



International Code Council
500 New Jersey Avenue, NW
Sixth Floor
Washington, DC 20001
t: 888.ICC.SAFE (422.7233)
t: 202.370.1800
f: 202.783.2348
www.iccsafe.org

August 10, 2020

U.S. Global Change Research Program
1800 G Street, NW, Suite 9100
Washington, D.C. 20006

Via globalchange.gov

Re: Notice of request for public comment on the Fifth National Climate Assessment

The International Code Council is nonprofit organization, driven by the engagement of its 65,000 members, that is dedicated to helping communities and the building industry provide safe, resilient, and sustainable construction through the development and use of model codes (I-Codes) and standards used in design, construction, and compliance processes. Most U.S. states and communities, federal agencies, and many global markets choose the I-Codes to set the standards for regulating construction and major renovations, plumbing and sanitation, fire prevention, and energy conservation in the built environment.

Building codes have been recognized as a valuable tool in enhancing the resilience of communities and a cost-effective strategy for reducing the impacts of hazards on buildings, residents and communities. The National Institute of Building Sciences in its [Natural Hazard Mitigation Saves](#) study found that the adoption of up to date building codes resulted in an \$11 benefit for every \$1 invested. The [National Mitigation Investment Strategy](#) (NMIS) released by the FEMA-chaired Mitigation Framework Leadership Group (MitFLG) recommends “[u]p-to-date building codes and standard criteria should be required in federal and state grants and programs.”

Through the use of the I-Codes, communities, building owners, and designers lock in the long-term performance of buildings across their life-cycle. In many cases, those performance expectations can follow a building for seventy-five to one-hundred years. Currently, building code requirements are largely based on a historic characterization of risk. However, the Code Council and others within the building industry are increasingly recognizing that future risks are unlikely to track with the risks of the past due to climate change.

While the building industry can design and construct building to meet these future risks, they require guidance from the climate science community to help determine the reasonable risks to design against. The Code Council has undertaken efforts to help inform the incorporation of future climate risk in buildings codes including establishing a [dialogue](#) with code development and research organizations from Canada, Australia and New Zealand to help identify common strategies and research needs. The Code Council is also developing potential approaches to addressing climate risk within the I-Codes.

Preliminary work on this issue has revealed the importance of an authoritative source of climate data for incorporation into design decisions. It will be essential for this data to be in a format and over a sufficient timeframe to support the decision-making needs of designers and owners. The U.S. Global



International Code Council
500 New Jersey Avenue, NW
Sixth Floor
Washington, DC 20001
t: 888.ICC.SAFE (422.7233)
t: 202.370.1800
f: 202.783.2348
www.iccsafe.org

Change Research Program (USGCRP) and the National Climate Assessments (NCAs) are ideal sources for the type of data needed by the building industry to integrate future risk assessments to adequately protect structures from the risks posed by climate change. We strongly encourage that content of the NCA5 include a focus on the data needs of the building industry including the effective use of such data. While prior NCAs focused at the city or urban environment scale or on the built environment in general, additional guidance is necessary to support climate-related decision making at the scale of individual parcels by community leaders, architects, engineers, owners, developers and insurers.

Based on these needs, we make the following comments as USGCRP formulates the content of NCA5:

- 1. Identification of vulnerable populations for climate-related risks and potential impacts** – We commend USGCRP for addressing this important issue. This issue is particularly evident when focusing on residents of affordable housing. In many communities, the most affordable housing is built in areas where natural hazard risk is higher than the surrounding community. This can exacerbate the vulnerability of residents who are already struggling to meet their daily needs. As USGCRP addresses this topic, we recommend that it include a focus on housing and the specific risks of extreme temperatures (both heat and cold), flooding, wildfire and wind events (hurricanes and tornadoes).
- 2. Characterization of scientific uncertainties associated with key findings** – As indicated above, the building industry is recognizing the need to incorporate climate data in decision making for individual projects that are expected to last up to 100 years. The building industry will require climate data that they can reasonably rely on to make design decisions over that lifetime and at a scale appropriate for their project. Clearly indicating the uncertainties of climate data (both by time and scale) will be essential for the development of adaptive codes and standards and for implementation in individual projects.
- 3. Characterization of current and future risks. . . with the needs of multiple audiences in mind** – The building industry is a key audience for the use of information conveyed by the NCA5. We strongly encourage USGCRP to consider this audience as you characterize risks, keeping in mind the life-cycle of building projects and the scale needed to inform project design.
- 4. Emphasis on near-term trends, long term projections and timeframes past 2100** – Some building projects can be designed to last 100 years or more. Given the nature of the building process, some of the design decisions made today will remain with the project throughout its life-cycle. Currently, the building industry is attempting to develop methods that address the relatively certain risks in the near-term while building in adaptability for the range of risks possible over the building’s life-cycle. Naturally, the narrower the band of long-term risks, the easier and less expensive it is to design to adapt the building to those risks. Therefore, to the greatest extent possible, we request that NCA5 keep the building industry in mind as it develops these projections (adequately explain the underlying assumptions and degree of uncertainty).

Including underlying assumptions will be particularly useful as in addition to designing buildings to respond to hazard risk, the building industry contributes to the greenhouse gases (GHGs) emitted. [The U.S. building sector is responsible for 40 percent of the nation’s primary energy use](#)

[and associated GHG emissions](#). Providing insight on how these emissions contribute to future climate-related risks and their contributions to uncertainties related to these risks will provide the industry with valuable information to help support industry-wide strategies to address climate change. [The Code Council has conducted research into the intersection of building energy codes and resilience](#), identifying potential areas of synergy or co-benefits for resilience. Climate science related research in this area would make an invaluable contribution to further understanding and acting on these synergistic opportunities.

5. **Risks to interconnected natural, built and social systems** – In addition to building code development and related building-level activities, the Code Council is a founding member of the Alliance for National & Community Resilience (ANCR). ANCR recognizes the interconnectedness of systems, identifying 19 community functions that contribute to the social, organizational and infrastructural resilience of communities. ANCR is developing benchmarks for each of these 19 community functions to support communities in understanding their current resilience and opportunities to improve. To date, ANCR has developed benchmarks for Buildings and Housing and is in the process of developing its Water Benchmark. While each benchmark includes requirements focused on climate risk increased understanding of vulnerabilities or cascading effects across systems would help ANCR assure that its Community Resilience Benchmarks fully capture the interconnections across the 19 community functions. USCGPR may wish to use these community functions when describing systems in NCA5 (provided in Figure 1).

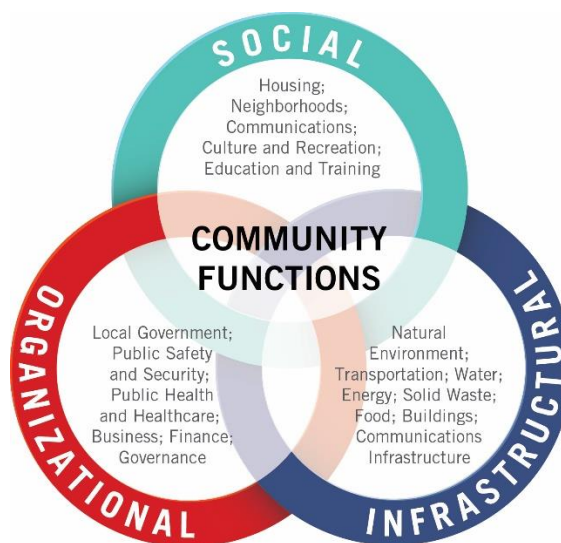


Figure 1. Community Functions Contributing to Resilience as Identified by the Alliance for National & Community Resilience

6. **Human health and welfare, societal, and environmental vulnerabilities to a changing climate** – For the reasons outlined above, this section of NCA5 will be incredibly valuable for members of



International Code Council
500 New Jersey Avenue, NW
Sixth Floor
Washington, DC 20001
t: 888.ICC.SAFE (422.7233)
t: 202.370.1800
f: 202.783.2348
www.iccsafe.org

the building industry if the content is focused in a way that is accessible to this audience. The Code Council would be pleased to work with USGCRP to develop a section examining the specific needs for codes and standards developers and members of the building industry including architects and engineers.

- 7. Regional analysis within the United States** – The Code Council strongly recommends that NCA5 focus on providing information at the most granular level possible to support decision making within the building industry (with any necessary caveats). If community-level or parcel-level data is not available, NCA5 should include information on the research or data needed to support the development of authoritative data at this scale. Given the economic value of real estate, its relatively long life-cycle and the potential consequences of hazard events such data would help reduce the risk exposure of this sector. Case studies should specifically include examples from communities that have begun incorporating climate risk into their design requirements including New York City, South Florida and the Massachusetts Transit Authority.

To further support the building sector’s incorporation of climate data, NCA5 should include discussion on the appropriateness of various strategies for using regional data at the community and parcel scale including downscaling of national or regional climate models.

- 8. Information needed to support climate change adaptation, increased resilience and risk reduction** – While many of the needs for the building industry are outlined in the comments above, this section will be a valuable synthesis of how the building industry can effectively use climate science today and how ongoing activities will provide further insight. In addition to including likely conditions regardless of emissions pathway scenarios by emissions pathway would also be useful (particularly as the building industry has an opportunity to influence the emissions pathways).

As previously identified, the building industry requires an authoritative source of data to support decision making and the development of codes and standards. The NCA5 could be a valuable source of such authoritative data, but the content will need to be framed as such. We recommend identifying climate data as authoritative where possible.

The Code Council individually and with the assistance of code development colleagues around the world will be conducting research and publishing papers on the challenges and opportunities of incorporating climate risk in codes and standards. As USGCRP pulls together NCA5 we recommend consulting those papers to understand the needs of the building industry as well as the type of climate science data building codes in other countries have already begun to incorporate and including them in their literature reviews.

--

Thank you for the opportunity to provide comments on the content of the upcoming NCA5. The Code Council looks forward to the opportunity to provide ongoing input to assure that the information and



International Code Council
500 New Jersey Avenue, NW
Sixth Floor
Washington, DC 20001
t: 888.ICC.SAFE (422.7233)
t: 202.370.1800
f: 202.783.2348
www.iccsafe.org

data contained within the Assessment can support resilience activities within the building industry and the appropriate incorporation of future risk in the codes and standards we administer. Please reach out if you have any questions on these comments or desire additional feedback.

Sincerely,

A handwritten signature in blue ink, appearing to read "R. Colker", is positioned above the typed name.

Ryan M. Colker, J.D., CAE
Vice President, Innovation
Executive Director, Alliance for National & Community Resilience