

# Throwing Caution to the Wind: A Weather-Savvy Perspective on Wind Terminology and Wind-related Damage

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## Introduction:

- Prior to the 1990s, the National Weather Service (NWS) presented any wind hazard as a Special Weather Statement to the general public (personal communication, Steve Nelson, SOO, NWS Peachtree City).
- However, as part of the NWS modernization effort, the NWS significantly restructured the format (Steve Nelson) and variety (NWS 1992) of weather products that it issued.
- As a result, the NWS communicates the risk of nonconvective wind hazards using three products (high wind watch, wind advisory, and high wind warning) that each vary in issuance criteria based on the WFO.
- With studies revealing that nonconvective wind events harm **as many** individuals as winds associated with severe thunderstorms and hurricanes, there is a need to further examine the public's perception of the current wind products (Lacke et al. 2007; Ashley and Black 2008, Knox et al. 2011).

## Method:

- To focus on the perceptions of nonconvective wind events, we partnered with two local weather blogs in Georgia and Virginia to advertise the online survey to weather-savvy individuals.
- Participants completed a 38 question survey regarding their previous wind experiences, familiarity and definition of a wind advisory (WA) and high wind warning (HWW), and willingness to change their plans.
- Weather-savviness was measured using six questions from the Weather Salience Short Form (Stewart 2009). Out of 30, the mean score was 24.30 (S.D. = 3.177).
- We closed the survey on 1 June 2015, with 374 complete responses. Overall, 54.8% reported residing in Georgia with 45.2% living in Virginia.

## Familiarity:

Have you heard of a High Wind Warning/Wind Advisory?			
High Wind Warning: 90.3%		Wind Advisory: 92.0%	
Mean Wind Speed: 38 mph		Mean Wind Speed: 28 mph	
GA	VA	GA	VA
85.3%** 35 mph**	96.4%** 41 mph**	89.2%* 26 mph*	95.3%* 29 mph*
** significant at p < 0.01 * significant at p < 0.05		Actual WA KFFC: 20-35 mph (≥ 35 mph) Criterion: KGSP: ≥ 35 mph (n.s.) (Gusts) KROA: 31-39 mph (< 57 mph)	

## Change in Plans:

How likely are you to change your plans, on a scale of 1 (extremely unlikely) to 10 (extremely likely), given a...		
High Wind Watch	Mean: 3.78	SD: 2.27
Wind Advisory	Mean: 2.74	SD: 2.10
High Wind Warning	Mean: 5.19	SD: 2.57

## Wind Damage:

Has a tree/branch ever fallen on your house or property?			
Tree:		Branch:	
Yes: 51.3%		Yes: 70.1%	
No: 48.7%		No: 29.9%	
Frequency	Past Experiences with Wind Damage		
	52 (13.9%)	169 (45.2%)	97 (25.9%)
	Minor Disruption	Minor Damage	Moderate Damage
			Extreme Damage

## Definitions:

What does a High Wind Warning/Wind Advisory mean to you?			
	Example:	HWW (N):	WA (N):
Impacts:	"Be careful of low lying limbs or trees that could break onto property or roads."	42.7% (158)	23.2% (85)
Speeds:	"Wind gusts over 57 mph and sustained winds over 35 mph."	23.7% (88)	20.1% (73)
Impacts & Speeds:	"Winds that are under 40 mph that have the potential to cause damage to property."	8.2% (30)	2.7% (10)
Temporal:	"It means that high winds have been reported in the area."	6.8% (25)	0.8% (3)
Uncertainty:	"Possible chance of high winds that can do damage to property"	8.4% (31)	34.1% (124)
General:	"Dangerous high winds."	10.2% (38)	19.1% (70)

## Correctness:

Were the participants' definitions correct?		
<ul style="list-style-type: none"> <li>• The definitions for both wind products were classified as correct, if they included:                             <ol style="list-style-type: none"> <li>1) A phrase suggesting that the event was currently occurring, happening now, or affecting their area soon.</li> <li>AND/OR</li> <li>2) If they indicated the correct speed threshold associated with the specific wind product for their WFO.</li> </ol> </li> <li>• If a definition mentioned the potential for winds, favorable conditions, etc., then it was considered Watch criteria.</li> </ul>		
Correct:	HWW (N): 17.2% (64)	WA (N): 9.1% (33)
Incorrect:	81.6% (302)	69.8% (255)
Watch Criteria:	1.2% (4)	21.1% (77)
<i>Note: Responses coded as Watch Criteria were also incorrect.</i>		

## Conclusions:

- Through asking a weather-savvy public to define both a high wind warning and wind advisory, our study revealed that participants identified with the potential impacts **more than** potential wind speeds.
- Additionally, our survey revealed that respondents were **more likely** to alter their daily plans for a high wind watch compared to a wind advisory, thus acknowledging their confusion with the watch/advisory/warning hierarchy.
- While NOAA and NWS initiatives are redefining the watch/advisory/warning system (NWS 2015a) and impact-based messaging (NWS 2015b), this study identifies the need for nonconvective wind hazards to be included in this revolution.
- We hope this research will highlight the need for a better approach in communicating the NWS wind products to the public. This can be accomplished through the use of impact-based graphics and phrasings, as well as clearly emphasizing the order in which these products are issued.



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## References:

- Ashley, W.S., and A.W. Black, 2008: Fatalities associated with nonconvective high-wind events in the United States. *J. Appl. Meteor. Climatol.*, **47**, 717-725.
- Knox, J.A., Frye, J.D., Durkee, J.D., and C.M. Fuhrmann, 2011: Non-convective high winds associated with extratropical cyclones. *Geography Compass*, **5**(2), 63-89.
- Lacke, M.C., Knox, J.A., Frye, J.D., Stewart, A.E., Durkee, J.D., Fuhrmann, C.M., and S.M. Dillingham, 2007: A climatology of cold-season nonconvective wind events in the great lakes region. *J. Climate*, **20**, 6012-6022.
- Nelson, Steve, Science and Operations Officer, NWS Peachtree City, 7 May 2015; personal communication.
- National Weather Service, 1992: WSOM Chapter C-44, non-precipitation weather hazards. Operations Manual. Accessed 31 May 2015. [Available online at <http://www.nws.noaa.gov/wsom/manual/archives/NC449206.HTML#d4.1>]
- National Weather Service, 2015a: National Weather Service impact based warnings. Accessed 13 September 2015. [Available at <http://www.weather.gov/impacts>]
- National Weather Service, 2015b: National Weather Service hazard simplification project. Accessed 13 September 2015. [Available online at <http://www.nws.noaa.gov/com/weatherredynation/files/HazSimp8.3.2015.pdf>]
- Stewart, A.E., 2009: Minding the weather: The measurement of weather salience. *Bull. Amer. Meteor. Soc.*, **90**, 1833-1841.