

Weather-Ready Nation Ambassador Roundtable

1:00 Welcome

1:05 NOAA Acting Administrator and NWS Director Opening Remarks

1:15 Status of 2018 Roundtable Actions

1:20 WRN Ambassador Topics

- Manufactured Housing Messaging and Outreach
- Faith-based organizations initiative
- American Public Works Association partnering opportunities with Weather Enterprise
- AMS Policy Special Guest

1:50 Weather-Ready NationS

2:00 Open Discussion

2:20 NWS Deputy Director Closing Remarks

2:28 NWS Partners Meeting Announcement

2:30 Wrap-up

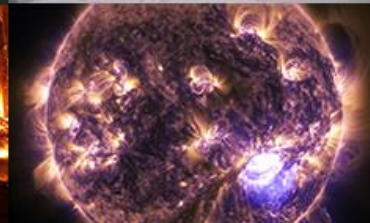
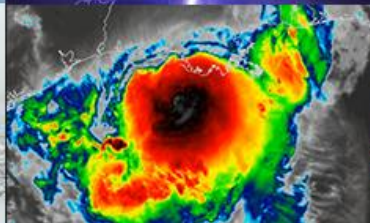


NATIONAL WEATHER SERVICE

Weather-Ready Nation Ambassadors: Helping Communities be Ready, Responsive, and Resilient to Extreme Events

JANUARY 12, 2020

Dr. Louis W. Uccellini | NWS Director



EVOLVING THE NATIONAL WEATHER SERVICE TO BUILD A WEATHER-READY NATION -

Connecting Observations, Forecasts, and Warnings to Decision-Makers through Impact-Based Decision Support Services

Authors: Louis W. Uccellini and John Ten Hoeve

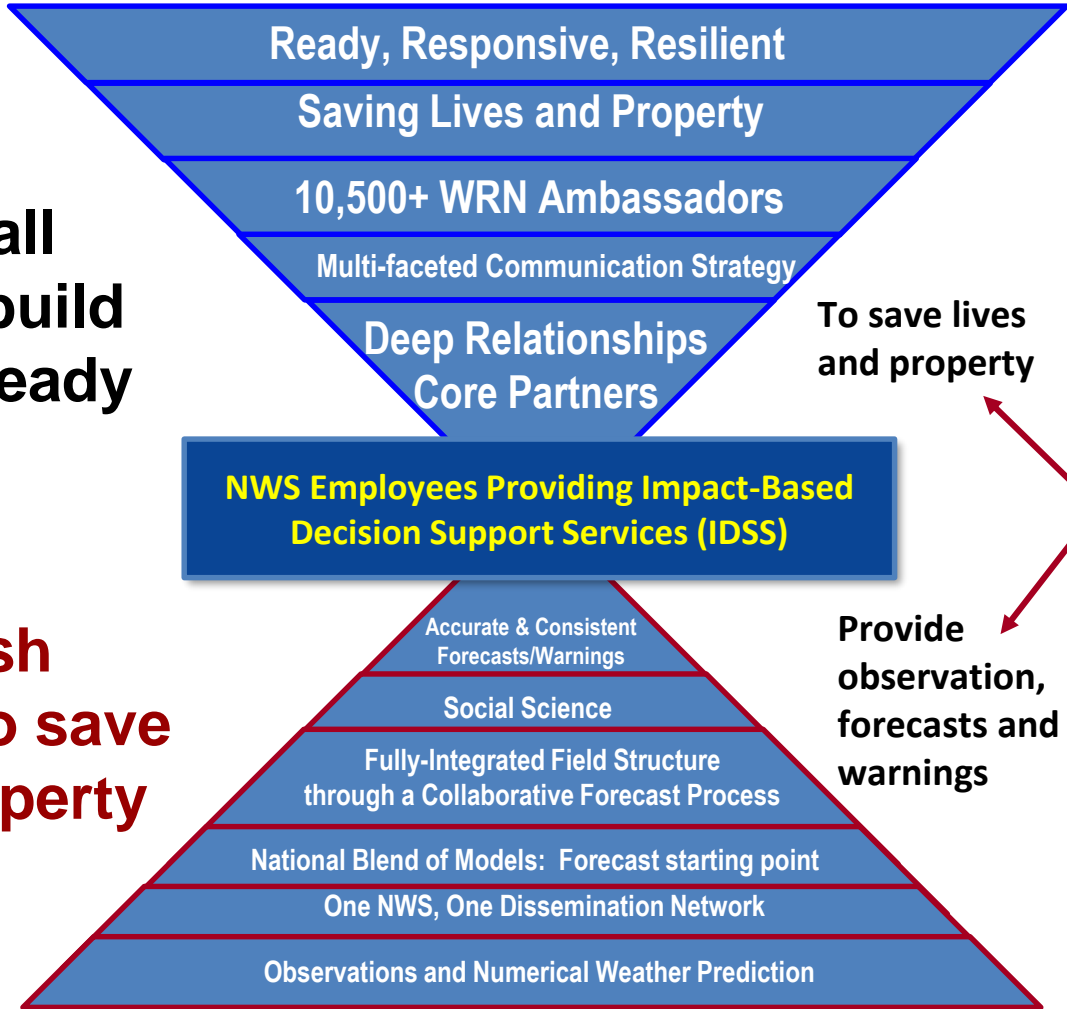
Reference:
Uccellini, L., Ten Hoeve, J. (2019). Evolving the National Weather Service to Build a Weather-Ready Nation; Connecting Observations, Forecasts, and Warnings to Decision-Makers through Impact-Based Decision Support Services. Bulletin of the American Meteorological Society, (100), 10. 1924-1942.





Pulling it all together to build a Weather-Ready Nation

and to accomplish our mission to save lives and property



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solely through verification of forecasts and warnings. The NWS is shifting to a collaborative forecast process, leveraging the varied expertise across the entire organization from WFOs to CWSUs, RFCs, regional operations centers, and national centers. This will result in more efficient and effective operations and will provide a basis for the consistency required in NWS products and services, particularly where multiple NWS offices serve a single jurisdiction. We are recognizing that evolving the traditional forecast process to one that is more team based, and where success is measured not only by an accurate forecast, but also by a forecast that influences decisions, represents a significant culture and mindset change throughout the NWS. Social science research and concepts will be built into forecast products and services across the NWS, delivered by the integrated field structure. These forecast products will shift over time from predominately deterministic to probabilistic across all scales, across a variety of hazards (e.g., Rothfus et al. 2018).

IDSS is the lynchpin, placed in the middle of the hourglass (Fig. 8), connecting the production of observations, forecasts, and warnings with the partners and actions required for community preparedness and responsiveness to impending extreme events. A multifaceted communication strategy that includes NWS's One Dissemination network, satellite broadcast systems, the entire array of social media, wireless emergency alerts, and NOAA Weather Radio ensures that NWS reaches all of our partners in public safety and national security through the weather, water, and climate enterprise, along with the general public, quickly and reliably. NWS preparedness information, forecasts, and warnings are provided to a wide array of the enterprise and beyond through the 300+ storm-ready and tsunami-ready communities and 9,800+ WRN ambassadors throughout the United States that act as force multipliers of NWS information to every town, community, and county across the entire United States ("Weather-Ready Nation Ambassadors"). It is through these connective efforts that the NWS works to build a WRN and realize its mission of saving lives and property while enhancing the nation's economy.

While aspects of the bottom part of the hourglass lend themselves to consolidation or automation as numerical weather prediction and other forecasting tools become more advanced, the top part of the hourglass requires a place-based, distributed, and well-trained workforce across the United States to meet the IDSS needs at all government levels and to support local NWS observations and infrastructure.

AMERICAN METEOROLOGICAL SOCIETY

WEATHER-READY NATION AMBASSADORS

One way the National Weather Service has connected with the enterprise and beyond to organizations that are users of weather information across the nation is through the WRN Ambassadors Initiative, created in 2013. The WRN Ambassadors Initiative weaves the entire weather enterprise into the fabric of local, regional, and national communities of decision-makers: addressing and ensuring awareness, preparedness, and responsiveness to extreme weather, water, and climate events, an essential step for public safety, mitigating property loss, and accelerating recovery efforts after the event. As of August 2019, there are over 9,800 WRN ambassadors located across the entire United States, including public, commercial, and nonprofit organizations from national to local levels. Many of these ambassadors are in the private sector, including within the enterprise and others within the many economic sectors that are dependent on weather, water, and climate information. The number of WRN ambassador organizations has steadily increased, helping to ensure the WRN initiative touches every county in the United States, every day.

The heart of building a Weather-Ready Nation is taking action and improving decision-making in the face of extreme weather, water, and climate events. WRN ambassadors act as force multipliers, not only serving as an example themselves, but also engaging others to know their risk and support informed decision-making. Success stories are numerous because the initiative taps into what each ambassador organization does best. Television stations, for example, are able to access WRN outreach material and share it with their viewers. Public safety officials (e.g., police, fire, and first responders) can encourage best practices across their communities, such as having multiple sources to receive weather warnings. Working together with our WRN ambassadors, and through a whole-community approach, NWS can raise the level of preparedness and decision-making and realize the strategic outcome of a Weather-Ready Nation.

We are observing what the OWA and other external reviews emphasized: local, place-based, customer-centered meteorologists and hydrologists providing IDSS to local government officials is crucial to ensuring that every county, every community, is ready, responsive, and resilient, which is key to achieving the vision of building a Weather-Ready Nation. This entire transformation is consistent with best practices in government and the direction of many federal agencies (Chenok et al. 2017).

CONCLUSIONS. Over the last decade, NWS has recognized through internal studies, external reviews, and actual events that the key to realizing the strategic

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EVOLVING THE NATIONAL WEATHER SERVICE TO BUILD A WEATHER-READY NATION -

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Thank you!



Manufactured Housing Industry Update

Weather Ready Nation Ambassador's ROUNDTABLE

AMS Centennial Meeting
Boston, MA

January 12, 2020

Valerie E. Sanders, President/Meteorologist
WeatherCall Services, LLC

Dr. David Roueche
Assistant Professor (Civil Engineering), Auburn University



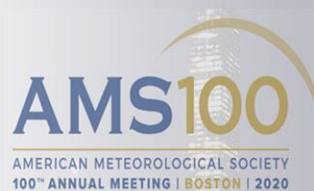
BACKGROUND

Fall 2015: HazardCall was developed for small communities, no basements

- **Ready, Set, GO** info begins to arrive the day before an event.
- IBW tags, appropriately matched with a **attention-getting modality** when the situation has become **life threatening**.

Sept. 2016: WeatherCall entered into a partnership with the Manufactured Housing Institute. MHI would market HazardCall to their membership.

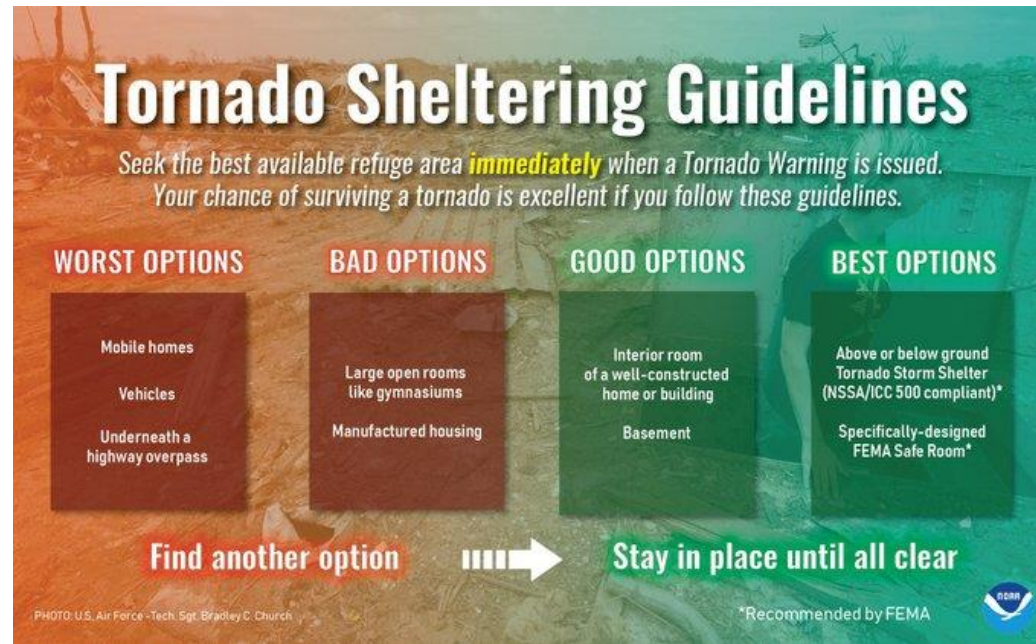
- Be proactive within their industry with better warnings and improved safety for what are often low-income, at-risk populations.
- Positive image building
- MHI Became WRN Ambassadors



February of 2017: Factory visit

- Tim Marshall and engineer Marshall Montgomery toured Champion and Palm Harbor factories in the Ft. Worth area.
- **Conclusion:** The “boxes” constructed under rigid HUD scrutiny are **STRONG**. Such construction oversight does not exist in any other home-type building industry.

2018: WRN Tornado Sheltering Graphic was created by a collaboration of NWS, MHI, and private sector partners.



Components of a Typical MH

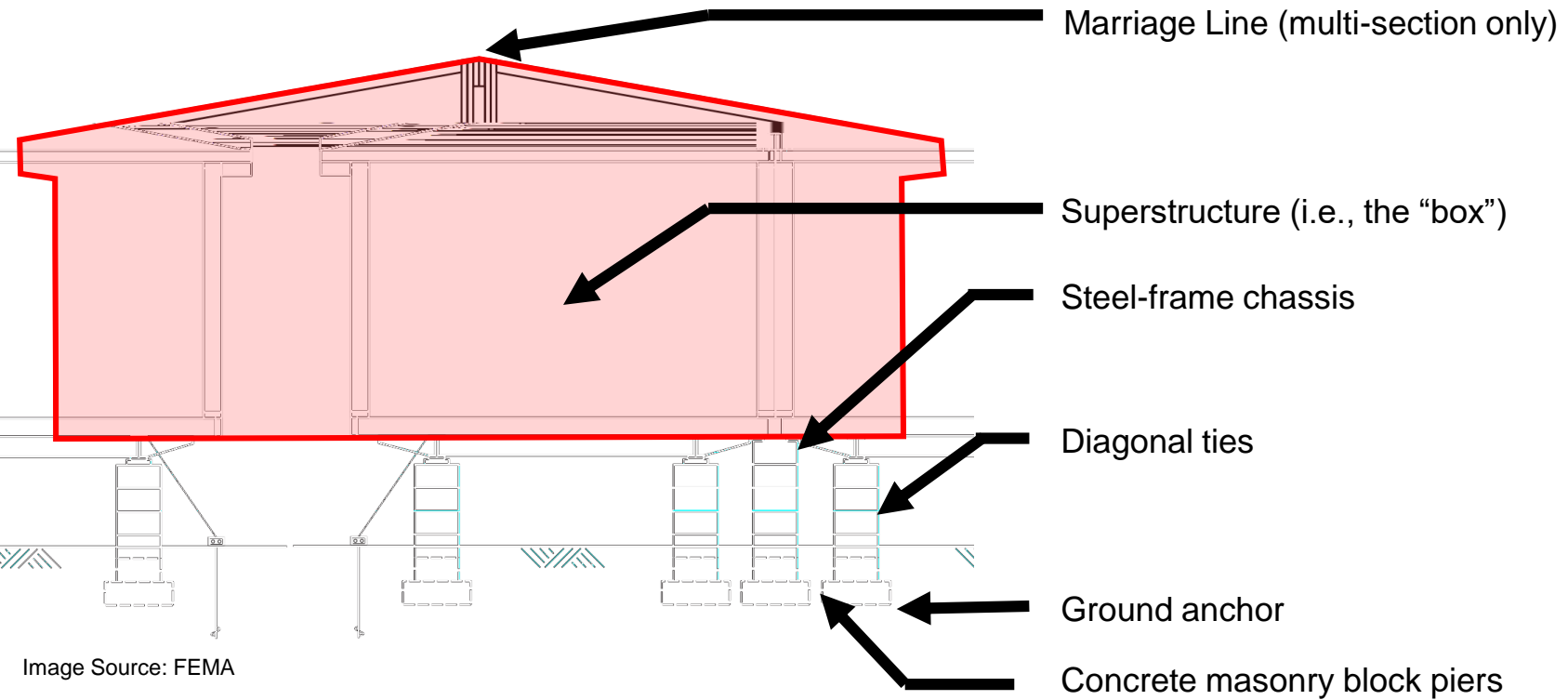


Image Source: FEMA



Manufactured Home Anchorage Systems

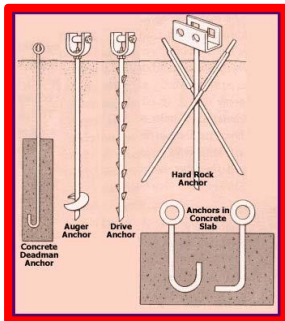
Traditional Ground Anchors and Ties



Alternative Anchorage Systems



Common Ground Anchors



WIND ZONE II HURRICANE ZONE		SPACING		WIND ZONE I NON-HURRICANE ZONE	
*Length of Mobile Home (ft)	**No. of Vertical Ties	No. of Diagonal Ties	***No. of Vertical Ties	***No. of Diagonal Ties	
0 - 40	5	5	0	4	
41 - 60	7	7	0	6	
61 - 90	9	9	0	8	

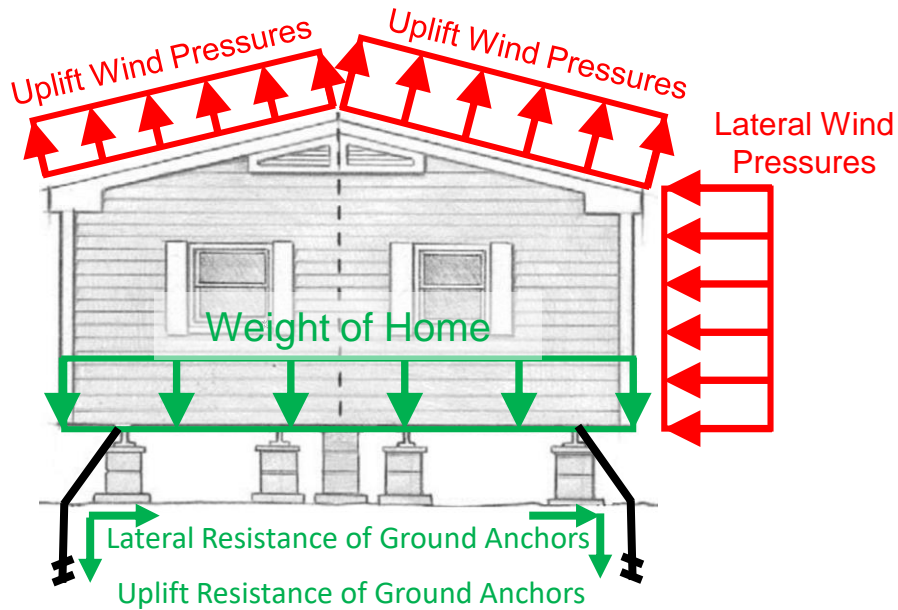
Source: Alabama Manufactured Housing Commission CHAPTER 535-X-13.

Most Common Alternative Systems:

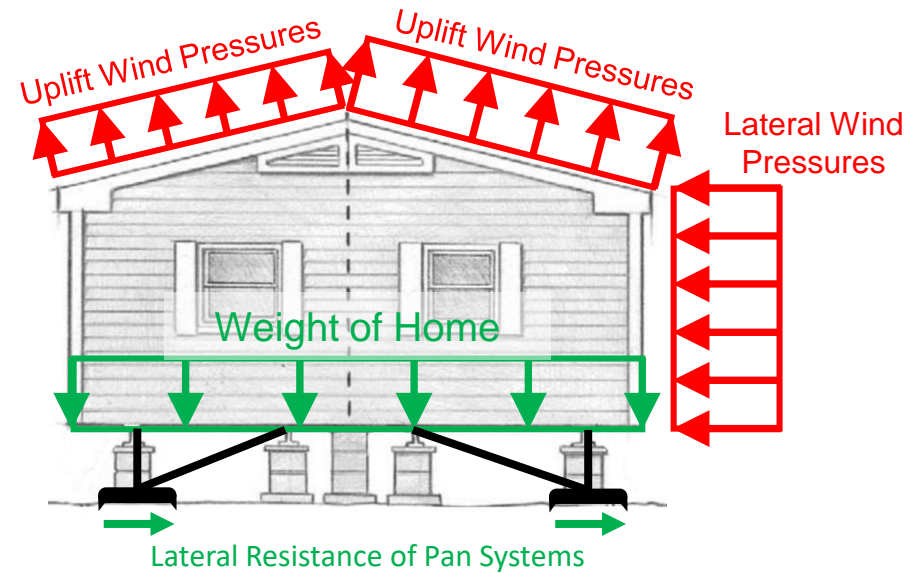
- Oliver Technologies ASFS (“pan system”)
- Vector Dynamics
- Minute Man
- Xi2

Per AL installers, **most** newer MH are being installed with pan anchorage systems

Ground Anchors and Ties



Pan Anchorage Systems



With pan anchorage systems, the **only force resisting the uplift wind pressures is the weight of the home itself**. Ground anchors and straps provide at least some uplift resistance in addition to the weight of the home, but field surveys find widespread corrosion/incorrect corrosion.



March 2019 Lee County AL Field Visit: Revealed a tragic discovery by researchers.

- 19/23 fatalities were in newer model HUD tagged homes, most installed using pan anchorage systems
- Recommendations:
 - The pan anchorage system needs to be banned immediately from new sales until new engineering tests can be conducted.
 - Traditional straps can be retrofitted to houses with Pan systems, but at whose expense?
 - Traditional straps need to be [inspected/replaced every 10 years!](#)

75% of factory built homes fail at the foundation¹. Oversight of new installations, aggressive retrofitting and regular maintenance of anchoring devices such as replacement of straps can dramatically improve the safety of factory built homes in lower-end, more frequent high wind events.

¹ Based on an analysis by Dr. David Roueche of 9 years of damage data in the NWS Damage Assessment Toolkit (DAT).



What **PRIMARILY** makes MH fail in lower-end events?

- Poor installation & anchoring or even NO anchoring.
- Failure to perform routine inspection and maintenance on straps and anchors
- Long-term corrosion/degradation

Extremely complex and expensive issue to fix going forward, more difficult going retro.

Immediate, cost effective, proactive improvement?
Engage professional weather risk management company who can create a solution to meet their industry's unique needs.

EF1 Tornado in Troy, AL



HazardCall is in use in 46 manufactured home communities in 12 STATES: AL, FL, GA, IA, IN, MO, MS, NC, ND, NY, TN, TX

WIN, right?

MHI's NCC 2018 50 Top MH Community Owners and Operators

1. Sun Communities, Inc. – Southfield, Mich. – 83,294 home sites
2. Equity LifeStyle Properties, Inc. – Chicago – 73,700 home sites
3. RHP Properties, Inc. – Farmington Hills, Mich. – 60,163 home sites
4. YES! Communities – Denver – 47,278 home sites
5. MHP Funds, LLC – Cedaredge, Colo. – 31,652 home sites
6. Hometown America – Chicago – 24,355 home sites
7. UMH Properties, Inc. – Freehold, N.J. – 20,000 home sites
8. Lautrec, Ltd. – Farmington Hills, Mich. – 19,150 home sites
9. **Newport Pacific Family of Companies – Irvine, Calif. – 17,375 home sites**
10. Kingsley Management Corporation – Provo, Utah – 16,000 home sites

We have barely scratched the surface. Partnerships with state level associations more successful, resulting in the growth of medium to smaller communities.





Education Opportunities

Homeowner perception of pan anchorage system (from interview by Dr. Daphne Ladue after March 3rd, 2019 tornado):

“...it’s a manufactured home, but underneath we have crossbars, steel crossbeams that are buried into the ground about eight feet, nine feet. And then there are steel straps that go over it. So, it’s just not sitting on my foundation, it is [2 sec. pause] attached to it.”



Education Opportunities

In an address to the general assembly of the Manufactured Housing Institute Conference on May 7, 2019, HUD Secretary Dr. Benjamin Carson was quoted as saying:

“On a recent visit to Alabama, I was shown a site that was demolished by massive tornadoes – and the only homes in the area that successfully weathered the storm were manufactured houses. It was a silent testament to their resilience”.

In reality, there were a few manufactured homes in the path of the tornado (near Lee Rd 38 / 721 intersection) that had performed ok (1 double-wide with minor damage, 1 double-wide with collapse of one section, and 1 double-wide with partial roof removal), but they were surrounded by manufactured homes in which people were killed and seriously injured. Overall, 19 of the 23 fatalities in the March 3rd event occurred in **manufactured homes.**



Conclusions:

Warnings: Slow but steady progress in the medium to smaller companies by working more in alignment with State Associations than at a national level.

Preparedness: HUD code homes, when not anchored correctly, fail in very recognizable ways in high wind events. Familiarize field assessment teams with failure signatures so data can be collected. Regulations must be changed to force the failure point to be something other than anchorage first.

New Challenge: HUD home demand is growing, but new Tiny Home and Park Models appeal to new demographics: Step-down baby boomers and millennials due to the traditional housing crisis.

- Not subject to HUD regulations.
- They have no anchoring requirements.
- Marketed as permanent homes, they are no safer than an ordinary RV.

The growth of this industry, and especially this new class of owners, will place more people in vulnerable homes which has the potential to impact tornado fatality statistics over time.



Thank you!

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AMERICAN PUBLIC WORKS ASSOCIATION

APWA

Your Comprehensive Public Works Resource

New England Chapter President
Richard “Chip” Barrett, PWLF
Highway Superintendent
Town of Westford, Ma.

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- ✓ **WITH A WORLDWIDE MEMBERSHIP MORE THAN 30,000 STRONG, APWA INCLUDES NOT ONLY PERSONNEL FROM LOCAL, COUNTY, STATE/PROVINCE, AND FEDERAL AGENCIES, BUT ALSO PRIVATE SECTOR PERSONNEL WHO SUPPLY PRODUCTS AND SERVICES TO THOSE PROFESSIONALS.**



- ✓ **ALL MEMBERS OF A CPWA CHAPTER ARE MEMBERS OF APWA.**

So what can we do to help each other's Mission?



**We have boots on the ground
for real time information**

We have real time Data Sourcing



RWIS



**Mobile Data
Collection**

Cutting Edge Technology



SENSING OUR WORLD...

Temperature	Audio	RTLS
Humidity	Video	O2 & CO2
Seismic		UVA/UVB
Ambient Light		Ultrasound
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		Particulate Matter

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Weather-Ready Nations: An impact-based forecasting project



Courtney Draggon
Director, NWS International Affairs
Office



USAID
FROM THE AMERICAN PEOPLE



Why Impact-based Forecasting?

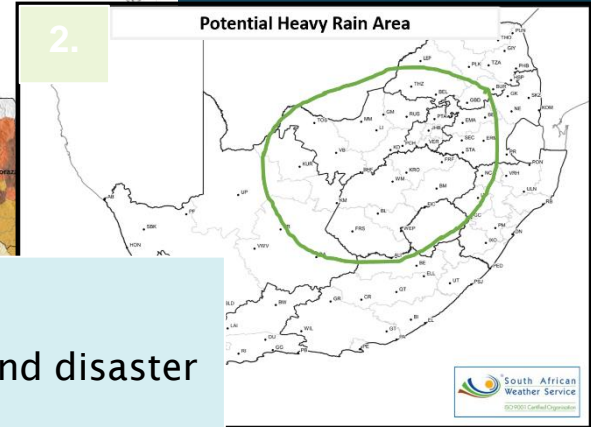
Currently, the WRNs program is in various stages of implementation in the Republic of South Africa, El Salvador, Costa Rica, Guatemala, Barbados, and Indonesia.

Implementations are just beginning in Sri Lanka. Future projects: Additional Caribbean projects beginning in spring, 2020; possible Pacific Island projects

GOALS	MEANS	OUTCOME
Strengthen Country preparedness for severe weather-related events	<p>IBF products and uncertainty</p> <p>Guided Workshops that bring together forecasters, disaster managers, first responders, other stakeholders</p> <p>Developing decision support tools to link uncertain forecasts with decisions to</p>	<p>Capacity building of national met/hyd agencies, disaster management agencies.</p> <p>Improved reliability and lead time of effective forecasts</p> <p>Improved communication of forecast information to responders and disaster management agencies</p>



Impact-Based Forecasting?



Western Cape Government
DISASTER MANAGEMENT

Memo

Date: 7 June 2017

SITUATION REPORT AS AT 07 JUNE JUNE 2017

Warning #1
 Issued: 12/06/2018 @ 12:33
LEVEL 1 YELLOW WARNING for WIND
 valid 08:00 (SAST) on 14/06/2018 Until 15:00 SAST
 Affected DM / LM / Metro / area

Breede Valley (LM), Langeberg (LM), Central Karoo (DM), Edenburg (DM), ...

Short Message
 There is a Medium likelihood of Minor impacts to occur over the Breede Valley, Langeberg Local Municipalities, Central Karoo Thursday into Friday afternoon due to wind.

Discussion
 A cold front affecting the Western Cape will result in strong north-westerly winds over the interior of the Western Cape morning. Wind speeds are expected to reach 65-80km/h by gusts up to 90-95km/h. These north-westerly winds will affect the N1, N2 and N7 highways and associated major railway 45-60km/h during the evening with strong winds remaining over the Central Karoo for Friday evening.

Impacts
 Strong to Gale force and gusty crosswinds along the N1, N2, N7 may result in these major routes as well as corresponding roads affected. Dangerous driving conditions may lead to road accidents along the route. High-sided vehicles are at risk of being toppled by in gusts along the route. These strong winds along with dry and warm conditions may cause run-away wildfires over the Central Karoo and Edenburg.

LIKELIHOOD	WIND			
	Minimal	Minor	Significant	Severe
High	1	2	3	4
Medium	1	2	3	4
Low	1	2	3	4
Very Low	1	2	3	4

IMPACT

How do we do it:

1. Establish cooperation between met service and disaster management agency
2. Understanding the risk (e.g. identify vulnerable areas, community risk assessment, population data, behavioural and livelihood information).
3. Identifying impacts (e.g. historical events, analysis and insights from crowd sourced data, identify at risk populations, identify trigger levels).
4. Assessing the expected weather conditions and using the impact tables and matrix table to decide on the appropriate warning level.
5. Informed discussions that support decision making in level of response.
6. Communicating warnings in “easy-to-understand” wording – through a variety of mediums.
7. Collect post event information for analysis and verification.

LIKELIHOOD		IMPACT			
		Minimal	Minor	Significant	Severe
High	2	6	10		
Medium	1	5	9		
Low	4	8			
Very Low	3	7			

Significant	Severe
Localised	Widespread
Short term strain on emergency personnel	Prolonged strain on emergency personnel
Flooding of roads and settlements (formal and informal)	Widespread flooding of roads and settlements
Danger to life (fast flowing streams / deep water)	Danger to life (fast flowing streams / deep water)
Large communities not accessible/cut-off for a prolonged period	Large communities not accessible/cut-off for a prolonged period
Displacement of affected communities	Widespread displacement of affected communities
Some communities temporarily not accessible/cut-off	Widespread damage to property, buildings and loss of livelihoods and livestock
Damage to property, infrastructure, loss of livelihood and livestock	Widespread transport



disturbed
 Wet roads and reduced visibility
 Minimal traffic congestion
 Isolated mudslides and

Difficult driving conditions on dirt roads
 Minor motor vehicle accidents due to slippery roads
 Closure of roads crossing low water bridges

Impact Based Forecasting (IBF) is about building community resilience in the face of increasing vulnerability to extreme weather:

REQUIRES...

- Accurate, Consistent Forecasts and Warnings
- Impact-based Decision Support Services (IDSS)
- Linking Physical and Social Sciences
- Multiple Dissemination Pathways
- Working with Partners to Gain Response; includes embedding personnel in Emergency Operations

- Improve awareness and strengthen capacities at all levels (national, regional, district, local).

- **Challenge to both developed and developing economies.**

“Ready, Responsive, Resilient”



How to get involved

WMO Open Consultative Platform

IBF/IDSS Support Initiatives in countries

Increased sectoral and climate resilience support



Questions



THANK YOU!

Strengthening the Weather-Ready Nation Ambassador Program

Erica Grow

Non-Resident Policy Fellow, American Meteorological Society

egrow@ametsoc.org || [@ErcaGrowNYC](https://twitter.com/ErcaGrowNYC)

My Project: A Fresh Look at the WRN Ambassador Program

- The WRN program has the potential to be a game-changer for the people we serve. It is a congressionally-mandated program that has received limited resources since its inception.
- Still, there are currently over 10,400 WRN Ambassadors. They range in size from small weather consulting firms to major corporations and everything in between.
- Some Ambassadors are actively involved in the program, some are not. The limited commitment required for becoming an Ambassador is important in order to be inclusive, but it cannot be an impediment to NWS's mission, either.
- I'm working to identify options which the NWS can choose to evaluate (or not- their choice) as a Fellowship with the AMS Policy Office.

Potential Options for the WRN Ambassador Program

Options are Presented Without Bias or Value Judgment. Examples Include:

- Linking IDSS Core Partners with WRN Ambassadors at Community Events
- Including WRN Materials in Weekly Bulletins for Faith Congregations
- “Safe Place Selfie Challenge” Contest
- Establishing a Training and/or Certification Program for Ambassadors
- Periodic Webinars with Timely Information for WRN Ambassadors

I Want to Hear From You!

What are you doing in your organization that works well, and could work for WRN?

Do you have any ideas that might not be applicable to your organization, but may be a great fit elsewhere within the WRN Community?

Email me at egrow@ametsoc.org