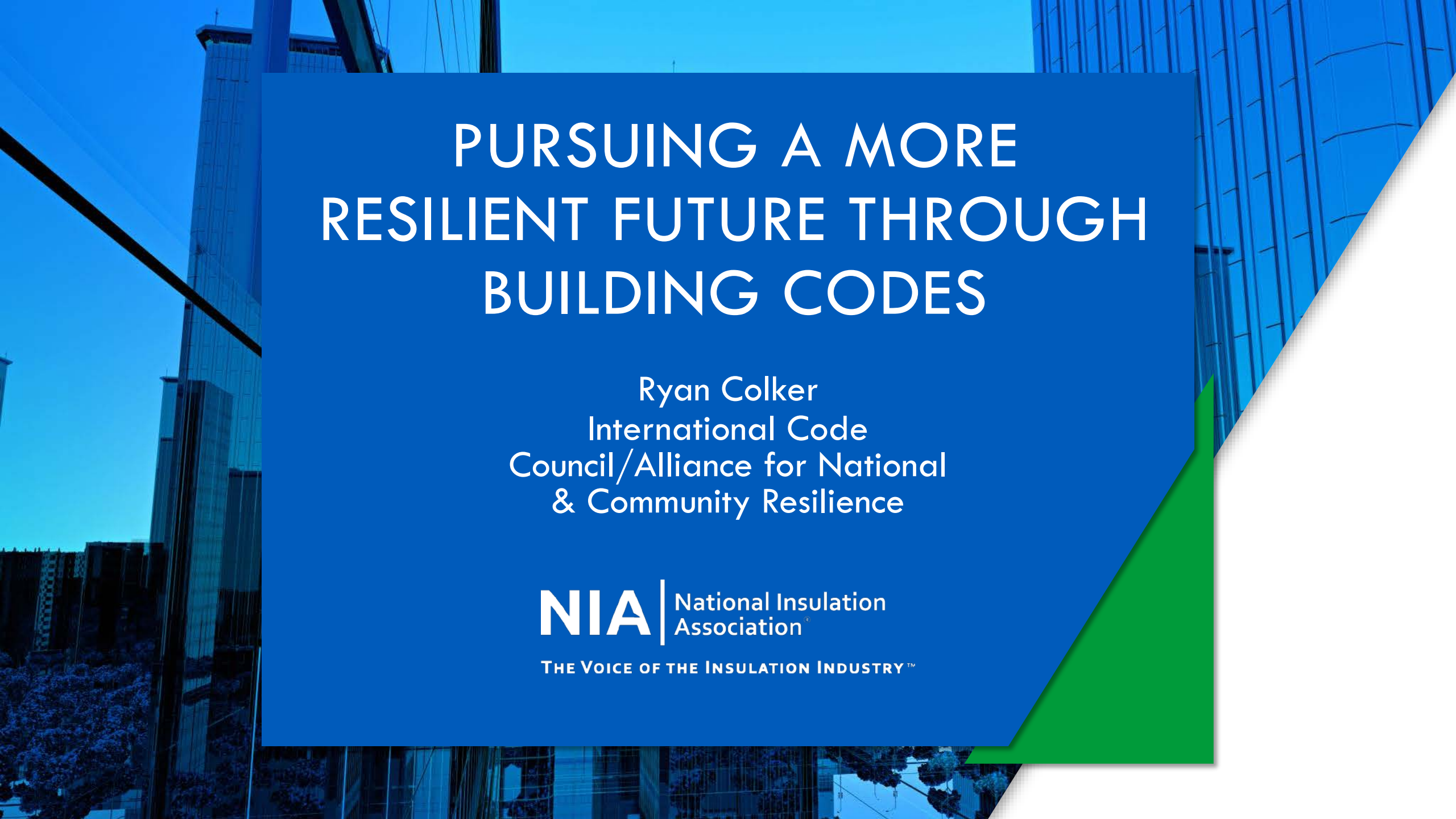


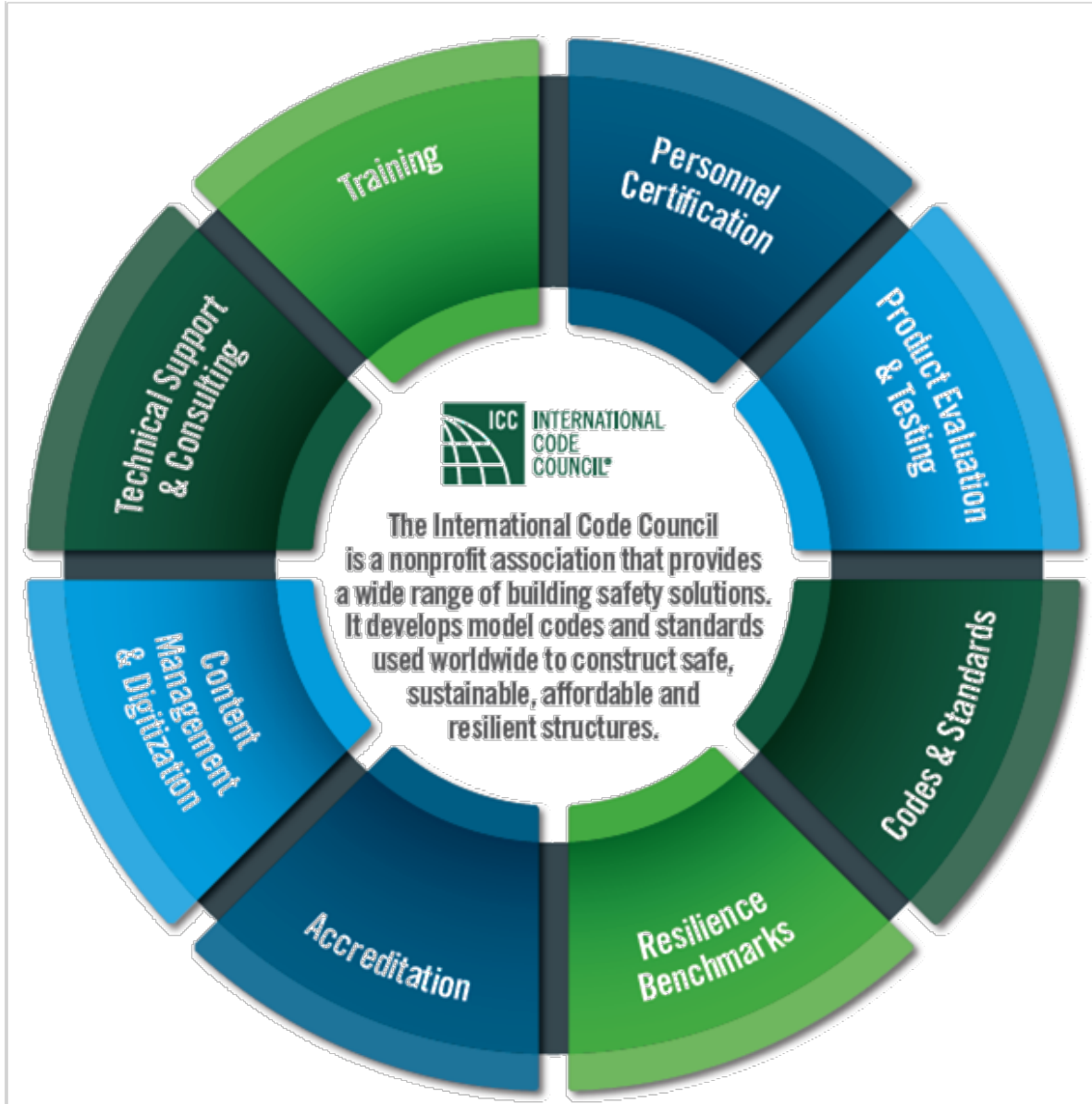
PURSUING A MORE RESILIENT FUTURE THROUGH BUILDING CODES

Ryan Colker
International Code Council/Alliance for National & Community Resilience

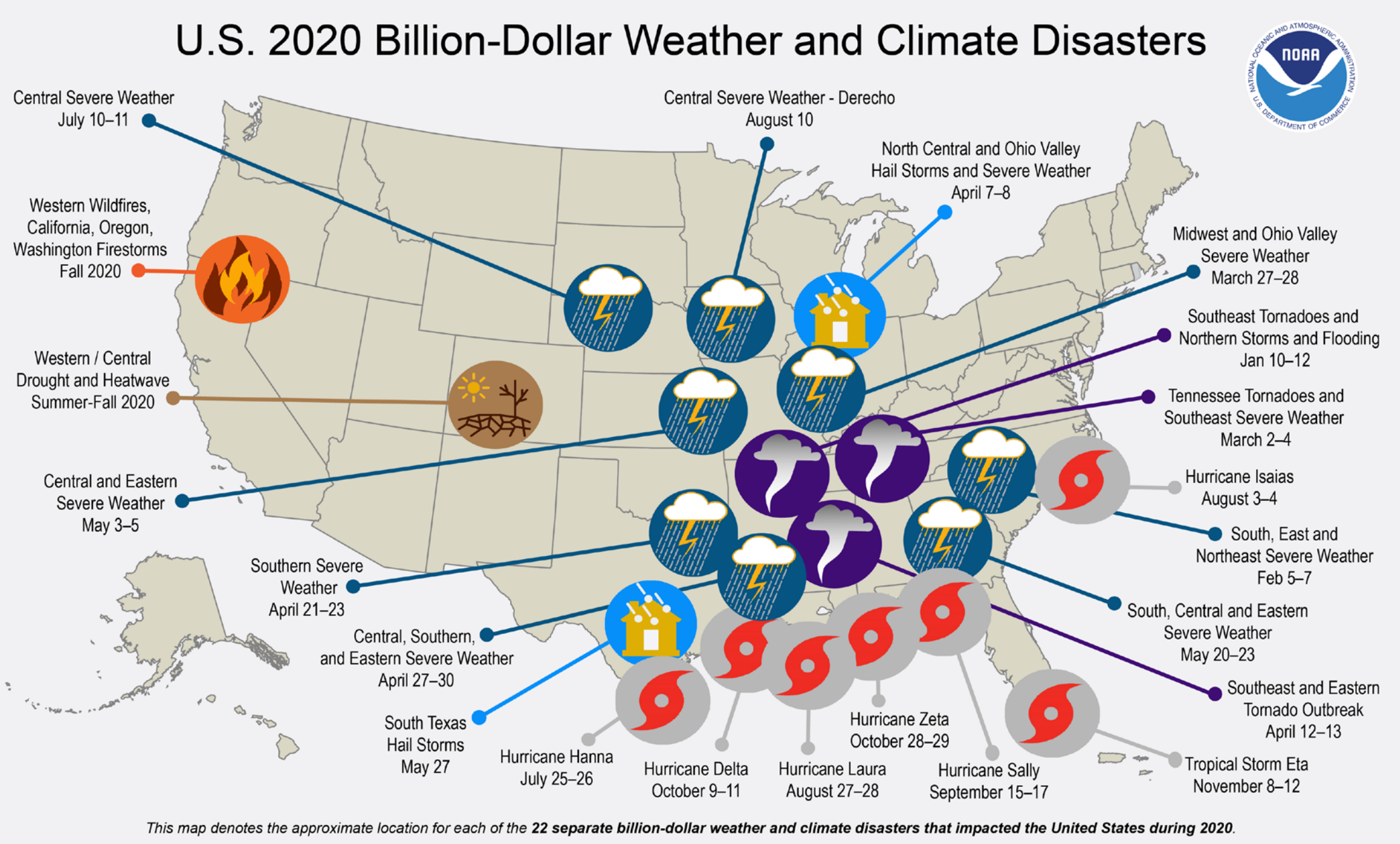
NIA | National Insulation Association®

THE VOICE OF THE INSULATION INDUSTRY™

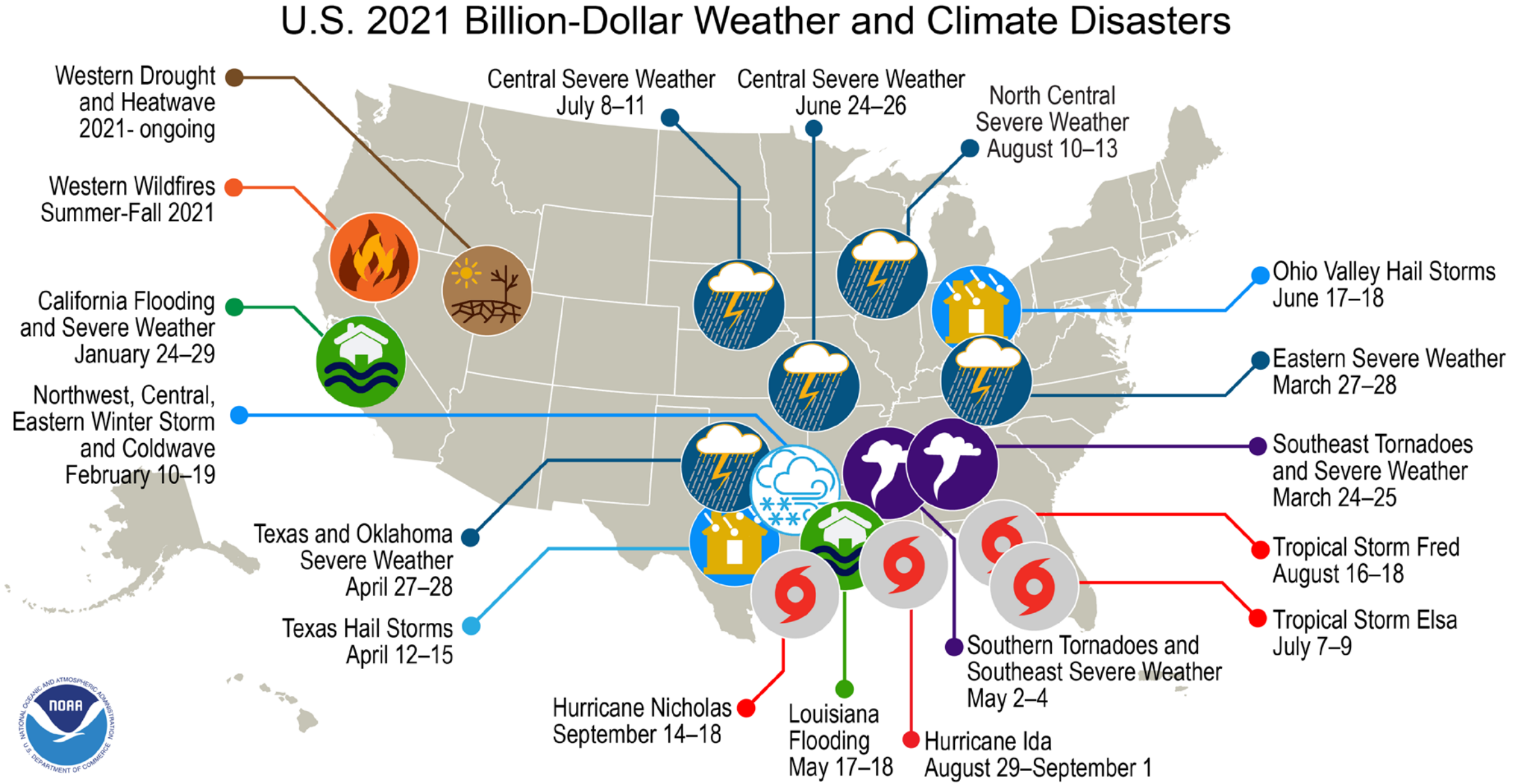
The Family of Building & Community Solutions



- Codes and Standards
- Personnel Training and Certification
- Product Evaluation
- Accreditation Services
- Codification & Administration Services
- Engineering Support
- Community Resilience Benchmarks®
- Third-Party Evaluation Services



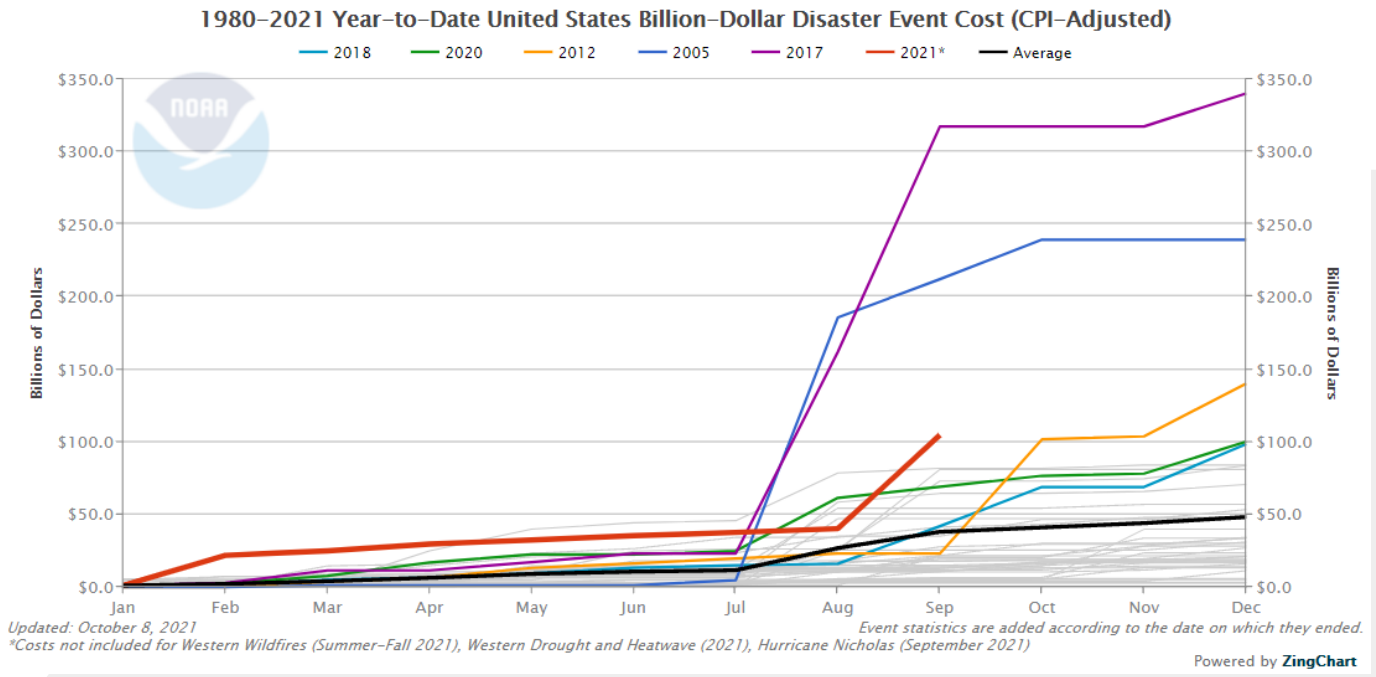
NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73

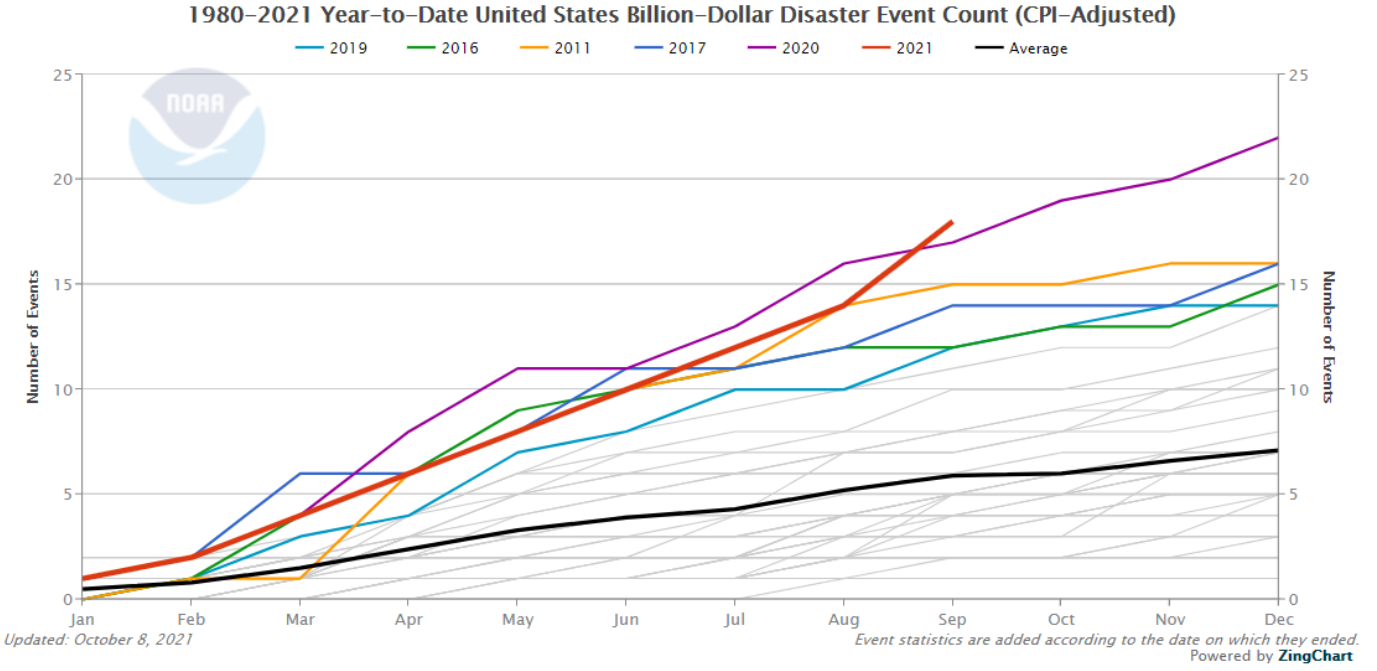


*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters that impacted the United States January–September 2021**.*

NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73

2020 sets the new annual record of 22 events—shattering the previous annual record of 16 events that occurred in 2011 and 2017. 2020 is the sixth consecutive year (2015–2020) in which 10 or more billion-dollar weather and climate disaster events have impacted the United States.





NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73

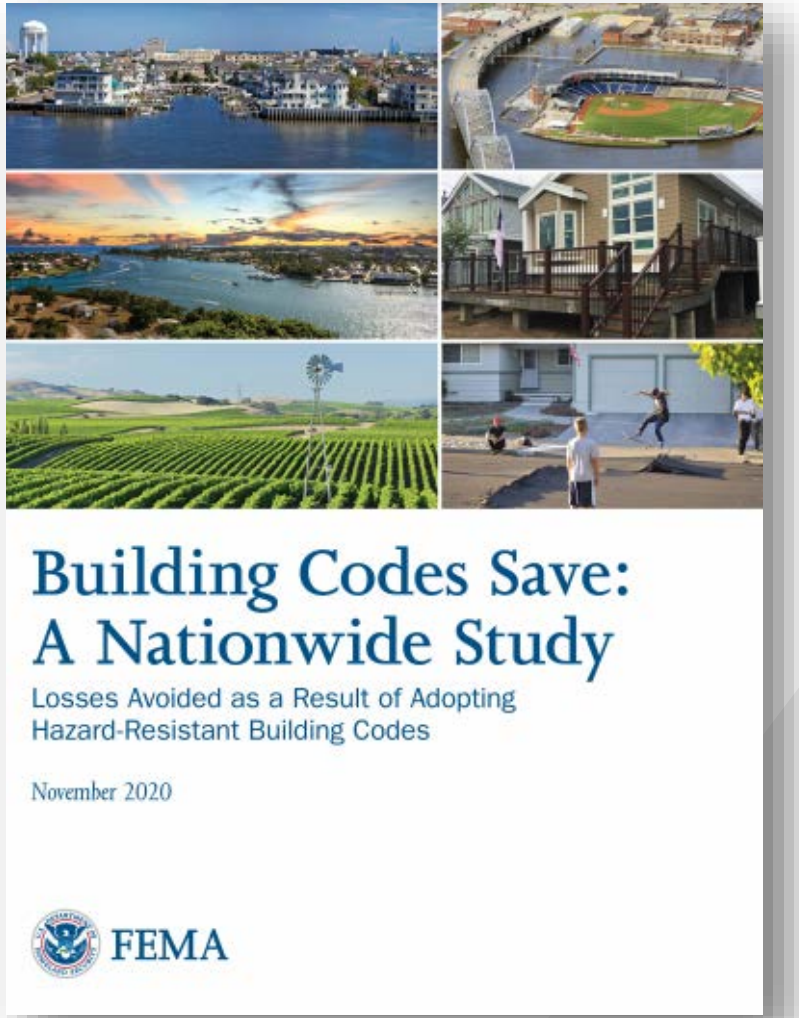
MITIGATION IS HIGHLY COST EFFECTIVE

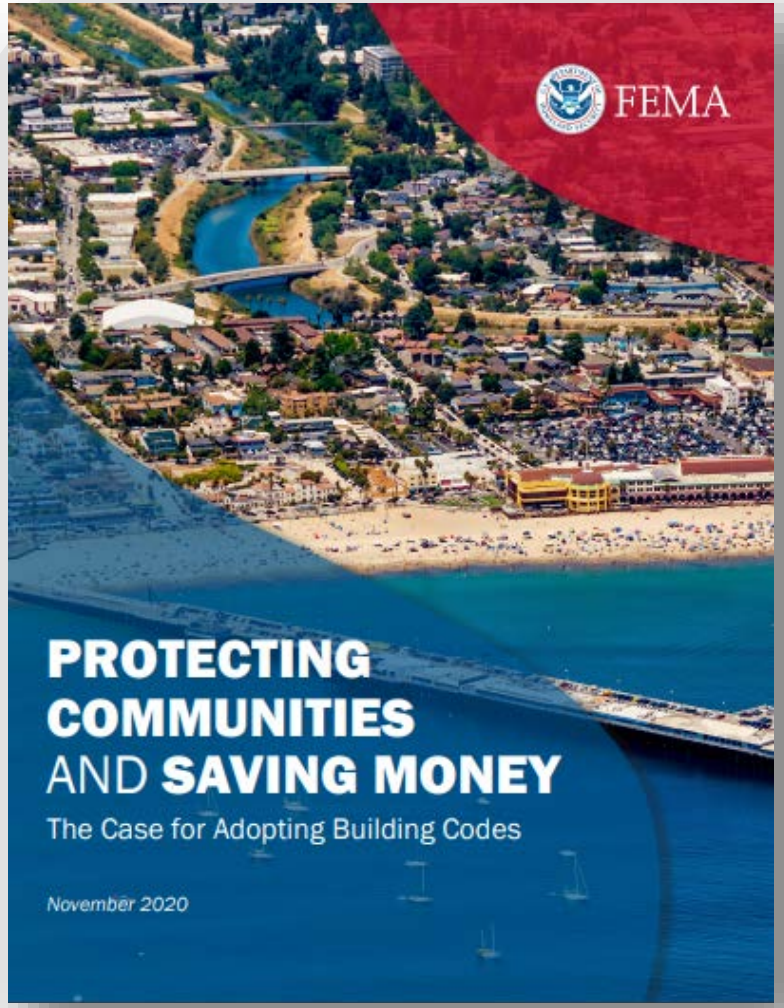
National Institute of BUILDING SCIENCES™

	ADOPT CODE	ABOVE CODE	BUILDING RETROFIT	LIFELINE RETROFIT	FEDERAL GRANTS
Overall Benefit-Cost Ratio	11:1	4:1	4:1	4:1	6:1
Cost ($ billion)	$1/year	$4/year	$520	$0.6	$27
Benefit ($ billion)	$13/year	$16/year	$2200	$2.5	$160
Riverine Flood	6:1	5:1	6:1	8:1	7:1
Hurricane Surge	not applicable	7:1	not applicable	not applicable	not applicable
Wind	10:1	5:1	6:1	7:1	5:1
Earthquake	12:1	4:1	13:1	3:1	3:1
Wildland-Urban Interface Fire	not applicable	4:1	2:1	not applicable	3:1

www.nibs.org/mitigationsaves

FEMA BUILDING CODES SAVE STUDY





https://www.fema.gov/emergency-managers/risk-management/building-science/building-codes-save-study

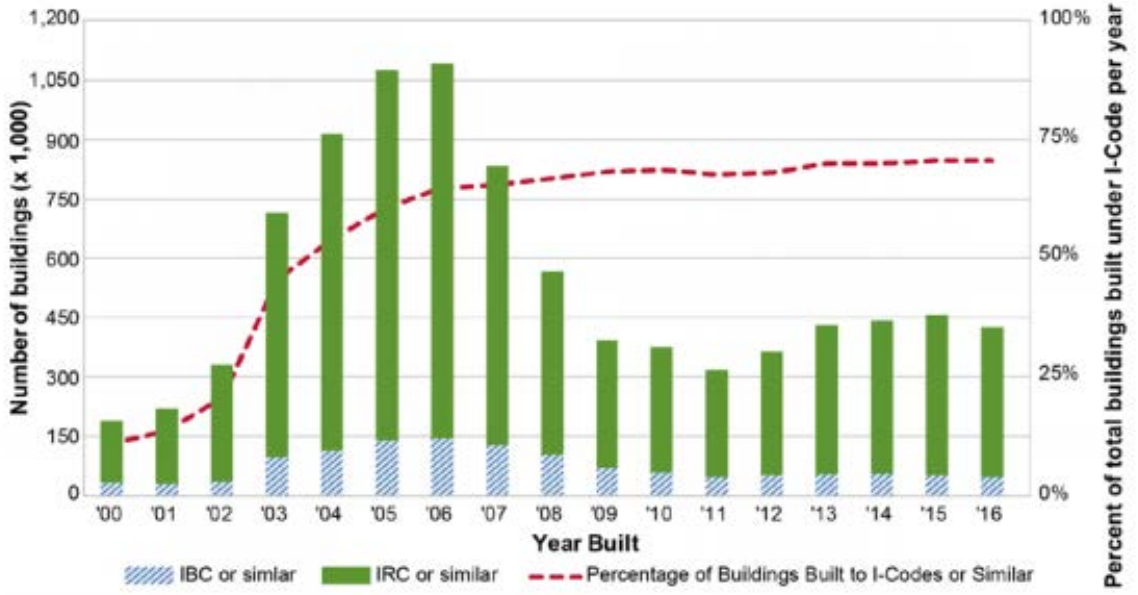


Figure ES-2: Buildings constructed to I-Codes or similar standards, 2000–2016

The projected future I-Codes savings will compound to at least $3.2 billion per year AALA by 2040 for total cumulative losses avoided of $132 billion!

Table ES-2: Average Annualized Losses Avoided by Hazard

Hazard	No. of Bldgs. Modeled(1)	AALA (x$1,000)
Flood	786,473	$483,602
Wind	9,200,267	$1,060,692
Seismic	2,441,923	$59,924
	Total AALA	**$1,604,218**

(1) The numbers of buildings that were modeled are not totaled because many were built to mitigate against more than one hazard.

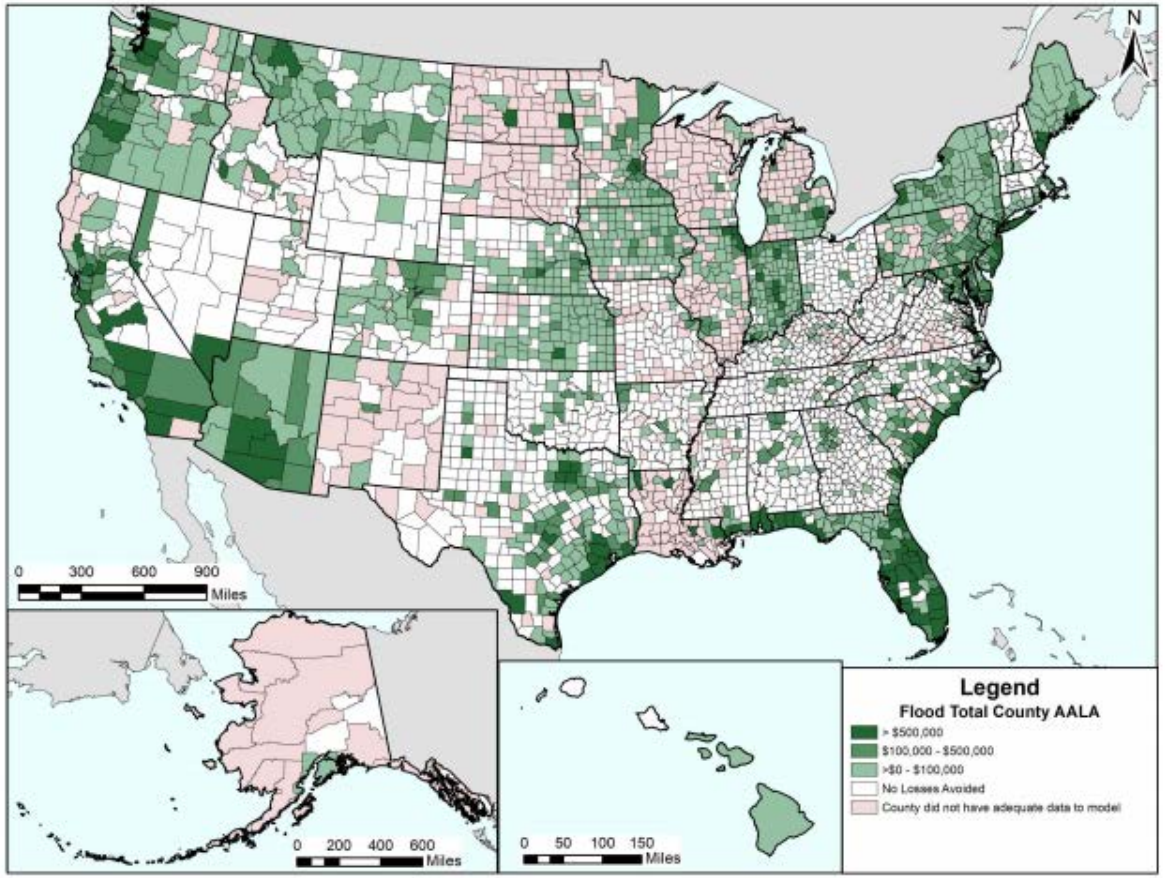


Figure 7-1: Total AALA by county for flood hazard analysis

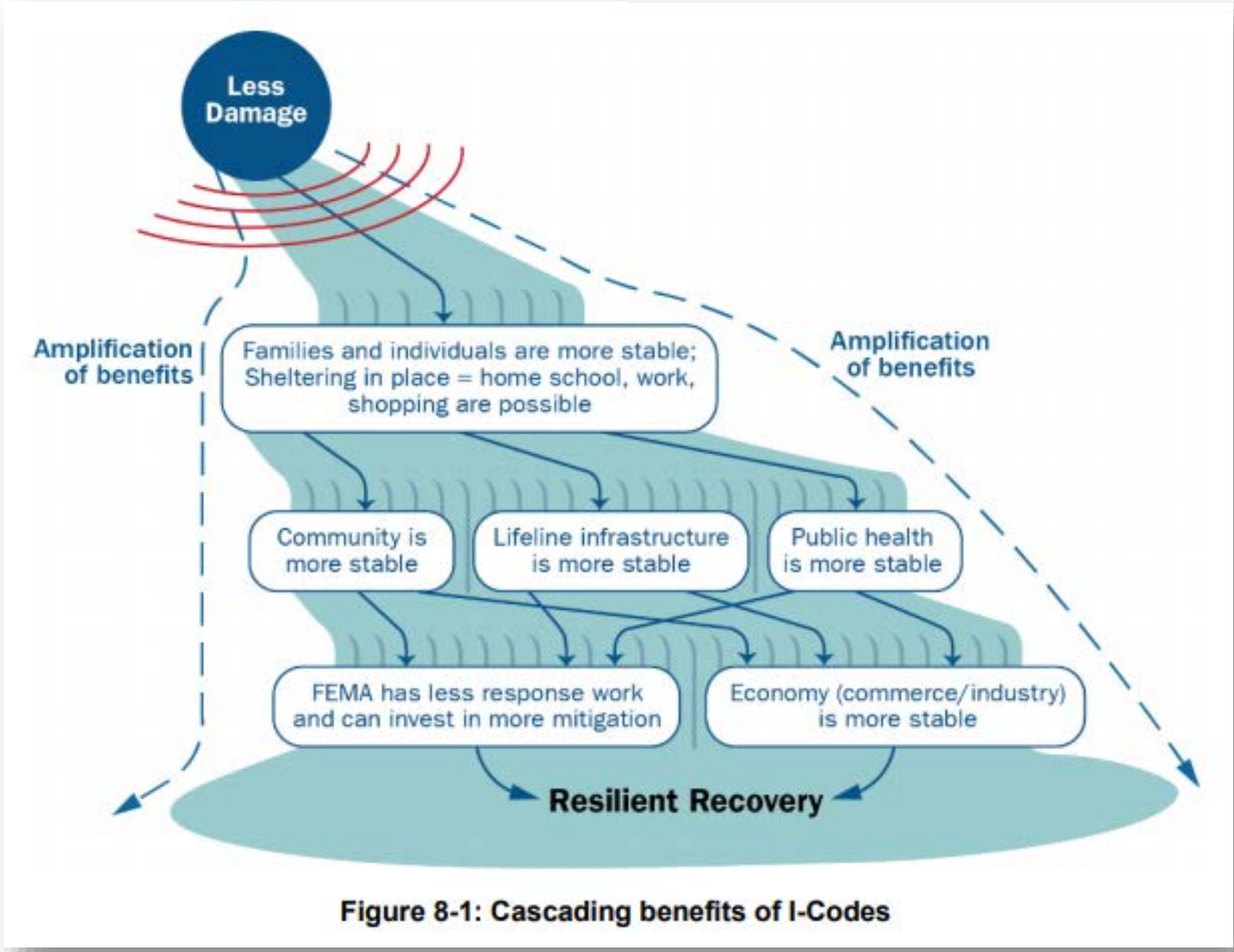
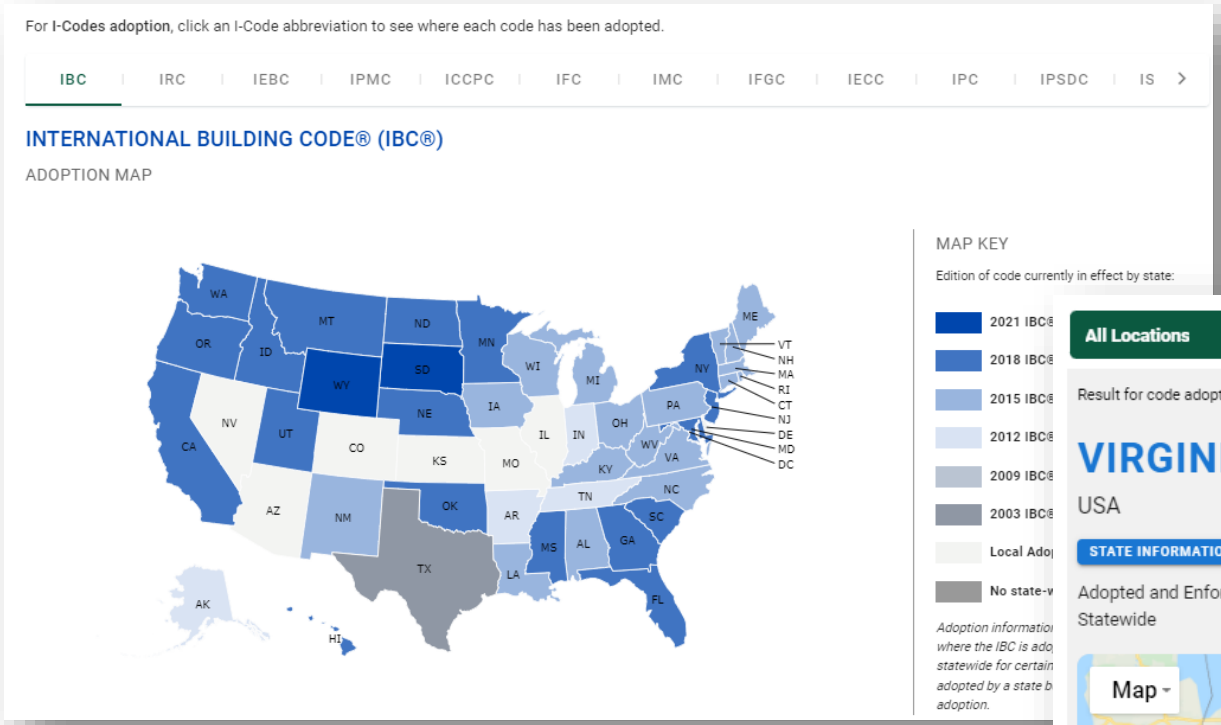
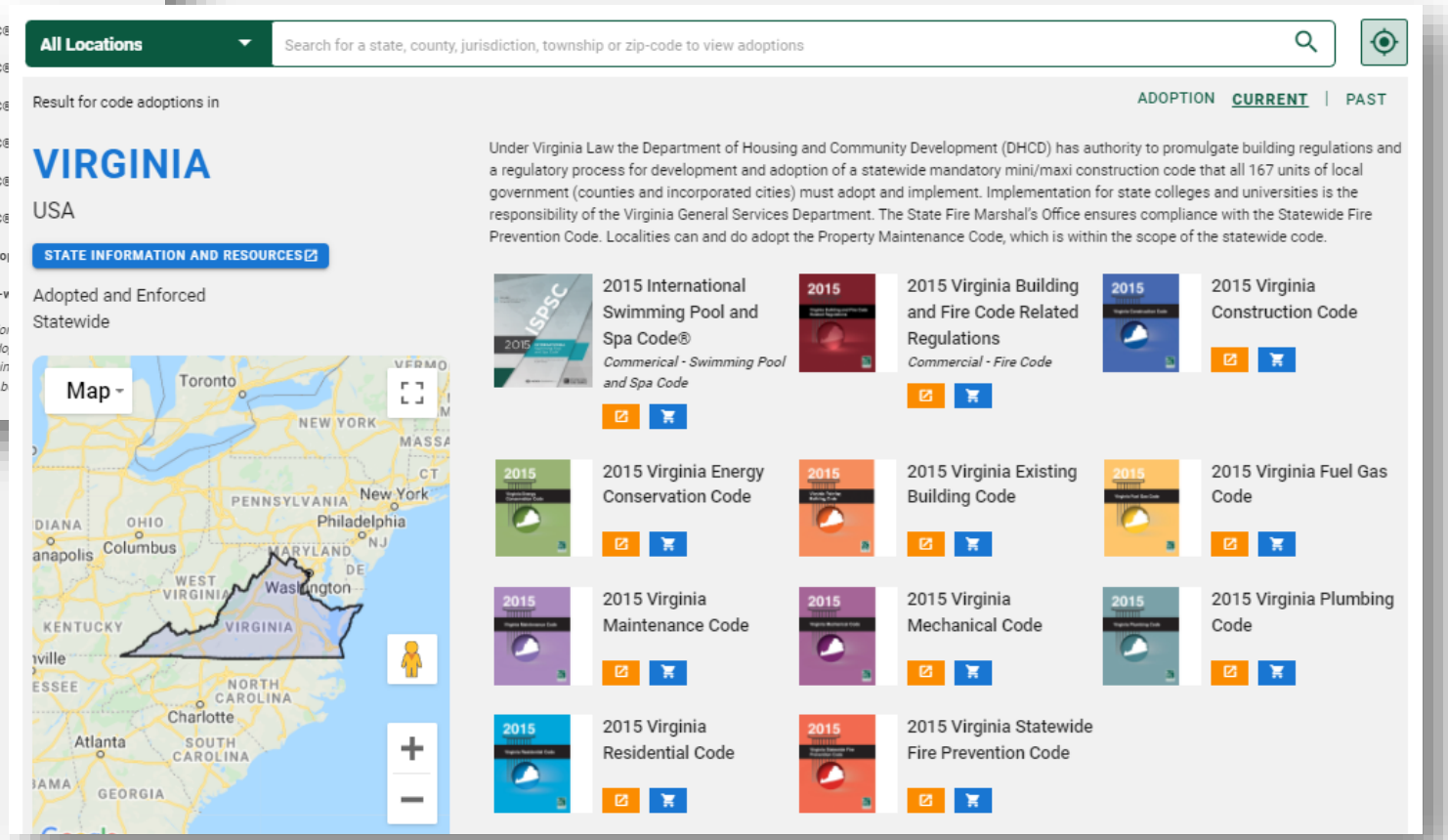


Figure 8-1: Cascading benefits of I-Codes

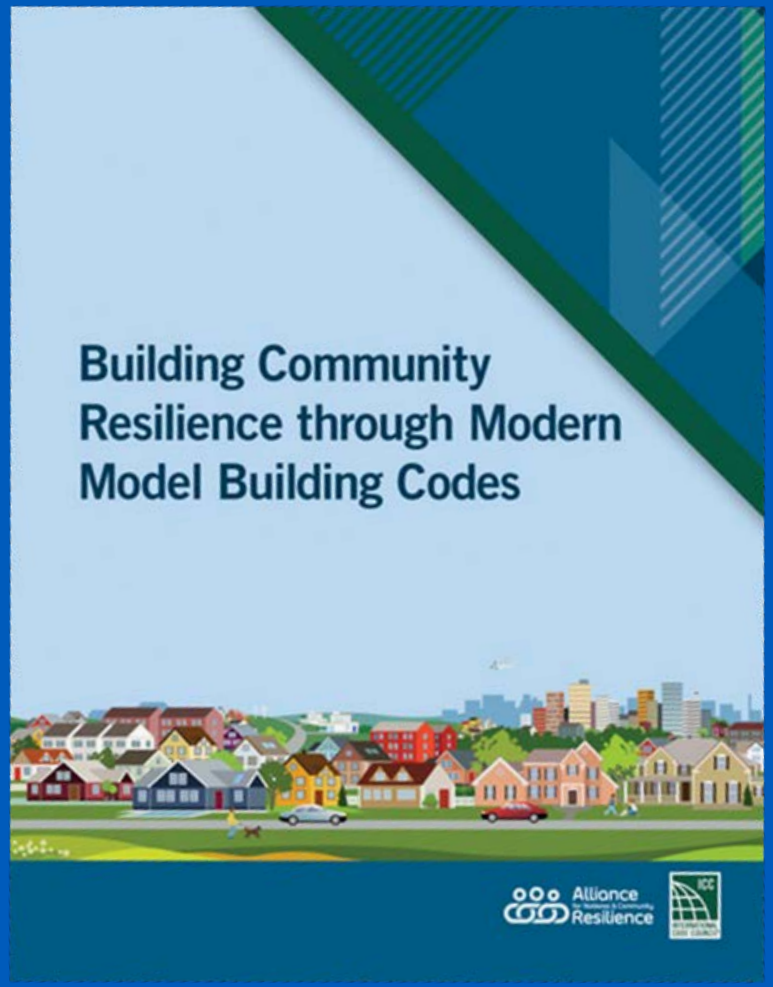
CODE ADOPTIONS DATABASE





codeadoptions.iccsafe.org

BUILDING CODES & RESILIENCE



Resilience in the built environment starts with strong, regularly adopted, and properly administered building codes. However, to attain whole community resilience, communities must look at the resiliency of all interconnected systems and function of the community as well.

Cities, states, and the federal government have committed to energy or greenhouse gas emissions goals.

C40 CITIES

CITY ENERGY
A JOINT PROJECT of NRDC + IMT

EcoDistricts

CLIMATE MAYORS

USDN | urban sustainability directors network

2030 DISTRICTS®

Pledge, Compact, Commitment, or Initiative	Number of Participating US Local Governments
Climate Mayors	407
We are Still In	307
Ready for 100	148
Under2MOU	26
Bloomberg American Cities Climate Challenge	25
Rockefeller 100 Resilient Cities	24
2030 Districts	21
DOE Zero Energy Schools Accelerator	14
DOE Energy Accelerator	11
DOE Zero Energy Districts Accelerator	4

ACCEPTANCE ON BEHALF OF THE UNITED STATES OF AMERICA

I, Joseph R. Biden Jr., President of the United States of America, having seen and considered the Paris Agreement, done at Paris on December 12, 2015, do hereby accept the said Agreement and every article and clause thereof on behalf of the United States of America.

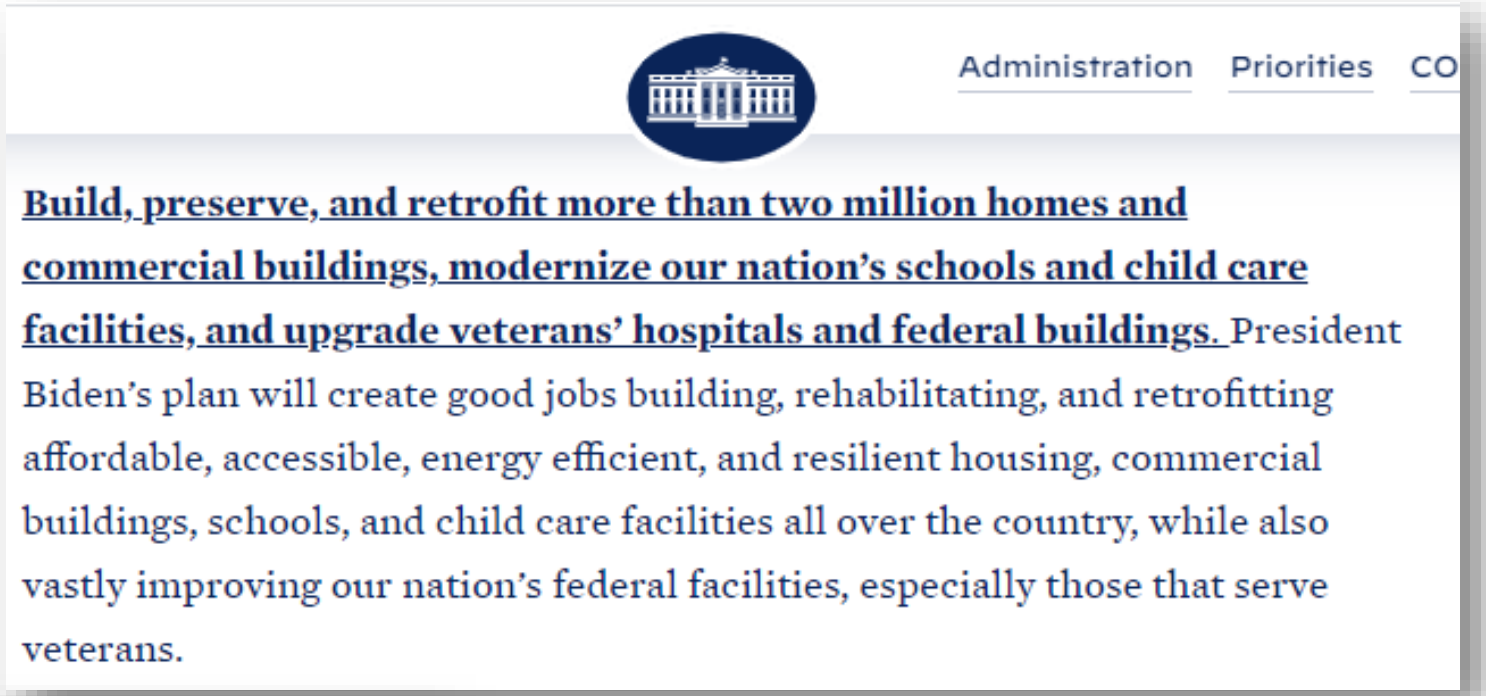
Done at Washington this 20th day of January, 2021.

JOSEPH R. BIDEN JR.

U.S. National Declared Contributions (NDCs)

- 50 to 52% reduction in GHG emissions by 2030
- From 2005 baseline

With a Special Focus on Equity



Zero-Energy Building Goals:

- 2030 for New Construction
- 2050 for All Buildings

BUILDING TO COP26

COP26 Communiqué

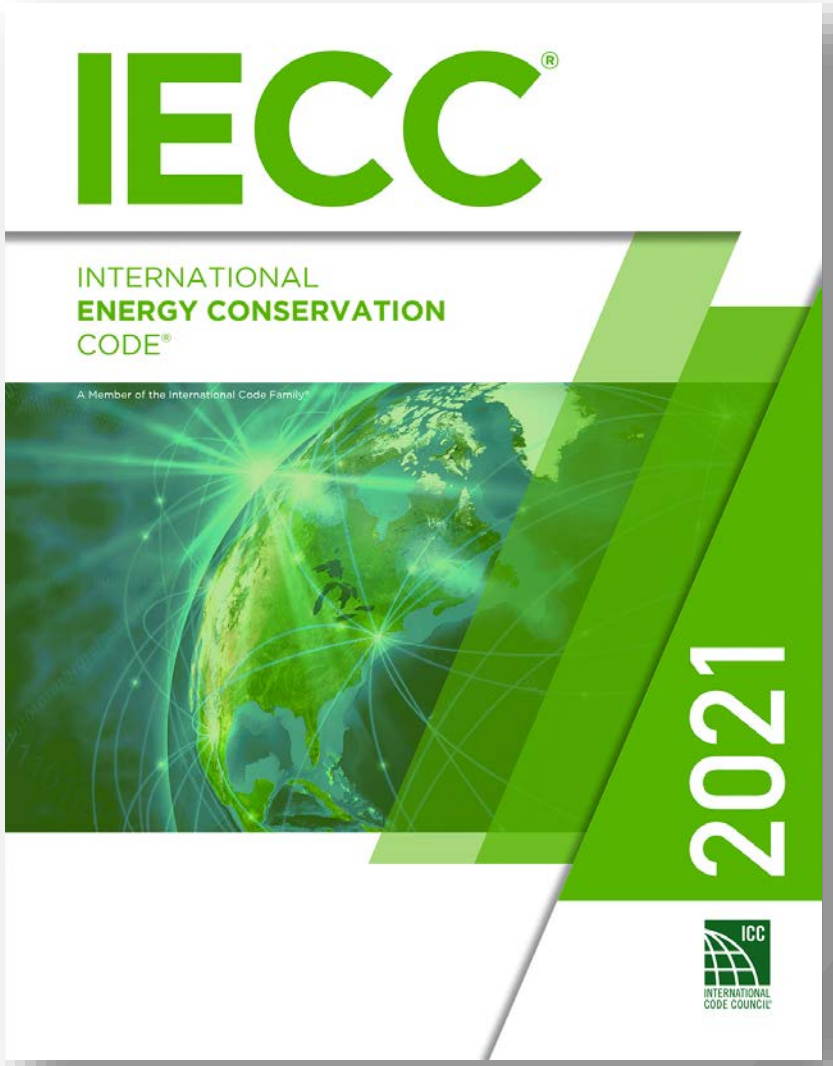
Global Alliance for Buildings and Construction

Cities, Regions and Built Environment Day

- November 11

1.5°C Paris Agreement Target

- 65% Emissions Reduction by 2030
- Zero CO_2 Emissions by 2040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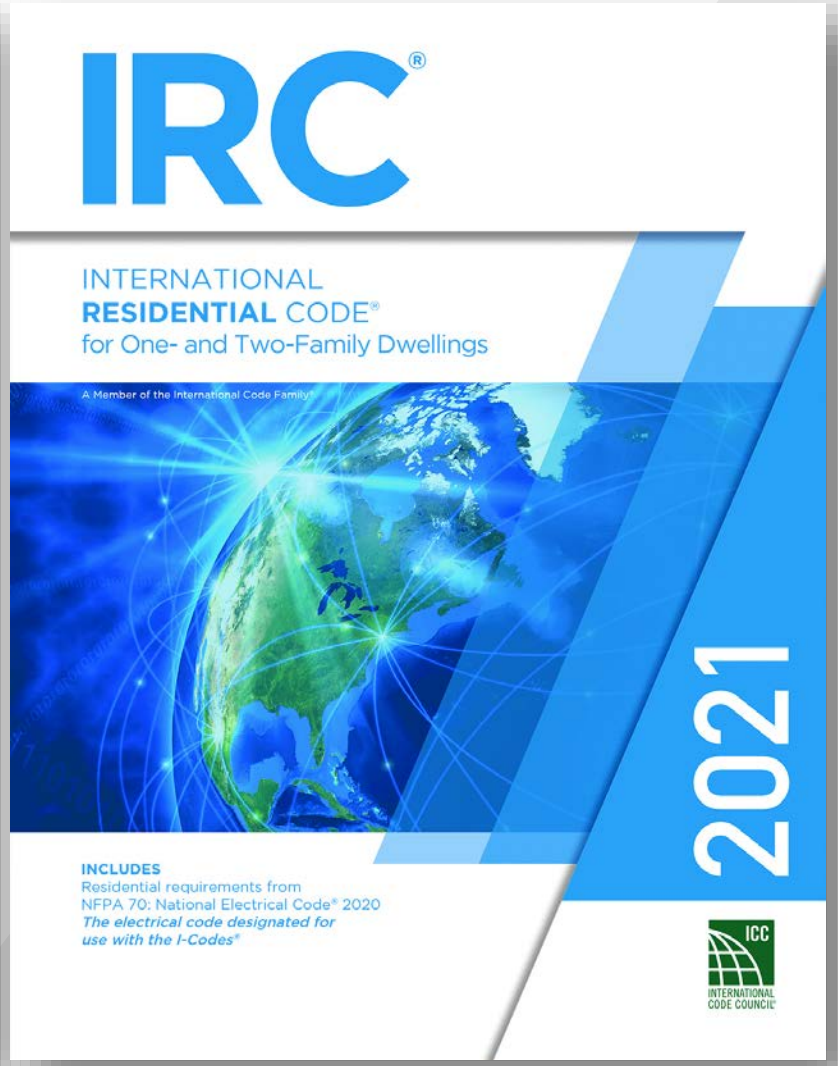
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NFPA 70: National Electrical Code® 2020
The electrical code designated for
use with the I-Codes®
2021
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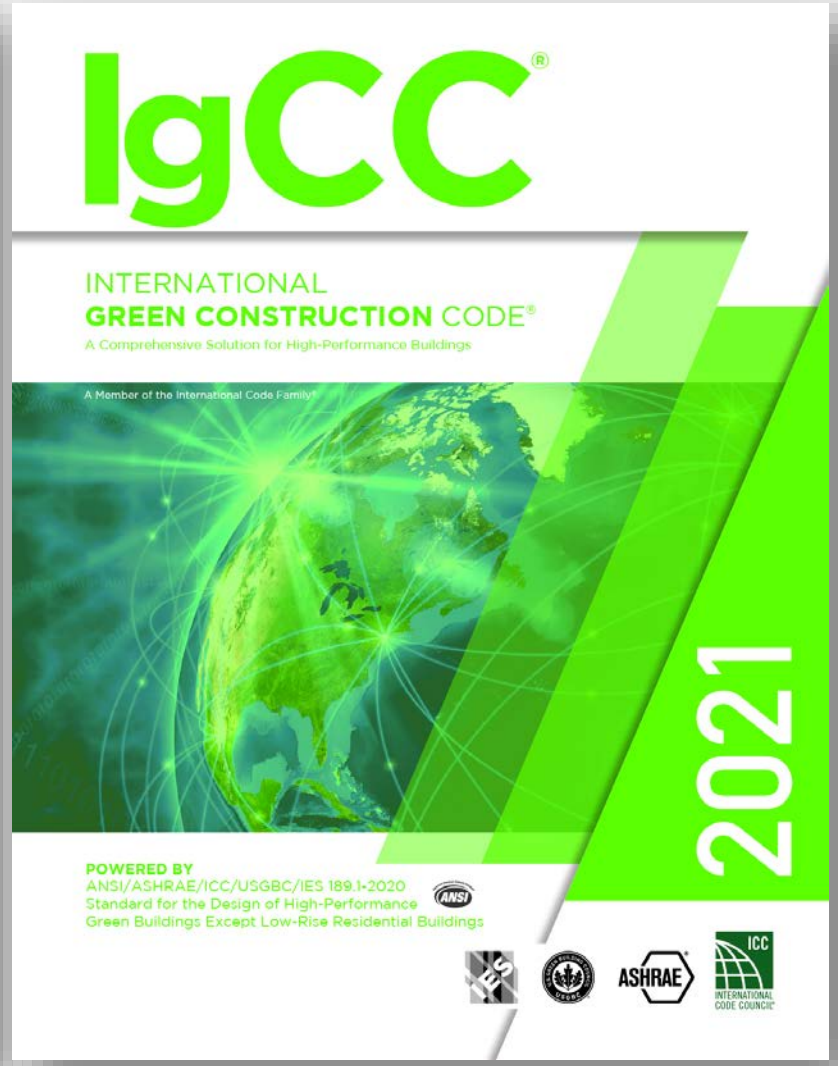
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Standard for the Design of High-Performance
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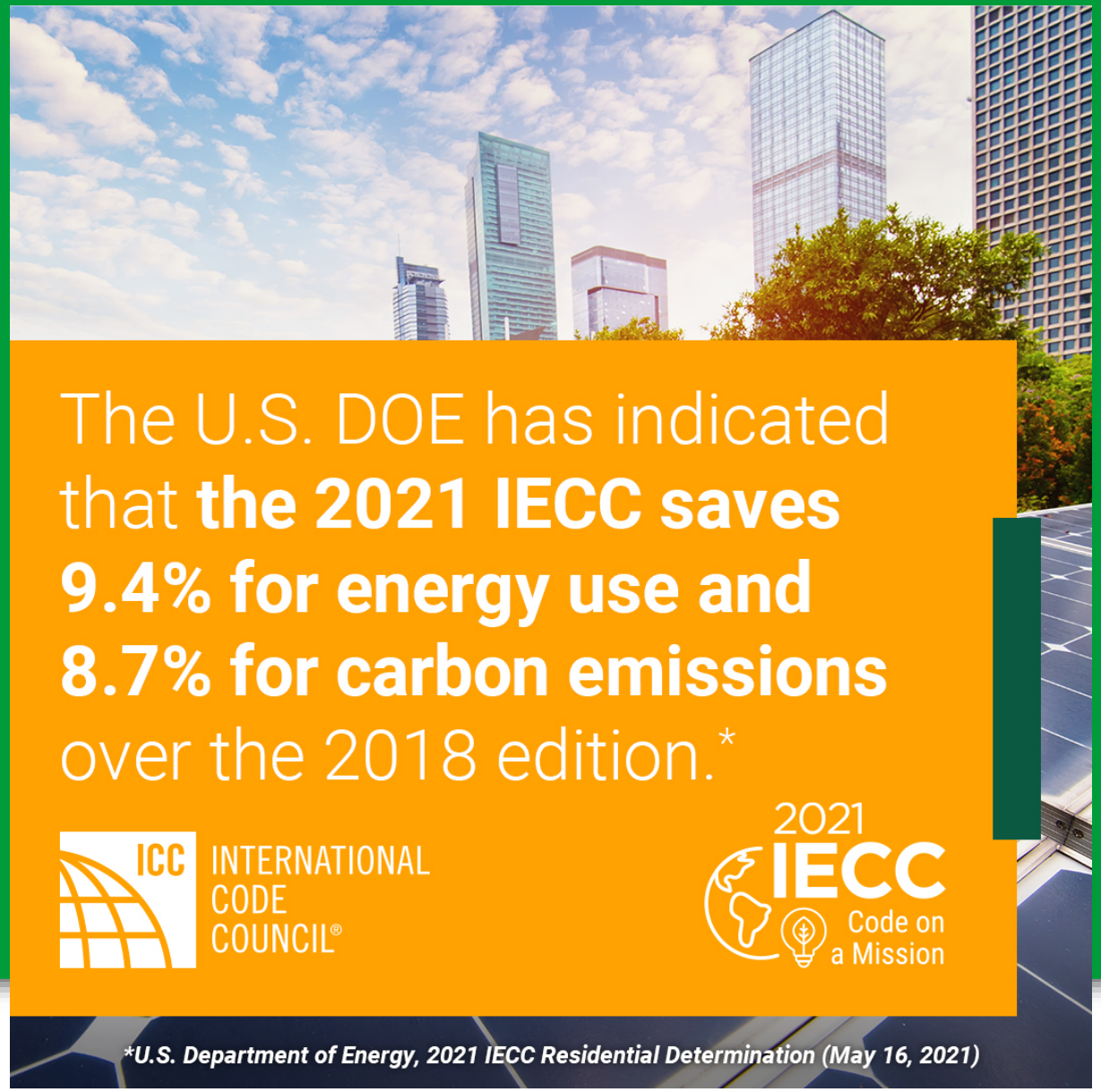
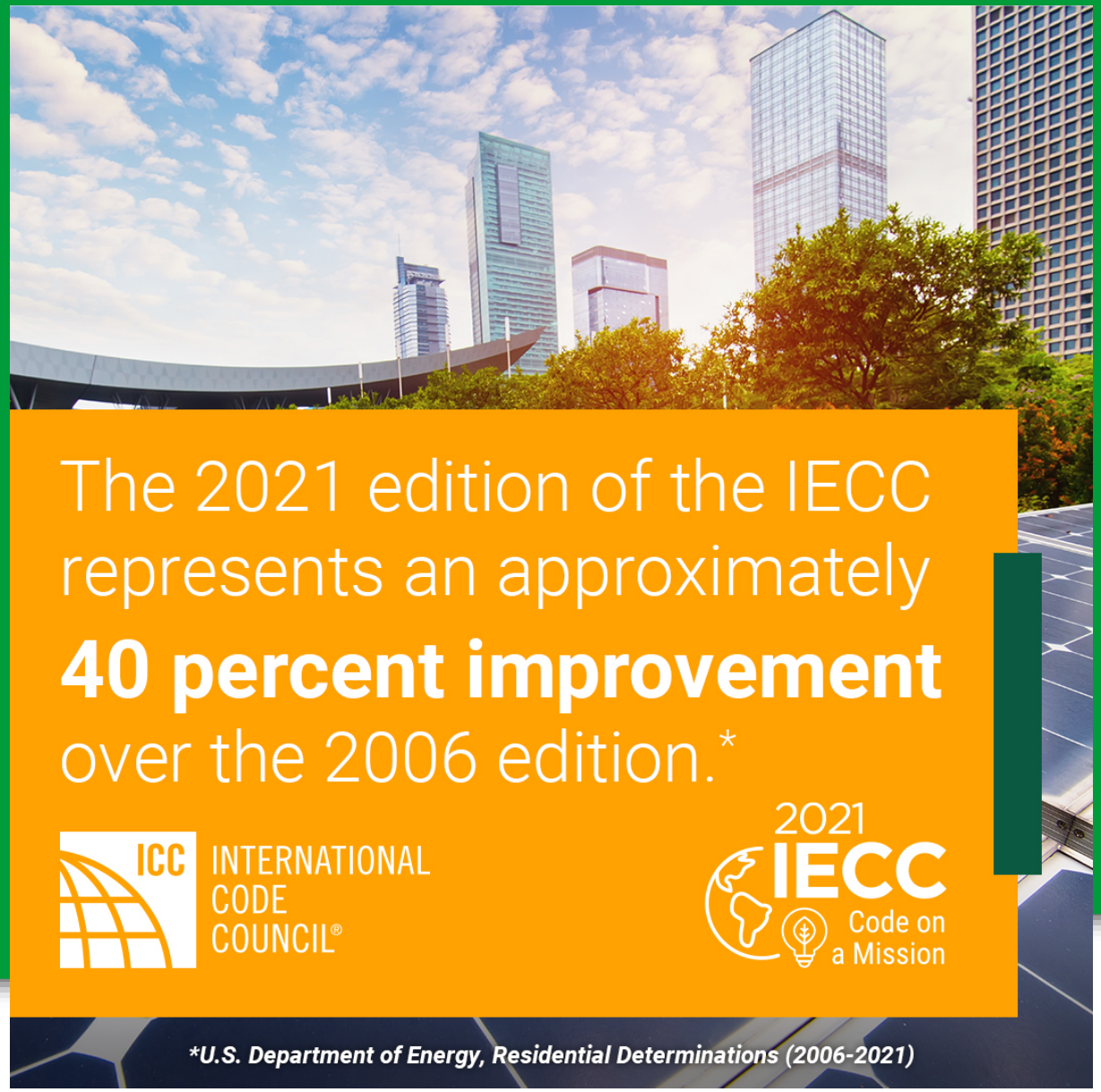


The U.S. DOE has indicated that **the 2021 IECC saves 9.4% for energy use and 8.7% for carbon emissions** over the 2018 edition.*

INTERNATIONAL CODE COUNCIL®

2021 IECC Code on a Mission

*U.S. Department of Energy, 2021 IECC Residential Determination (May 16, 2021)

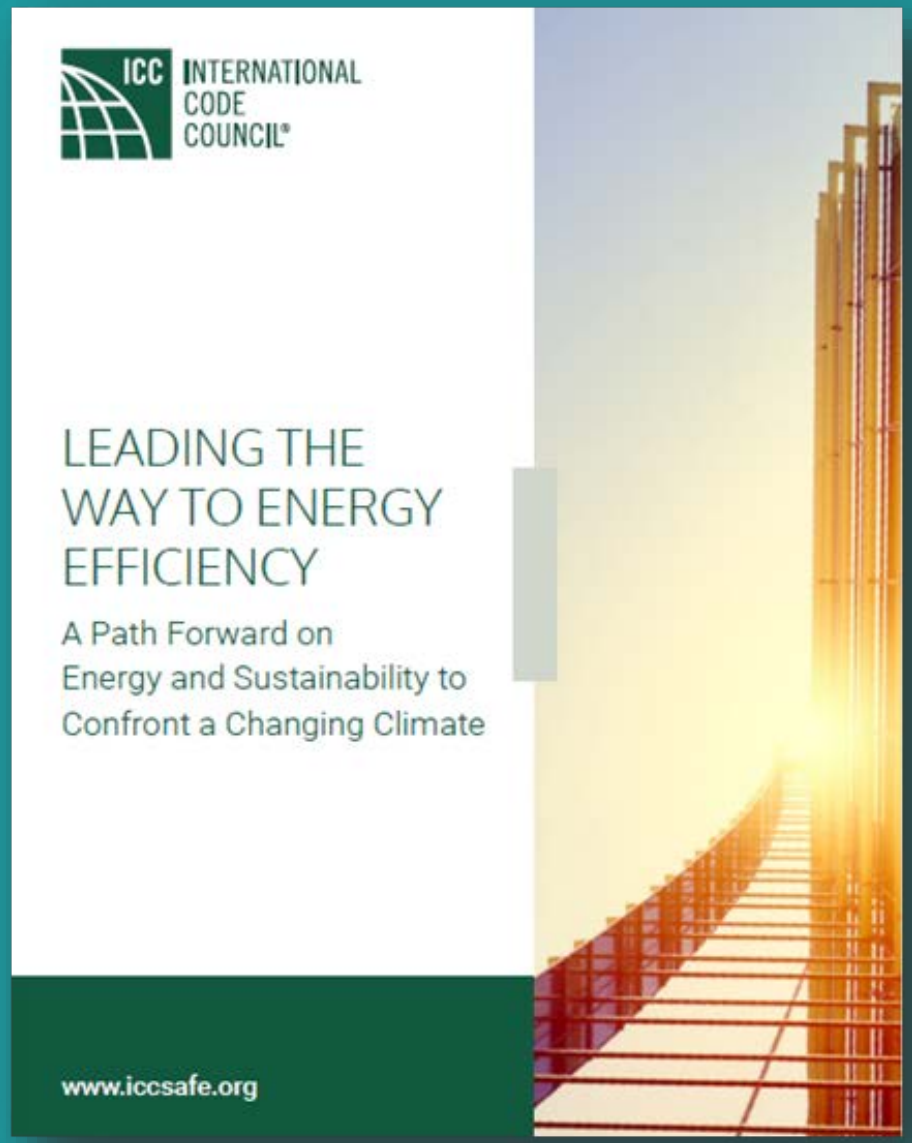


The 2021 edition of the IECC represents an approximately **40 percent improvement** over the 2006 edition.*

INTERNATIONAL CODE COUNCIL®

2021 IECC Code on a Mission

*U.S. Department of Energy, Residential Determinations (2006-2021)



- Updated IECC development process
- Enhanced Energy & Carbon Reduction resources
- Energy and Carbon Advisory Council

www.iccsafe.org/energy

IECC DEVELOPMENT PROCESS

Appoint Committees	Public Comments	Proposal Review	Public Comment Draft(s)	Committee Ballot
Residential & Commercial	Initial draft posted (2021 IECC)	Proposals to subcommittees for review	Committee publishes public comment draft capturing results of proposal review	Once all comments resolved, committee votes on approval of final document
Call for members closed on April 23	Public comments (code change proposals) solicited	Subcommittee recommendations to full committee	Seeks comments on review draft	Content published as next edition IECC
Appointed by Code Council Board of Directors	All conducted online through cdpAccess	Committee votes on content	Committee reviews and addresses comments	
	Closed October 12	Open meetings	Repeat public comment period on revised draft if necessary	

ENERGY CODES & RESILIENCE

Works in Tandem with Other Model Codes

Durability

Durability ensures home is livable for decades

Extreme Weather Protection

Better envelopes
Habitability – more lives saved

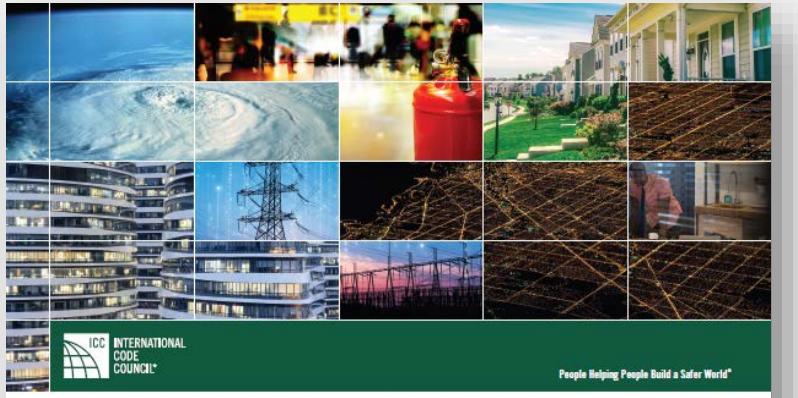
Moisture Management

Rot, mold, mildew

Energy Efficiency

Grid Stability
Microgrids
Energy Storage

Fire Safety

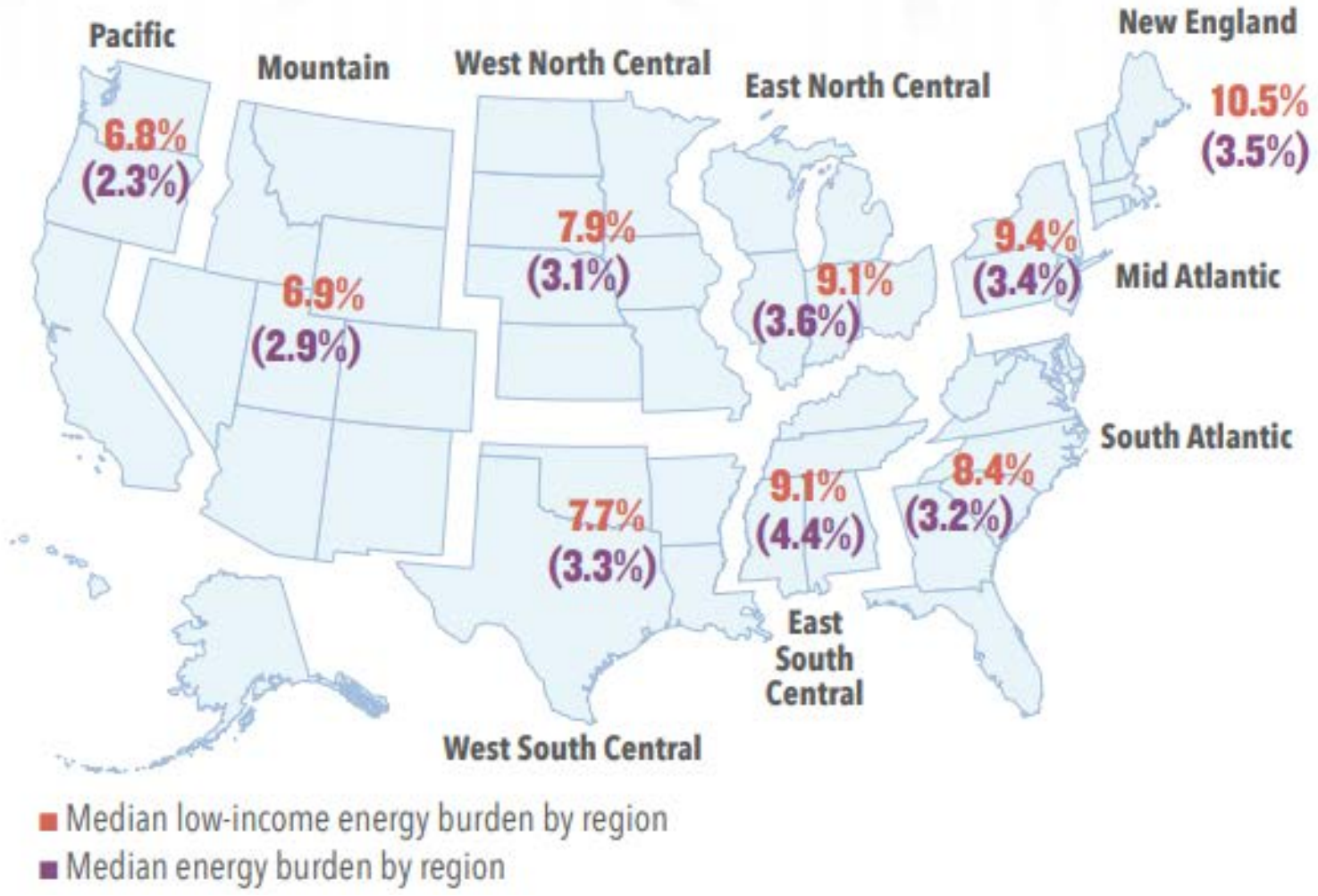


The Important Role of Energy Codes in Achieving Resilience

https://www.iccsafe.org/wp-content/uploads/19-18078_GR_ANCR_IECC_Resilience_White_Paper_BRO_Final_midres.pdf

ENERGY BURDENS & LOW-INCOME HOUSEHOLDS

FIGURE 3. Median low-income (< 200% FPL) energy burdens by region (red) compared to median energy burdens by region (purple)

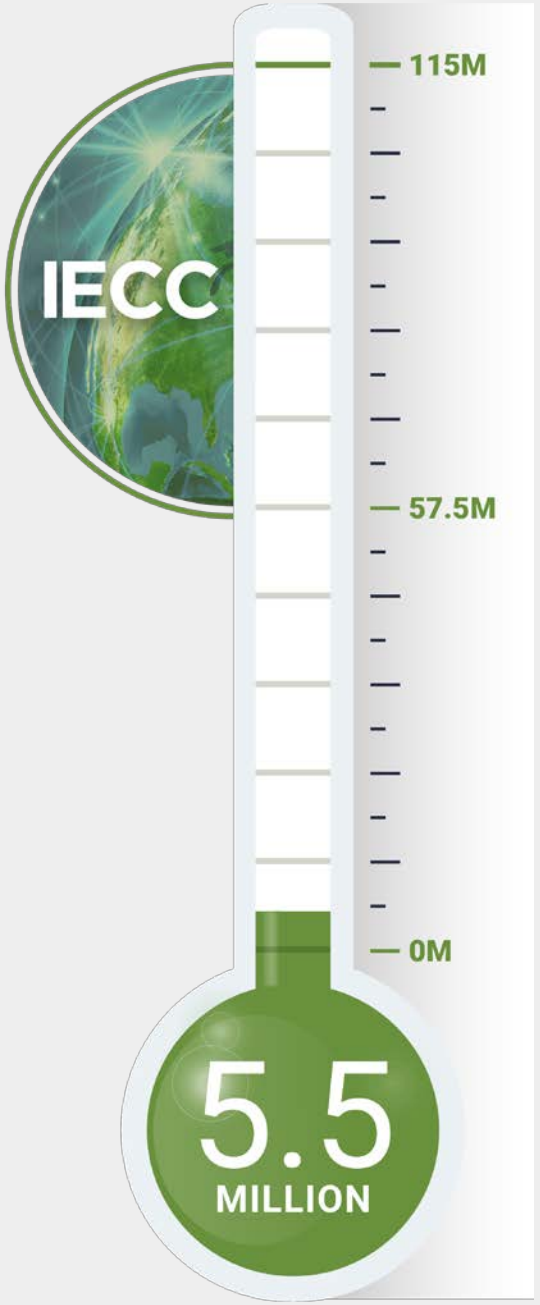


https://www.aceee.org/research-report/u2006

CODE ON A MISSION CAMPAIGN

2021 IECC Code on a Mission

Supporting Organizations



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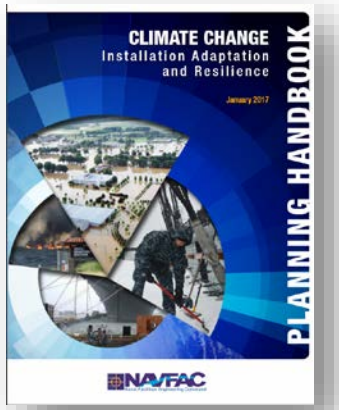
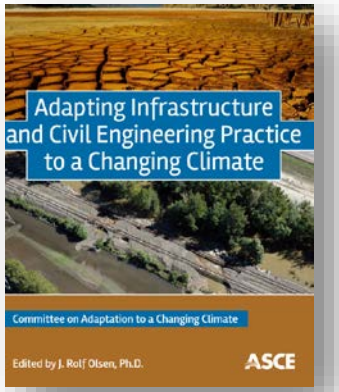
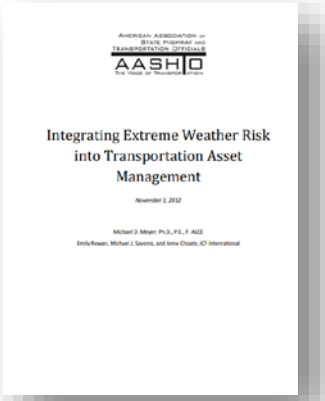
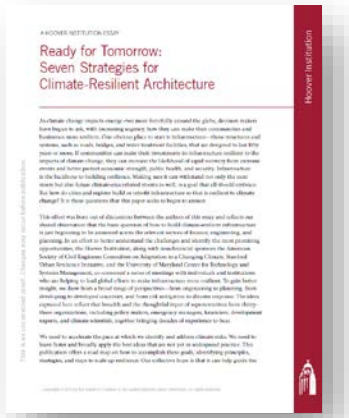
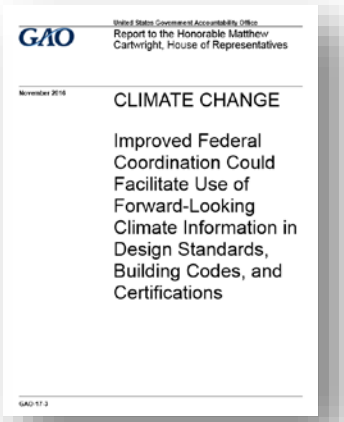
AN ESSENTIAL RESILIENCE ISSUE: DESIGNING FOR FUTURE RISK

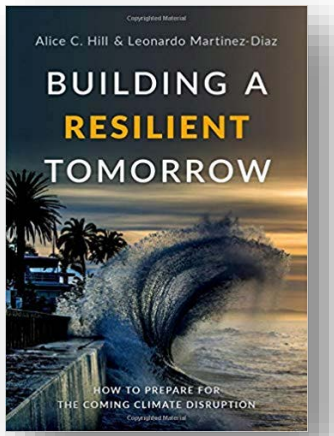


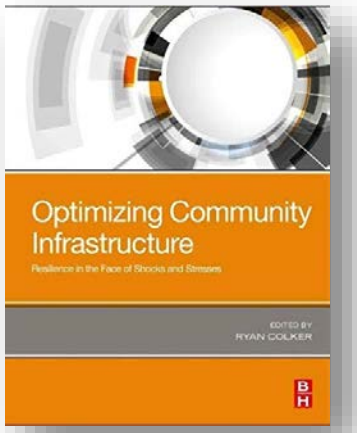


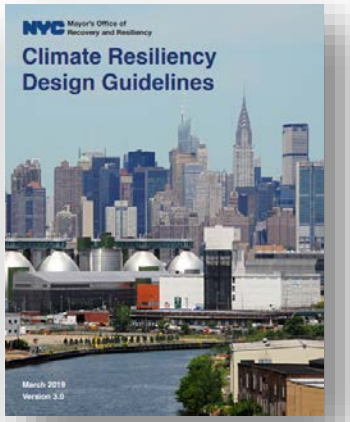




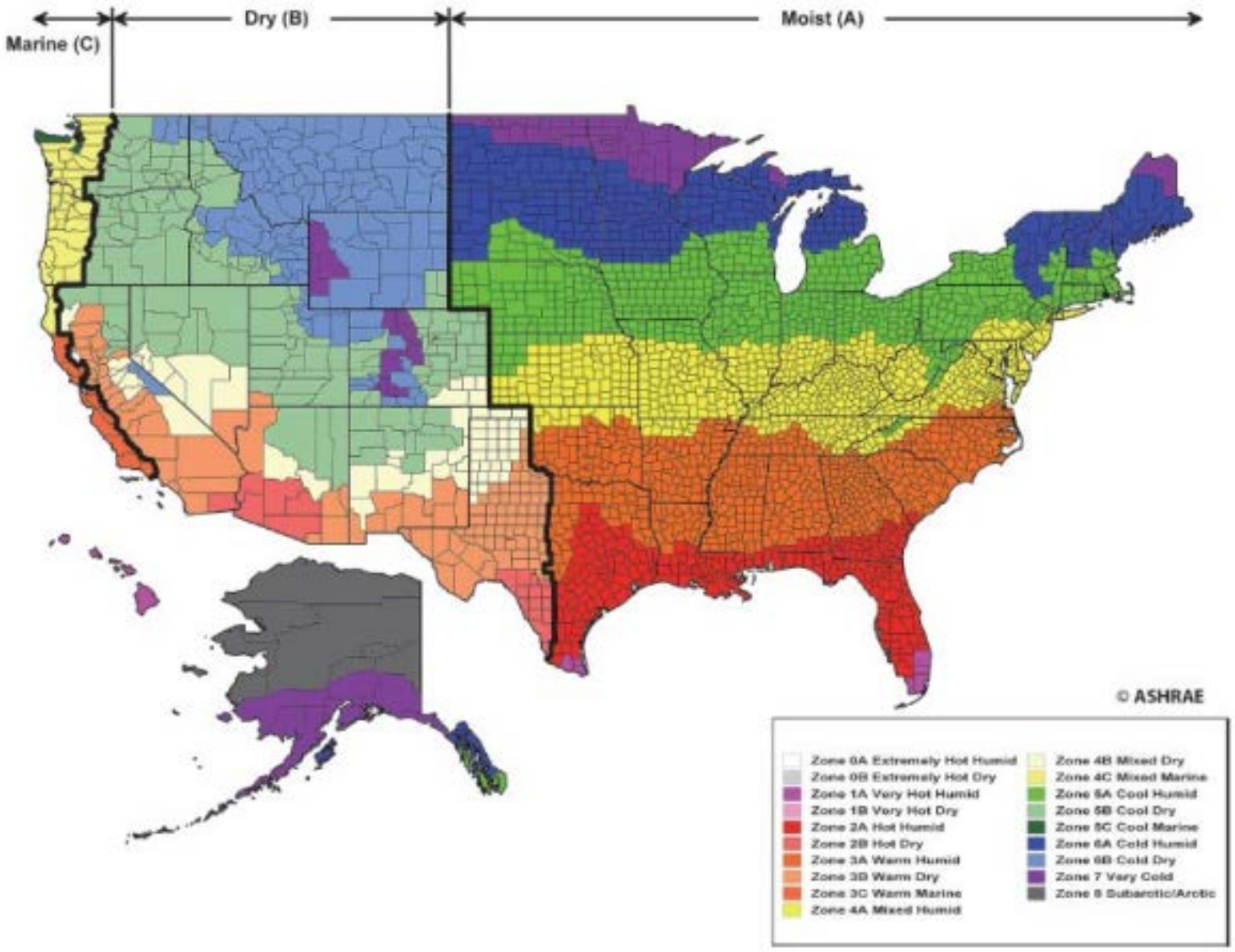








Climate Change and the Codes



IECC C301/R301

- ASHRAE 169-2013
- Creates Climate Zone 0
- Approximately 400 U. S. counties out of more than 3,000 were reassigned, most to warmer climate zones

BUILDING SAFETY JOURNAL

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Code Council launches global initiative on building resilience

NOVEMBER 22ND, 2019
by ICC

QUICK HITS

The International Code Council launched a new global initiative to bring together experts from the U.S., Australia, Canada and New Zealand to improve building resilience worldwide. This new collaborative forum provides a valuable opportunity for participants to discuss common struggles, and to share knowledge, research, and best practices, as they consider the role of building codes in resilience and durability in the face of increasingly severe weather events.

The Code Council hosted the first roundtable in Newport Beach, California, from October 29-30, 2019. The gathering included building code developers and experts in emergency management, climate science and resilience. The discussion was moderated by Alice Hill, Senior Fellow for Climate Change Policy at the Council on Foreign Relations. The group explored a broad range of issues such as extreme wind, rain, flooding, sea level rise, tidal surge, wildfires and heat stress, and how they create differing approaches to the regulation of buildings and building safety.

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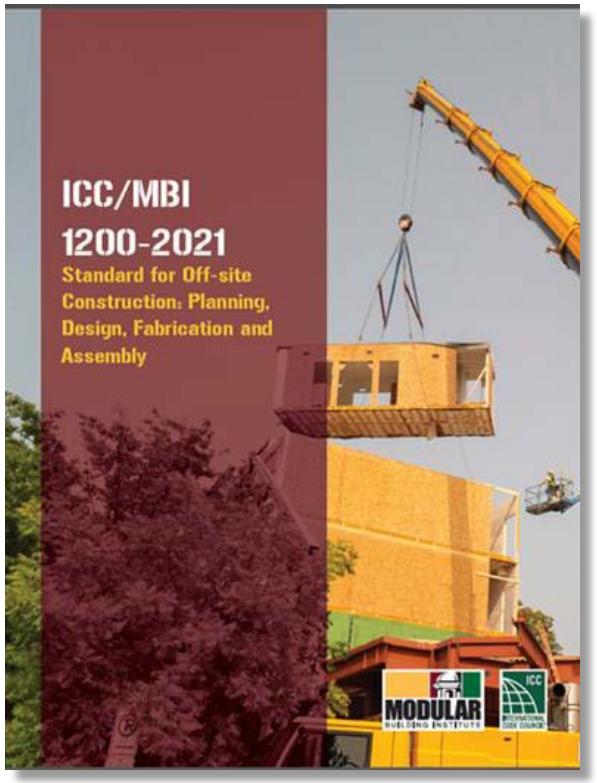

ICC/MBI Standard 1210 (upcoming)

Mechanical, Electrical, Plumbing Systems, Energy Efficiency and Water Conservation

https://www.iccsafe.org/offsite

CODE COUNCIL OFF-SITE RESOURCES (WWW.ICCSAFE.ORG/OFFSITE)

- Guideline 5-2019 Guideline for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components
- ICC/MBI 1200—Standard for Off-Site Construction: Planning, Design, Fabrication and Assembly
- ICC/MBI 1205—Standard for Off-Site Construction: Inspection and Regulatory Compliance
- FAQs on Off-Site Construction
- Learning Center Specialty Catalog on Off-Site Construction
- Digital Codes Premium Off-Site Resources (forthcoming)
- Conformity Assessment Services from ICC-ES, IAS, NTA

DIGITAL CODES PREMIUM

Energy Collection

ICC INTERNATIONAL CODE COUNCIL®

ASHRAE®

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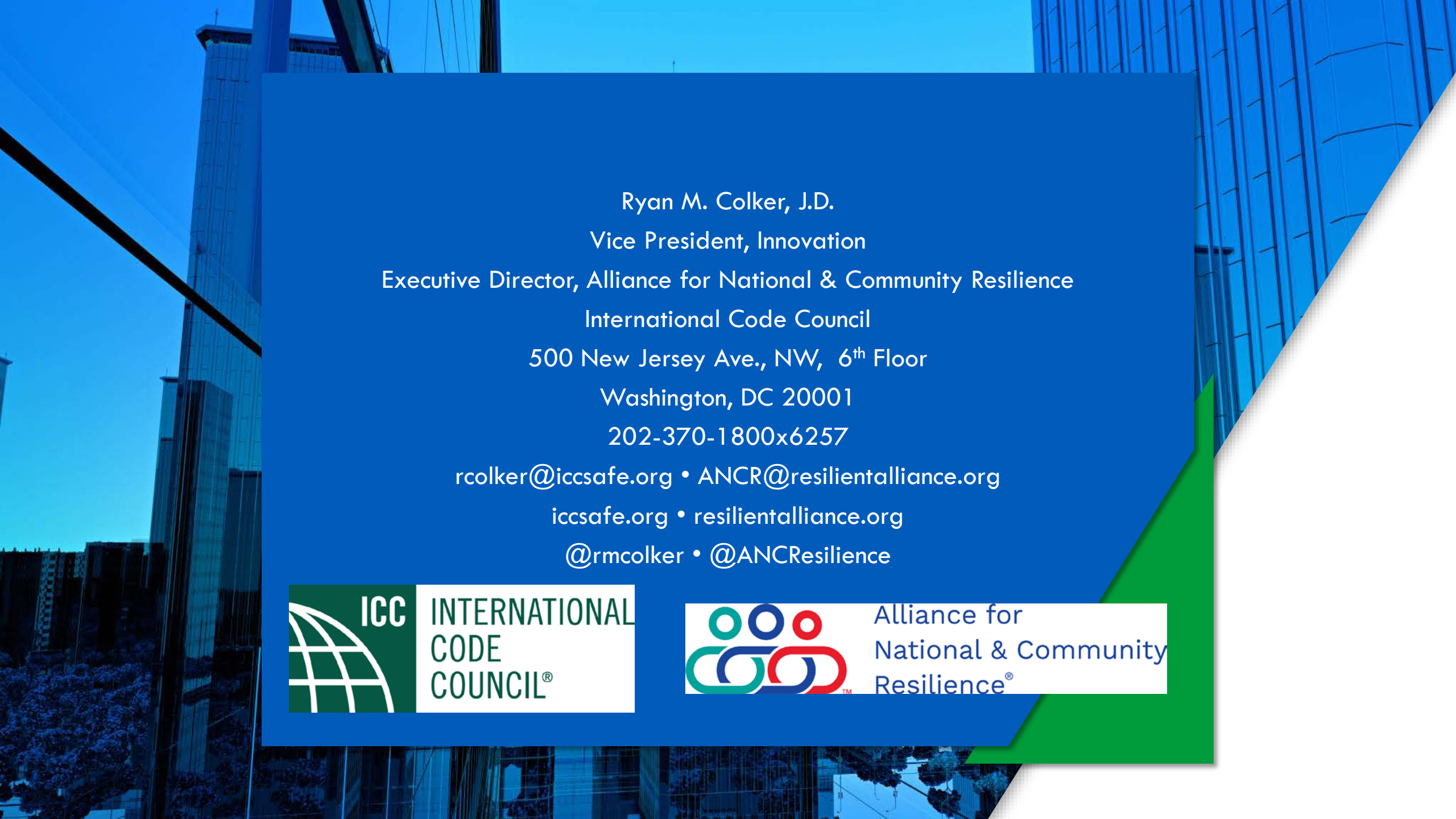

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Vice President, Innovation

Executive Director, Alliance for National & Community Resilience

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