Improving Storm Surge Risk Communication

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Current Understanding

- In one exploratory study, only 2 out of 33 coastal emergency managers believed the residents in their region understood surge

  -Morrow 2007

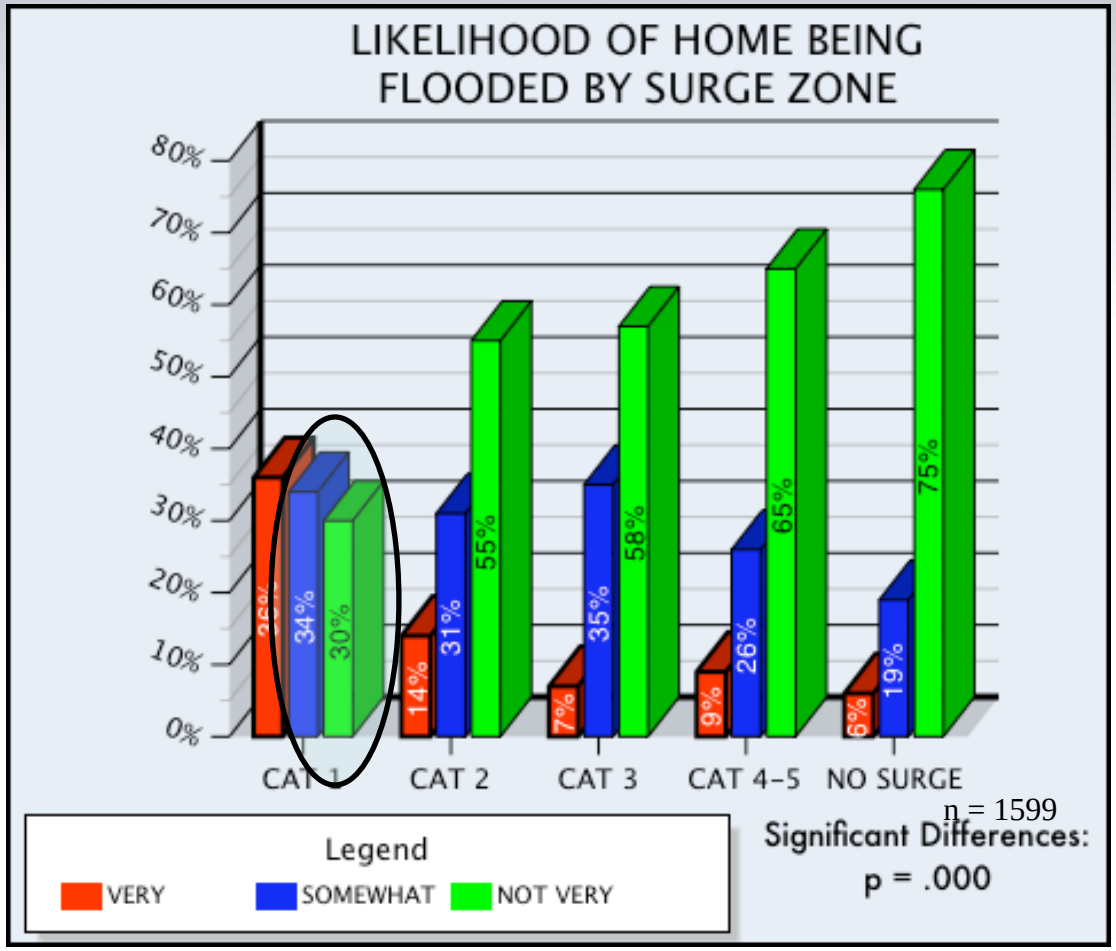
- In spite of forecast information most residents in the path of Hurricane Ike were taken by surprise by storm surge

  – Morss & Hayden 2010

- When asked what the expected sea level would be if a 15-foot surge occurs at the time of a 2-foot tide, only 19% gave the correct answer

  – Morrow & Gladwin 2007

Knowing Vulnerability

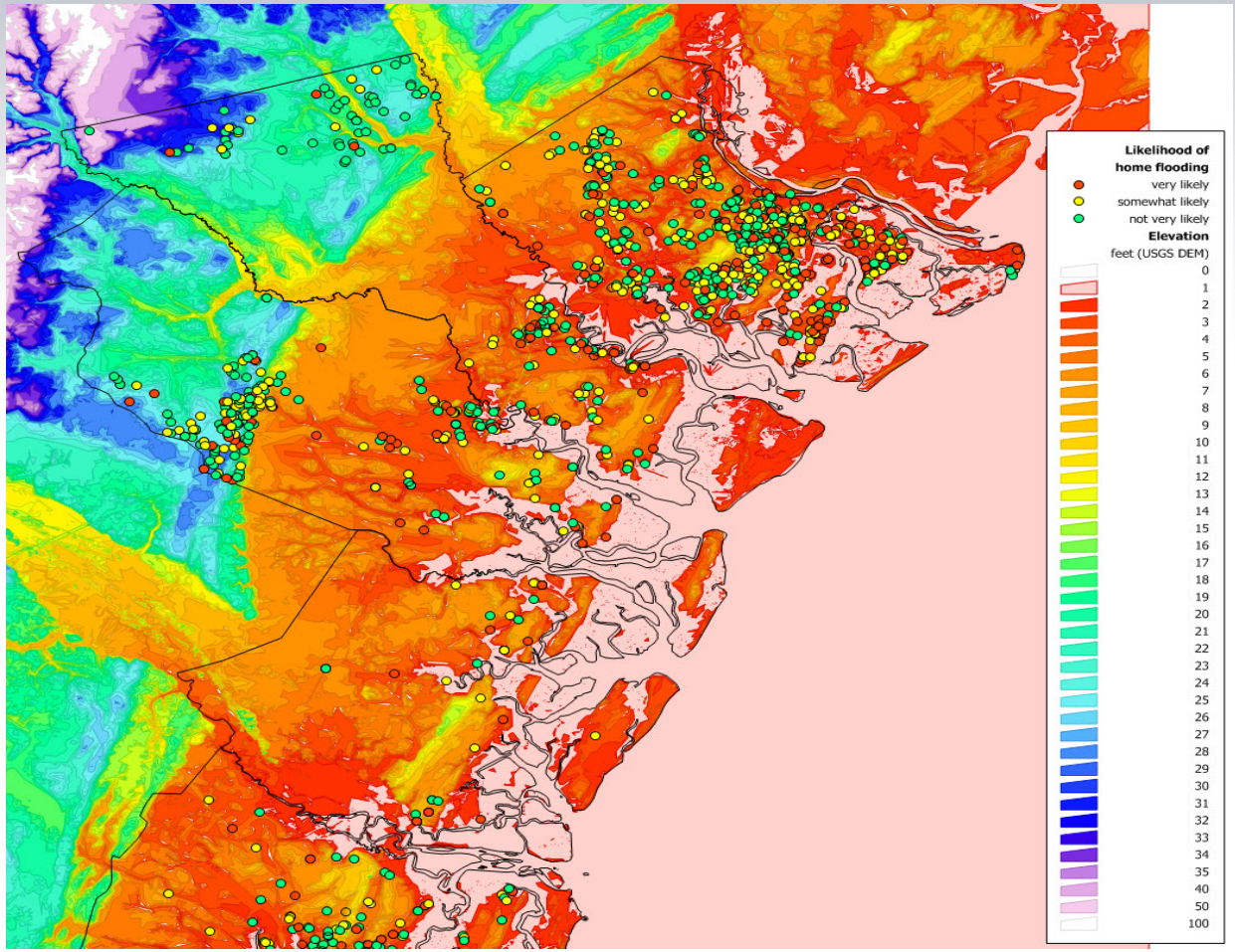


Of those in Cat 1 zone, about one third are each of these:

- **Very concerned**
- **Somewhat concerned**
- **Not very concerned**

Hampton Road VA Evacuation Study. 2010. Morrow & Gladwin through Dewberry for FEMA and USACE

Knowing Vulnerability



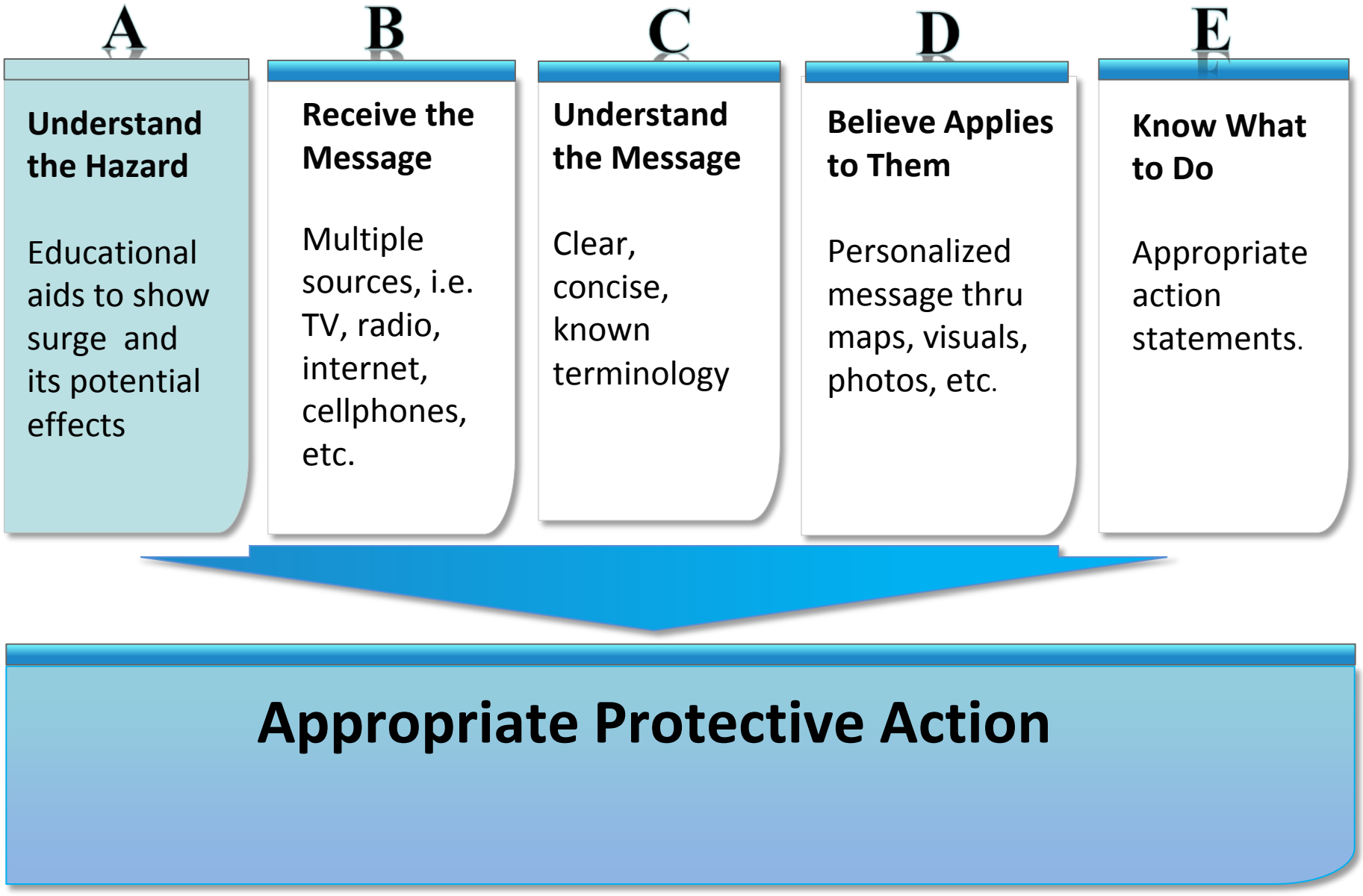
Likelihood Would Be Flooded in Major Hurricane:

- Not Very Likely
- Somewhat Likely
- Very Likely

Each dot = one interview

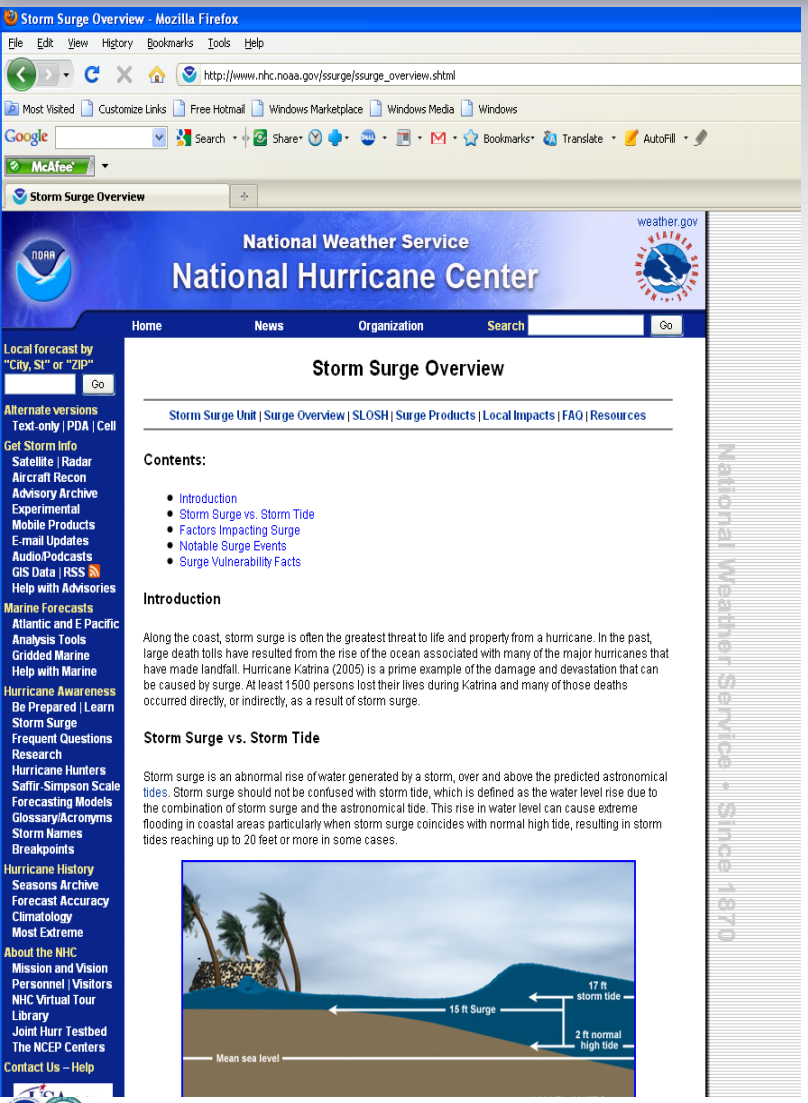
Coastal Georgia Evacuation Study. 2010. Morrow & Gladwin through Dewberry. 2009 for FEMA and USACE.

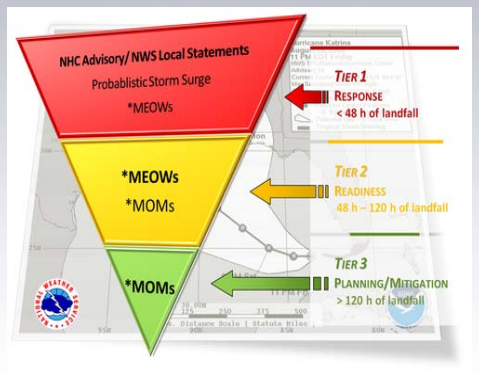
Steps to Effective Surge Response



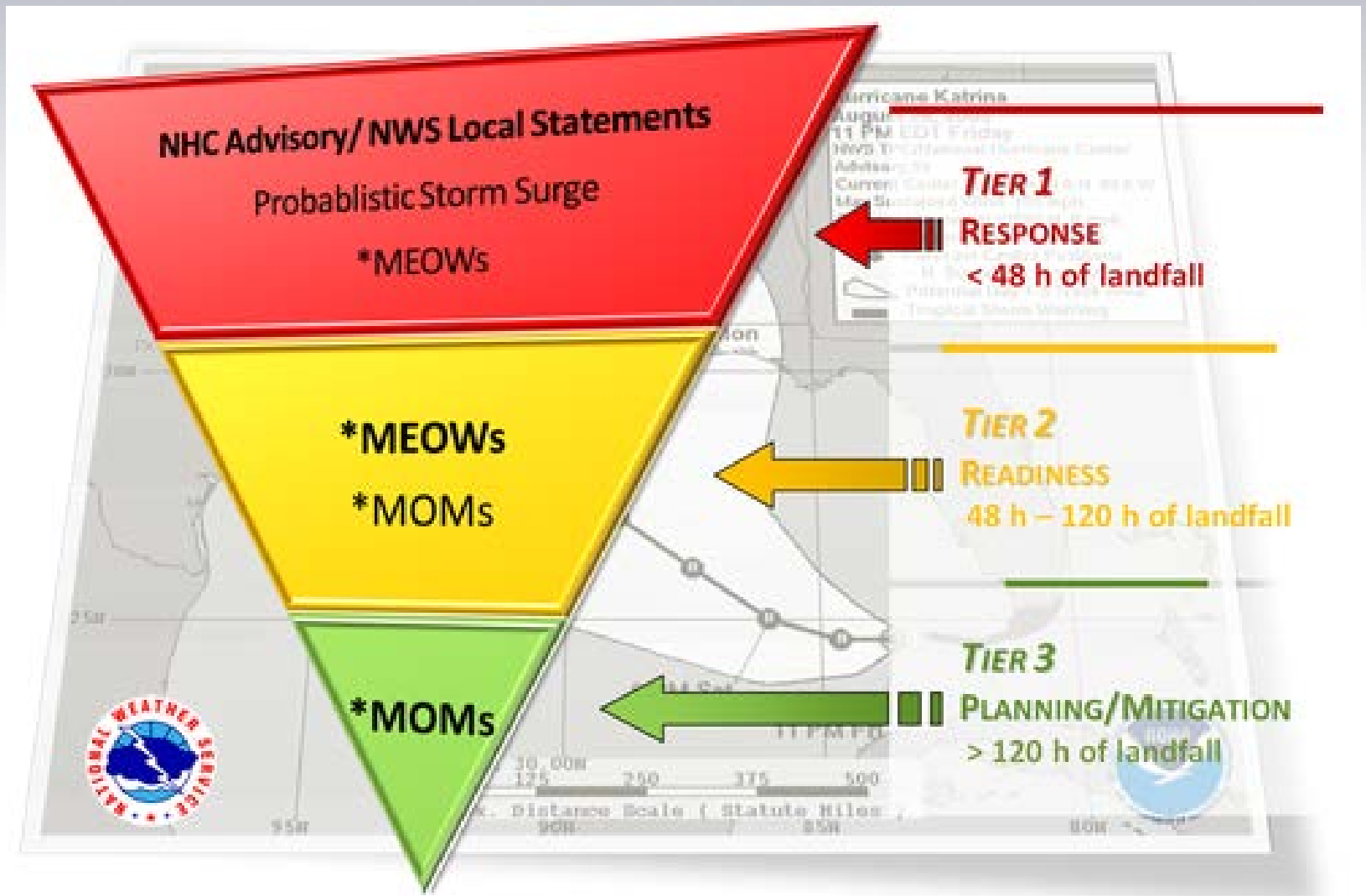
A Dedicated Outreach Campaign

New Interactive Website

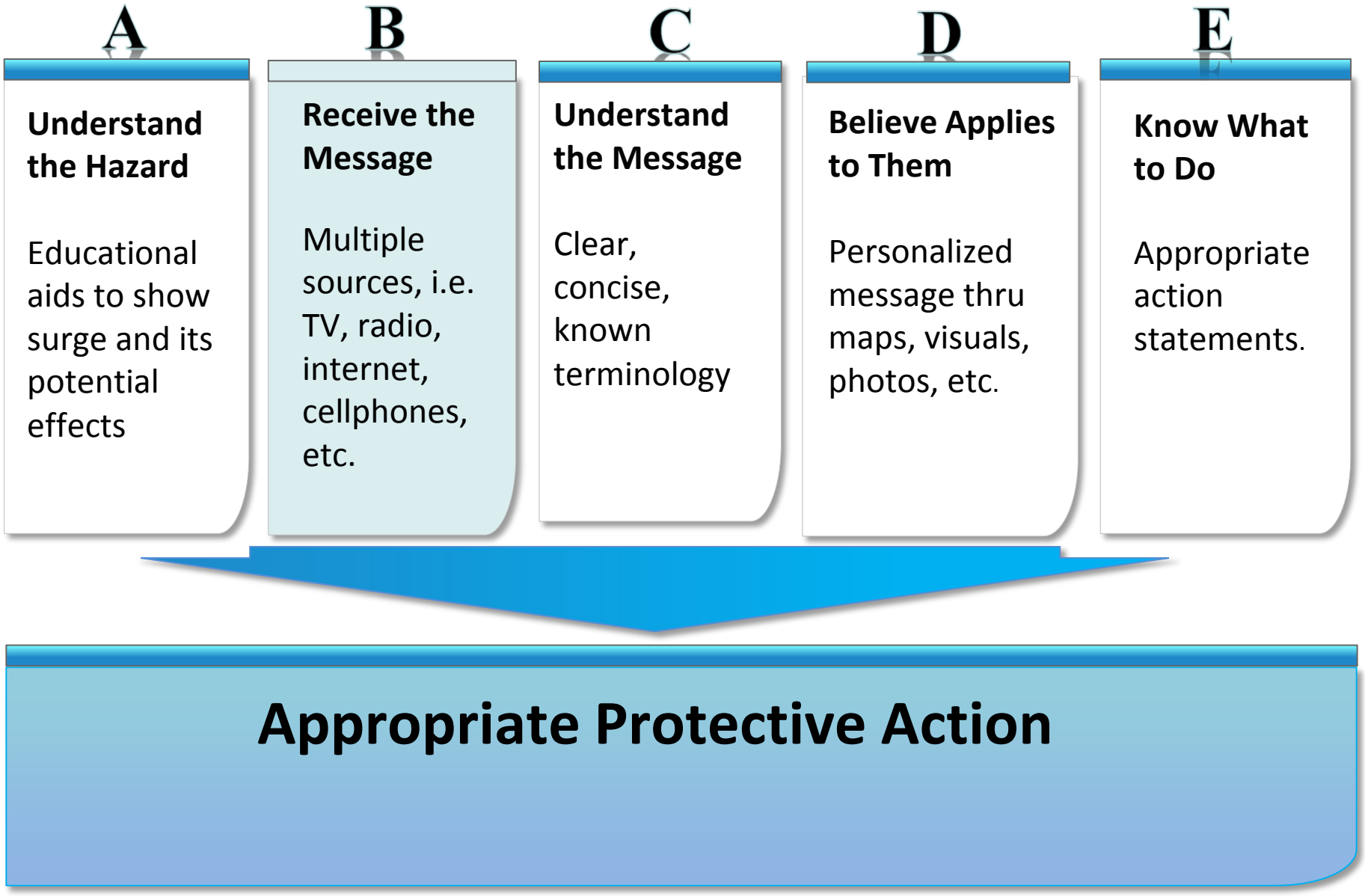




Improving Access to and Clarifying our Products



Steps to Effective Surge Response



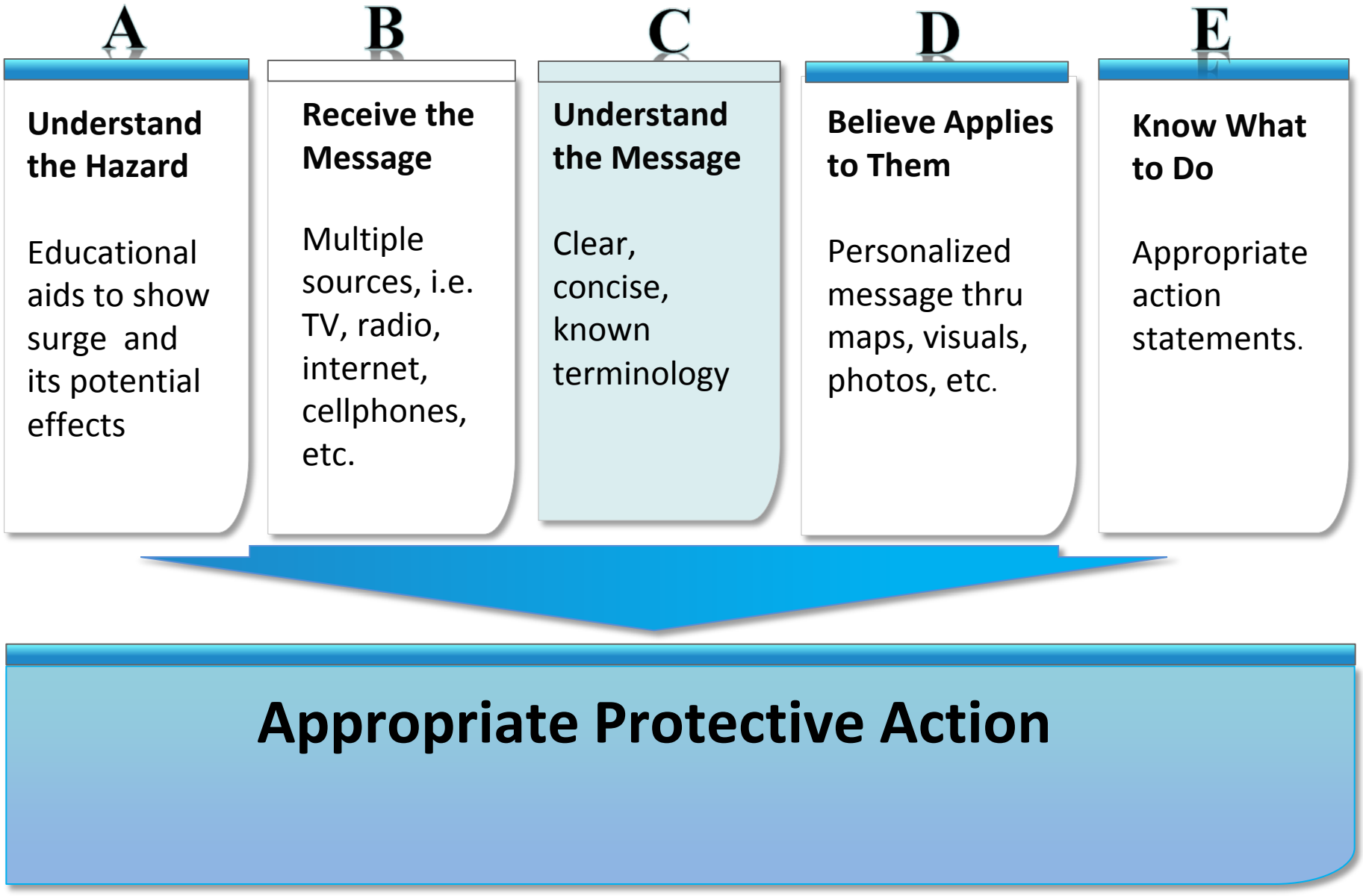
Multiple Messages Multiple Channels

Use of Technologies Survey
Charleston, SC (2008)

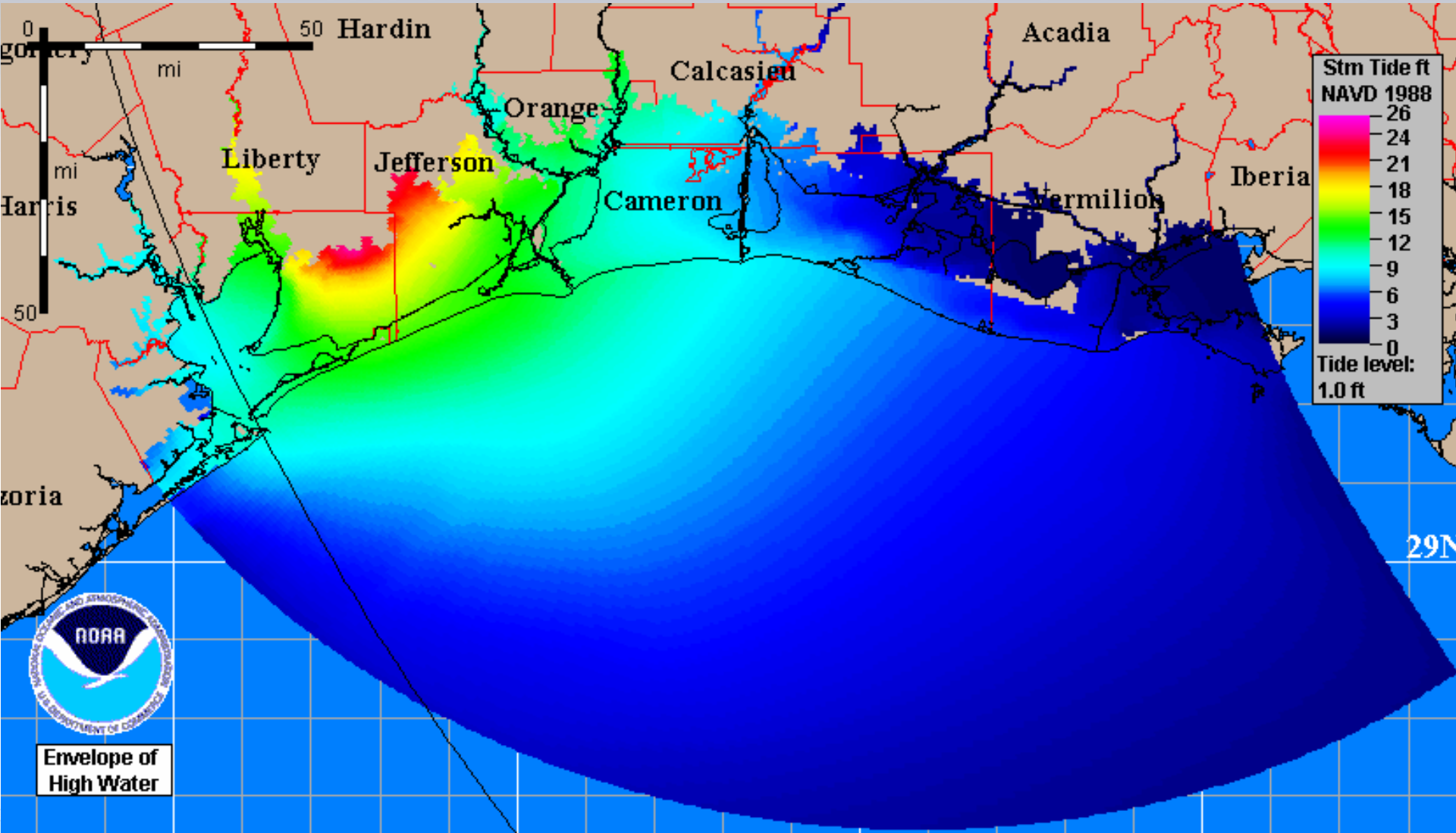
- **70% have cell phones**
- **67% over age 65 have cell phones**
- **60% said they would use cell phone to contact family in emergency**
- **56% under age 29 use texting**
- **6% over 65 used texting**

Providing Access to Resilience-Enhancing Technologies for Disadvantaged Communities and Vulnerable Populations. Oak Ridge Associated Universities. Oak Ridge Associated Universities. www.orau.org/university-partnerships/files/The-PARET-Report.pdf

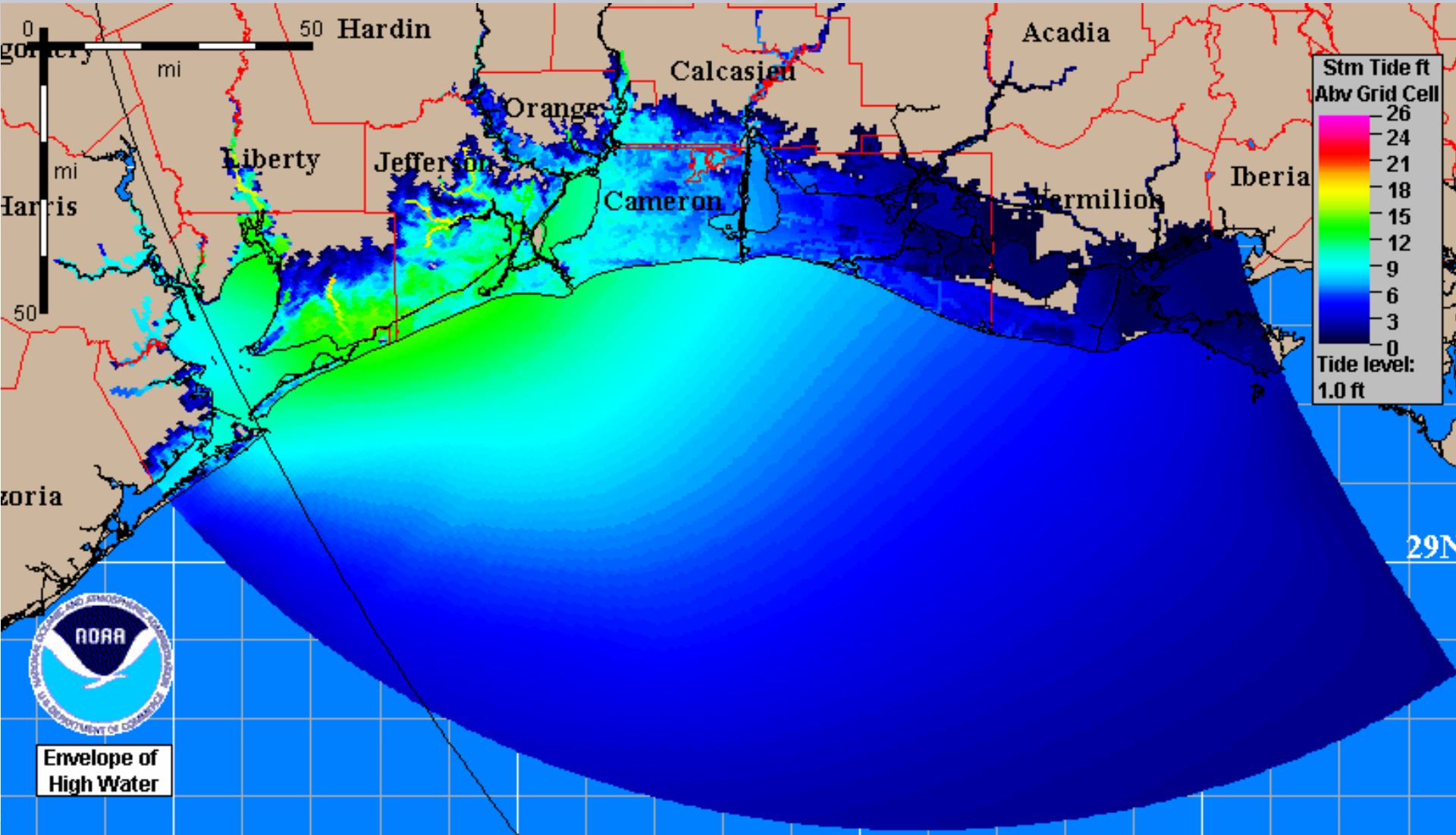
Steps to Effective Surge Response



Height Above Reference Level



Height Above Ground Level
(Inundation)



New NHC Surge Statement

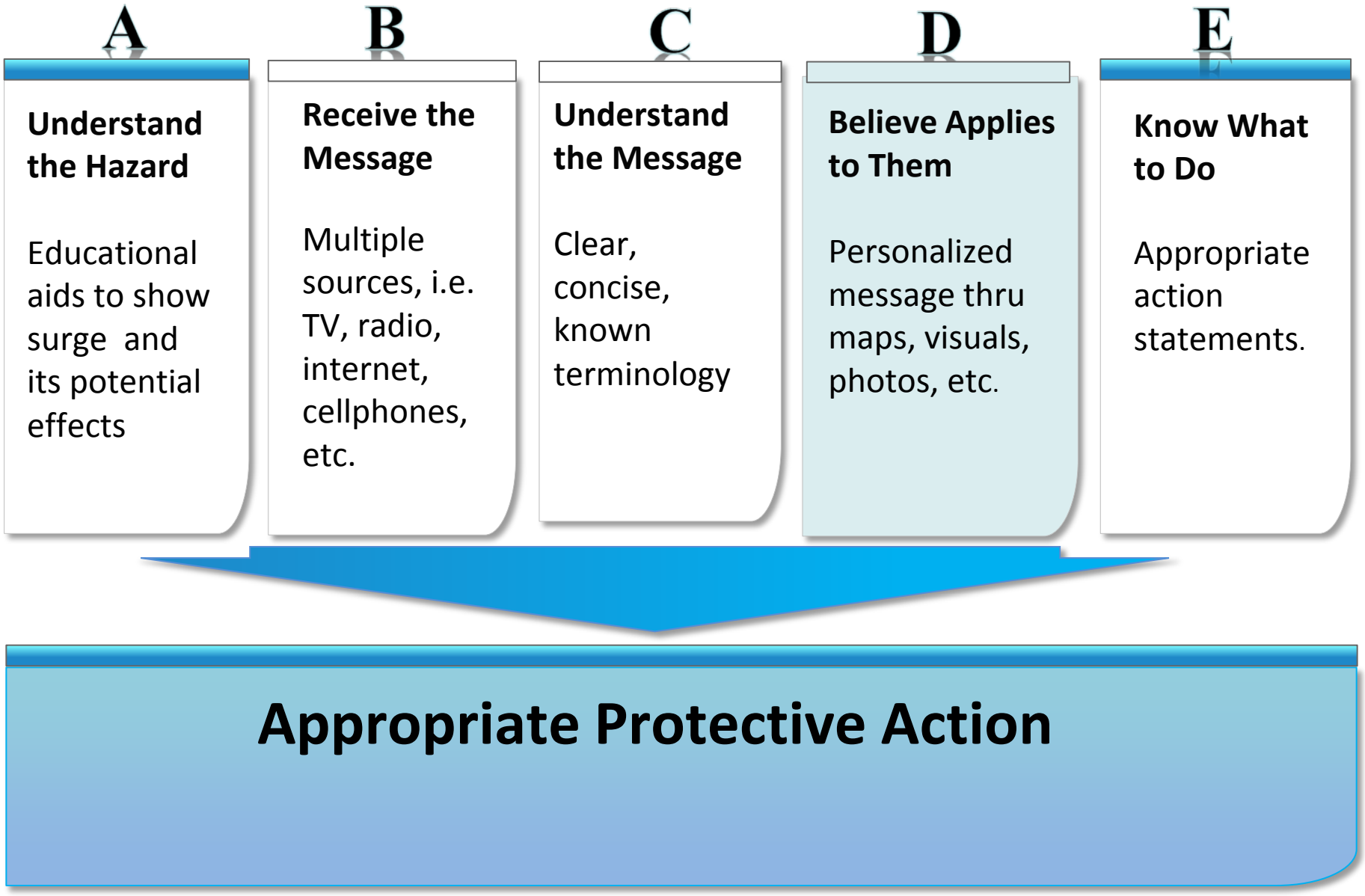
•Old Statement:

•Storm surge flooding of 2 to 4 feet above normal tide levels can be expected along the west coast of Florida in areas of onshore flow south of Venice and in Florida Bay. Storm surge should begin to decrease along the east coast of Florida.

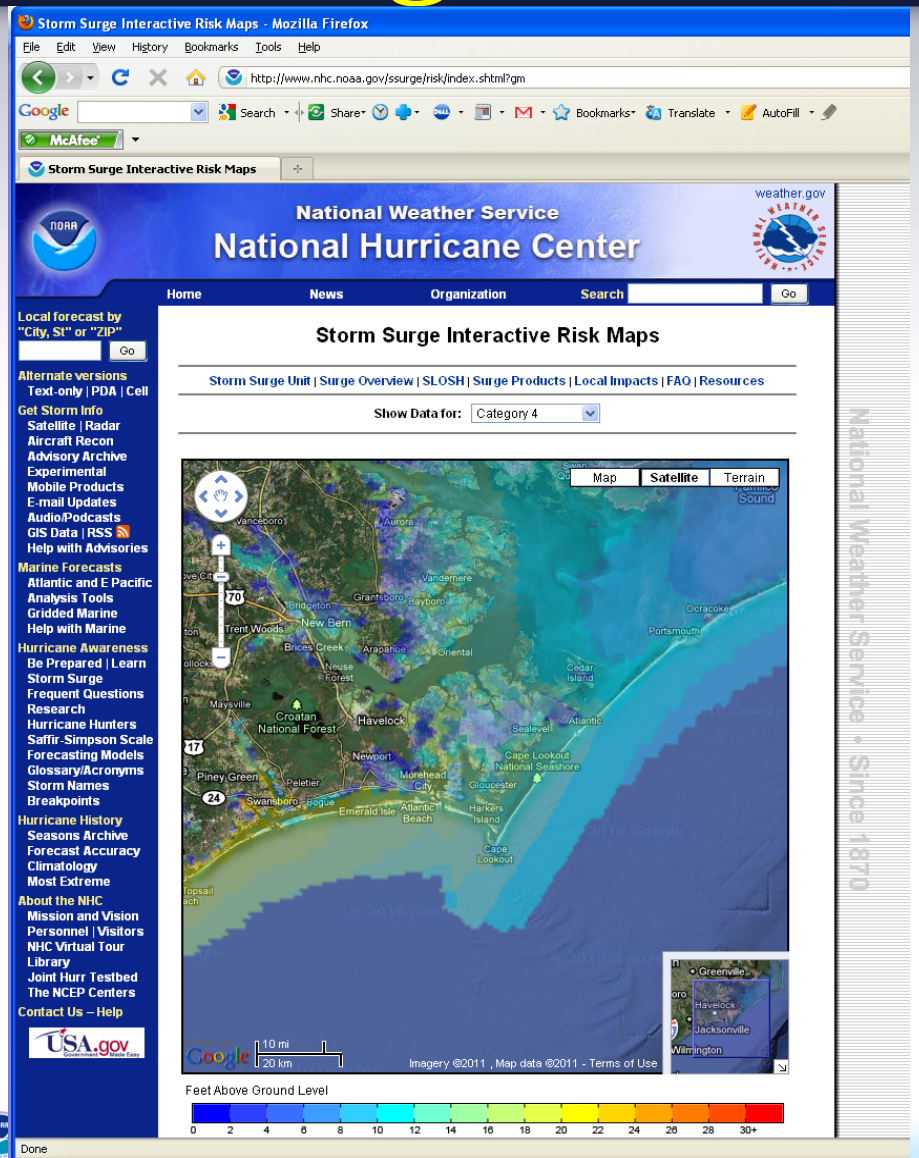
•New Statement:

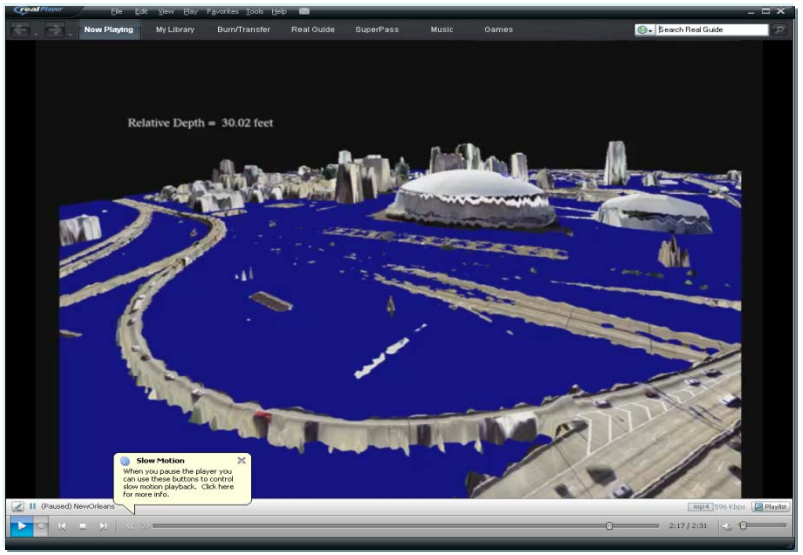
•STORM SURGE WILL RAISE WATER LEVELS BY AS MUCH AS 4 FEET ***ABOVE GROUND LEVEL*** ALONG THE WEST COAST OF FLORIDA IN AREAS OF ONSHORE FLOW SOUTH OF VENICE AND IN FLORIDA BAY ... WITH LARGE AND DANGEROUS BATTERING WAVES ... ***THE SURGE COULD PENETRATE AS FAR INLAND AS ABOUT 10 MILES FROM THE SHORE*** WITH DEPTH GENERALLY DECREASING AS THE WATER MOVES INLAND. STORM SURGE SHOULD BEGIN TO DECREASE ALONG THE EAST COAST OF FLORIDA.

Steps to Effective Surge Response



Personalizing the Message





Steps to Effective Surge Response

A	B	C	D	E
Understand the Hazard Educational aids to show surge and its potential effects	**Receive the Message** Multiple sources, i.e. TV, radio, internet, cellphones, etc.	**Understand the Message** Clear, concise, known terminology	**Believe Applies to Them** Personalized message thru maps, visuals, photos, etc.	**Know What to Do** Appropriate action statements.

Appropriate Protective Action

Actionable Information: Storm Surge Warning

- Why consider a storm surge warning?
  - Current criteria for TC watches and warnings is wind-based
  - Significant coastal flooding can occur well outside the extent of current wind-based TC watches/warnings
    - Example: Ike along central Gulf coast
  - Customer feedback indicates significant confusion and need for actionable information
  - WMO has recommended improved surge warning systems
  - Federal partners have requested improved storm surge information and warning message

Questions or Comments?

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