managers and Local Stakeholders (where they live!)





# National Weather Service Offices Train and Work with Core Partners



# National Weather Service Offices Train and Work with Core Partners

## Decision Support Service “Road Show”

### Practiced an hurricane scenario “full-scale” drill

- ‘Operations – to – Deployments’ Services
- Handling urgent life safety weather support requests
- Crisis media communications & public messaging






# Community Preparedness for Emergency Responders

- Hurricane Decision-Making Exercises
- Local Impact Considerations
  - Storm Surge, Rainfall Flooding, Wind
- Decision Support Services
- Coordinating Emergency Communication
  - Social Media, Electronic Media



# Friday, September 1

## First Daily E-Mail Briefing for Irma



National Weather Service  
WFO Florida Keys  
305-295-1316

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**Monroe County Informational Weather Briefing**  
Concerning Hurricane Irma in the East Atlantic

Issued Sep 1, 2017 – 11:30 am EDT

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For: Emergency Managers serving the Florida Keys

*No impacts beyond normal summertime rainy season weather are expected in the Florida Keys of Monroe County through the Labor Day weekend and at least through much of the next work week.*

*There remains plenty of time to monitor the progress of Irma. Unless significant forecast changes occur, expect increasing NWS monitoring and weather brief frequency beginning Labor Day, September 4<sup>th</sup>.*

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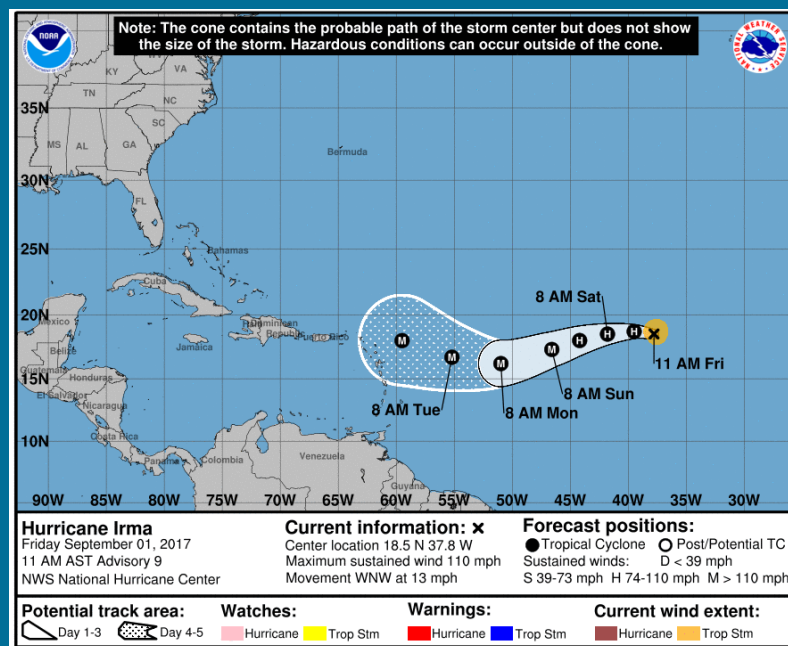
**Situation**

As of the 11 am EDT NHC Advisory, Hurricane Irma was intensifying rapidly over the eastern Atlantic, about 1580 miles east of the Lesser Antilles. Irma is a Category 2 on the Saffir Simpson Hurricane Wind Scale, with 110 mph winds. Irma weakened slightly since yesterday afternoon, but this was due to structural changes in the hurricane's core and not to a change in forecast conditions. Irma was moving toward the west-northwest at 13 mph. As high pressure builds strongly to Irma's north, Irma is expected to turn toward the west by tonight, and west-southwest on Saturday.

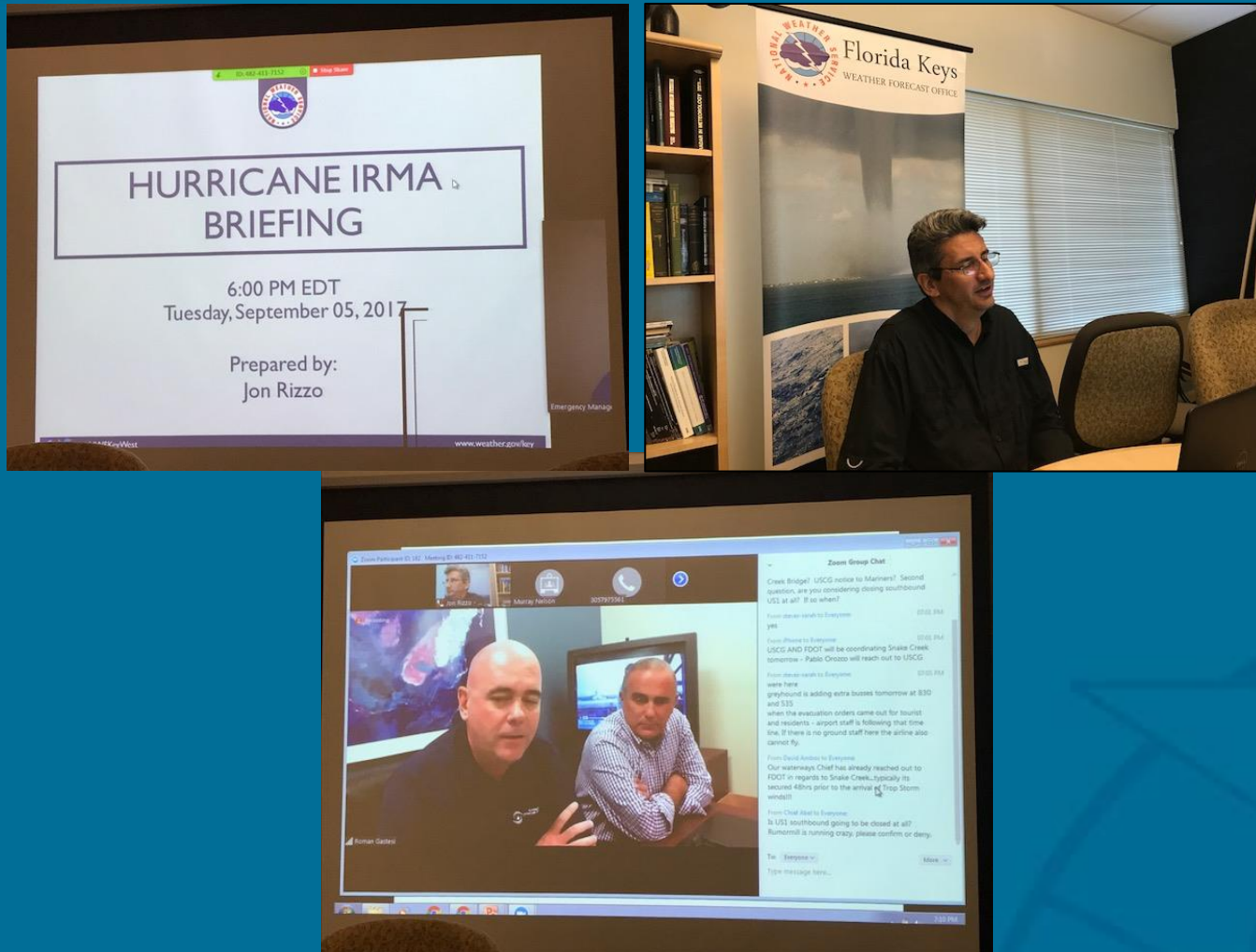
Irma's intensity is expected to fluctuate over the next few days, with conditions favoring a bit more strengthening early next week. Regardless, Irma is expected to remain a powerful hurricane through the weekend, and be a major hurricane as it nears or passes northeast of the Leeward Islands early Wednesday.

While there are no immediate threats to the Florida Keys into middle of next week, there is great uncertainty in its track as it passes near or north of the Leeward Islands and Puerto Rico after Wednesday.

For information purposes, and without confidence in any significant change in speed or track beyond the next 5 days, the earliest "best guess" of when a forecast cone "could" touch the Upper Keys could be Tuesday morning.



# Escalate to Multimedia Briefings





# “All Hands On Deck”



# WCM Deployment

NWS Key West Warning Coordination Meteorologist  
deployed to Monroe County EOC – 9 Day Deployment

Transition from remote briefings to in-person, stand-up,  
full access for operational decisions





# Critical Decisions

Phased Evacuations – Visitors to residents

Continuity of Operations for life-safety agency & the EOC

Shelter-in-place

Initial assessments

Recovery – maritime, aviation, lightning, heat stress for responders

The Daily Mission – public safety



# EMPHASIZE CUSTOMER THRESHOLDS

**Be aware of customer thresholds included  
in plans/checklists/playbooks.**

Threshold Value	Impact
Arrival of Tropical Storm Winds	Evacuation Terminated – Opening of Last Resort Refuge.
Storm Surge Exceeding 5 Feet	Coastal Roads Inundated – Communities become isolated .
Rainfall in Excess of 10 Inches	Major River and Stream Flooding – Widespread Urban Flooding.

# EMPHASIZE IMPACTS

## ...not specific meteorological conditions...

Flooding → Impact

Rainfall → Condition

If the forecast is for 3 to 6 inches of rainfall, discuss what that amount of rainfall will do (or not do).



### ***Example:***

***Rainfall amounts of 4 to 6 inches are expected with passage of the storm. This will result in moderate flooding of most secondary roads in south Florida. Major roadways should remain passable.***

# EMPHASIZE IMPACTS

## ...not specific meteorological conditions...

Tropical Storm Force Wind → Impact  
Wind Speed → Condition

If the forecast is for near 40 mph sustained wind with gusts to 60 mph, discuss what the impact will be, and possibly what not



### *Example:*

*Winds sustained near 40 mph with gusts to 60 mph with the passage of the storm. This will result in downed trees and power lines. Widespread structural damage to homes and businesses is not expected.*

# Support for Recovery



Agencies: Emergency Management, Search & Rescue, Operational Divisions

Critical decisions: Bringing in resources for water and power recovery; when to lift evacuation or consider new orders



# Takeaway Concepts

- Thresholds from partner agencies
- Use thresholds to temper forecasts/briefings
- Avoid Thin-Slicing (Operational Significance)
- Pay attention to customer planning (Operational Cycles)

# Don't Let The Customer Sort It Out



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