

Building Connections between Emergency Management and Climate Adaptation

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Federal Emergency Management Agency

“FEMA’s mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.”

- President’s 2015 Opportunity, Growth, and Security Initiative (OGSI)
- Executive Order 13653 Preparing the United States for the Impacts of Climate Change
- President’s 2013 Climate Action Plan
- FEMA’s Climate Change Adaptation Policy
- 2014-2018 FEMA Strategic Plan

All identify the risks and impacts associated with climate change on community resilience to natural hazards, and direct Federal agencies to support climate resilient infrastructure.



State Hazard Mitigation Plan: Focus on Reducing Risks

*Resilience in terms of mitigation planning, means the **ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruptions caused by a hazard.***

State risk assessments must be current, relevant, and include new hazard data, such as recent events, current probability data, loss estimation models, or new flood studies as well as information from local and tribal mitigation plans, as applicable, and consideration of changing environmental or climate conditions that may affect and influence the long-term vulnerability from hazards in the state.

FEMA recognizes there exists inherent uncertainty about future conditions and will work with states to identify tools and approaches that enable decision-making to reduce risks and increase resilience from a changing climate.

An understanding of vulnerabilities will assist with prioritizing mitigation actions and policies that reduce risk from future events.



Trends and Implications for Emergency Management

- Rising Temperatures
- Increased storm intensity and frequency
- Rising sea levels (how does that affect MN?)
- Changing drought and fire risk
- Shifting threats to human health and disease patterns



FEMA and Minnesota

MN HSEM implements federal Hazard Mitigation Assistance (HMA) grant programs

- Hazard Mitigation Grant Program (HMGP)
 - Post-disaster
- Pre-Disaster Mitigation (PDM) Program
 - Annually congressionally appropriated
- Flood Mitigation Assistance (FMA) Program
 - National Flood Insurance Fund/Program



Traditional Hazard Mitigation Projects

Eligibility - Local Hazard Mitigation Plans (natural hazards)

- Acquisition/Elevation/Relocation
 - Substantially or repetitively damaged (flood or erosion)
 - Threat of imminent danger (slope failure)
- Tornado Safe Rooms (severe storms/tornadoes)
- Powerline retrofit/strengthening (severe storms/ice)
- Wildfire sprinklers/defensible space/resistant materials
- Slope stabilization
- Flood risk reduction activities



Climate Resilient Mitigation Activities

- Climate Resilient Mitigation Activities (CRMA) for HMA
 - Aquifer Storage and Recovery (ASR)
 - Floodwater Diversion, Storage, and Recovery
 - Floodplain and Stream Restoration
- Guidance on drought mitigation as well as sustainable actions to mitigate other risks (e.g. flood, erosion)
- Encourages communities to incorporate climate resilience in all mitigation actions through use of green infrastructure methods and designing projects to increase ecosystem service benefits



Green Infrastructure

- Sustainable approach to natural landscape preservation and storm water management
- Include in **eligible hazard mitigation activities** as well as provide additional ecosystem benefits
- Ecosystem-based approach to replicate a site's pre-development, natural hydrologic function.
- Benefits include:
 - Increase water supply
 - Improved water quality
- Can be scaled to size and designed to fit site conditions,
- Additional ecosystem services:
 - Improved air quality;
 - Provide habitat for pollinators or other wildlife;
 - Reduce urban heat island impacts



Aquifer Storage and Recovery

- Subsurface storage of surface water runoff and groundwater in natural aquifer
 - Takes advantage of seasonal variations in surface water runoff and periods of high precipitation leading to more surface and ground water availability
 - Storage underground protects water from pollutants, evaporation...
- Mitigation action for drought, salt water intrusion, capture flood for groundwater recharge
- Two aquifer formation types: confined and unconfined
- Many Considerations and Challenges



Flood Diversion and Storage

- Diverting storm or floodwaters into lakes, channels, floodplains, irrigation canals, wetlands, or other natural or manmade green infrastructure surface storage (e.g. bio-swales, bio-retention, bio-detention basins)
- Floodwater is detained and released slowly to facilitate ground infiltration/seepage
 - Recharge groundwater supply/water table using green infrastructure methods
 - Recharge wells can be used to resupply an unconfined aquifer
- Benefits include
 - Flood risk reduction and/or management
 - Harvest excess storm/surface water for later use in dry periods (e.g. drought)
 - Green infrastructure/potential ecosystem services
- Many Considerations and Challenges
 - Projects can vary in complexity and size and affect project costs, design, and environmental impacts
 - Larger projects may require more extensive EHP review



Floodplain and Stream Restoration

- Restore original function of floodplains and associated wetlands of flood prone river and stream systems to pre-development conditions
 - Connectivity and storage capacity
 - Physical stability, hydrology, and biological functions of impaired stream and river banks to restore a natural stable riparian system
 - Seasonal variations in water supply
 - Capture spring rain or snowmelt to recharge both surface water and groundwater supplies
 - Provide erosion mitigation to stabilize banks, avoid bank collapse
 - Projects lend themselves readily to green infrastructure methods maximizing ecosystem service benefits
 - Restore or improve water quality
 - Restore habitat for wildlife
 - Restore stream, estuary, and/or wetland ecology
 - May provide dual-use for recreation or environmental education space
- Many Considerations and Challenges



How to connect?

Emergency Managers:

- Include climate change in Plan updates
- Apply for HMA grants
- Connect with local experts
- Continue to expand knowledge on risk and vulnerability of jurisdiction
- Attend trainings, continuing education

Climate Change Adaptation professionals:

- Participate on city/county planning teams
- Assist with project applications as subject matter experts
- Publish/promote studies
- Continue the good work!



How to connect?

- HSEM is connection between FEMA and LGUs
- Who are you connected to?
- HSEM participates in Climate Change Adaptation at various levels
 - City
 - County
 - State Inter-Agency Climate Adaptation Team (ICAT)
- HSEM participates in USACE “Silver Jackets”
- Keep in contact!



Resources

Climate Change in Hazard Mitigation Assistance:
fema.gov/climate-change

Email: Hazard.mitigation@state.mn.us

