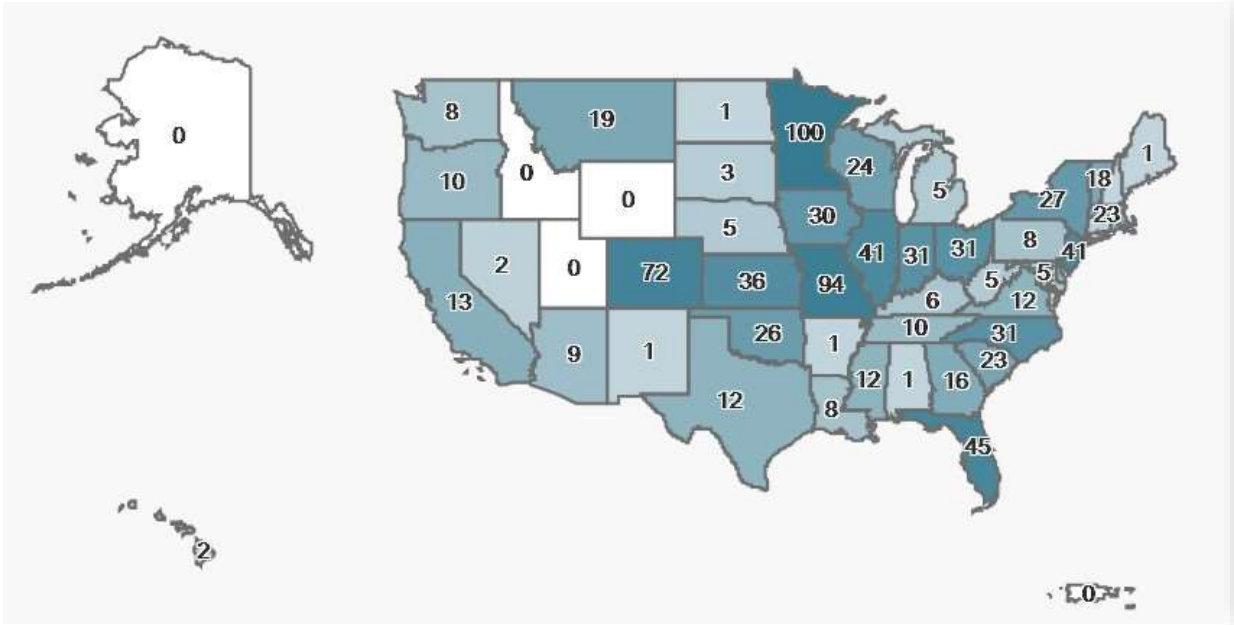
Flood Mitigation and Risk Reduction Use Case

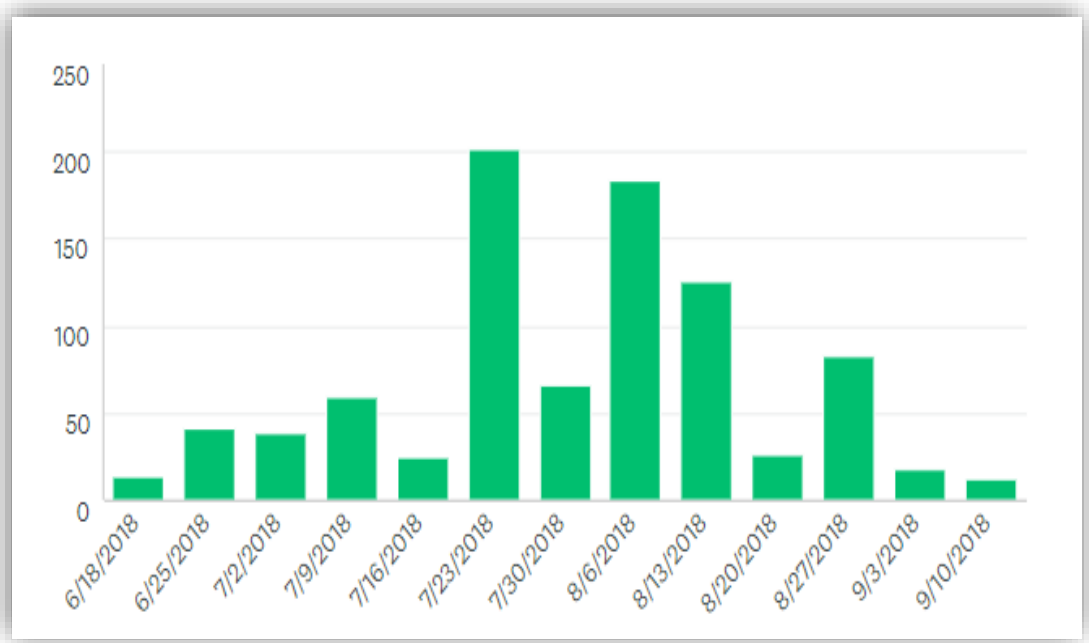
- Moving knowledge out of the domain of scientists and putting it in the hands of innovators, practitioners and policy-makers remains a major stumbling block for the flood management community.
- There is considerable investment in flood science that needs to be unlocked, exploited, leveraged and put to work to reduce flood risk and increase resilience.
- There are untapped and unrealized partnership opportunities available for leveraging shared capital from the public and private sectors to help address global and national concerns with flooding.

S&T Partnered with Charlotte-Mecklenburg Storm Water Services

- Gather input from communities on flood mitigation and risk reduction to inform R&D
- Received 896 responses from 46 States and the District of Columbia



Survey Response Totals by State



Weekly Survey Response Count

Charlotte-Mecklenburg STORM WATER Services

NAPSG Foundation

Findings from National Survey

U.S. DHS S&T / Charlotte-Mecklenburg Stormwater Services

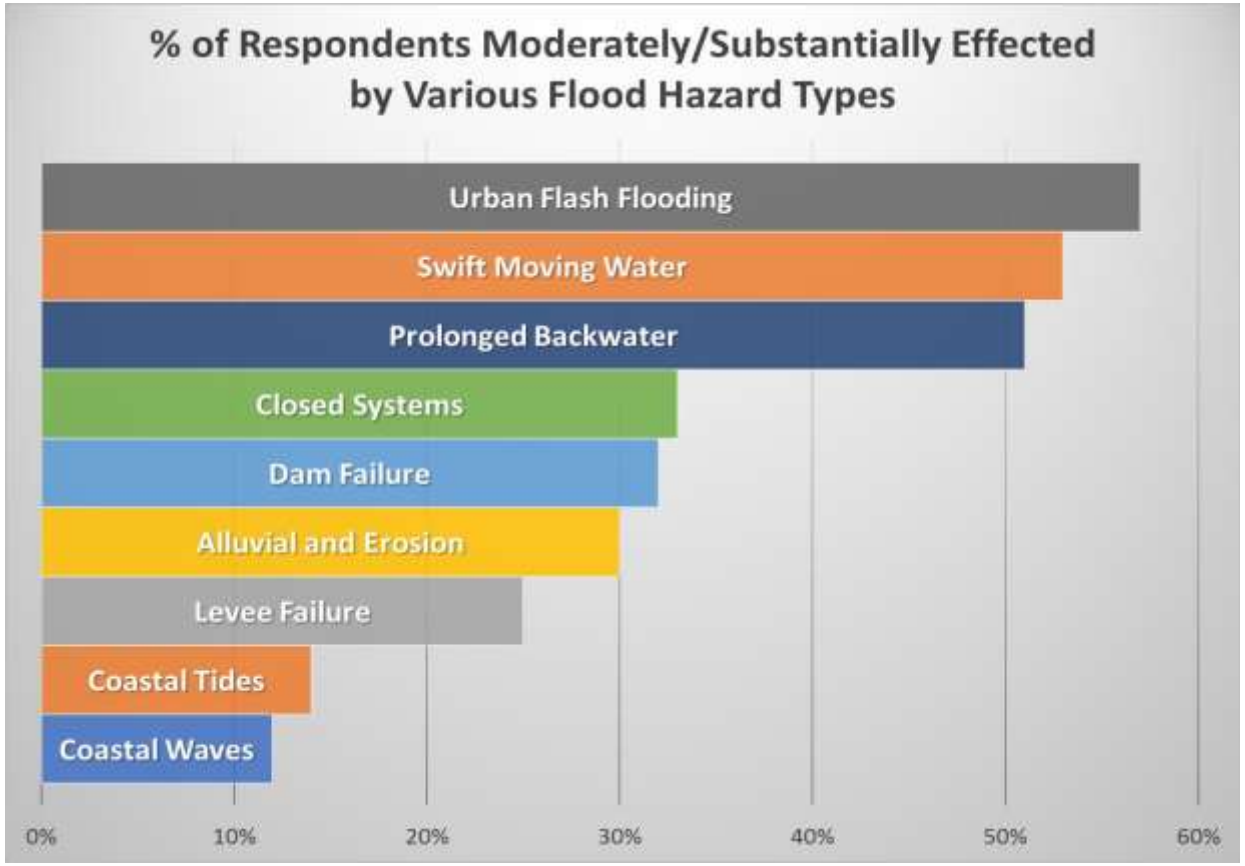
Respondents/Likely Users

- **Majority** of respondents have less than **10 years experience** & will have **other job duties**.
- **Over 70%** of respondents manage **less than 1,000 buildings** in floodplain.
- **75%** of communities would find a community flood risk tracking system **Useful**.
- Flood hazard **mitigation plans** are common, but **rarely detailed to the building-level**.

Findings on Flood Mitigation & Investment

U.S. DHS S&T / Charlotte-Mecklenburg Stormwater Services

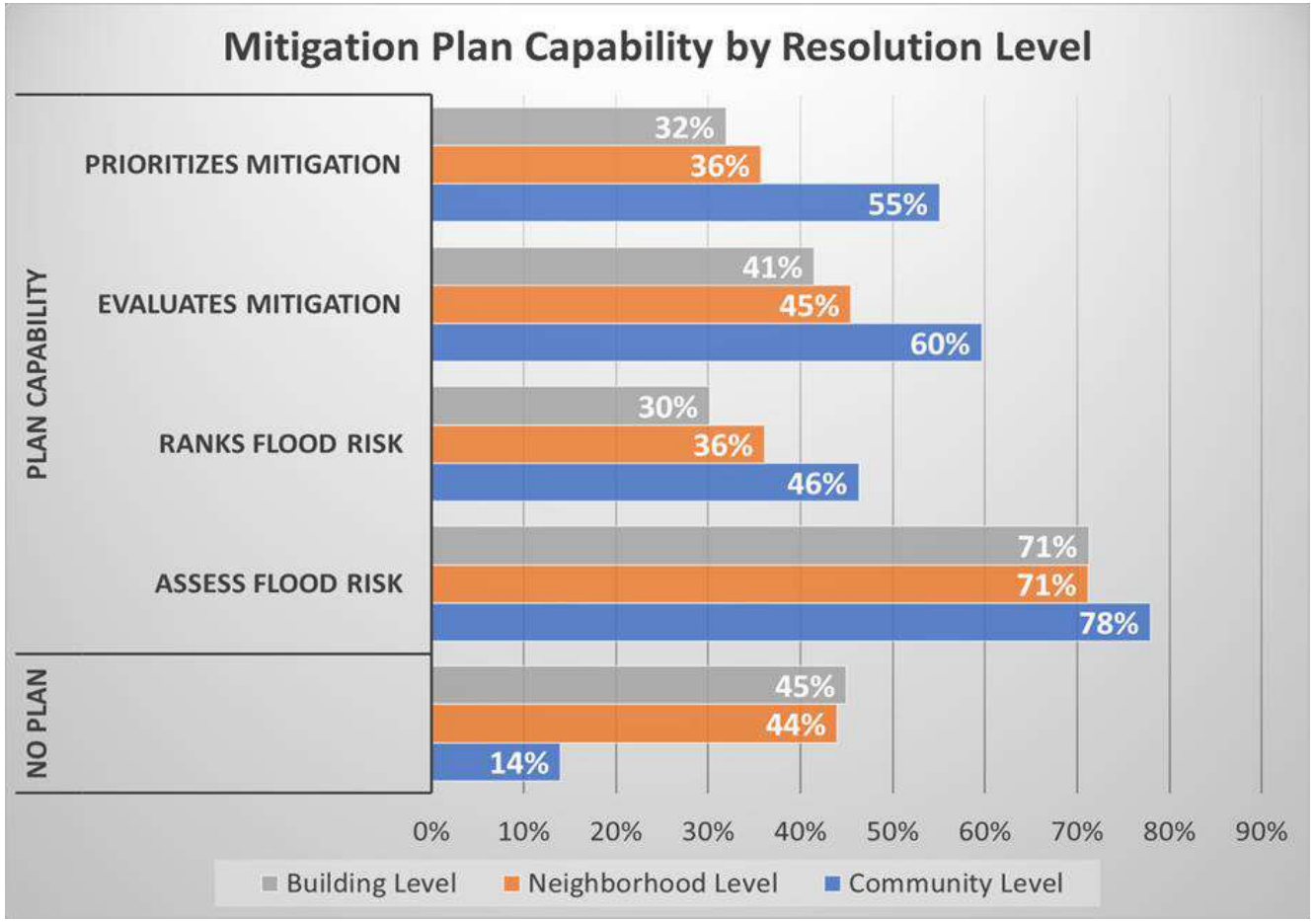
- Majority of respondents from riverine communities with mix of flood hazards
- More than **50%** of respondents say these hazards cause significant damage:
  - Urban flash flooding
  - Swift moving water
  - Prolonged backwater



Findings on Flood Mitigation & Investment

U.S. DHS S&T / Charlotte-Mecklenburg Storm water Services

- Over **85%** have a mitigation plan at the **community level**
- **30%-45%** have a plan at the **neighborhood or building level**
- Vast majority of the plans do **not rank flood risk** or prioritize mitigation



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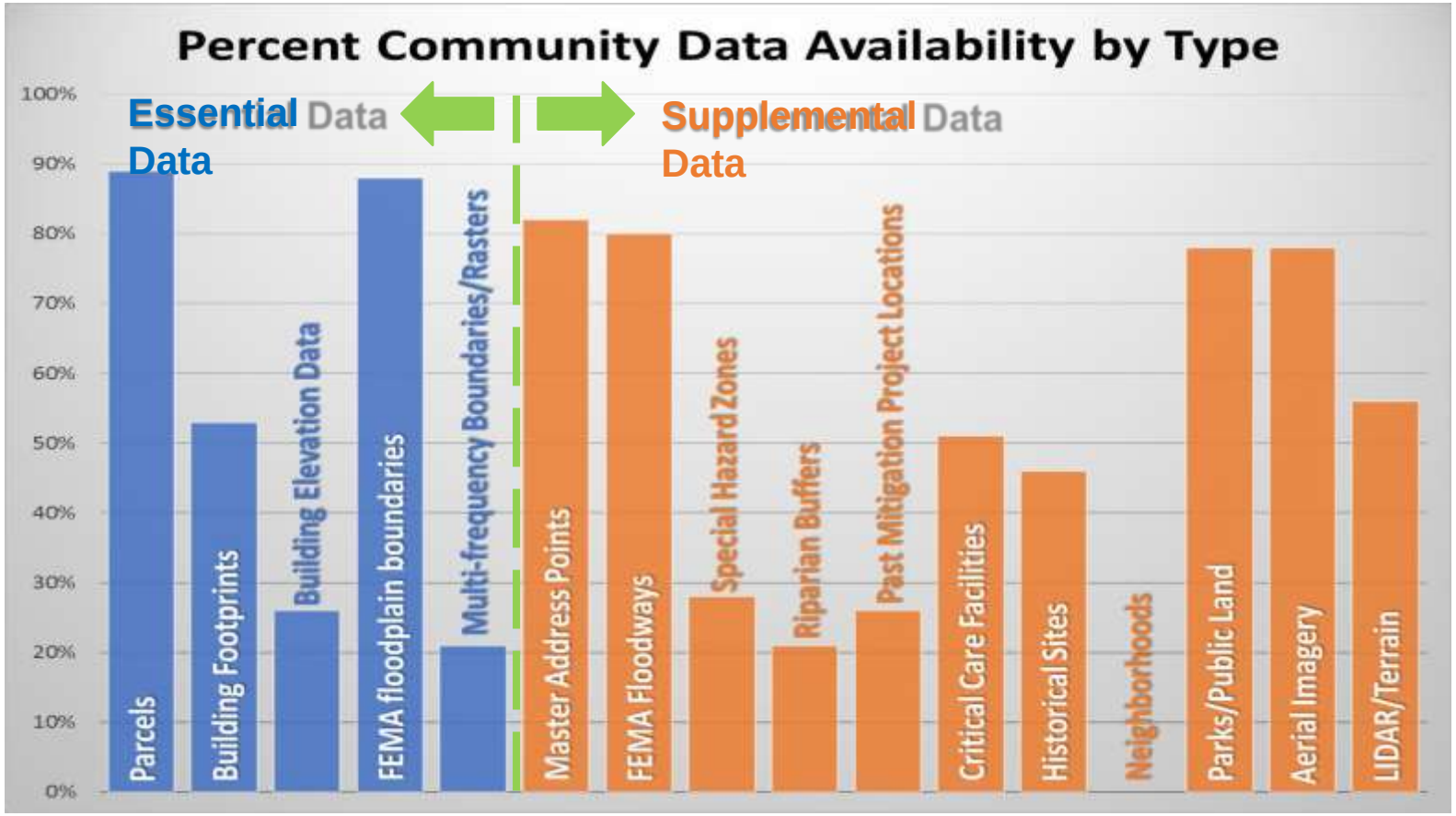
Findings on Flood Risk Data & Access

U.S. DHS S&T / Charlotte-Mecklenburg Stormwater Services

Data Needs

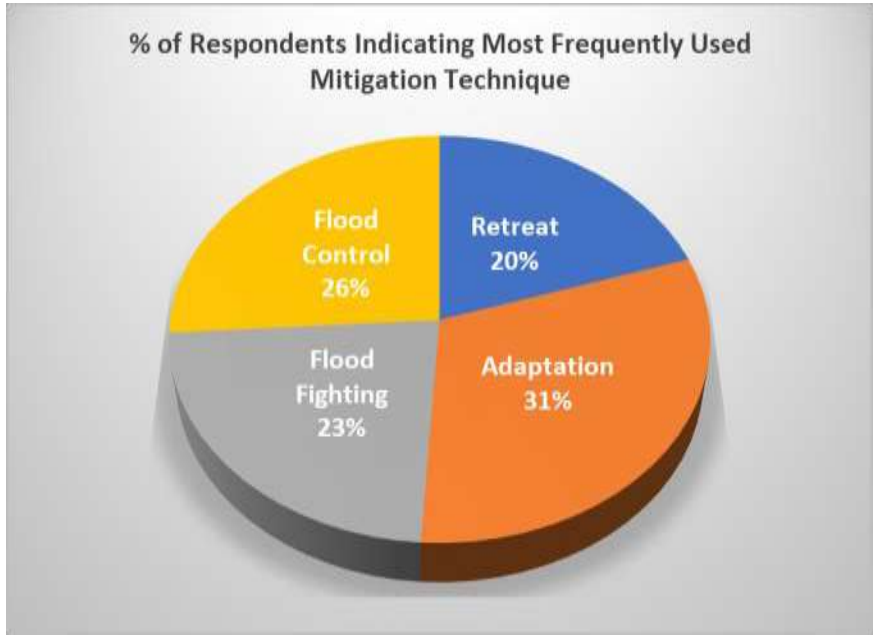
- Over **74%** of respondents are **missing 1-2 essential data sets** to manage flood risk at the building level.
- About **33%** of respondents lack Base Flood Elevations in **at least half** their community.
- Nearly **20%** of respondents are '**not confident**' or don't have adequate floodplain maps.

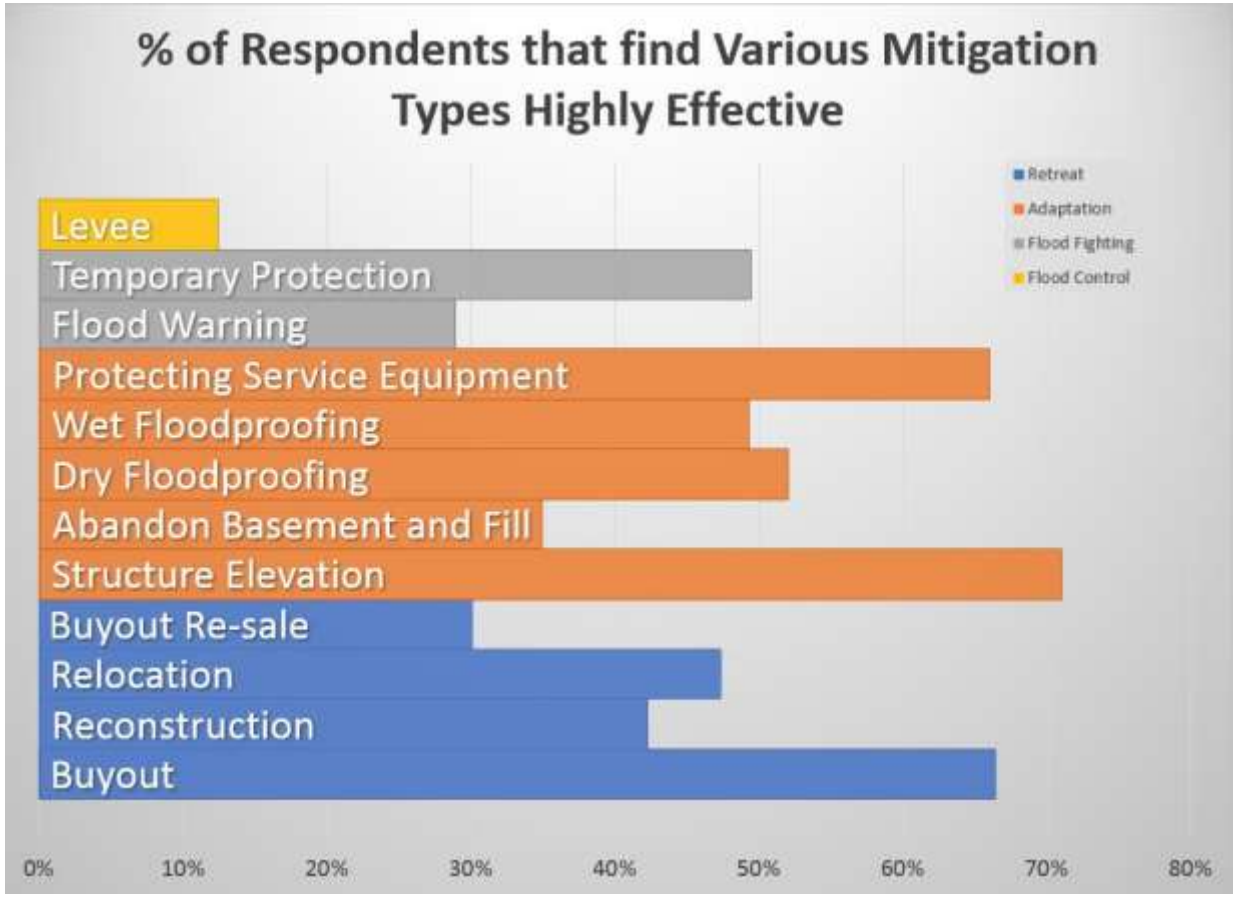


Findings on Flood Mitigation & Investment

U.S. DHS S&T / Charlotte-Mecklenburg Storm water Services

- **Top 3** most effective actions:
  - Structure elevation
  - Buyouts
  - Protection of service equipment





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U.S. Modeling of Flood Hazards and Risks

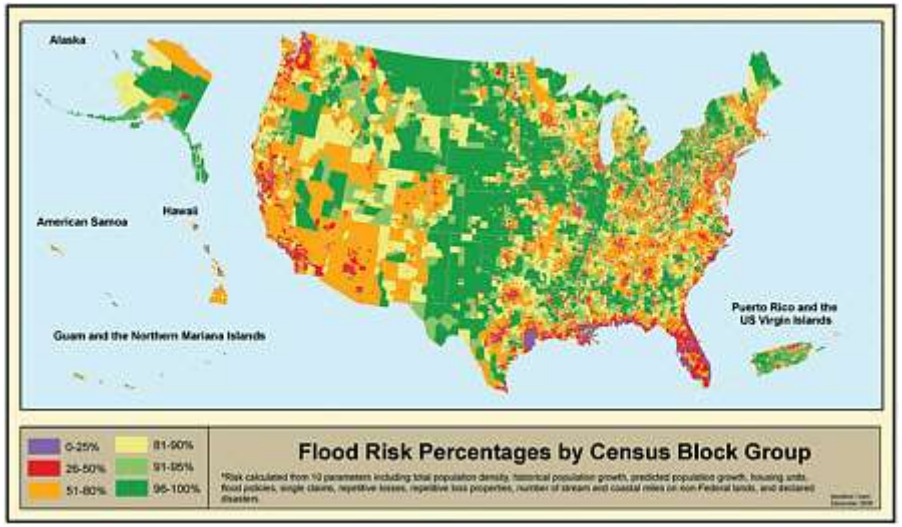
Trend toward use of AI\Machine learning, space/aerial and IoT ground sensors tied into Smart infrastructure

Two different but complimentary approaches

Detailed engineering

What is the hazard on at my location?

Generalized / Portfolio / Catastrophic



What is the exposure of my portfolio?

Mitigation Discussion Questions

- What is your vision for how technology is used for mitigation?
- What challenges have you experienced in using technology to support mitigation and risk reduction?
- What additional tools and resources would be most useful to your agencies in support of mitigation activities?
- Do you have specific technology, data, or knowledge gaps?
- Have you identified new technology of interest? S&T could assist you in tech scouting that technology.
- Are you experimenting with new and emerging technology? S&T could partner in those experiments.