

Symposium on Disaster Data Science

FEMA's Data Strategy, Desensitized Data Sharing, and Data Modeling



FEMA

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What's in the FEMA 2023-2027 Data Strategy?



VISION

FEMA'S NORTH STAR

An insightful organization empowered and resourced to leverage data and advanced analytics at all levels of decision making before, during, and after disasters.

STRATEGIC GOALS

SETTING THE COURSE

1. Data Enablement
2. Data Citizenship
3. Data Access and Security
4. Evidence-Building



GUIDING PRINCIPLES

RULES OF THE ROAD



1. FEMA will regard data as a strategic asset of the federal government, SLTT governments, and the American people.
2. FEMA will securely share data by default and prioritize data access.
3. FEMA will safeguard the information privacy and confidentiality of survivors, communities, and FEMA personnel.
4. FEMA will ensure the quality, integrity, and useability of data throughout the data lifecycle.
5. FEMA will foster a data-driven culture that infuses data and analytics into decision making.
6. FEMA will harness the full value of data through evidence building activities.
7. FEMA will embody its core values and ethics as data citizens.

[Click here to read the Data Strategy](#)



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In 2023 FEMA published a Blanket PTA for Sharing Desensitized data

FEMA required efficient sharing of data with FSLTT partners, NGOs, and the public

- This will decrease the review processes and time it takes to share critical data to stakeholders

FEMA is bound by US law to protect personal information (PII)

- The PTA provides approved methods to protect PII without the need to review every data element

FEMA's projects/programs can achieve short-term goals without disclosing PII

- PTA establishes numerous approved desensitization techniques to enable programs to meet various data sharing needs

An objective of FEMA's 23-27 Data Strategy is to securely share data by default

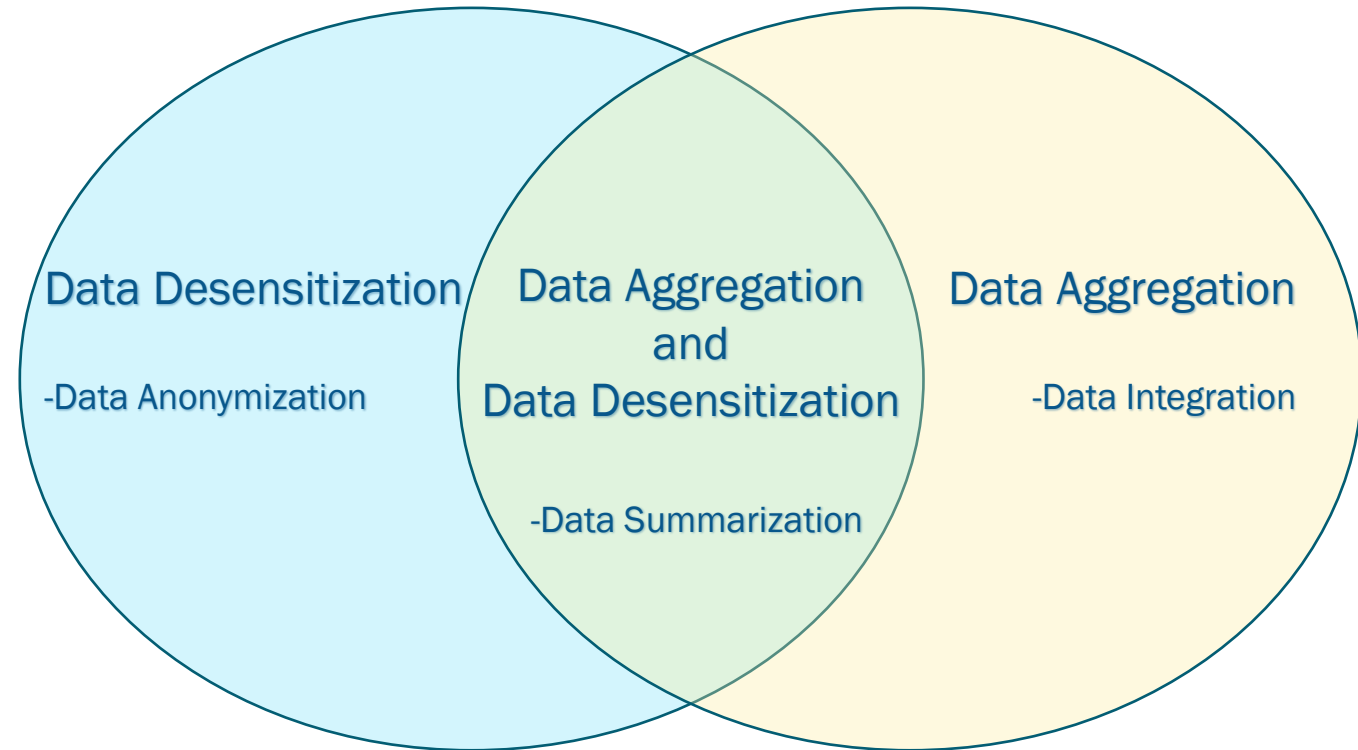
- This PTA enables programs to plan and develop aggregate and desensitized data products that will not require additional PTA and privacy reviews within scope.



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Confusion around Data Aggregation and Data Desensitization

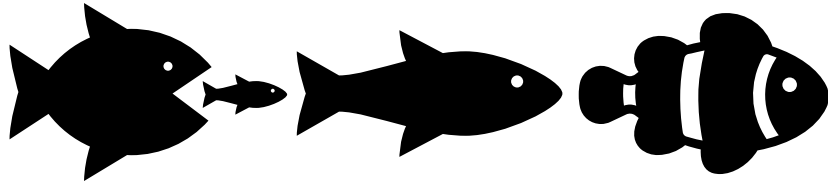
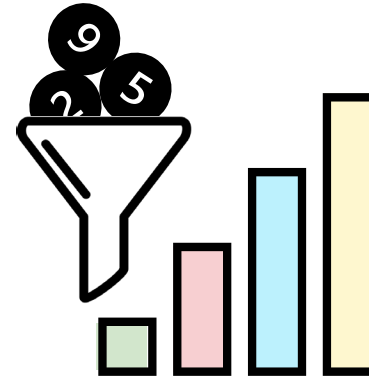
- Raw data can be
 - Aggregated by either integration or summarization.
 - Desensitized by anonymization or summarization.
- Summarization is both aggregation and desensitization
 - Anonymization is just desensitization
 - Integration is just aggregation.
- This PTA does not cover integration standalone
 - Data integration, to be covered, must be combined with a method of summarization and anonymization



Methods of Data Summarization

Attribute Bucketing

Clustering data values, such as age and income, into ranges to hide exact amounts.

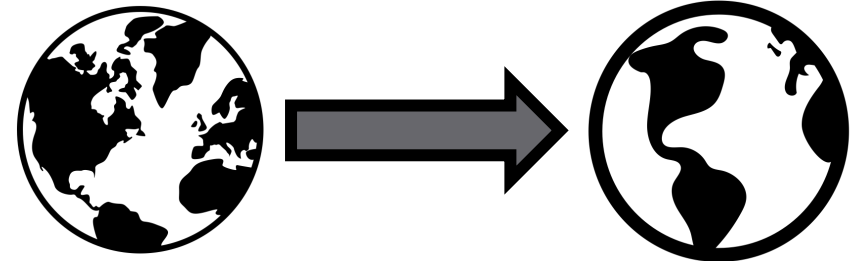


Arranging data values of similar or the same category or geography to be represented together

Category And Geography Grouping

Precision Reduction

Lessening accuracy of a location by removing decimal places for latitudinal and longitudinal coordinates.



FEMA's Threshold Bracketing i.e., 10 or Less Rule

Summarizing data elements from a population of 10 or less records, may be insufficient to protect sensitive information. In these scenarios, FEMA personnel must also employ anonymization methods, such as masking or redacting, to summarized values.

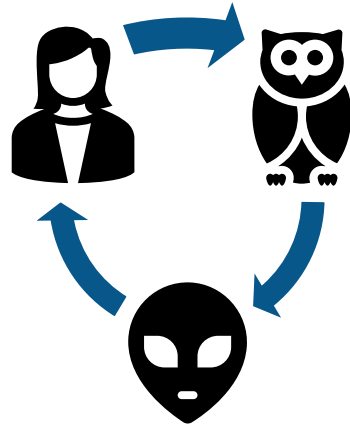


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Methods of Permanent Data Anonymization

Redaction

Removing identifiable information (e.g., name and address) to allow selective disclosure of data

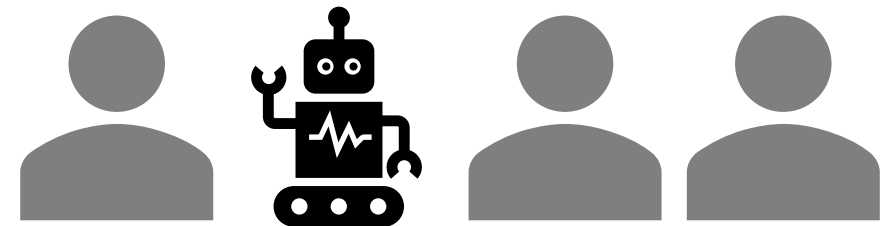


Trading data details while the underlying statistics are preserved

Data Swapping

Synthetic Data

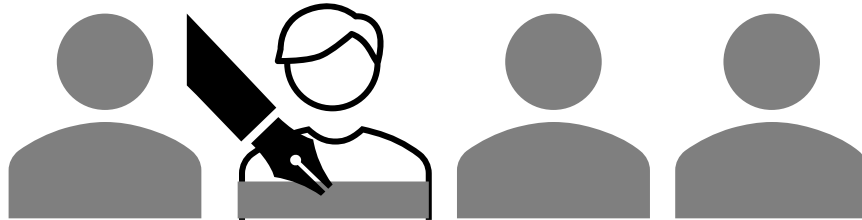
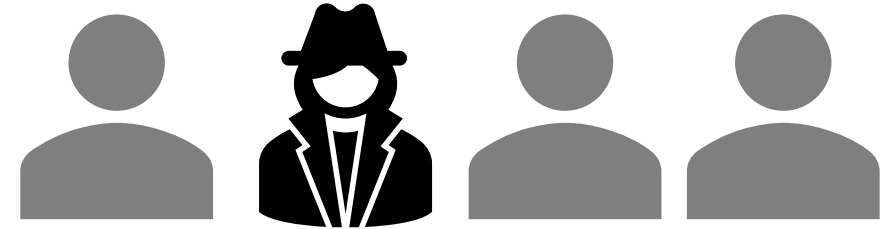
Generating completely artificial data that retains statistical properties of the real data



Methods of Reversible Data Anonymization

Pseudonymization

Replacing personally identifiable data elements with pseudonyms or “non-unique identifiers

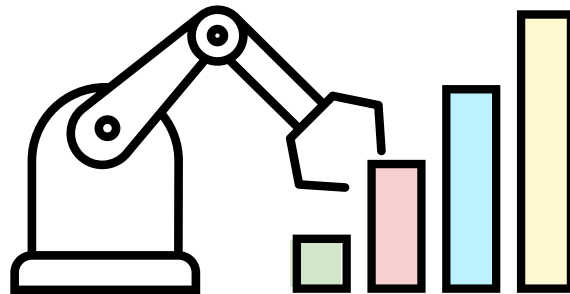
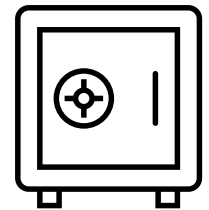
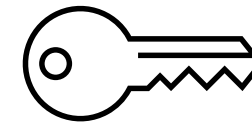


Modifying identifiable data so that it is of little to no value for unauthorized users, but remains meaningful to authorized users

Data Masking Or Data Obfuscation

Encryption

Transmuting existing data into ciphertext, which can be decoded with a decryption key



Manually or automatically substituting an identifiable data element with a non-sensitive equivalent which has no natural or usable meaning or value

Tokenization

Natural Hazards Risk Assessment Program, National Risk Index, and Hazus

Natural Hazards Risk Assessment Program Goals

1

Institutionalize an innovative and integrated risk assessment process to link risk with policy and program implementation

2

Leverage partnerships with hazard identification experts and other FEMA program areas to promote use of credible risk assessment data and practices

3

Empower states, local governments, tribes, and territories to reduce disaster suffering and to contribute to a more resilient nation

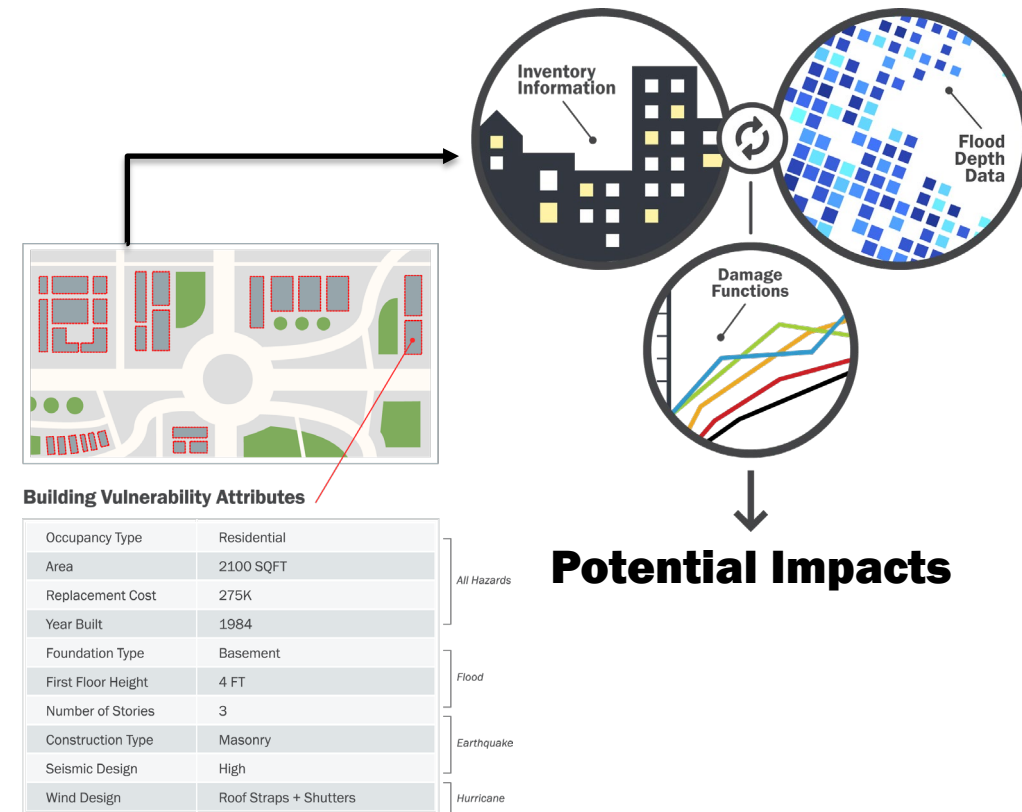


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Hazus and OpenHazus

- FEMA's Hazus software provides authoritative data, tools, methods, and guidance for risk assessment and communication to the emergency management community
- Standardized tools and data for estimating risk from earthquakes, floods, tsunamis, and hurricanes
- Bottom-up approach for Risk Assessment and ability to analyze hazard risk and impacts at the structure-level
- Provides the ability to develop multiple mitigation scenarios to evaluate potential mitigation strategies and actions.

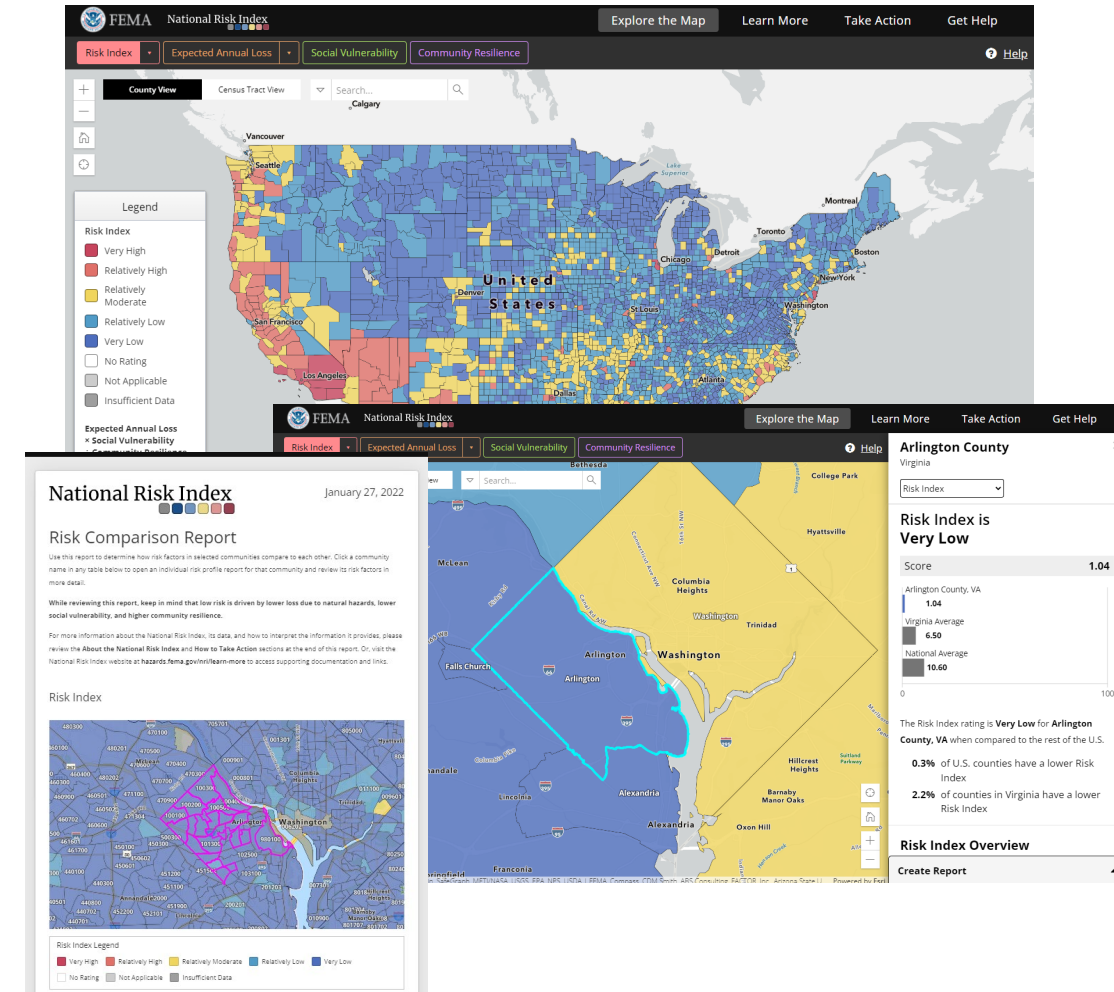
HAZUS™



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National Risk Index

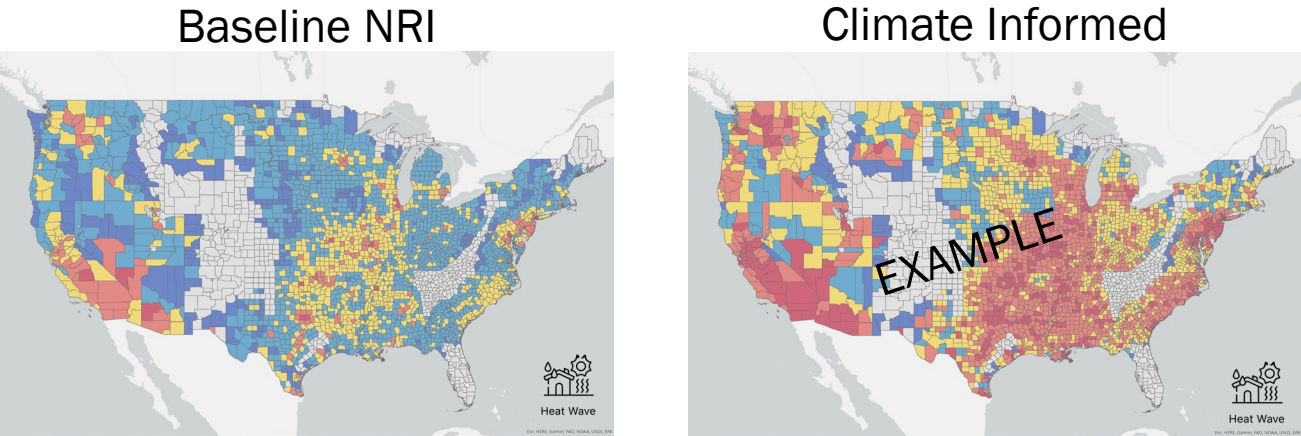
- Online mapping application that identifies communities at risk to natural hazards
- Reduces the cost of risk assessment allowing community planners to prioritize action and investments
- Provides pre-calculated, top-down national baseline risk assessment with free and comprehensive data across the U.S.
- Allows for easy and effective dialogue around all hazards risk for a community by incorporating Social Vulnerability and Community Resilience



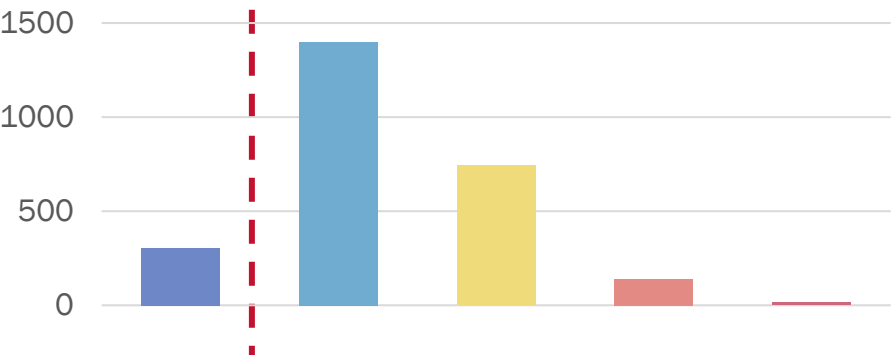
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Climate-Informed National Risk Index

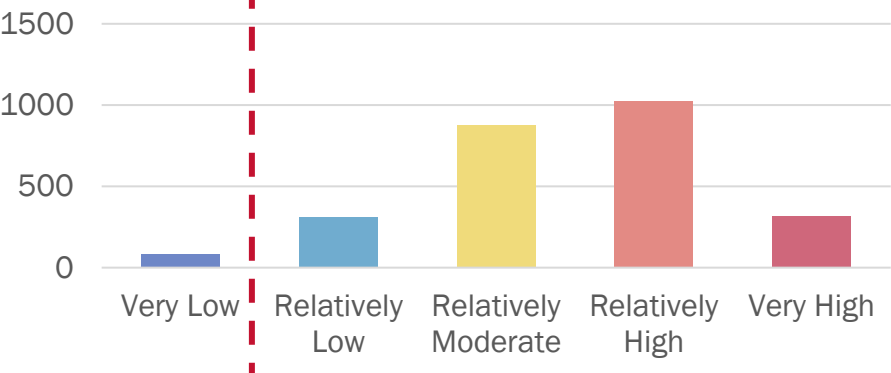
In order to show how hazard risk changes as a result of climate change, Adjusted EAL and Risk Values are sorted into Base NRI Rating Bins using Fixed Thresholds.



Base National Risk Index



Climate Informed



Fixed Bin
Thresholds

The **goal** of the Community Disaster Resilience Zones Act is to **build disaster resilience** nationally **by driving federal, public, and private resources to underserved communities** especially at risk to natural hazards.



Vision

Strong and thriving communities resilient to climate change and natural hazard impacts



Mission

Harness the power of collaboration to accelerate resiliency in the nation's most vulnerable areas



Aspiration

Groundbreaking Public-Private Resilience Innovation Ecosystem aligned for Collective Impact

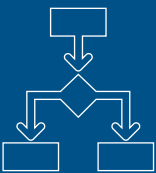


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Cross-cutting Principles:

- Protect the Nation's Most Vulnerable
- Community-Driven
- Cross-sector Partnerships
- Disruptive Innovation



Strategic Outcomes:

- ✓ Fiscally and Socially Sound Investments
- ✓ System-wide Aligned Progress
- ✓ Enhanced Community Capacity
- ✓ Strengthened Assets

The National Risk Index

Discover the landscape of natural hazard risk in the United States.

The National Risk Index Map

Use the interactive National Risk Index Map to visually explore natural hazard risk data across the United States.

[Explore the Map](#)

What Is the National Risk Index?

Gain insight into what the National Risk Index is, how it's made possible, and how it can help.

[Learn about the National Risk Index](#)

Frequently Asked Questions

Review answers to questions that have been asked about the National Risk Index.

[Check the Frequently Asked Questions](#)

Determining Risk

Gain an understanding of the risk equation and data supporting the National Risk Index.

Expected Annual Loss

Natural hazards - including flooding, earthquakes, wildfires, and more - are factored into the National Risk Index as Expected Annual Loss.

Access the National Risk Index

- NRI Application - <https://www.fema.gov/nri>
- CDRZ Platform - <https://www.fema.gov/cdrz>
- Hazus - <https://www.fema.gov/hazus>

Thank You

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National Risk Index



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