



Center for Risk-Based Community Resilience Planning

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Marc Levitan
National Institute of Standards and Technology

Wednesday January 27, 2021- 10:00AM MST (12:00PM EST)
VIRTUAL SEMINAR

Join Zoom Meeting

<https://zoom.us/j/98706355931?pwd=TE5ETDFsQXlXMTE3QVlpV0krMTluQT09>

Meeting ID: 987 0635 5931

Passcode: 234051

ABSTRACT:

**Tornado Loads on Building and Structures:
Development of Tornado Hazard Maps and Load Provisions for ASCE 7-22**

Marc L. Levitan, Ph.D.

Lead Research Engineer, National Windstorm Impact Reduction Program
National Institute of Standards and Technology

The ASCE 7 Standard on Minimum Design Loads and Associated Criteria for Buildings and Other Structures is the basis for load determination in US model building codes. Until now, that standard has specifically excluded any requirements for consideration of tornado hazards. It should therefore come as no surprise that our buildings and infrastructure perform poorly in tornadoes – given that they are not designed to resist tornadic loads. According to the Insurance Information Institute, over the 20-year period from 1997-2016, events involving tornadoes comprised 40% of total US insured catastrophe losses, compared to 38% for hurricanes and tropical storms (adjusted for inflation).

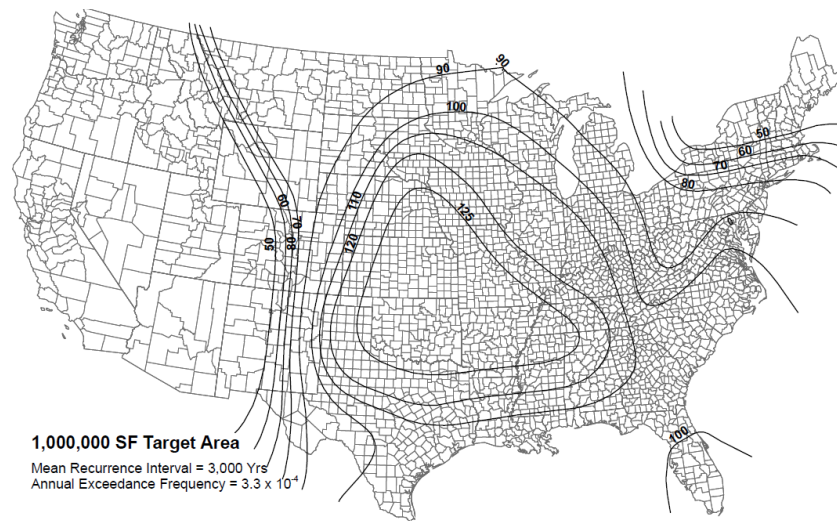
This presentation will provide an overview of the development of tornado load provisions proposed for incorporation into ASCE 7-22. These provisions are based on the wind load framework provided in ASCE 7-16 for other types of windstorms with modifications for tornadoes. Design speeds are defined using the first-ever engineering-derived probabilistic tornado wind speed maps, which also account for the dependency of tornado risk on the plan size of the building or structure. Unique tornado characteristic such as the bullnose-shaped vertical velocity profile, strong updrafts, and atmospheric pressure change are also accounted for. These tornado load proposals are currently working their way through the standards approval process for inclusion in ASCE 7-22.



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One of a suite of tornado design wind speed maps, proposed by NIST for incorporation in ASCE 7-22 as part of a new chapter on tornado loads



BIO: Marc Levitan is the Lead Research Engineer for the National Windstorm Impact Reduction Program at the National Institute of Standards and Technology. He has over 25 years in research on tornado, hurricane, and extreme wind effects on buildings and structures. With respect to tornado research, Dr. Levitan served as lead investigator for NIST's National Construction Safety Team technical investigation of the Joplin tornado, as well as for the NIST study of the 2013 Moore tornado. Dr. Levitan also leads implementation of many recommendations resulting from these investigations, including chairing: the SEI committee developing tornado load provisions for ASCE 7-22; the ICC committee that developed the 2020 edition of the ICC 500 Storm Shelter standard; and the ASCE/SEI/AMS committee developing a new standard on Wind Speed Estimation in Tornadoes.