NSF R2I2
Project Title: Identifying Community Need Based Adaptation and Resilience Priorities in the US Northeast
Private Sector (MAP) Meeting 1
Summary and Key Findings

March 25th, 2026
10:00 am – 12:00 pm

Attendees

Nicole Govert	Mary Buchanan	Diane Mas
James O'Donnell	David Murphy	Erik Mas
John Truscinski	Dean Audet	Kathleen Fallon
Yaprak Onat	Kyle Johnson	Alex Felson
Louanne Cooley	Ilana Judah	Elsa Leohmann
Beth Kirmmse		

Introduction

This report provides a summary of grant themes and a synthesis of discussions from the first NSF R2I2 Private Sector (MAP) meeting. The MAP convenes municipal, agency and private sector groups to identify and prioritize community-driven climate adaptation and resilience needs across the U.S. Northeast.

R2I2 Grant Themes

Flood Hazard Mapping

Priorities:

- Scalable stormwater mapping
- Reliable local mapping that can be used for regulatory decisions

Gaps:

- FEMA mapping only takes fluvial flooding into account, but a lot of short-term risk in municipalities is due to pluvial flooding.
    - As FEMA data fails to match the conditions that people experience, they are increasingly losing confidence in the maps, which may undermine broader trust in “trusted sources.”

- Pluvial flood models are resource-intensive and difficult to develop at scale. Existing models are often proprietary, making it difficult for practitioners to cross-check across multiple models.
- Data on stormwater infrastructure is often limited, not public, and can vary significantly by town. Firms are not always able to access the data needed to model and understand the full stormwater system comprehensively.

Potential Projects:

- Develop an effective, affordable, efficient, reliable way to map a stormwater system, perhaps combining field data collection + model. May suit the TIP opportunity.

Flood Adaptation Modeling & Decision Support:

Priorities:

- Strong need for standards – standards of care, risk, resilience, infrastructure

Gaps:

- There is no standard of care right now that would stand up in a courtroom. There are already lawsuits with engineering firms and resilience decisions.
- Uncertainty in modeling when future-casting, especially considering multiple risk scenarios. Firms might decide to design to the 90th percentile case scenario, but that's still not the worst-case scenario and may be exceeded. It's not clear what the legal responsibility is for the decisions and which scenario to design for.
- Standard of risk for critical assets and corresponding design periods (ex: Resilient Mass Action Team), to give a baseline for how sensitive a model needs to be given the value of the asset, and what the design standard should be.
- Infrastructure standards are often prescriptive, static, and based on past data, instead of dynamic, performance-based standards than can actually be field-monitored.

Potential Projects:

- Develop a state resilience standard for what needs to be evaluated to make these design decisions – this would help from a liability and standard of care standpoint.
- Explore how AI/Machine learning may be able to help optimize modeling.

Flood Prediction & Alerts:

Priorities:

- Flood alert system which has ongoing support for maintenance, is under state control and not subject to federal cuts.

Gaps:

- Need for data that is more than just points in time. Monitoring systems that can give continuous data over time could help with ground-truthing models.
- Point-based data from gauges and sensors have gaps between them.
- Different models are needed for different operational decisions: closing roads, deploying property-specific measures, longer-term community planning, real-time emergency management, etc.
    - Models based on 24-hour representative storms with SCS-type distribution do not capture the increasingly frequent "cloudburst" events that occur within 2 hours. These model runs don't help to make decisions for critical infrastructure in this shorter time window.
- Lack of funding for maintenance of alert systems over time.
- Reliance on NOAA data which may be subject to federal cuts.

Potential Projects:

- Opportunity to collaborate with the National Weather Service forecasting to improve forecasting models and practices
- Develop data collection methods that are continuous over time and not limited to points, as well as a system for data management.
- Design a state-led flood alert system

Nature-Based Features:

Priorities:

- Performance metrics and evaluations for NBS

Gaps:

- Firms report that it is difficult to work within the regulatory environment while still having the flexibility to be creative in design.

Potential Projects:

- Develop performance benchmarks for evaluating NBS
- Develop a way to tie financing mechanisms to the NBS performance

- Select a specific type of feature (ex: Metro North berms) where NBS can be implemented, then quantify impact of implementing along the coast.
- Compare how NBS are defined in states that allow for incorporation of hardscape into design (what the "flexibility of design" is seeking) and to update CT regulation or determine "if/then" criteria for flexibility. Seems fairly straightforward as a policy objective, if metrics exist to show value of allowing this.

Wind Hazards & Power Grid Resilience:

Priorities:

- Address data gaps and modeling uncertainty
- Consistent messaging on wind vs. trees vs. power outages in hazard discussions with municipalities.

Gaps:

- Uncertainty about climate modeling for wind
- Uncertainty about applicability of models and enforcement. What would you do with a better model if you had it? Changing the state building code or relying on people to make asset-related decisions on an individual basis?
- Data gaps:
    - Much of existing wind-modeling has focused on tropical storms rather than nor'easters. The larger decisions for building codes are relying on ensembles that may not be including nor'easter data.
    - Much existing data are city-level resolution, not neighborhood/block.
    - Limited access to utility data
- Inconsistent messaging about wind hazards (vs. tree concerns or power outages instead of wind), which may downplay its importance in climate communication even though many insurance losses are due to wind.

Heat and Health Risk:

Priorities:

- Addressing heat and health resilience in locally appropriate ways for rural and urban areas, which have different needs.
- Quantifying the cost of heat risks (public health, lost work, etc) and incorporating these costs into BCAs and other mitigation planning.

Gaps:

- The data readily available does not capture the human experience of heat at the street level.
- Quantifying the cost of heat risks and incorporating these into BCAs. A lot of costs and impacts from heat are hidden and not currently captured in the status quo BCA approach for investments.
- Heat mitigation projects need better performance criteria over time (e.g. urban forestry).

Potential Projects:

- Intersectional collaboration with public health sector.
- Quantifying the cost of heat risks (public health, lost work, etc) so they can be incorporated into BCAs and mitigation planning.
- Develop better design guidelines for heat mitigation projects.

Workforce Development:

Priorities:

- Interdisciplinary training (ex: Solar Decathlon)
- Training on creative, adaptive, risk-based design approaches to resilience

Gaps:

- Limited capacity in communities
- Practitioners often struggle with risk-based designs and adaptive management designs. Better understandings would help make these projects cost-effective.

Potential Projects:

- Development of a certificate program
  - TBD: Mid-career or early career training
  - TBD: is there a way to pair students with professionals for training opportunities and if so, how would we incentivize participation from firms?
    - Example: UConn Law Extern Program

Policy :

Priorities

- Policy should emerge from key themes identified through scientific research and practitioner experience

Gaps:

- Rapidly evolving climate challenges and slower-moving legal and regulatory frameworks, necessitating policies grounded in up-to-date, measurable science and informed decision-makers.
- Flood: Even if better models are available, regulations are based on FEMA.
- Flood: Not much incentive for communities to go above and beyond state standard, because of the expense and the possibility of repelling developers. Also in past, federal level grants only reimburse to certain levels, would not take into account higher cost due to higher state standards.
- Flood: Translating data into decision-making is a challenge. There are a variety of ways to use data to predict future conditions, and these predictions will affect infrastructure decisions.
- Wind: Some states (like MA) have issues with legal preemption – communities cannot supersede standards (within their local standard) with standards that go further than the state building code.

Potential Projects:

- Flood: Develop a state resilience standard for what needs to be evaluated to make design decisions – this would help liability and standard of care.
- Wind: A lot of wind mitigation measures are at the building scale, rather than civil landscape scale, because they are mandated through the building code. A regulatory component like the building code could much more easily come into play here for wind compared to some of the other hazards.
- NBS: Defining NBS, allowing for some limited use of hardscaping in guidelines or advocating for including of NBS in regulation.

Highlights from the Theme Discussions and Broader Conversation:

- Stormwater infrastructure data gap is a significant barrier to effective stormwater modeling. If we could develop an effective, affordable, efficient, reliable way to map a stormwater system, along with a data management framework, this would be very valuable to municipalities.
    - Can we find a funding mechanism to build these baseline models that towns could add to?
    - Could look at New York City InfoWorks model of their entire CSO system.
- Given the shortcomings of FEMA maps, a key question is what the standard should be for making a model trustworthy enough to be used in state regulation.
    - Could look at New Jersey example.

- An accessible inventory of case studies that show post-implementation performance of NBS and other adaptation measures, including heat mitigation approaches, would be helpful for practitioners for evaluation of NBS.
- We need new approaches to policy rather than trying to conform to existing policy that lags behind the science.
    - Adaptive regulation (regulations written to change with conditions, such as population density, rather than being static) might be a solution here, which we currently do not have (although PA 18-82 is somewhat similar to this).
- There is a big gap in planning for organized retreat to meet the scale of the problem.
- The health and economic impacts of extreme heat need to be quantified accurately so they can be incorporated into BCAs and mitigation planning in a more reliable and robust way.
- Wildfires are a growing concern, as flash droughts are increasing the risk.
    - A key regional point: New England doesn't tend to have large landowner tracts so it's harder to get a management strategy together.
    - How reliable are wildfire models for the Northeast?
- Risk-based design and adaptive design is an interest of the private sector, and an identified area where professionals need more training.