



Evacuation with Efficiency:

An Inland and Coastal Flood Based Emergency Evacuation Planning Scorecard Proposal

Georgia Planning Association Spring 2021

Mr. Ian P. Newman

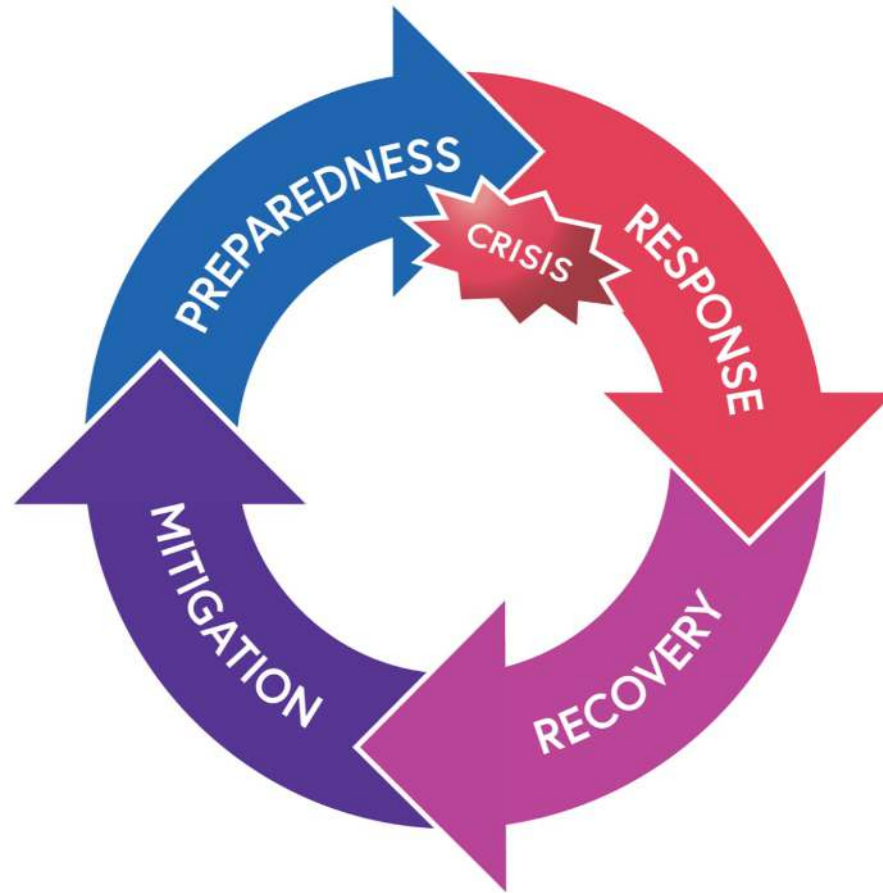
04/23/2021

Introduction

- About Me
- General Outline
- Context of Research
 - Research Question
 - Research Mission



Disaster (Management) Cycle



Flood Origin Specifications

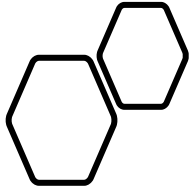
- Inland Flooding
 - From Severe Precipitation Events
- Hurricane-Induced Flooding
- Nuisance/High-Tide Flooding
- Infrastructure Failure



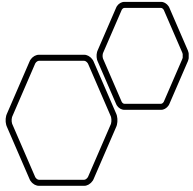
Image Source: Stephen Pingry ; tulsaworld.com | Event: 2019 Arkansas River Floods



Image Source: Time Magazine | Event: 2005 Hurricane Katrina



- Image Sources:
Above Baltimore City Nuisance Flood Plan | Event: Nuisance flooding in Fells Point in May 2020.
- Below foxbaltimore.com |
Event: Nuisance flooding combined with Severe Rain Event in April 2020



- Image Sources:

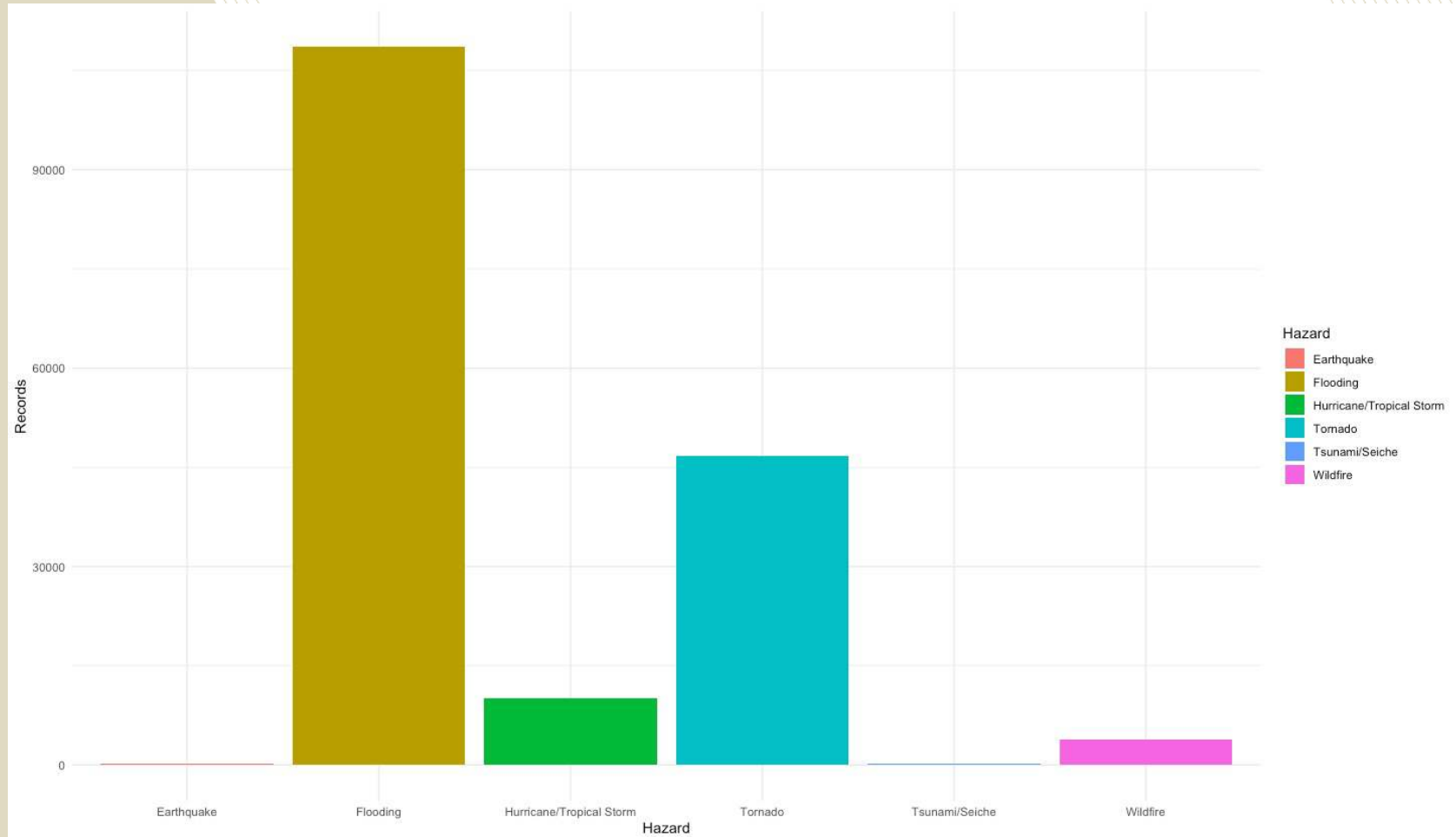
Above www.nbcbayarea.com
Event: Sanford Dam Break in
May 2020

• Below clickondetroit.com |
Event: Edenville Dam Break in
May 2020



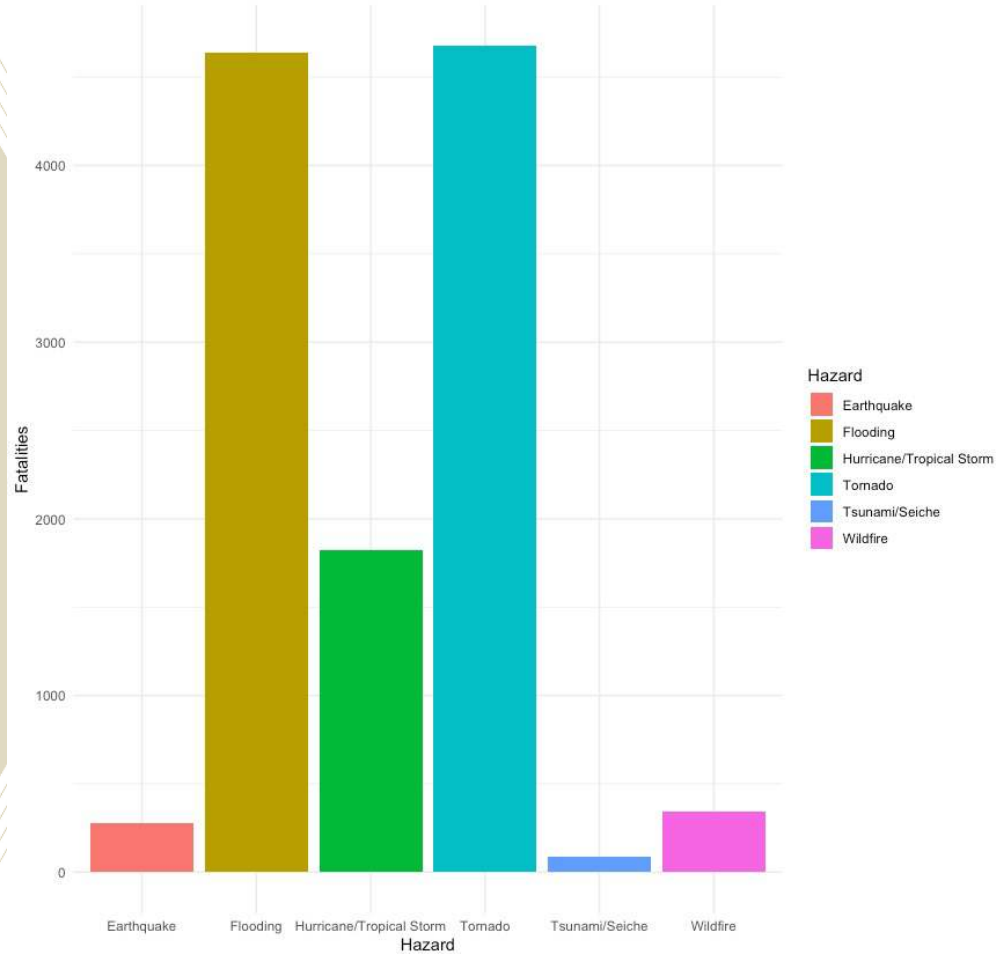
Contextual Graphs – Records

From 1/1/1960 – 1/1/2020



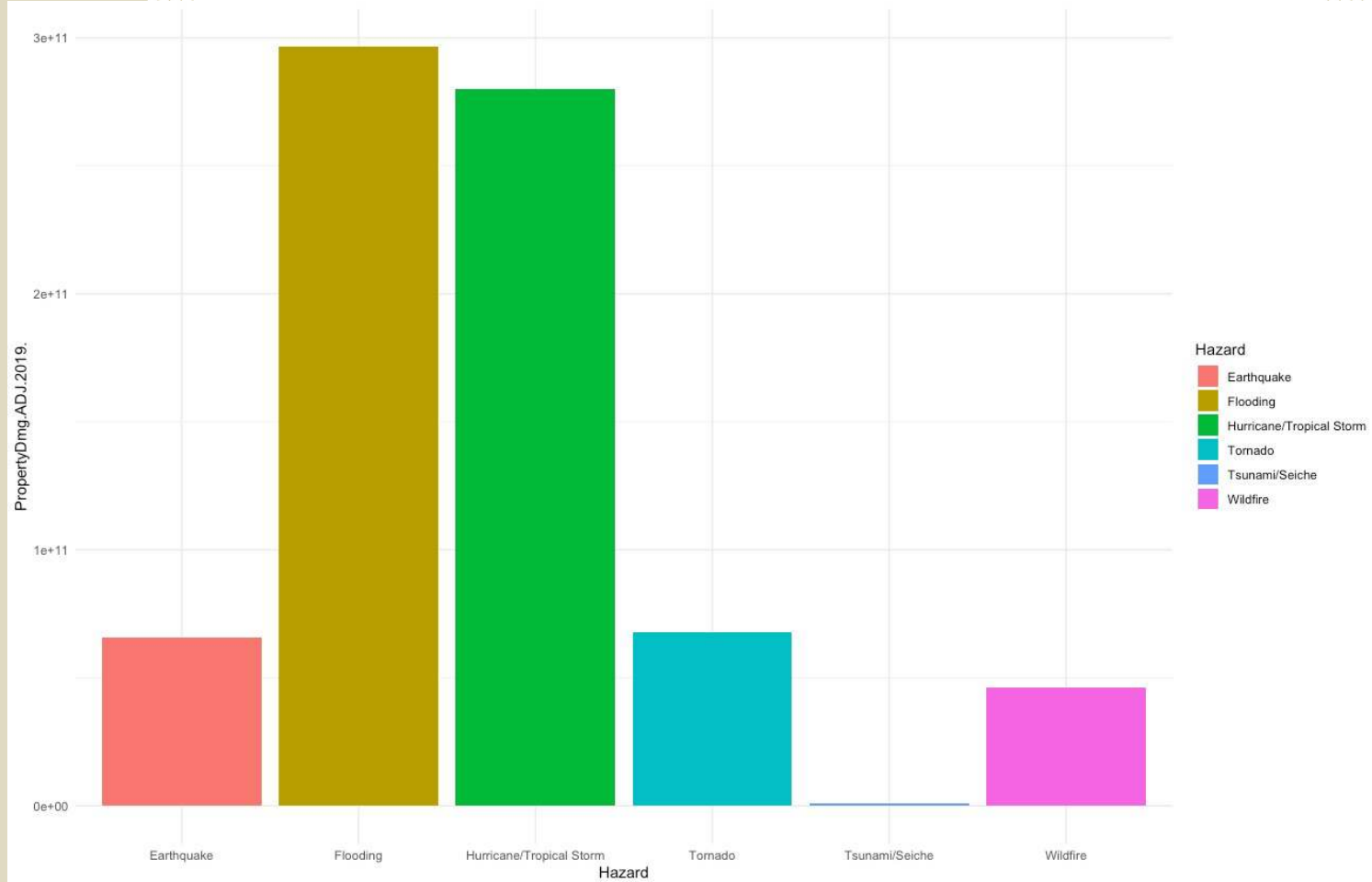
Contextual Graphs – Fatalities

From 1/1/1960 – 1/1/2020



Contextual Graphs – Property Damage

From 1/1/1960 – 1/1/2020 | (2019 USD Adjusted)



Current Scorecards

- National Cooperative Highway Research Program (NCHRP)
 - Maintaining System Resilience Concepts into Transportation Agencies
- National Weather Service (NWS)
 - *StormReady*
- Federal Emergency Management Agency (FEMA)
 - Community Rating System (CRS)
- Texas A&M University
 - Plan Integration for Resilience Scorecard Guidebook.

Evacuations are an *element* but not the focus!

Flood Emergency Evacuation Scorecard (FEES) Proposal Elements

- Where is the FEES's Value?
 - Process NOT the Deliverable
 - 0 External Incentives (Fiscal, PR, Insurance Benefits etc.)
- Less Than 15 Minutes to Complete
- Intuitive, Transferable, Interactive & Novel
- Anonymous Posting for Comparing/Contrasting

Access Site & Methods

- <https://sites.gatech.edu/giscc/fees/>
1. Literature Review
 2. Interviews
 3. InDesign Form Builder + Export to Interactive PDF
 4. Send to Case Study Jurisdictions
 - A. New Orleans
 - B. City of Baltimore
 - C. Tulsa County
 5. Next Step: Website Publication for Completed Scorecard Upload



Tulsa, Oklahoma | 2019 | Image Source: oklahoman.com

Page 1:

Instructions and Context

Flood Emergency Evacuation Scorecard (FEES)

Instructions and Context for the Flood Emergency Evacuation Scorecard

The Flood Emergency Evacuation Scorecard is designed to help communities evaluate their current status of mitigation, preparedness, response and recovery (the phases of the Disaster Cycle) efforts, in relation to emergency evacuation planning, in order to highlight areas of opportunity to be better prepared for the next flood event that strikes that community.

Please evaluate each metric on a scale from one (1) to five (5) with one being the weakest score and five being the strongest. There are three (3) metrics per phase of the Disaster Cycle, which are asked in order to best gauge that community's overall status on emergency evacuation planning in response to floods.

Sum your score across the measures at the end of each phase, and for all phases at the end of the scorecard to determine next steps and where your community's plan needs addressing. The value of this scorecard is in the planning process of filling out the scorecard **honestly**, there are **zero** outside incentives to any score. Please score responsibly.



Tulsa, Oklahoma | 2019 | Image Source: kjrh.com

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Community Information

Flood Emergency Evacuation Scorecard (FEES)

Community Information

1. County/City/Town:

Example county/city/town would be written in here. For example, Cuyahoga County, OH

2. Population:

Cuyahoga County has a population of 1.235 million (2019) people (US Census Bureau)

3. Primary Contact: Name, Office, Title, City, State, ZIP, Phone Number, E-Mail Address

Mr. Ian Newman, Georgia Tech School of City and Regional Planning, Atlanta, GA, 30332, (440) 785-6523, inewman3@gatech.edu

4. Secondary Contact: Name, Office, Title, City, State, ZIP, Phone Number, E-Mail Address

Dr. William J. Drummond, Georgia Tech School of City and Regional Planning, Atlanta, GA, 30332, (404) 894-3880, bill.drummond@design.gatech.edu



Tulsa, Oklahoma | 2019 | Image Source: oklahoman.com

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Mitigation Measures

Flood Emergency Evacuation Scorecard (FEES)

Mitigation Measures

1. Rank the quality, on a scale of 1-5, of currently existing structural measures that mitigate the flood hazard

1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2. Rank the quality of currently existing non-structural measures that mitigate the flood hazard

1	2	3	4	5
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Rank the quality of the jurisdiction's current zoning situation in order to best mitigate the flood hazard

1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Insert Notes in the Box Below

Here, the professional filling this scorecard out for Mitigation Measures can make considerations, notes, concerns, comments, and general thoughts based on reflections of the score they attributed to the above three metrics.



New Orleans, Louisiana | 2005 | Image Source: slate.com

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Preparedness Measures

Flood Emergency Evacuation Scorecard (FEES)

Preparedness Measures

1. Rank the quality of the jurisdiction's current flood warning system (warning outlets & lead warning time)

1 2 3 4 5

2. Rank the level of preparedness in determining hazardous infrastructure and areas, if a flood strikes

1 2 3 4 5

3. Rank the level of consideration the jurisdiction places on evacuating vulnerable populations

1 2 3 4 5

Insert Notes in the Box Below

Here, the professional filling this scorecard out for Preparedness Measures can make (by typing in this text box, just like in Mitigation Measures) considerations, notes, concerns, comments, and general thoughts based on reflections of the score they attributed to the above three metrics.



Baltimore (City) Maryland | 2020 | Image Source: foxbaltimore.com

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Response Measures

Flood Emergency Evacuation Scorecard (FEES)

Response Measures

1. Rank the quality of the jurisdiction's ability to perform search & rescue operations within 24 hours of the flood

1 2 3 4 5

2. Rank the level of government agency organization and coordination for flood emergency evacuations

1 2 3 4 5

3. Rank the quality of the jurisdiction's ability to provide basic needs and resources for evacuated residents

1 2 3 4 5

Insert Notes in the Box Below

Here, the professional filling this scorecard out for Response Measures can make (by typing in this text box, just like in the above measures) considerations, notes, concerns, comments, and general thoughts based on reflections of the score they attributed to the above three metrics.



New Orleans, Louisiana | 2005 | Image Source: npr.com

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Recovery Measures

Flood Emergency Evacuation Scorecard (FEES)

Recovery Measures

1. Rank the level of consideration the jurisdiction places on applying for FEMA's HMA grant programs

1 2 3 4 5

2. Rank the quality of the jurisdiction's current plan in insuring residents' damaged homes and businesses

1 2 3 4 5

3. Rank the level of consideration the jurisdiction places on qualitatively & quantitatively documenting the flood

1 2 3 4 5

Insert Notes in the Box Below

Here, the professional filling this scorecard out for Recovery Measures can make (by typing in this text box, just like in the above measures) considerations, notes, concerns, comments, and general thoughts based on reflections of the score they attributed to the above three metrics.



Tulsa, Oklahoma | 2019 | Image Source: oklahoman.com

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Final Scoring Measures

Flood Emergency Evacuation Scorecard (FEES)

Final Scoring Measures

1. Aggregated Score out of 60 Total Points:

Here the professional filling the FEES would aggregate their four grey “Sum of Points” boxes. Here, in this example, the professional filling this scorecard out for Cuyahoga County, OH would find their aggregated score to be 39 points out of 60. The box below then offers considerations.

2. Scale and Considerations Based on Aggregated Score:

Point Score Ranges	Point Score Range Considerations
0 - 15 Points	Plan needs a timely and considerable upgrade across the four stages of the disaster cycle. Policy intervention is strongly encouraged.
16 - 30 Points	Plan is below average and needs upgrades across low-scoring stages of the disaster cycle for community.
31 - 45 Points	Plan is average-to-good and needs policy intervention for improvement. Consider intervention on the stages that performed lower than others for timelier needs.
46 - 60 Points	Plan is good, but can be improved and needs to be maintained at this level of quality or higher.

Conclusion & Final Thoughts

- FEES Design & Mission
- FEES Values
- Next Steps
- “Human beings – not nature – are the cause of disaster losses, which stem from choices about where and how human development will proceed” (Mileti, 1999)

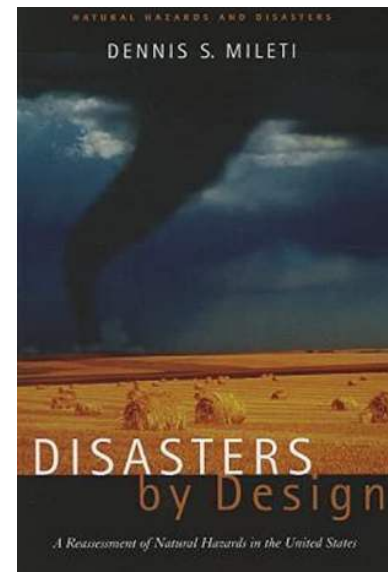


Image sources:

Headshot: Natural Hazards Center, 2021

Disasters by Design Book Cover:

Goodreads, Inc., 2021

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Dr. Michael Meyer

Ms. Laura Mellem

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I welcome any questions and comments you have; please do not hesitate to send them my way.

Thank you!