National Advisory Committee on Windstorm Impact Reduction (NACWIR) Meeting Summary

National Institute of Standards and Technology (NIST)
Gaithersburg, Maryland
May 17, 2017

MEETING PARTICIPANTS

NACWIR Members:

Walker Ashley	Northern Illinois University
John Boudreaux	Assumption Parish Office of Homeland Security and Emergency Preparedness
Parthiv Dangodara	AIG Property Casualty
Wanda Edwards	RCI, Inc
Katherine Grieg	New York City Office of Recovery and Resiliency
Forrest Masters	University of Florida
Kishor Mehta	Texas Tech University
Walter Peacock	Texas A&M University
Tim Reinhold, *Chair*	Insurance Institute for Business and Home Safety
Donald Resio	University of North Florida
Donald Scott	PCS Structural Solutions
Kevin Simmons	Austin College
Thomas Smith	TLSmith Consulting, Inc.

NWIRP Windstorm Working Group (WWG)

DaNa Carlis	National Oceanographic and Atmospheric Administration
Sharon Jasim-Hanif	U.S. Department of Energy
Ed Laatsch	Federal Emergency Management Agency
Marc Levitan	National Institute of Standards and Technology
Ted Mansell	National Oceanic and Atmospheric Administration
Shirley Murillo	National Oceanic and Atmospheric Administration
Robert O'Connor	National Science Foundation
Joy Pauschke	National Science Foundation
Long Phan	National Institute of Standards and Technology
Michael Uhart	National Aeronautics and Space Administration
Jonathan Westcott	Federal Emergency Management Agency

NIST Staff and Guests

Joannie Chin, *DFO*	Deputy Director, Engineering Laboratory
Jason Averill	Division Chief, Materials and Structural Systems Division
Jeffrey Harrington	Senior Attorney, Ethics Law and Programs Division, Office of the General Counsel, U.S. Department of Commerce
Steve Potts	Program Analyst, NWIRP
Benjamin Davis	Program Analyst, Community Resilience Group

Members of the Public

Eric Haefli	State Farm

Summary of Discussions

I. Opening Remarks

Dr. Joannie Chin, the Deputy Director of the Engineering Laboratory at NST, and the Designated Federal Officer (DFO) for this meeting, called the meeting to order at 9:05 am.

Dr. Tim Reinhold, Chair of the Committee, welcomed the NACWIR, WWG, NIST representatives and members of the public to the meeting.

He stated that there is lots of work, and a short time to do it. He clarified that the purpose of this meeting is to address much of the preliminary information so that by the end of our second meeting in June, we can have good start on the Draft Report to the Director of NIST on the National Windstorm Impact Reduction Program (NWIRP) Strategic Plan; and then move on to the other charges which include:

- Looking at trends and developments in the natural, engineering, and social sciences and practices of windstorm impact mitigation;
- Evaluating the coordination of the program;
- Evaluating the effectiveness of the program;
- Revisions important for the program going forward.

II. Introductions

Dr. Reinhold had each of the members of the NACWIR introduce themselves and provide a short description of their background and expertise.

III. Welcome and Charge to the Committee

Dr. Joannie Chin, Deputy Director of the Engineering Lab, welcomed members of new NACWIR. She stated that NIST is pleased to have such a distinguished set of members on the NACWIR. She acknowledged the great work of the WWG agencies, and thanked members of the public who are participating today. She noted that active engagement with individuals and organizations beyond the Federal Government are essential to the success of the NWIRP.

Chin noted that the impacts of windstorms on the U.S. between 1980 and 2016 –from hurricanes, tornadoes, thunderstorms, nor'easters and other windstorms events caused over 4,500 fatalities and over $700 Billion in economic losses. She also noted that windstorms dominate insured catastrophe losses in the US, with nearly $400B in insured catastrophes losses from 1995-2014, and that these devastating impacts continue to increase.

She described the legislation that created the National Windstorm Impact Reduction Program, beginning in 2004, and the National Windstorm Impact Reduction Act Reauthorization of 2015. Chin pointed out that among many directives in the Act, Congress tasked NWIRP to create a Federal Advisory Committee, NACWIR, to offer assessments and recommendations on the program, as Dr. Reinhold described in his opening remarks.

Chin reiterated that's why we're here today, to begin a process to obtain input from experts and stakeholders representing the broad windstorm community, on how we can most effectively reduce the human and economic toll of these destructive storms. She asked the Committee to look at the problem from end to end – from basic research to delivery of improved codes and standards to outreach and the education of design professionals, government officials, building and facility owners, and the generalpublic. Congress set a very high bar for NWIRP – to achieve major measurable reductions in loss

of life and property from windstorms. "We are counting on NACWIR to help the Program succeed in achieving these lofty aims," she concluded.

IV. Ethics Briefing

Mr. Jeffrey Harrington, Senior Attorney in the General Counsel Office of the Department of Commerce (DOC) presented the ethics rules that will apply to NACWIR members as Special Government Employees. His presentation was made available through a link on the Agenda, posted on the NACWIR website: https://www.nist.gov/sites/default/files/documents/2017/05/17/sge-summary_of_ethics_rules-2017.pdf.

After the presentation, a Committee member asked whether they could apply for a grant, after leaving the committee, if NIST puts out a call for proposals that will be built on this roadmap. Harrington said that if the matter is one that the member did not work on, and the member applied after leaving the Committee, there should not be a problem, as it would be considered a subsequent matter. He noted he would need to review the specifics.

Harrington reiterated that members of the Committee are considered Special Government Employees, and must abide by those rules. Harrington referred members to the contact information on the front page of the handout, and on the website at www.commerce.gov/ethics.

V. NWIRP Overview

Dr. Marc Levitan, Acting Director of the NWIRP, provided an overview of the program. His presentation was made available as a link from the Agenda, posted on the NACWIR website: https://www.nist.gov/sites/default/files/documents/2017/05/17/nacwir_meeting_1_-_nwirp_overview.pdf.

NWIRP Related Activities at the Four Program Agencies:

National Science Foundation

Dr. Joy Pauschke, Program Director, Division of Civil, Mechanical & Manufacturing Innovation described the NWIRP related activities in her program, including NSF awards in the Engineering and Geosciences Directorates. Dr. Robert O'Connor, Program Director of the Decision, Risk, and Management Sciences program described the work of the Directorate for Social, Behavioral and Economic Sciences (SBE) as it relates to the NWIRP program. Their presentation was made available as a link from the Agenda, posted on the NACWIR website: https://www.nist.gov/sites/default/files/documents/2017/05/17/nsf_nacwir_meeting_may_17_2017_slides_final.pdf.

The NACWIR Chair, Dr. Reinhold asked if it was possible to get a list of projects to look at for our meeting in June. Pauschke said NSF could provide examples of the awards made.

National Oceanic and Atmospheric Administration (NOAA)

Dr. DaNa Carlis, the Weather Portfolio Manager with NOAA's Office of Oceanic and Atmospheric Research (OAR), presented information on the National Weather Service's Weather Ready Nation Programs and research on:

- Hurricanes;
- Tornadoes;
- Thunderstorms, and

- Severe weather.

His presentation was made available as a link from the Agenda on the NACWIR page: https://www.nist.gov/sites/default/files/documents/2017/05/17/nacwir_noaa_update_may_17_2017.pdf.

National Institute of Standards and Technology (NIST)

Dr. Long Phan provided a summary of statutory and research activities in three NIST projects:

1) NWIRP Coordination Project (NIST is the NWIRP lead agency);
2) Wind Engineering and Coastal Inundation Project, and
3) Implementation of the Joplin Tornado Investigation Recommendations Project.

He also described that NIST is approximately one half-way through a four-year effort to develop new tornado hazard maps, which will provide significantly improved mapping of tornado risks throughout the continental US. His presentation was made available as a link from the Agenda posted on the NACWIR website: https://www.nist.gov/sites/default/files/documents/2017/05/17/nist_briefing_for_nacwir_meeting_1.pdf.

NACWIR member Thomas Smith commended NIST for making it a "thrust" to move the Joplin recommendations into implementation. "Many times recommendations are just left. Making those a thrust to move into practices is great to see." Phan responded that we have the commitment at the highest level at NIST to carry out these implementation activities.

NACWIR member Kishor Mehta asked if NIST has a prioritized roadmap of the recommendations from the Joplin study. Phan responded that for each project we have a project description that outlines in detail the roadmap or implementation plan for each individual recommendation - short term and long term. He also noted that the plan for each recommendation is somewhat dependent on the relevant standard or code development cycle, specifying that we need to time them carefully to affect codes and standards revisions.

Federal Emergency Management Agency (FEMA)

Mr. Edward Laatsch, Director of Safety, Planning and Building Science Division at FEMA, provided an overview of status of FEMA's activities.

FEMA has for some time worked on hurricane evacuation planning. This work started in the Mitigation Directorate, and has recently moved into the Preparedness Directorate. This is a longstanding and ongoing effort that FEMA Building Science continues to support.

Due to lack of appropriations and specific allocations of funding, FEMA's work on NWIRP has been and continues to be done mostly at the margins. FEMA has developed guidance documents on tornado safe rooms and high winds and worked with Mitigation Assessment Teams through disaster funding, but efforts have been and continue to be limited. FEMA authorized activities and responsibilities contribute to the three goals and a majority of the objectives identified in the Draft NWIRP Strategic Plan, reflecting FEMA's important transitional role between research and implementation.

Laatsch described two main areas where FEMA work takes place:

1) Programmatic Area;
2) Disaster Support, e.g. work with Hurricane Sandy on the Mitigation Assessment Team, which often represents the greatest share of FEMA's work.

This work is often done as a streamlined activity, or as a leveraged activity where there's crossing of hazards – for example where a disaster involves both a flood and wind peril, FEMA leverages flood resources and priorities to support ongoing wind activities.

Jonathan Westcott, a Civil Engineer in the Building Science Branch, highlighted some of the successes and described FEMA's accomplishments regarding safe rooms:

- Developed construction guidance beginning in1988 and distributed over 1 million copies; Thousands of safe rooms have been built and many lives have been saved. FEMA is not aware of any fatalities in a safe room built to FEMA criteria;
- Updated published guidance for better and more efficient design based on advances in engineering research and post-storm observations.
- Proposed two building code changes incorporated in the 2015 International Building Code (IBC), which require ICC 500 compliant shelters in new schools and first responder facilities in areas with the highest tornado risk.

Westcott summarized their typical process as follows – FEMA develops guidance, assesses that guidance during disaster events, then works to turn the guidance and best practices into codes and standards provisions.

He then described FEMA's Mitigation Assessment Team studies of windstorm damage:

- Conduct building performance studies after unique or significant disasters to understand how those events affected the built environment;
- Use Mitigation Assessment Teams when something new can be learned that helps develop recommended improvements to design and construction.
- Convey lessons learned through comprehensive report, recovery advisories, fact sheets

He also highlighted development of guidance materials for state of the art wind resistance design and construction.

- Distribute thousands of copies annually, for example, of both residential and community safe room guidance, along with a training curriculum, and many other fact sheets on wind resistant design.
- Recommend improvements for wind resistant provisions in model building codes and standards with NIST and other NWIRP Agencies. Support development of:
    a. ICC 500, which is the standard for design and construction of storm shelters,
    b. ASCE 7
    c. International Building Code and International Residential Codes
- Maintain HAZUS multihazard Loss Estimation Model (https://www.fema.gov/hazus-mh-overview), including hurricanes. Recently released HAZUS 4.0, including a tsunami model.

Lastly, Westcott explained that FEMA does a lot of education, outreach and information dissemination.

- All publications available free on FEMA web site google books, and MADCAD.
- Participate in dozens of conferences, builder shows,
- Additional dissemination methods include work with the Federal Alliance for Safe Homes (FLASH), partnership on a Disney World exhibit, and development of curriculum kits for schools.

VI. Strategic Plan

Dr. Levitan provided an overview of the Draft Strategic Plan. His presentation was made available as a link from the Agenda, posted on the NACWIR website. https://www.nist.gov/sites/default/files/documents/2017/05/17/nacwir_meeting_1_-_nwirp_strategic_plan_overview.pdf.

Questions:

One Committee member noted that in the Introduction, the case for economic losses was very well made, but there is nothing that shows how we will measure loss of life and public safety. The member noted that such information can be added easily.

VII. Committee Work Plan and Open Discussion – Led by Committee Chair Tim Reinhold

The Committee discussion included questions, observations and recommendations about the scope, time-frame and deliverables for the Committee.

- Reinhold noted that there is a very short period to get two reports completed. He reiterated the statutory requirements for the five things to assess and make recommendations on.
- He noted that the assessment of the Strategic Plan will be the first report that will come out. Reinhold said the Committee needs to assess what needs to be enhanced and make recommendations. He asked the committee to send bulleted comments over the next couple of weeks. Based on these comments, he will begin planning how to organize our time at the June meeting to be most efficient, and may decide to invite outside speakers. He suggested the Committee may break into small groups to work on specific topics.
- Reinhold indicated the Committee needs to get as close as possible to having a draft one week after the June meeting. He suggested the Committee will then review it, and then either get back together in person or on a conference call depending on how much debate is needed. Then the Committee will provide their report to NIST.
- Reinhold added that once the Strategic Plan review is completed, the Committee will assess coordination of the program and revisions.
- A Committee member asked whether the public comments on the plan would be distributed to Committee members? Reinhold responded that NIST is compiling that information. The public comment period closed on Monday.NIST will compile the comments and transmit to the committee.
- Another Committee member asked if there are 5 reports? Reinhold responded there are two reports:
  1) Review of the strategic plan;
  2) Report to congress that covers the other 4 items.

Levitan added that the report goes to the Director of NIST, and is then shared with the Interagency Coordinating Committee. The final report is due 9/30. He added that NIST has asked the Committee to prioritize the Strategic Plan, so we can take that, plus public comments and finalize the plan. Then the Committee will continue to work through September on other bullets on the list.

- A Question was asked whether the coordination of the program was only among the four stakeholder agencies, or beyond that? Levitan clarified that NIST needs to coordinate with other stakeholders beyond the four agencies.
- A suggestion was made that the committee attempt to provide those points of view.
- Reinhold added that we've heard there's not enough emphasis on mitigation and retrofitting existing buildings as there might be. He instructed the Committee to consider whether there's enough engagement with the public and social science in getting people to make the changes necessary to reduce infrastructure vulnerability.
- A Committee member suggested that it might be useful to communicate with the National Institute of Building Sciences (NIBS), since they prepare an annual report every year to the Congress. Reinhold acknowledged that if their viewpoints could be brought to the discussion, that would be useful.
- A question was asked about the statutory requirement to consider short, medium and long term priorities. Levitan clarified that in Chapter 2 under each of the objectives, there's a paragraph on whether NIST thinks meeting that objective will require short, mid, or long term efforts. NIST interpreted short term as one code or standard cycle, which is typically on the order of 3-6 years, mid-term as 7-15 years, and long-term to be beyond those. He added that prioritization and resource constraints influence how we implement these. He echoed Laatsch's comments from his discussion of FEMA's activities, that there's a lot of uncertainty in terms of resource levels.
- That led to further discussion about resource levels. Reinhold clarified it is in the scope of this Committee to comment on resource needs in this report.
- Reinhold suggested that Committee members think about the 80/20 rule – biggest impact affecting largest goals of reducing losses of life and property. These may be different for short and long term.

Reinhold then asked each member to identify their initial ideas. The following comments were made:

- Where you build should influence how you build. Design codes can be used as incentives to not develop in high risk areas.
- We should also include land use planning, such as incentive approaches and general land use approaches. There may not need to be as much emphasis on mitigation in this strategy, but instead focus on community and faith-based options. Consider broader tools of investigation not just focused on decisions made by individual homeowners. For example, multi-family housing are different vectors we need to consider in mitigation in our communities. In community planning, we need to evaluate "Where and How are we Building?" We also need to consider hazard and risk based mapping. When assessing event-based risks, need to evaluate community density and the type of construction that affects risk and vulnerability. We need to deal with community based risk more than we have. We should try to include GIS layers on ASCE 7 maps. Nobody wants to put that out there, but it's necessary for communities to use those mapping tools, along with assessment of their built environment and socio-economic aspects of communities, to do broad-based planning at the community level.
- Looking at buildings over the last several decades – the biggest causes of losses are from workmanship. If we can guide construction practices to be more simple or more effective, it could make a big impact. Usually it's not the design or planning, but the workmanship and maintenance that contributes to loss.
- In addition to improved construction practices, also need more inspections to reduce losses.

- It's a very difficult and lengthy process in rural areas to have a mitigation plan. Coordination and implementation between local, state and federal government is difficult because of the repertoire of their statutory requirements. Sometimes federal agencies go directly to the state agencies, not the locals. The state, then, has to be really motivated to go the locals. Sometimes listening to the federal agencies (today), I haven't heard of some of these programs even though I've been in this business 20 years.
- The insurance industry can play a key role, especially in developing permits at the local level. People react after an event – that's when you have to encourage people to act. Hopefully we have some of the insurance people involved to help people mitigate their home and financially assist those residents because your helping those people improve their structures – it's a win-win.
- A suggestion for short-term emphasis, is to make retrofitting a priority. In the long-term, even though the Draft Strategic Plan mentions development of human resources, it doesn't mention that we need to educate people in high school into the hazard mitigation industry and profession.
- Rehabilitation standards need to be developed. For seismic events, there are automatic triggers – if you do some upgrade on your building, you need to bring it up to full seismic code. For wind, most of our damage is with the building envelope, and this should be included in the Draft Strategic Plan.
- In one of the objectives, the Draft Strategic Plan talked about educating next generation of engineers and scientists, we need to add education of field workers.
- Regarding workmanship – objectives 10 /11 address the development of new and improved field diagnostic tools to assess existing buildings and new construction. This was identified as a high priority in the NIST NSF research roadmap.
- Challenge will be to identify priorities for how we move forward in consideration of lack of funds.
- These are exciting times from a research standpoint – new research facilities have come online in recent years. This creates a potential that didn't exist a few years ago.
- When infrastructure is destroyed, we can't neglect communication hubs and only concentrate on private ownership. Damage to these hubs can turns a catastrophe into a disaster.
- While the Draft Strategic Plan doesn't address increases in rainfall, or flooding issues, maybe we should consider wind-driven rain? After Hurricane Matthew, 3 facilities had leakage into building from amount of rain. As discussed earlier, the issue was workmanship – they re-roofed over the over-flow drainage. The primary drainage still worked, but the over-flow was blocked. It was in wind driven rain losses where the most damage occurred, as it got into cracks etc. at resort structures. The buildings incurred just as much damage as if they had broken windows. They were not maintained, seals not replaced.

Public Comments

- What's laid out is very encouraging. Very well organized. Look forward to how it plays out.

Wrap up/Action Items

The Committee discussed the need to make travel reservations for the next meeting as soon as possible. Reinhold reminded members to send him bullet comments on the Draft Strategic Plan to consider for the June meeting within the next couple of weeks. The Committee discussed the possibility of adding a half-day discussion on June 29, but decided that those who could stay, and were interested could get together, but the formal meeting dates would remain June 27 and 28.

Reinhold reminded the Committee that the first priority is to wrap up comments on the Draft Strategic Plan. The next priority will be to discuss trends in the members' respective fields.

The Committee adjourned at 12:55 pm.