

Pathways to Increased Local Resilience: Building Codes and FEMA Building Science Guidance

USGS MS River Science Forum | 16 February 2023



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Building Codes and Community Resilience

The application, adoption and effective enforcement of strong building codes and standards reduces damage



- Newer building codes and standards consistently demonstrate improved resilience over older ones
- Existing buildings can increase resilience through retrofits, renovations, rehabilitations or repair of buildings to newer codes and standards.

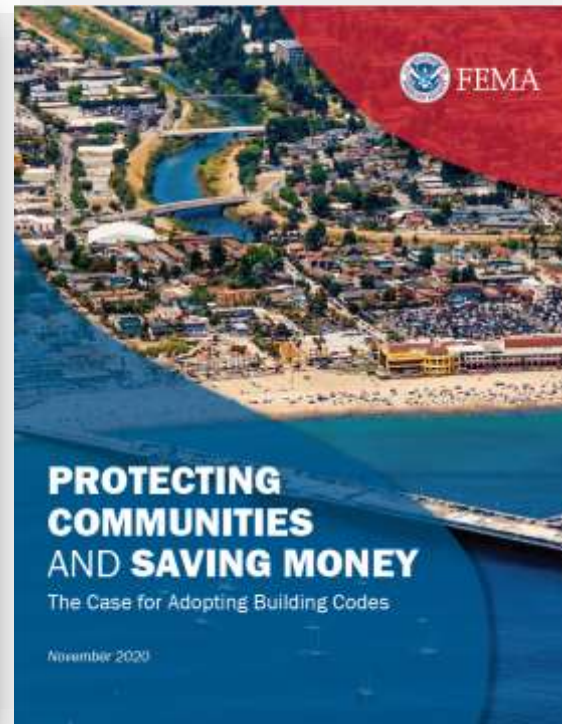
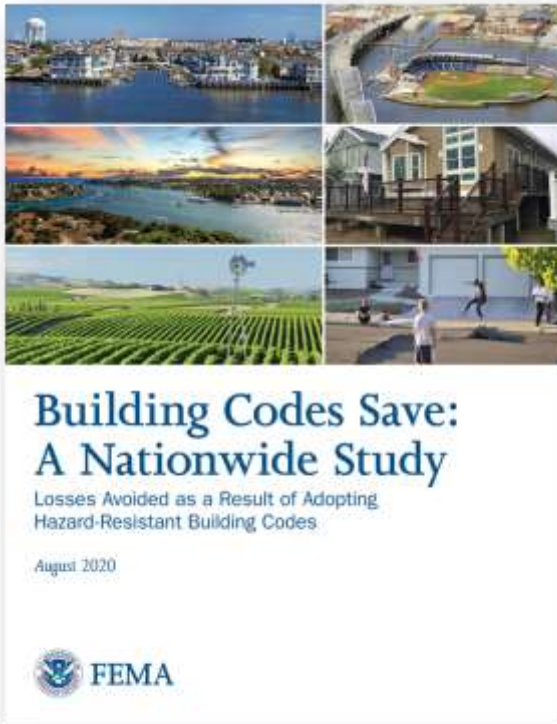


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Building Codes Save Lives & Money

Key Highlights

- Hazards: flood, hurricane wind, seismic
- **\$32 Billion saved over 20 years**
- **\$132 Billion in savings possible by 2040**
- Building and Contents damages only, just the tip of the iceberg!



FEMA Building Codes Strategy

Goal 1

Integrate Building Codes and Standards Across FEMA

- 1.1:** Understand stakeholder needs to identify opportunities that advance building code adoption and enforcement
- 1.2:** Advance building code research, including the impacts of climate change
- 1.3:** Use data-driven decision making to guide the application of building codes in program delivery
- 1.4:** Reduce future losses by implementing current building codes across FEMA policies and programs
- 1.5:** Leverage FEMA policies and programs to promote building codes, standards and community resilience
- 1.6:** Improve coordination and governance of building code activities throughout the agency

Goal 2

Strengthen Nationwide Capability for Superior Building Performance

- 2.1:** Establish and maintain building code expertise across FEMA
- 2.2:** Improve HQ and regional coordination before and after disasters
- 2.3:** Build the capability of external partners through funding, collaboration, training and exercises
- 2.4:** Expand support to underserved individuals and vulnerable communities to increase resilience

Goal 3

Drive Public Action on Building Codes

- 3.1:** Create unified, tailored, data-driven agency messaging on building codes
- 3.2:** Leverage partnerships to promote FEMA building code messaging
- 3.3:** Amplify climate science messaging to increase public demand for building codes and standards
- 3.4:** Target building code adoption and enforcement outreach to the most vulnerable communities

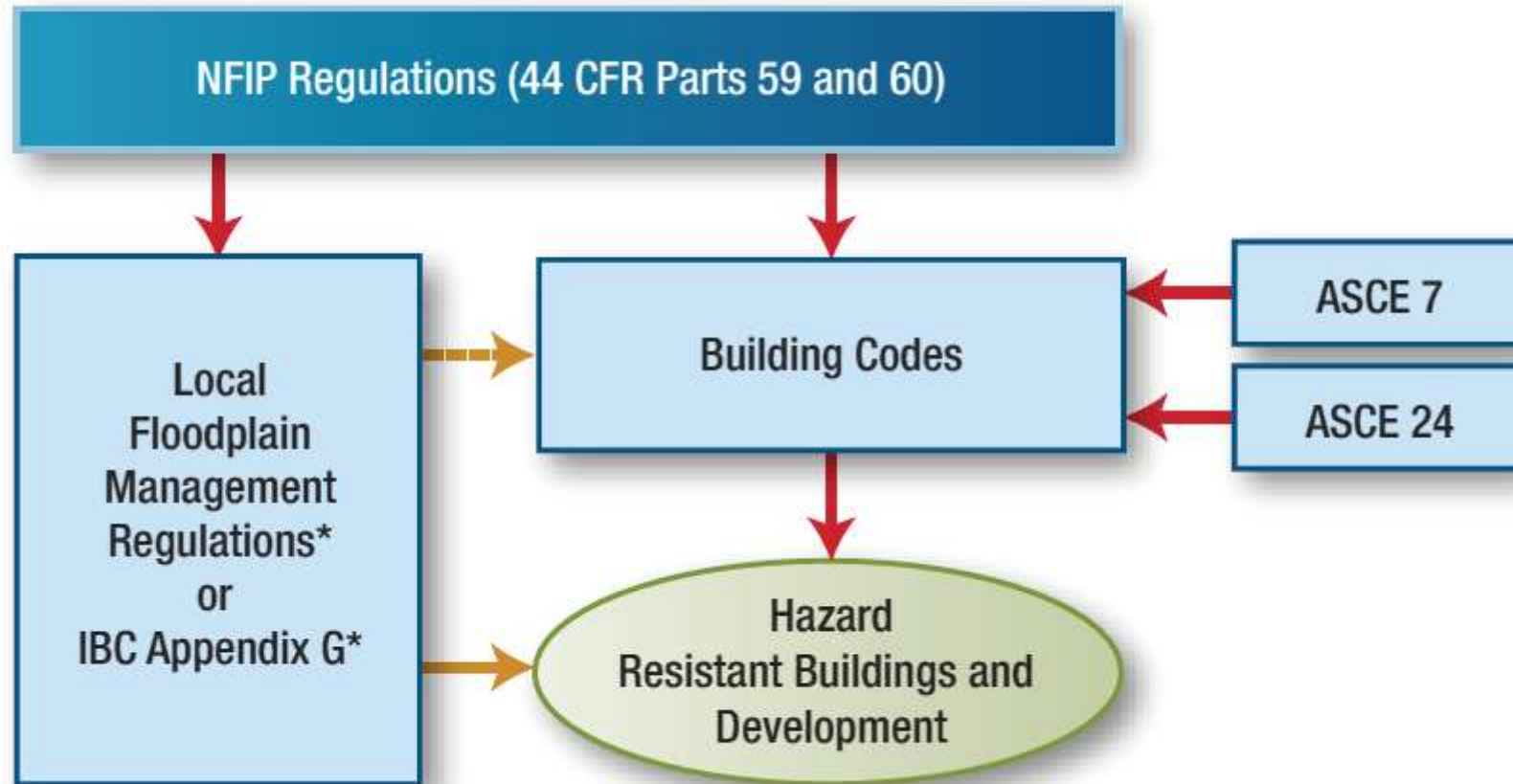
Vision: A resilient nation with superior building performance in disasters.

Mission: To coordinate and prioritize FEMA’s activities to advance the adoption and enforcement of disaster-resistant building codes and standards for FEMA programs and communities nationwide.



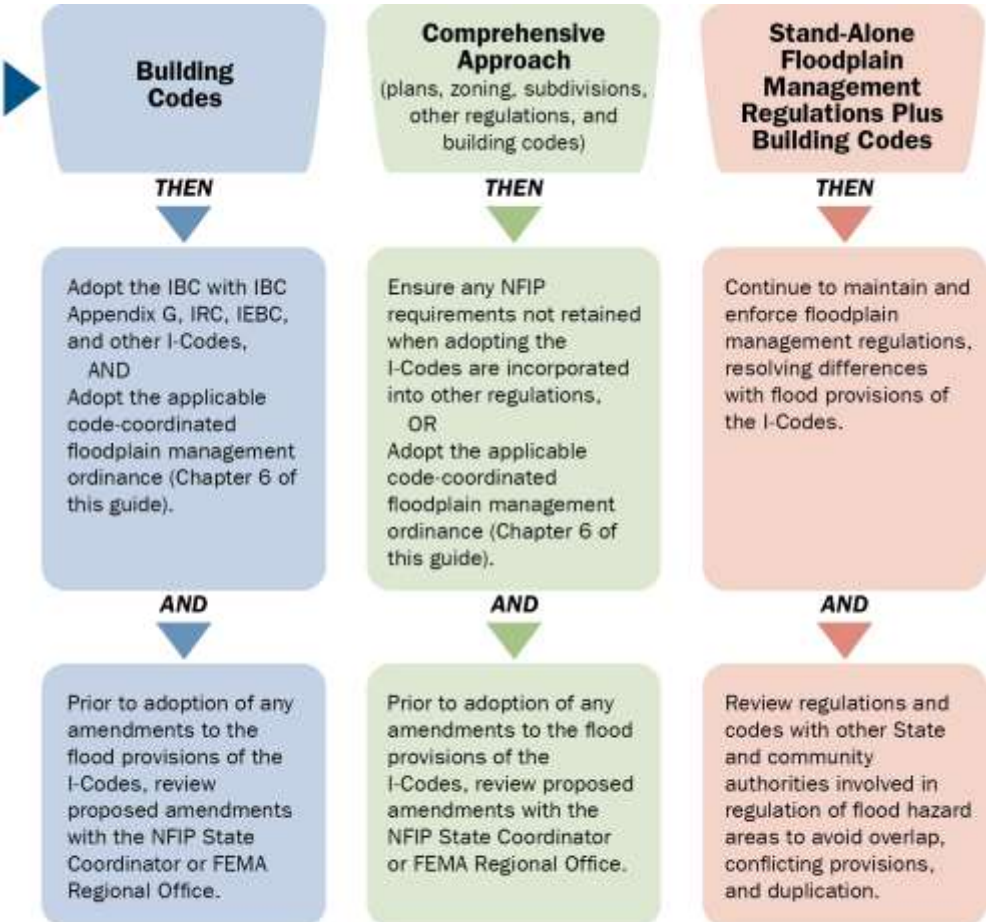
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Intersection of Building Codes, NFIP, Standards, and Floodplain Management



Community Floodplain Management Approaches

- **Building codes** – rely on I-Codes with IBC Appendix G and code-coordinated floodplain management ordinance
- **Comprehensive** – variety of planning, zoning, building codes, and other regulatory tools
- **“Stand-alone”** - floodplain management regulations plus building codes



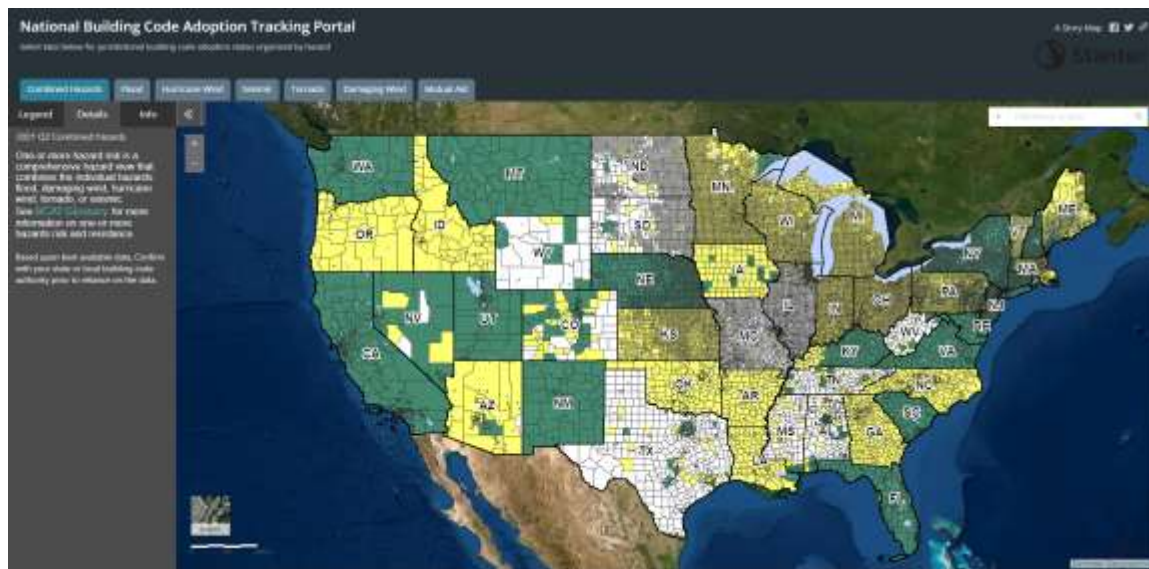
 [Reducing Flood Losses Through the International Codes](#)

NOTE: Take extra care if amendments to the flood provisions of the IBC, IBC Appendix G, IRC, IEBC, or other I-Codes are proposed. Amendments should be carefully reviewed to ensure the NFIP minimum requirements are maintained. Consult with the NFIP State Coordinator or FEMA Regional Office prior to adoption of amendments.

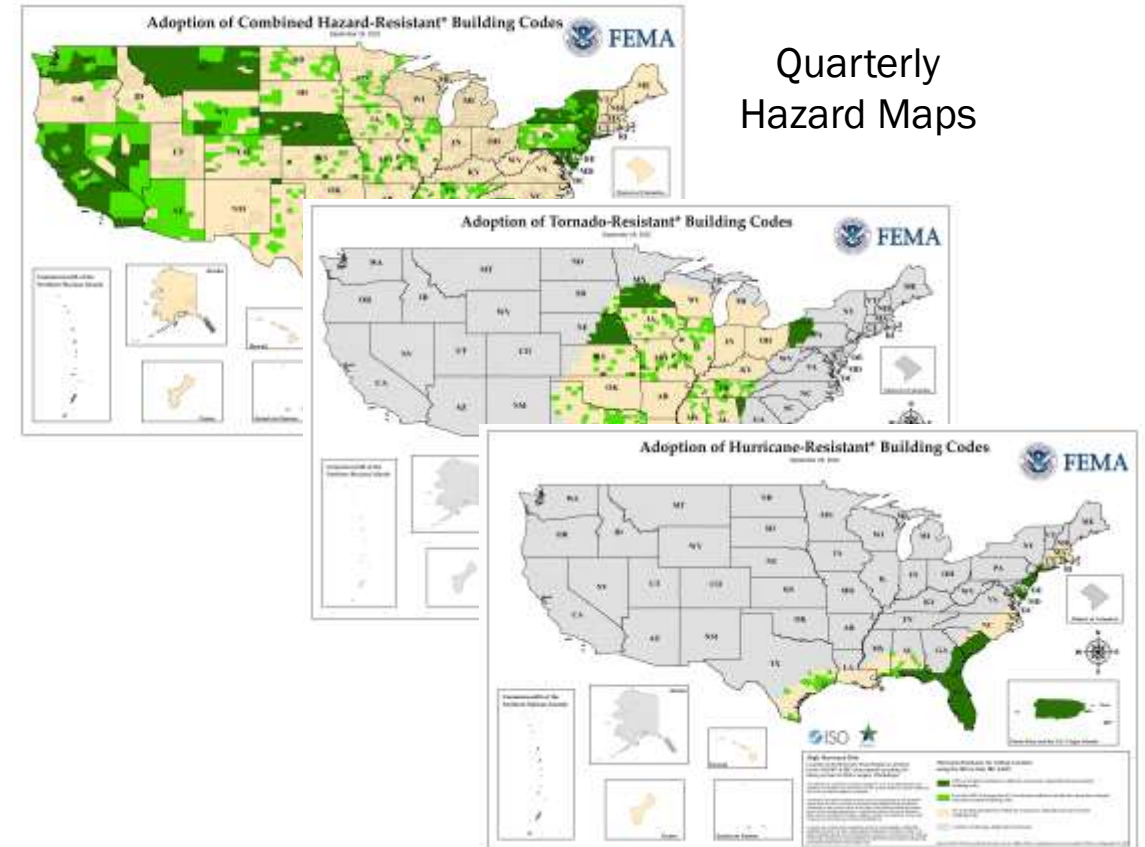


FEMA Building Code Adoption Tracking

While 2/3 of the Nation's communities have some type of building regulation, **less than 1/3 have adopted a current (2018 or later IBC & IRC) hazard-resistant building code.**



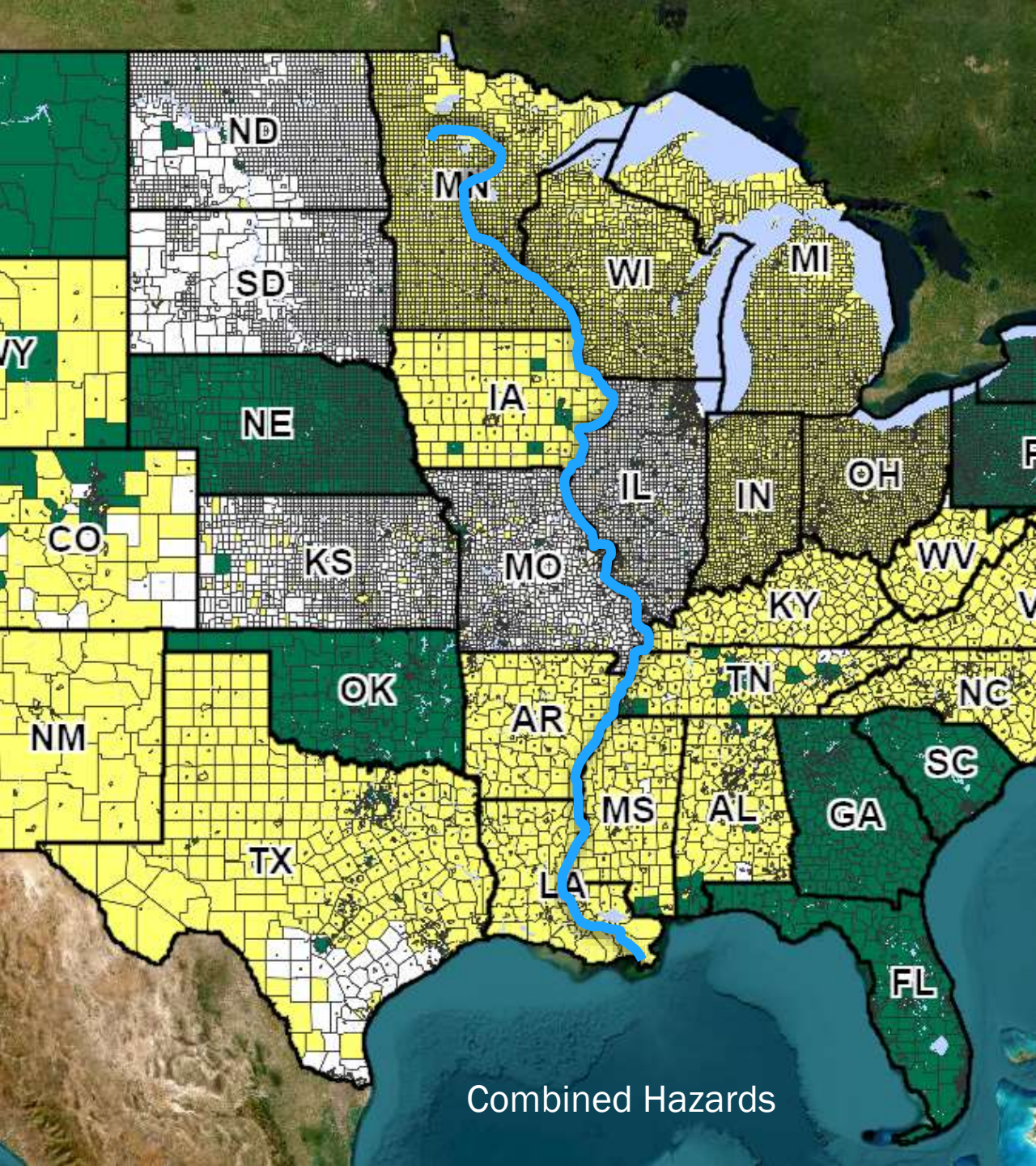
FEMA BCAT WebGIS Portal






Quarterly Hazard Maps



FEMA Building Code Adoption Tracking (BCAT) Portal



Combined Hazard Building Codes

-  No Building Code Data
-  Old or Weakened IBC/IRC, or No Code Adopted
-  2018 or later IBC & IRC

NFIP regulations and building codes represent minimums needed to address current risk. Exceeding the minimums reduces future risk.

Building Codes Adoption Playbook

Who should use it?

- Officials involved in adopting and enforcing building codes.

What is included?

- Guidance on the adoption of the most current model building codes to mitigate damage and loss
- Provides general knowledge on the importance of building codes, general steps to adopt and enforce them, information on FEMA grants and references to additional resources.



Building Codes Adoption Playbook

For Authorities Having Jurisdiction

FEMA P-2196 / August 2022



Learn more and scan the QR code now to access FEMA's Building Codes Adoption Playbook!



Building Resilient Infrastructure and Communities (BRIC) Grant

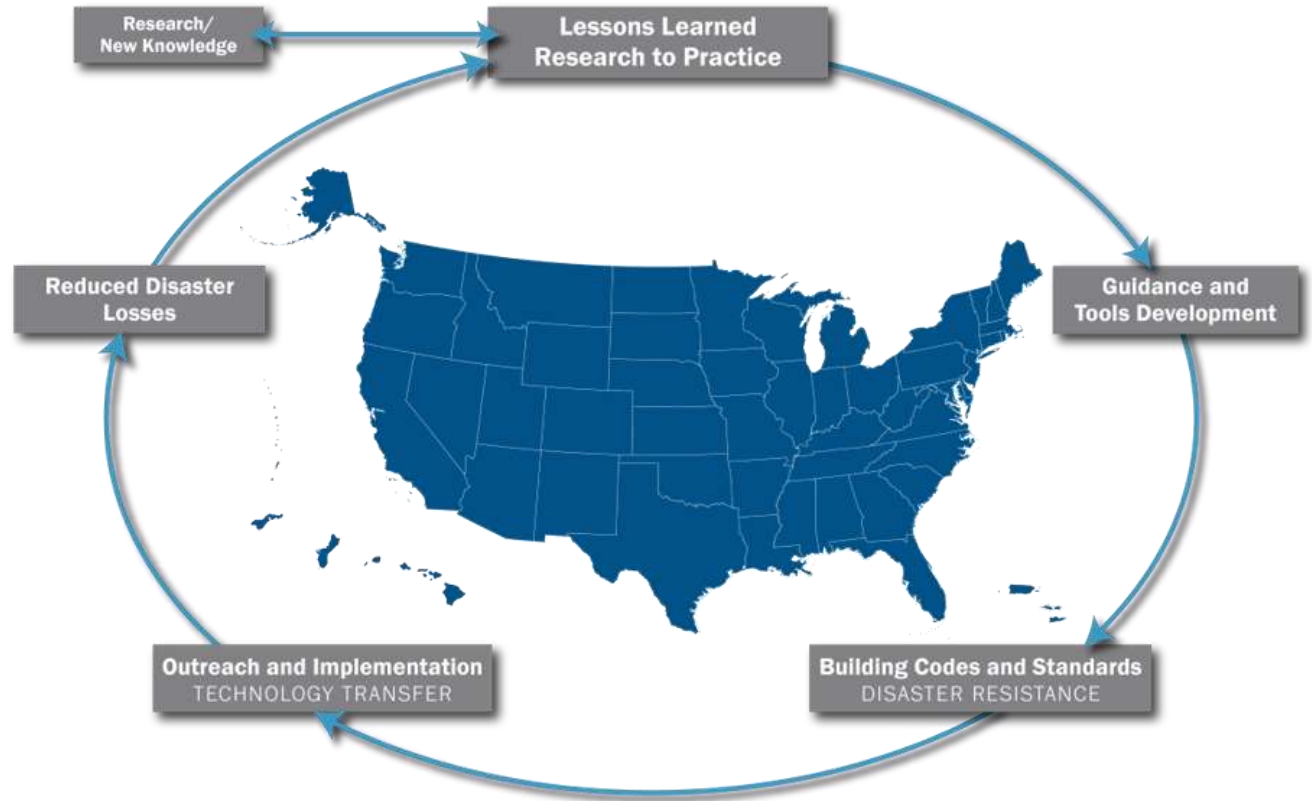
- **Competitive** grant program for SLTTs (state, local, tribal, and territorial)
- **Requires** projects to use **latest** published versions of **codes and standards**
 - Per DRRA 1234, “latest” means the 2 most recently published editions e.g. 2018 or 2021 I-Codes are currently required
 - The sunset date set forth by the law may have implications for the above definition.
- **Projects may include:**
 - Capability & capacity building (C&CB) activities
 - Includes building code adoption and enforcement activities
 - Mitigation projects
 - Management costs



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Role of FEMA Building Science

- Supports development, adoption, and defending of **building codes and standards**
- Develops multi-hazard mitigation **guidance**
- Conducts post-disaster building **performance assessments** and support services
- Conducts **education and outreach**



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FEMA MATs: Field to Practice Feedback Loop

Building Science Disaster Support (BSDS) Program

- The **Mitigation Assessment Team (MAT)** performs the work of the BSDS Program.
- The **MAT** evaluates post-disaster building performance and develops recommendations that:
 - Improve codes/standards/materials
 - Identify gaps in knowledge, testing, research
 - Promote best practices and successes
 - Provide guidance for homeowners, design professionals, code officials, local/state officials, building owners & operators, decision makers, FEMA, Non-profits, Other Federal Agencies, others as needed



Fort Myers Beach
Hurricane Ian, 2022



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Data Gaps and Areas of Concern

- **Climate change** impact on hazards
- **Building envelope** deficiencies
 - Window and door abilities to resist wind driven rain
- **Critical facility** design and performance
 - **Loss of utilities** adversely impacting operations
 - Insufficient and inadequate **shelter availability**
- Improved public messaging to **increase compliance with evacuation** or shelter-in-place orders
- Buildings outside and adjacent to flood zones can still be highly susceptible to flood damage
 - **Increased risks** associated with developments in and near floodways



Image: High wind rated roll-up door



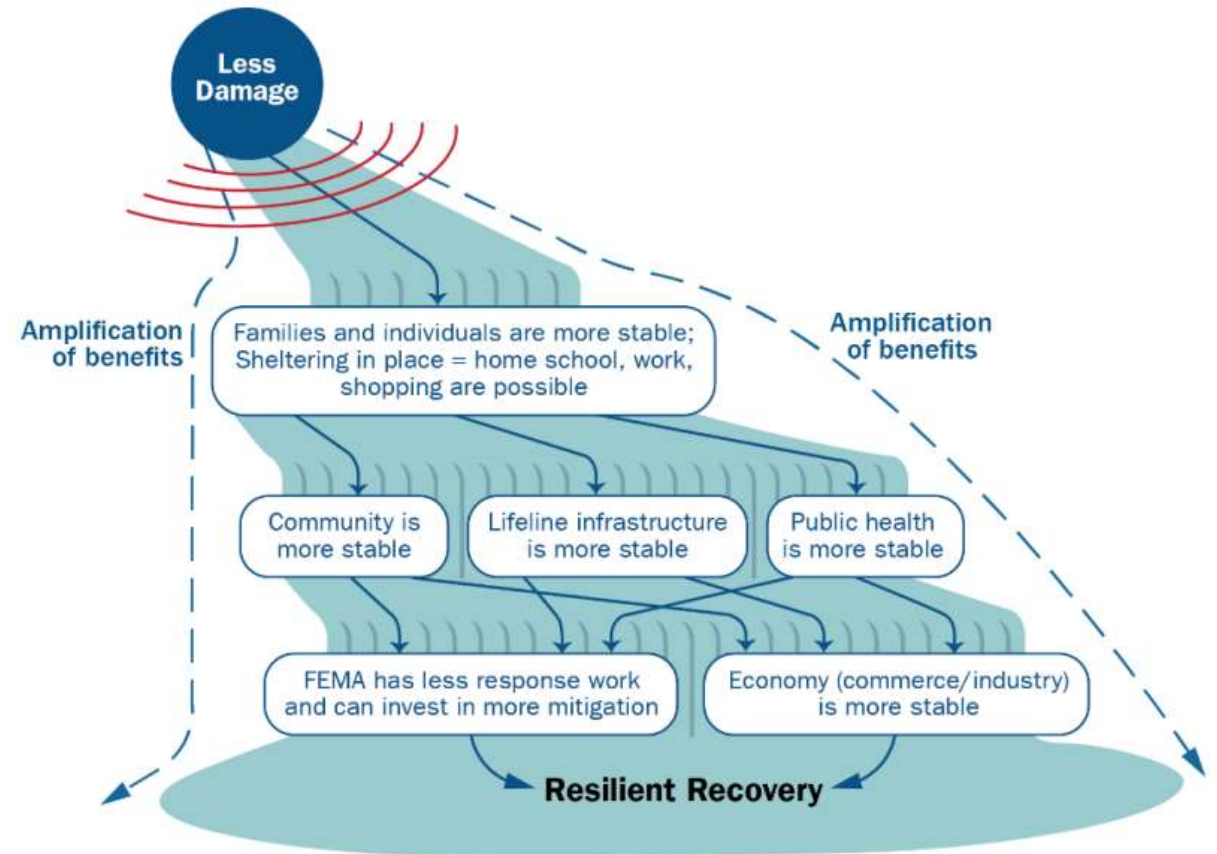
Image: ICC 500 storm shelter doors



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Next Steps - General

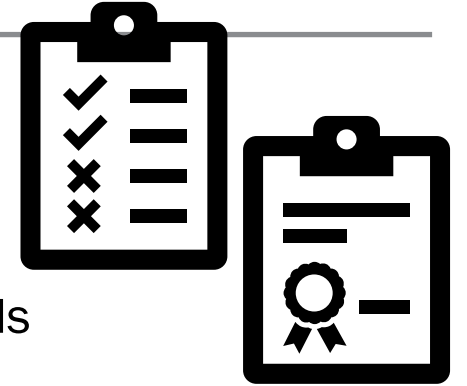
- Floodplain management (FPM) regulation updates forthcoming
- FEMA to help build the capability of external stakeholders through funding, collaboration, training, and exercises
- Industry supported advancements in building codes and standards
 - Through cross-functional collaboration and research
- FEMA to continue to perform **BSDS & MAT activities** as needed



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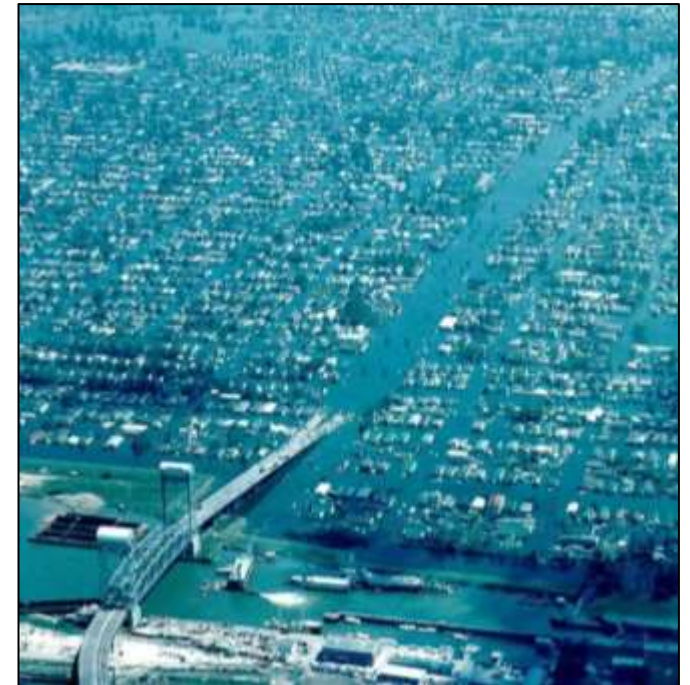
Next Steps - SLTTs

- Become aware of the **FEMA Building Codes Strategy Goals & Objectives**
- **Apply, adopt, and effectively enforce the latest building codes** in your AHJ
 - Utilize Disaster Recovery Reform Act (DRRA) Section 1206, BRIC, and PA funds
 - DRRA 1206 is available up to 180 days after a major disaster declaration
- **Utilize** BRIC, HMGP, STORM ACT, CDBG or other **grant funds** where possible
- **Update State and Local Mitigation Plans** to address known vulnerabilities, gaps, and issues
- Provide or request **building code training**
- Develop SLTT **preparedness exercises** to test building code, enforcement related injects to help improve community response, recovery, mitigation, and preparedness capabilities



Resources Needed to Advance Improving Local Resilience

- A different avenue to the DRF to more **quickly secure funding** that will enable the Building Science Disaster Support Program's MAT quicker access into the field to **conduct building performance assessments** after a natural disaster
- **Dedicated** resources to support with **building code adoption and enforcement**
- **Dedicated or additional resources to advance multi-hazard resilience** of the following programs:
 - NEHRP – seismic
 - NWIRP – windstorm
 - **Hazard gaps – flood, fire, etc.**
- **Additional funding for Community Assistance Program – State Support Services Element (CAP-SSSE)**
 - Increased capabilities to implement **resilient zoning and planning measures**



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Thank you!

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