



University of Colorado Boulder

Start with the *Why*:

Gaps and Priorities in Hazards, Risk, and Disasters



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NSF Award #1635593, #2536173, #1841338



Natural Hazards Center



CONVERGE

Start with the *Why* of the Enabling Program

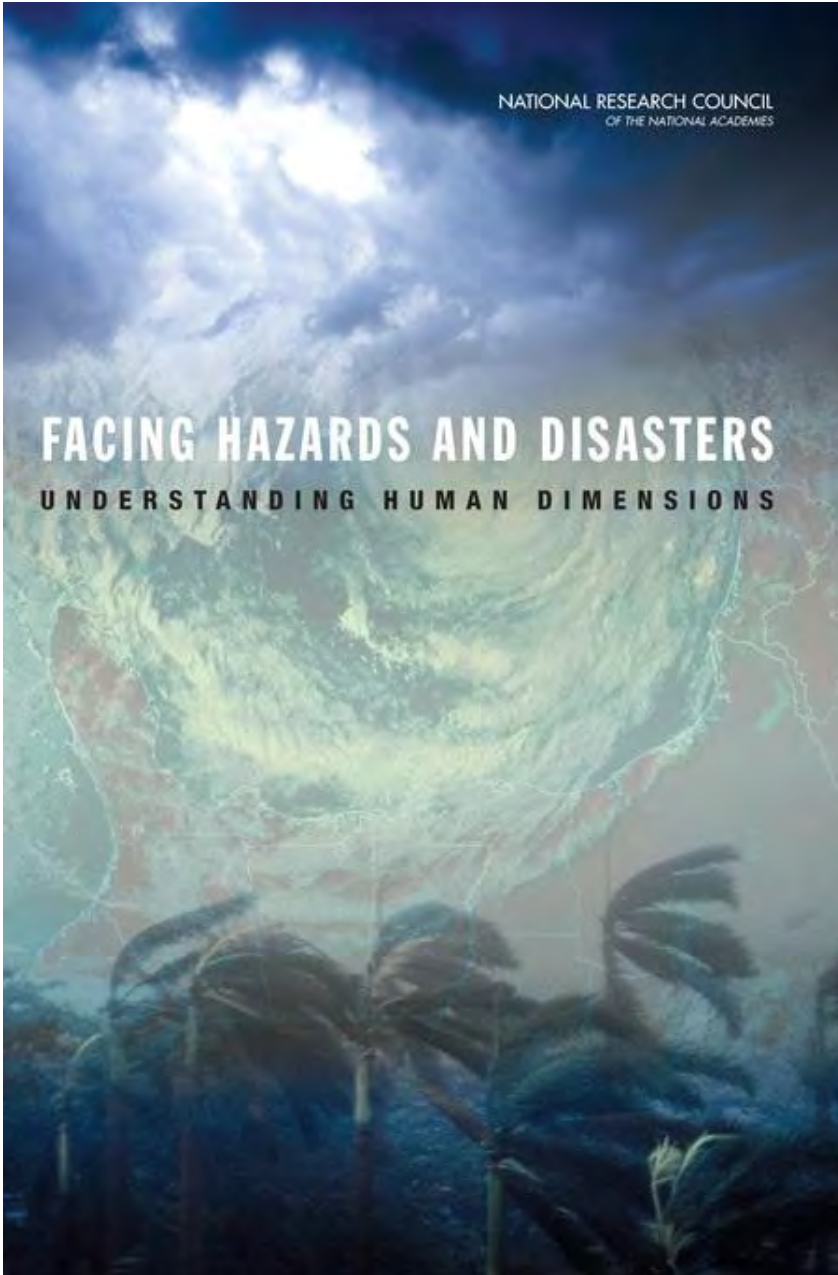


Happy 30th
anniversary
to the
**Enabling
Program!**

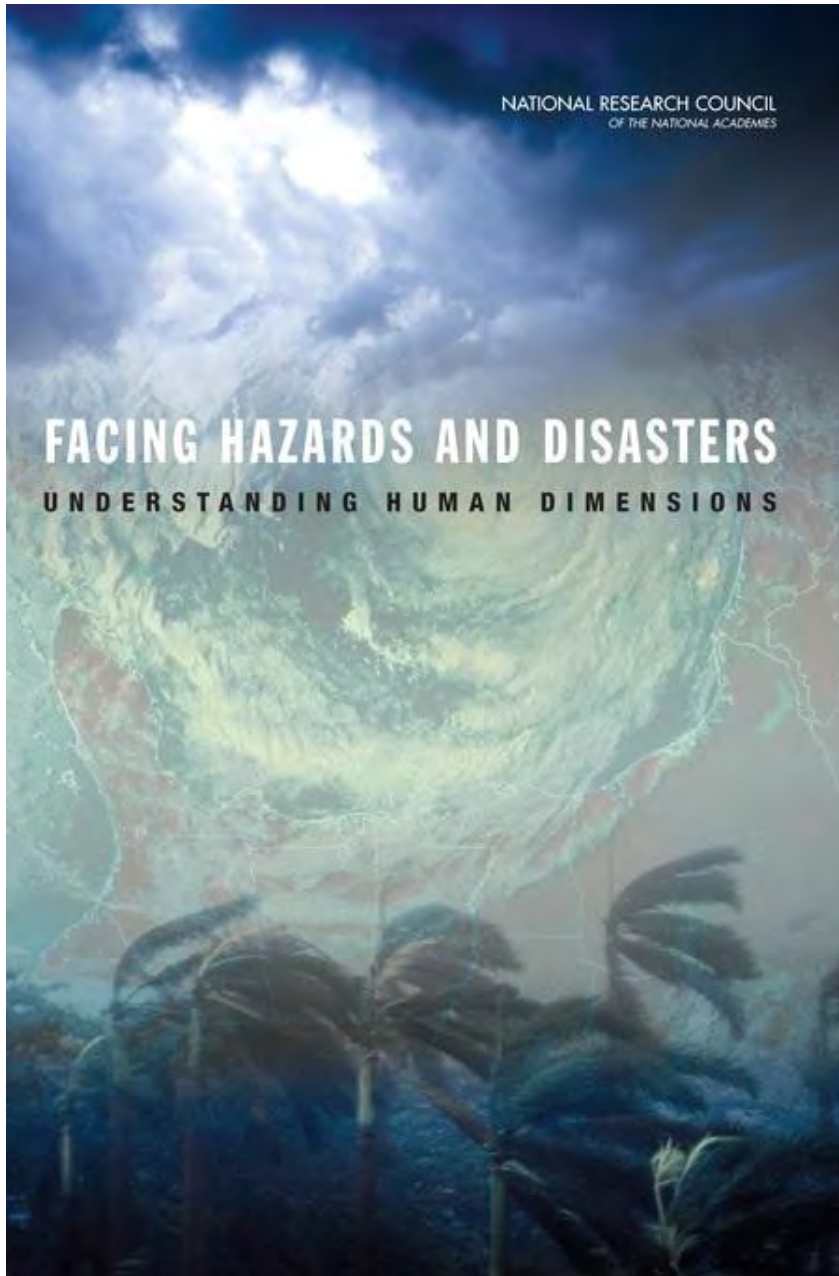


Q: Why has the
National Science
Foundation (NSF)
funded the
Enabling Program
6 times over the
past **30 years?**



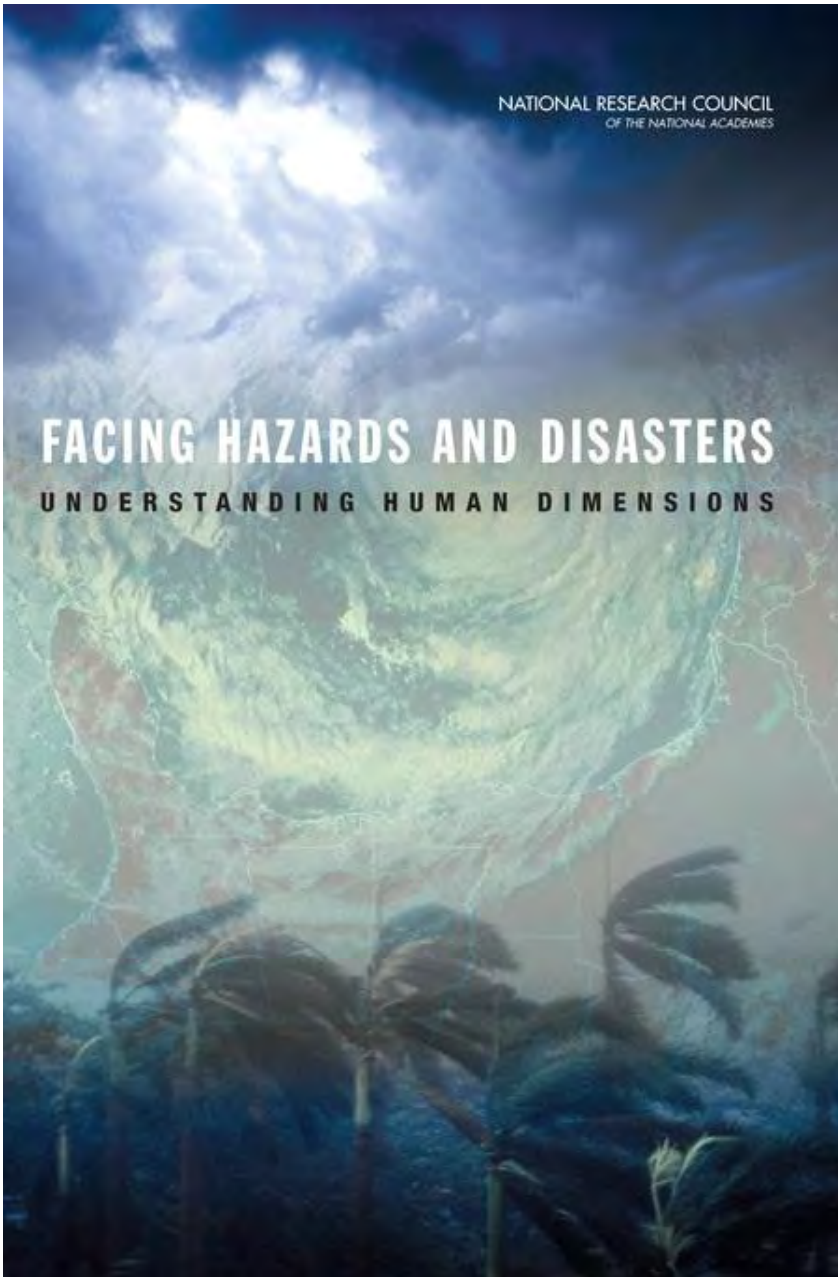


Chapter 9: The Present and Future Hazards and Disaster Research Workforce



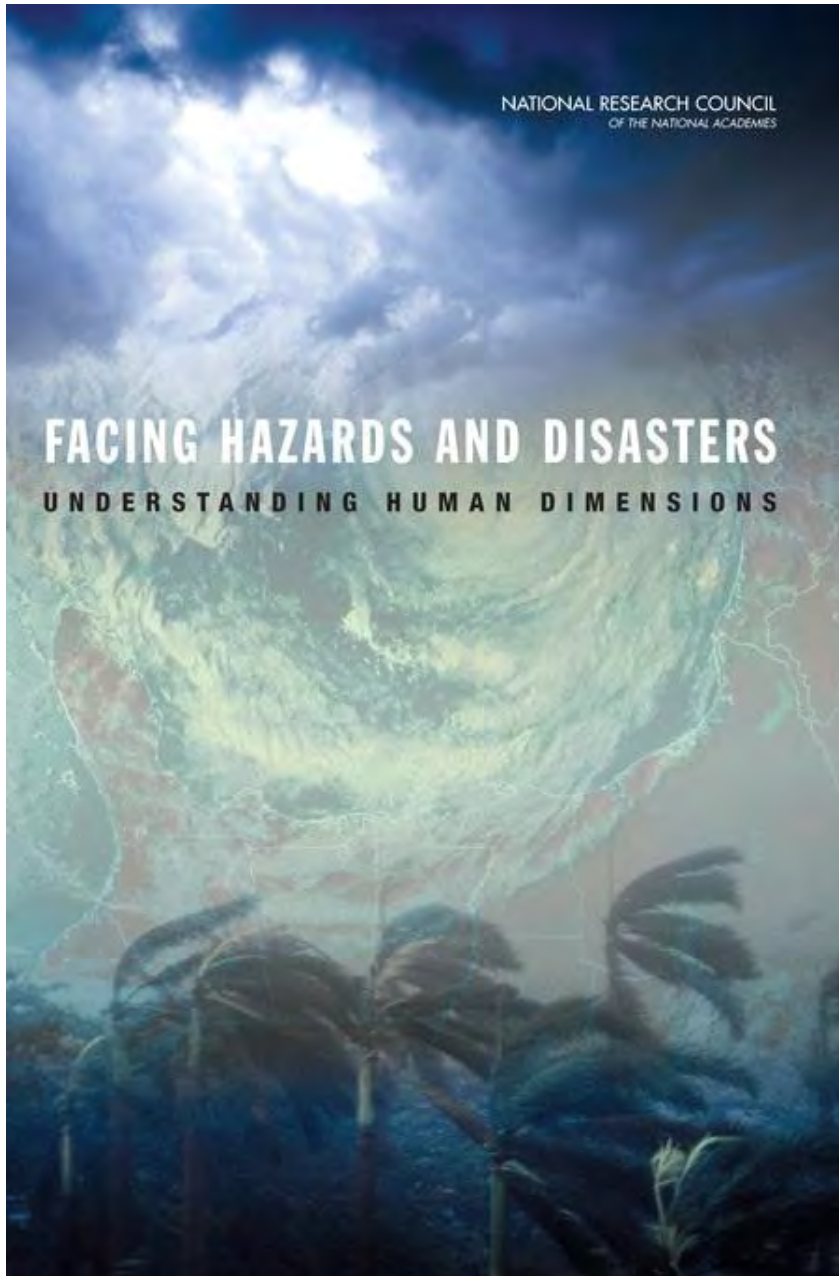
Chapter 9: The Present and Future Hazards and Disaster Research Workforce

How to establish significance.



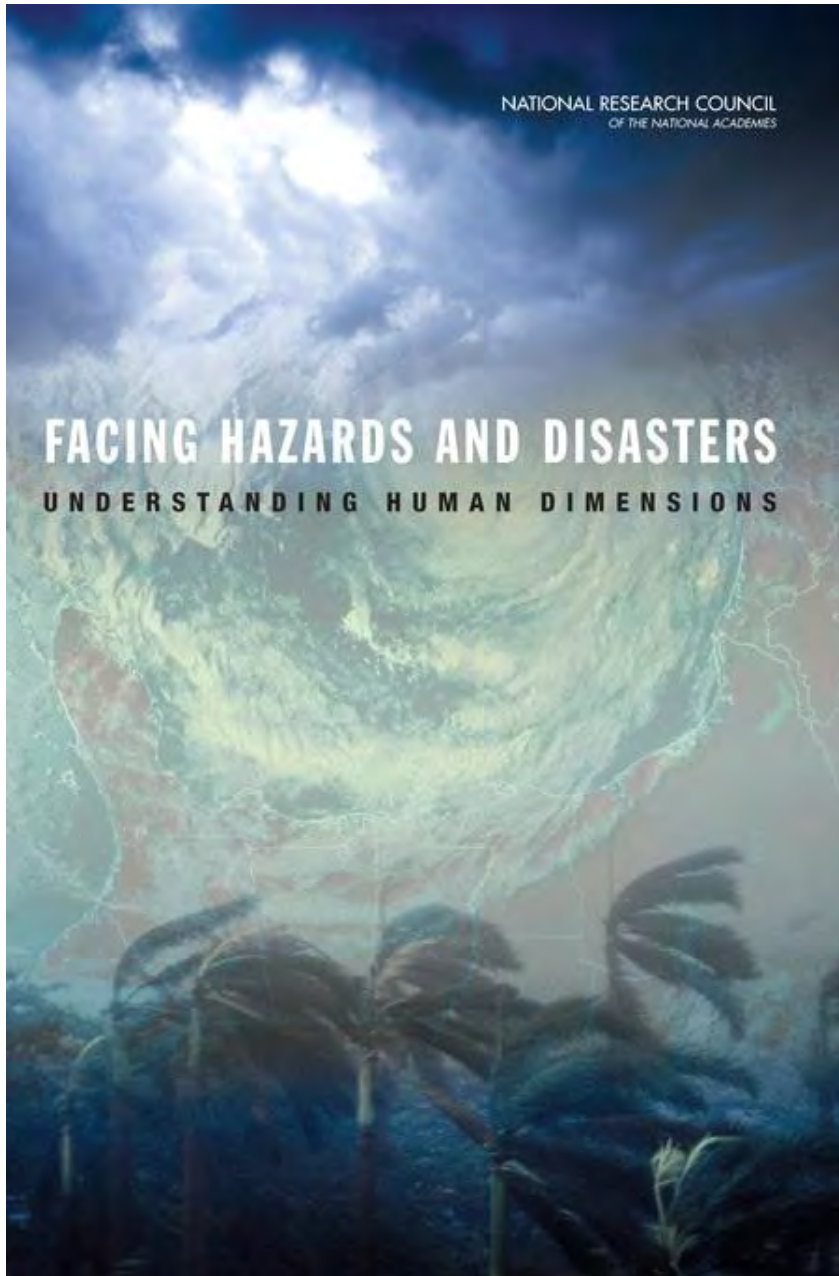
The **IMPORTANCE** of the Workforce:

“The size and composition of the hazards and disaster workforce will significantly **determine** the extent to which the social sciences, in general, can **respond forcefully to twenty-first century demands** for basic social science knowledge and its application” (p. 317).



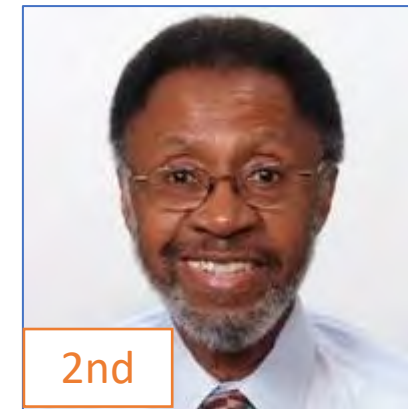
The GAP:

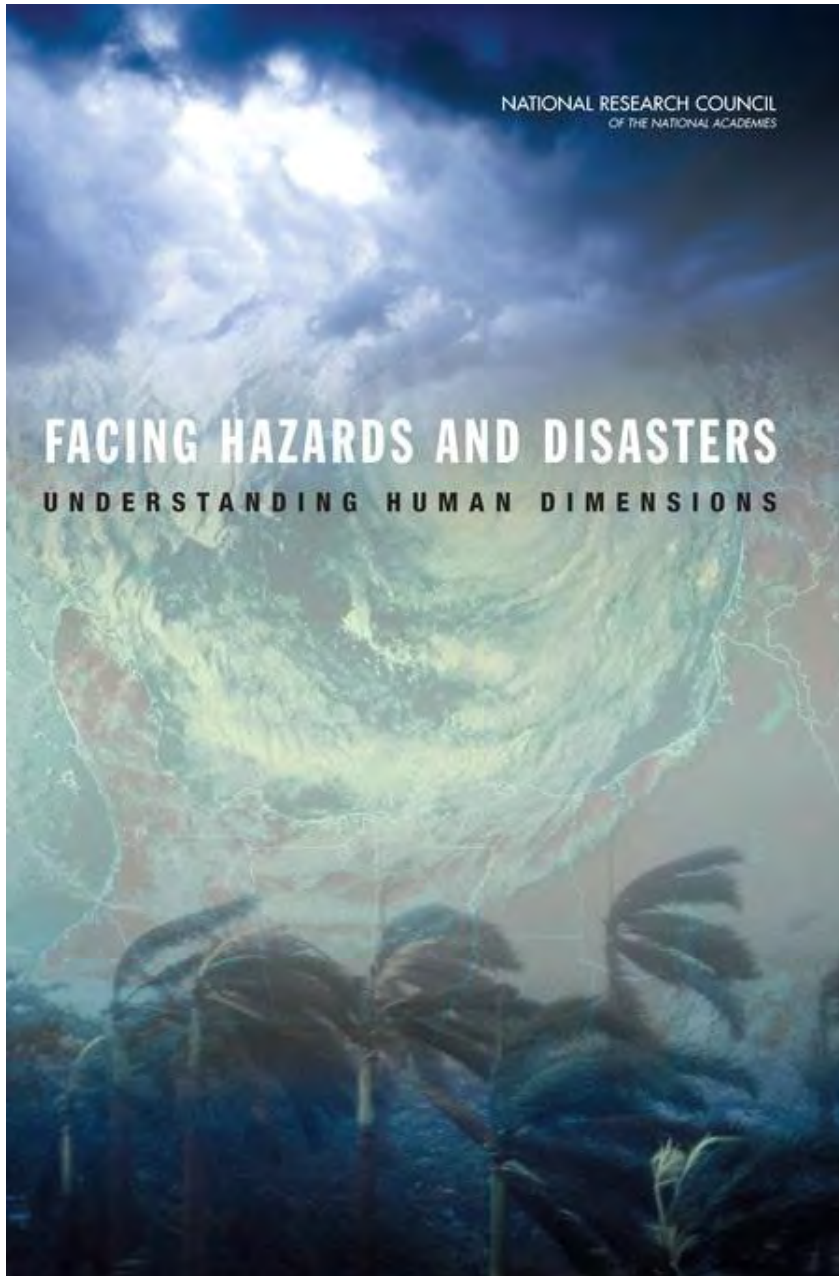
“The committee does not have a precise accounting of the **numbers of social scientists from respective disciplines** currently engaged in hazards and disaster research. Neither government agencies nor professional associations systematically collect data on this research workforce...” (p. 320).



The NEED:

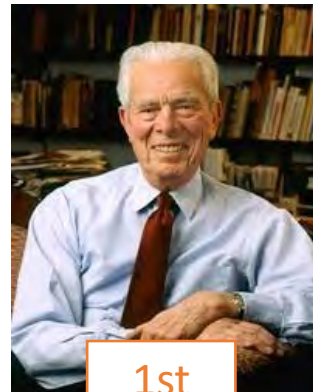
For the workforce to be sustained:
“...specific strategies must be devised
(1) to put the **next generation** of
researchers in the pipeline and **(2)** to
recruit new researchers from the
existing pool” (p. 320).





The NEED:

For the workforce to be sustained:
“...specific strategies must be devised **(1)** to put the **next generation** of researchers in the pipeline and **(2)** to **recruit new researchers** from the existing pool” (p. 320).



1st



2nd



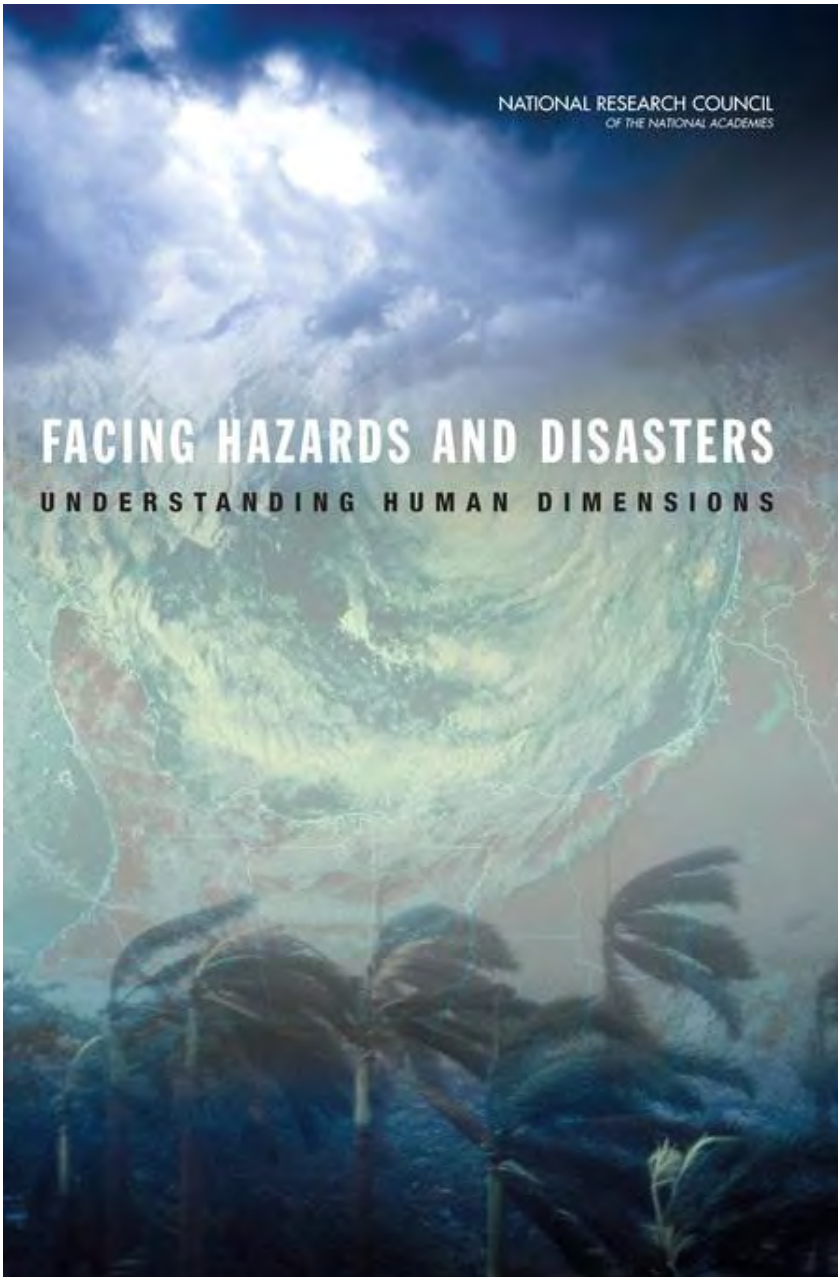
3rd



4th



5th



The VISION:

In an ideal world, the hazards and disaster research workforce: “...will be of **adequate size, reflect the diversity of the nation,** and include researchers who have both **basic and applied research interests** and are capable of carrying out **disciplinary, multidisciplinary, and interdisciplinary research.** The natural, technological, and willful disasters that confront humankind in the foreseeable future **require such a research workforce...**” (p. 319).





Researcher Typology

Sources: NRC, 2006; Peek et al., 2020



Emerging

- Includes students and others who are new to the field and who are still learning about its disciplinary, multidisciplinary, or interdisciplinary histories, theories, methods, and approaches. Emerging researchers may have limited experience or may not have yet conducted their own original empirical research.

Situational

- Not previously trained or involved in the hazards and disaster field but had the opportunity to study new phenomena or processes based on a situational event; for example, a researcher who undertook a study after his or her community was affected by a major disaster.

Periodic

- Is not primarily engaged in hazards and disaster research but focuses on related topics from time to time throughout one's professional career.

Core

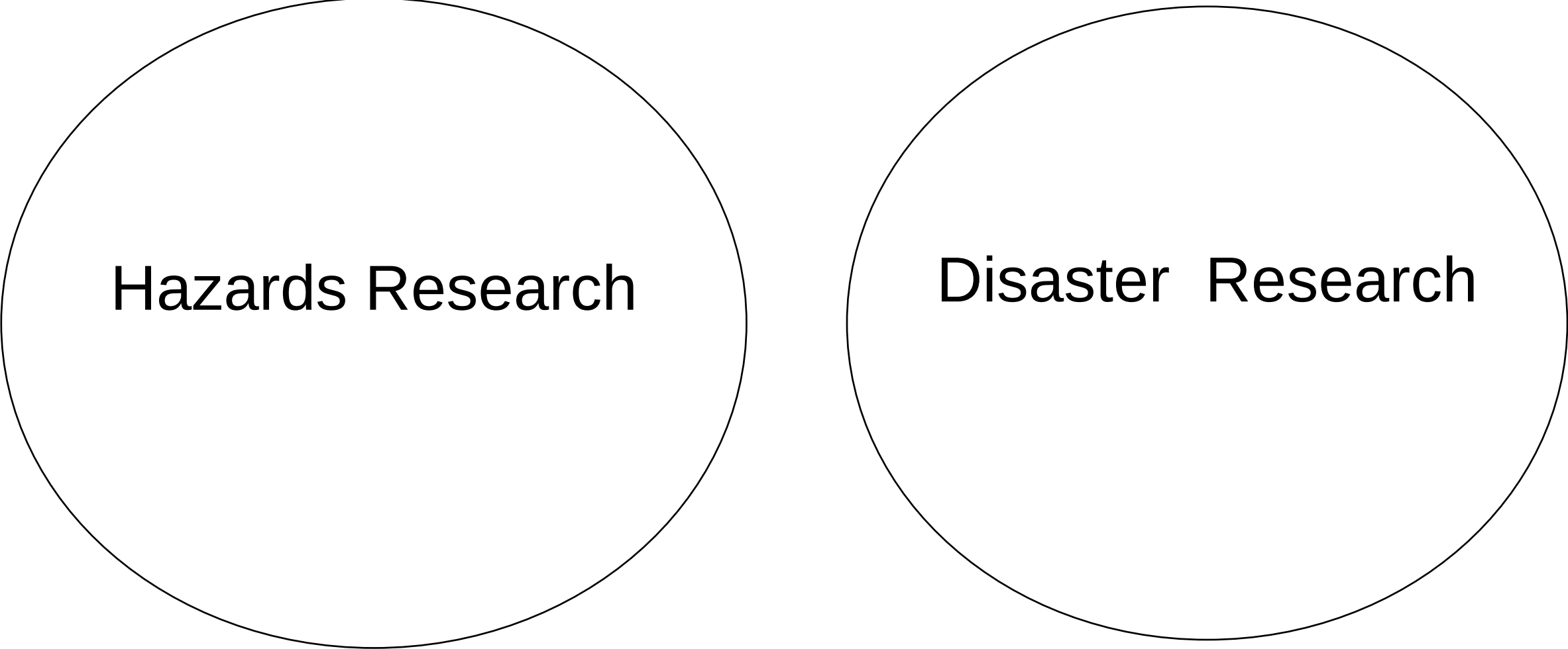
- Strongly self-identifies as a hazards/disaster researcher, has a deep commitment to the field, and has engaged in hazards and disaster research for a sustained amount of time.

Researcher Typology

Sources: NRC, 2006; Peek et al., 2020b

The Evolution of the Hazards and Disaster Field

The Evolution of the Hazards and Disaster Field



The diagram consists of two large, empty circles positioned side-by-side. The left circle contains the text 'Hazards Research' and the right circle contains the text 'Disaster Research'. The circles are drawn with thin black outlines and are set against a white background.

Hazards Research

Disaster Research

1627 M6.8 earthquake in
Southeastern Italy

1755 Lisbon earthquake

1857 Neapolitan
earthquake

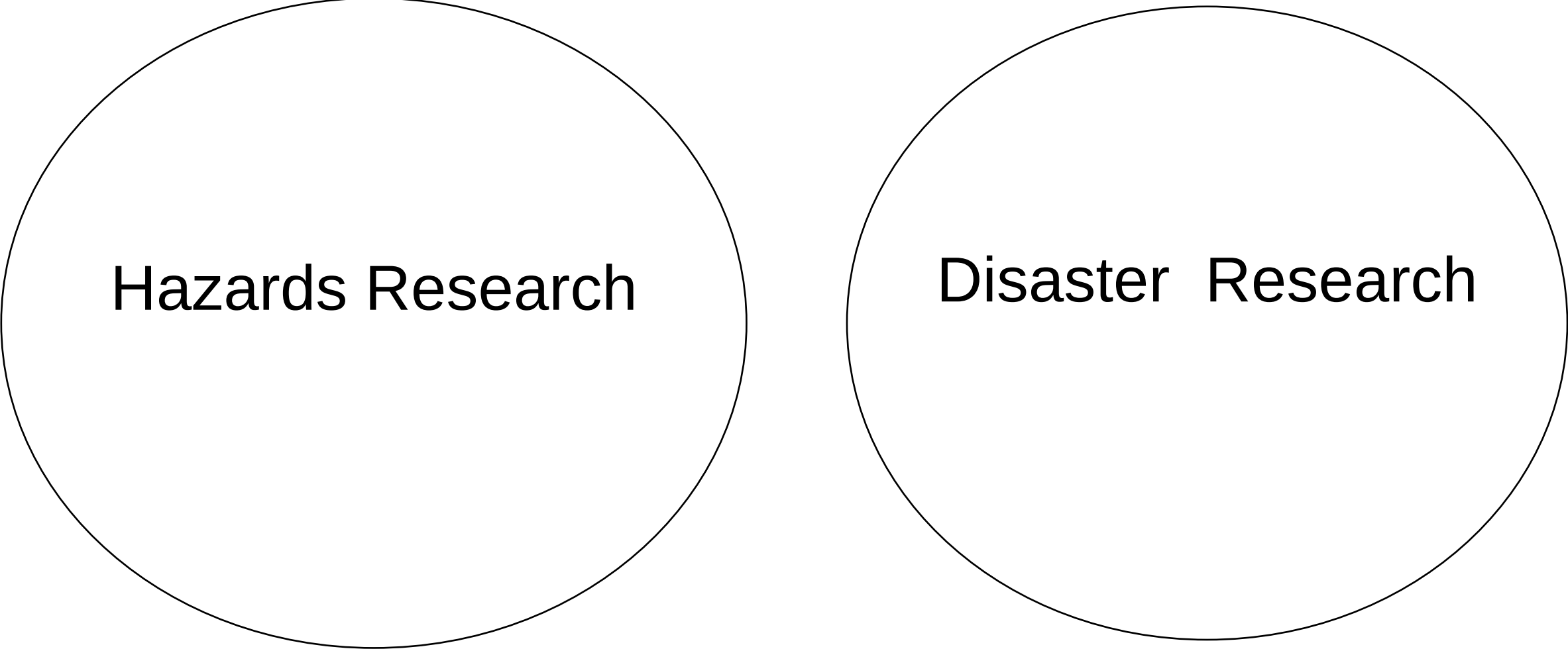
1920 Study of the Halifax
Explosion, Samuel Henry
Prince, *Catastrophe and
Social Change*

1942 Dissertation, Gilbert
F. White, "Floods are 'acts
of God,' but flood losses
are largely acts of man"



Source: Spence, R. 2014. "The Full-Scale Laboratory: The Practice of Post-Earthquake Reconnaissance Missions and Their Contribution to Earthquake Engineering." *Perspectives on European Earthquake Engineering and Seismology*.

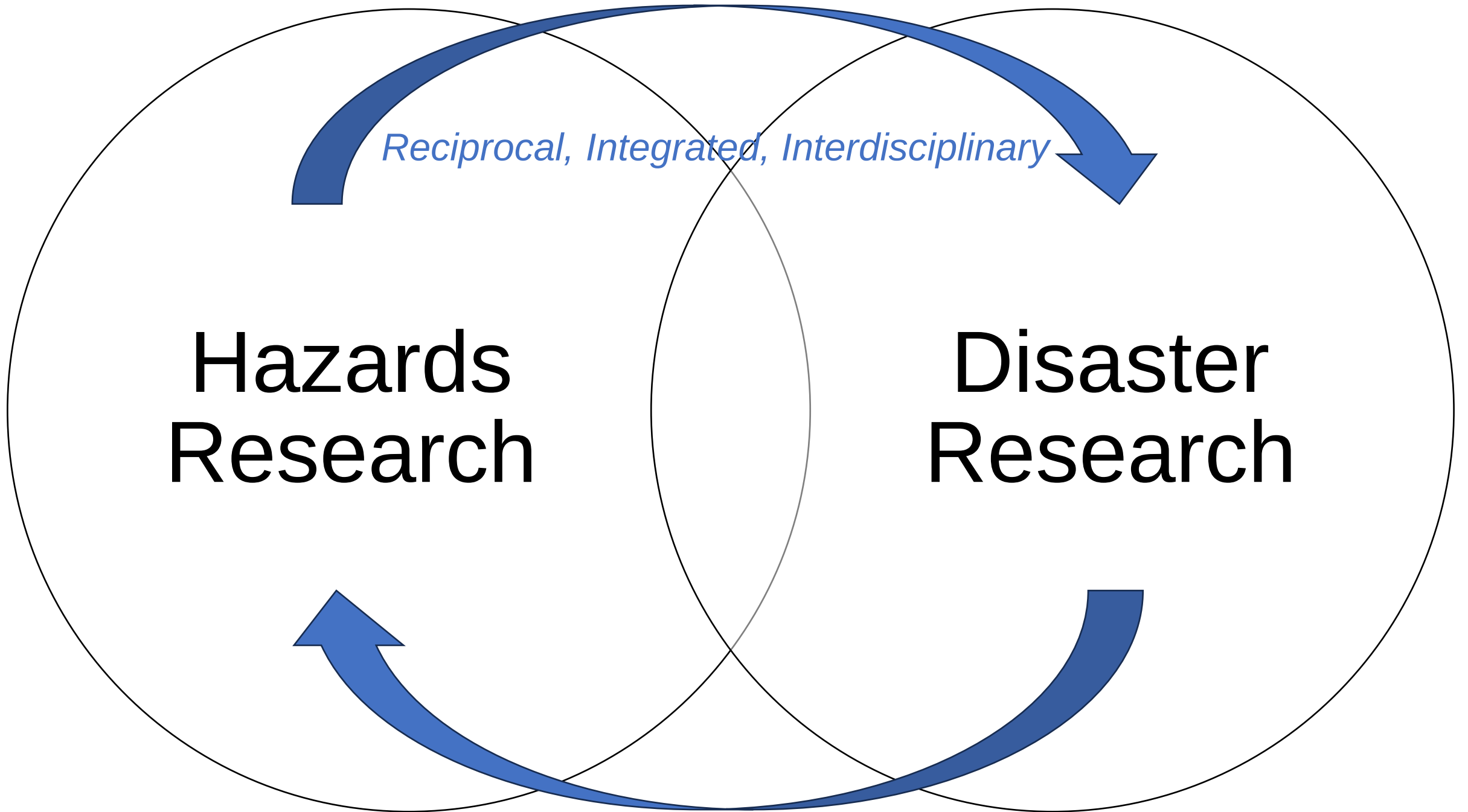
The Evolution of the Hazards and Disaster Field



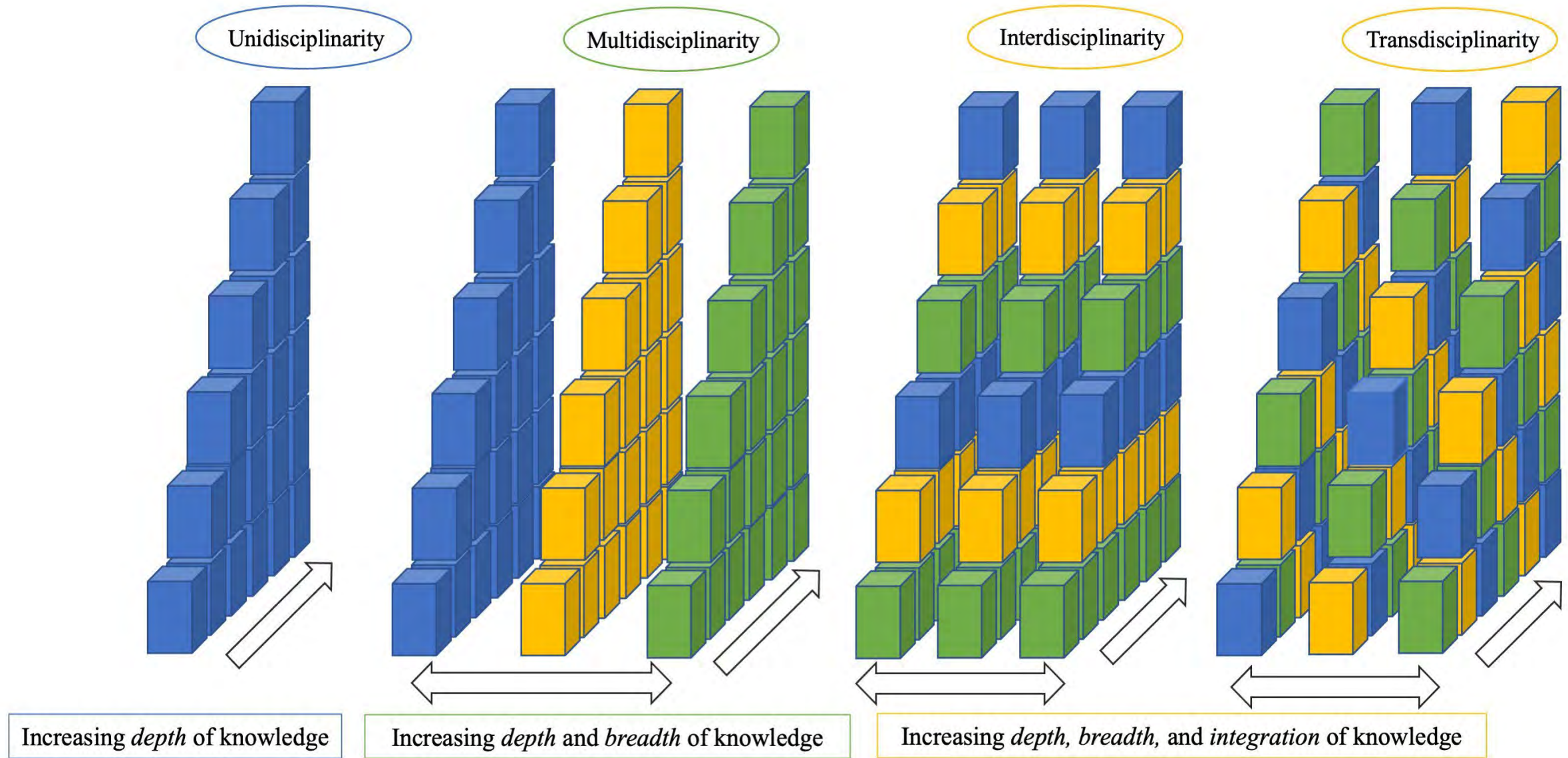
The diagram consists of two large, empty circles positioned side-by-side. The left circle contains the text 'Hazards Research' and the right circle contains the text 'Disaster Research'. The circles are drawn with thin black outlines and are set against a white background.

Hazards Research

Disaster Research







Source: Peek and Guikema, 2021, "Interdisciplinary Theory, Methods, and Approaches for Hazards and Disaster Research, *Risk Analysis*.



EERI/ISSS Social Science and Government Inspection Team, Tōhoku Earthquake and Tsunami

Research Matters

1. 70+ years of **multi-disciplinary, multi-hazards** and **disaster** research has led to knowledge breakthroughs and a robust body of research evidence
 - ✓ Characteristics of natural hazards
 - ✓ Performance of engineered and non-engineered structures
 - ✓ Causes of deaths and injuries
 - ✓ Protective action decision-making and other human behavior under conditions of extreme duress
 - ✓ Organizational and collective response to crisis
 - ✓ Identification and mapping of socially vulnerable populations
 - ✓ Economic, emotional, physical, educational impacts of disaster
 - ✓ Drivers of long-term recovery
 - ✓ Quantification of economic savings based on mitigation investments
 - ✓ Loss estimation for future events

Research Matters

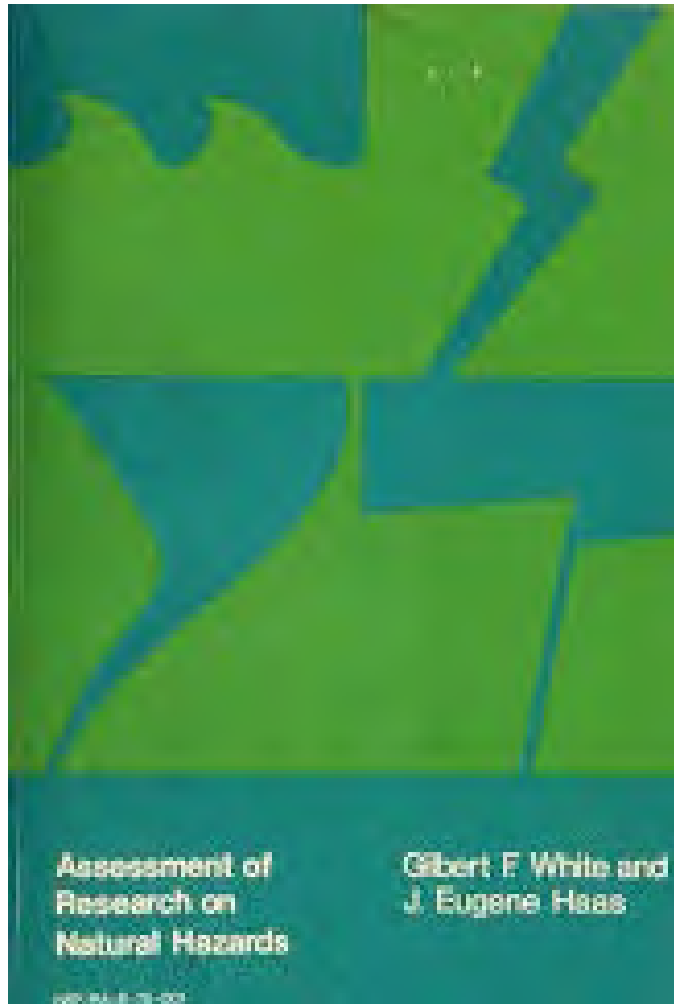
1. 70+ years of **multi-disciplinary, multi-hazards** and **disaster** research has led to knowledge breakthroughs and a robust body of research evidence
2. These efforts—unapologetically applied—have led to fundamental **changes in policy and practice**
 - ✓ Stronger building codes and standards
 - ✓ Better forecasting
 - ✓ Advancements in early warning systems
 - ✓ More inclusive and effective risk communication messaging
 - ✓ Enhanced evacuation planning
 - ✓ Additional focus on especially vulnerable structures and potentially vulnerable populations
 - ✓ Nationwide hazard and risk mapping efforts

The Role of Assessments in *Advancing* the Hazards and Disaster Field

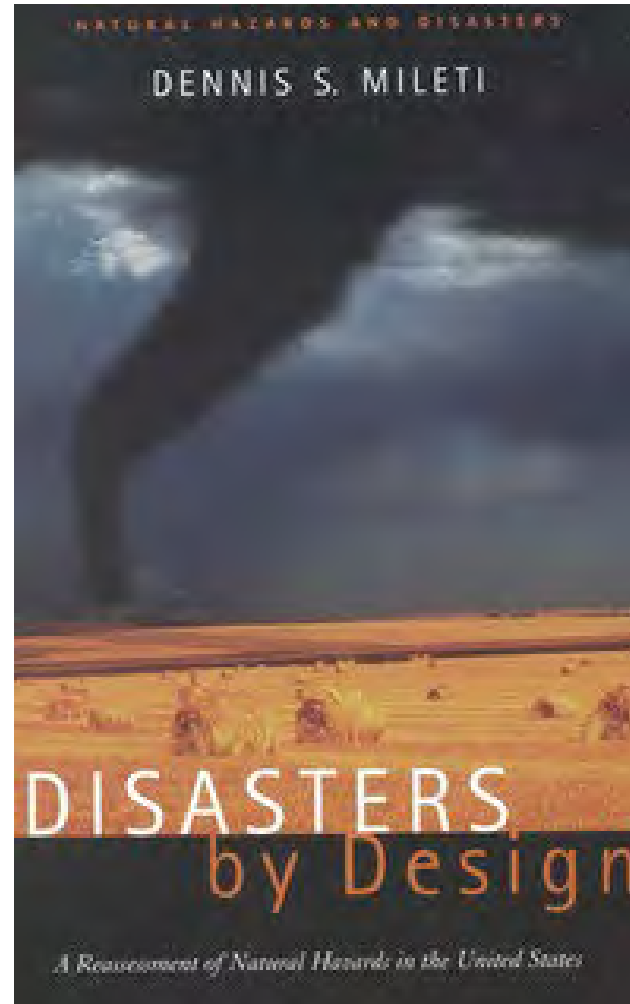
What is the Purpose of an Assessment?

- Critically **assess and synthesize** the state of human-centered hazards and disaster knowledge in the United States.
- Develop **research-informed recommendations for decisionmakers** with the goal of prompting action to reduce disaster risk and losses.

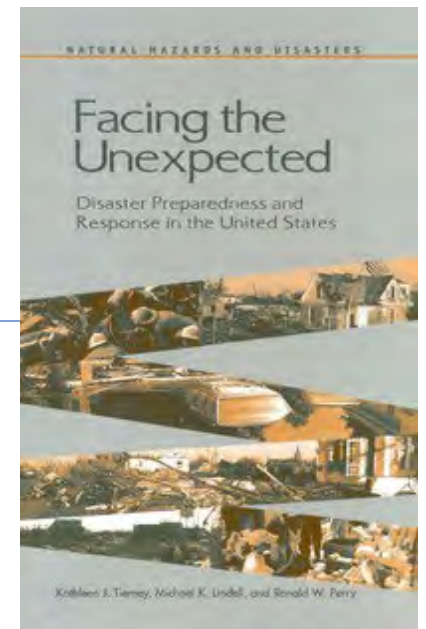
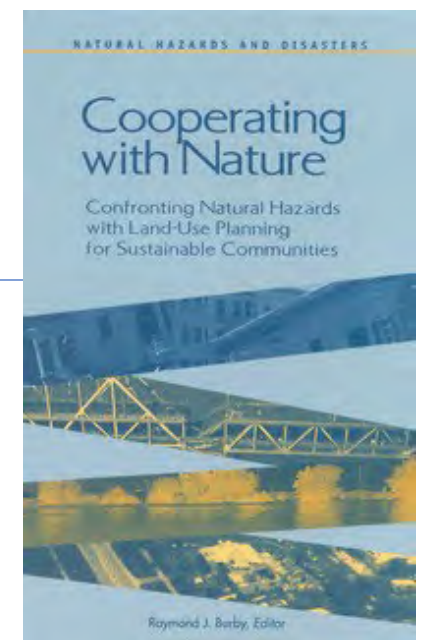
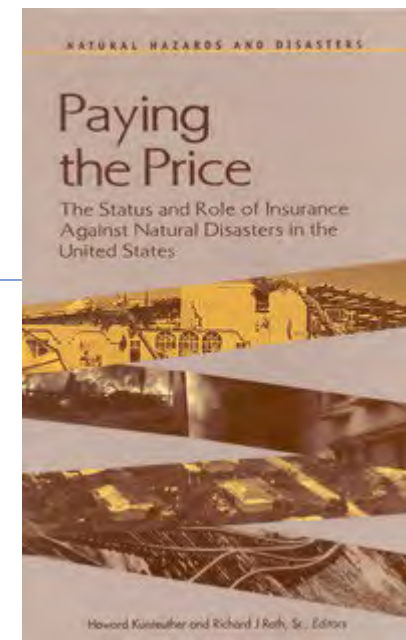




First Assessment, 1975



Second Assessment, 1999



Additional Volumes from the Second Assessment, 1998-2001

Yes, And, And, And.... Many Additional Monographs, Books, Articles, *Natural Hazards Review*, Natural Hazards Center, etc.

The Third Assessment is Underway!



Why a *Third Assessment*?

1. It's time to **take stock** of what we do (and don't) know. In the 27+ years since the last national hazards assessment:
 - **Threats** have become more complex, compounding, cascading;
 - **Number of people, places, and assets affected** by natural hazards and disasters has increased.
 - Concurrently, the **body of available research** has grown dramatically.
2. By assessing what we have learned, we can **make evidence-informed recommendations to decisionmakers** to reduce disaster impacts and improve public health, safety, and resilience.
3. The assessment will establish a forward-looking **national research strategy** to guide the future of the field. **With recent impacts to science and the scientific workforce, this clarity of focus is urgent.**



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Chapter 1: Natural Hazards in the United States

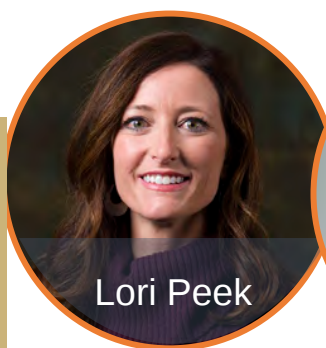
Chapter 2: Counting the Costs: The Rising Toll of Disasters

Chapter 3: The Enduring Consequences of Disaster

Chapter 4: Understanding Risk and Resilience: Exposure, Vulnerability, and Capacity

Part I.

Natural Hazards and the Human Toll of Disaster



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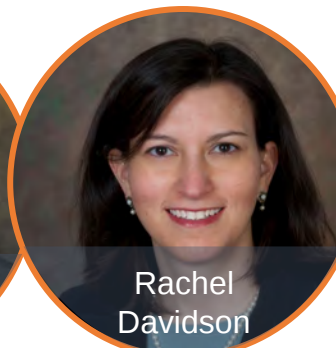
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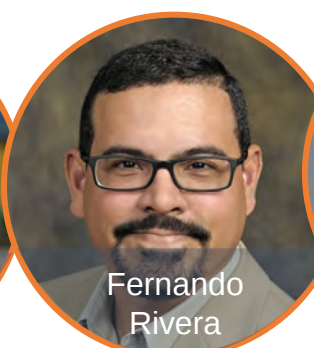
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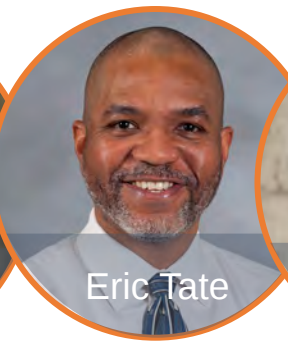
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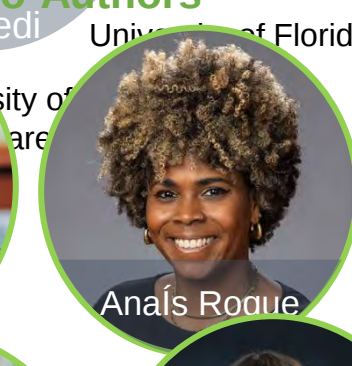
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Chapter 5: Preparing for Action

Chapter 6: State of Emergency: Responding to Disaster

Chapter 7: Recovering from Disaster

Chapter 8: Mitigation Matters: Reducing the Impact of Disasters

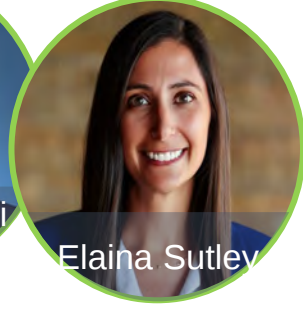
Part II.

What Research Has Revealed Across the Disaster Lifecycle



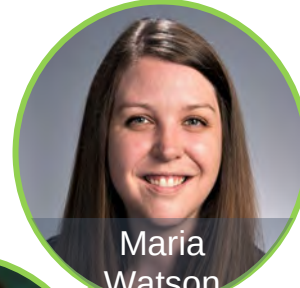
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Chapter 9: The Research
Workforce and Research
Infrastructure

Chapter 10: Ethics, Methods, and
Data in Hazards and Disaster
Research

Chapter 11: The Future of
Hazards and Disaster Research
and Its Applications

Part III.

**The Future of
the Field**



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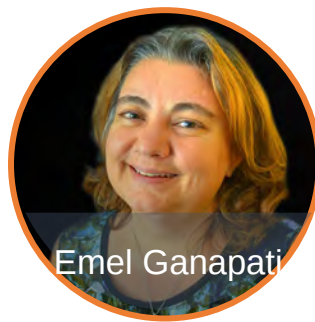
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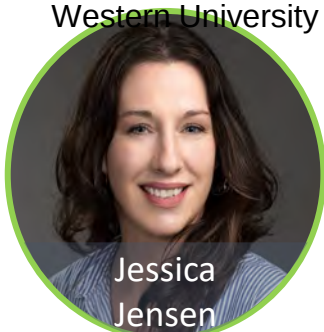
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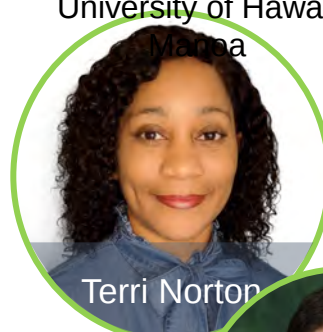
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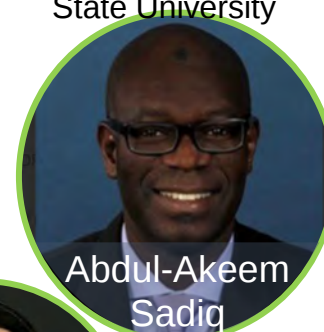
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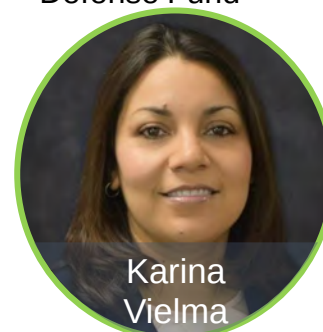
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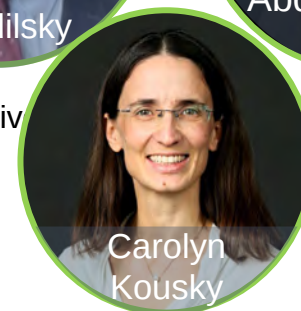
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Third Assessment

The *Approach* to the *Third Assessment* is Rooted In:

1. A principled recognition that we are stronger when working together. (“No one of us is as smart as all of us.”)
2. The grand challenges we face and the problems we are trying to address demand an inclusive, unified, convergent approach.
3. An understanding that perhaps the most important outcome of the prior assessments was the cultivation and nurturing of the next generation.



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End with Your *Why*

Why Research Questions Matter

- In science, research questions serve as our North Star.
- Once established, research questions:
 - provide *focus* and *clarity*
 - define the *scope* of our inquiry
 - influence *methodology*
 - determine what we do (and don't) *learn* about natural, built, social, and technical environments.

Use the Enabling Program to Identify Your Whole-Person North Star

- Once established, it will provide
 - *Direction*
 - *Illumination*
 - *Inspiration*

THANK YOU



Questions? Contact:
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