

Secretary Moore TPs on Resilience  
December 5, 2023

- In the context of our changing environment – where we are seeing more severe storms more often, extended periods of drought, heat waves both earlier in the summer and later in the fall, and increased health risks from air pollution and disease – the State of Vermont is continuing to take steps to better cope with and effectively recover from a wider range of environmental conditions.
- To be able to anticipate, prepare for, and respond to weather extremes – is to become more resilient.
- And there are both infrastructure and natural systems components of thinking about resilience in the face of climate change.
  - Vermonters and Vermont communities need access to clean water, safe roads and bridges that can withstand high flows, and affordable, energy-efficient housing.
  - Vermont’s wildlife – animals and plants – species and ecosystems – require connected habitats that support their ability to adapt and move across the landscape.
- That said, resilience is not synonymous with eliminating all risk.
- Obviously, the path of every storm, rainfall amounts, and what debris ends up where is different, so it can be difficult to make a direct comparison between events, but all indications are that the programs and projects undertaken to repair the damage created by Tropical Storm Irene and improve resiliency performed well this summer.
- In the coming years, it will be imperative to continue to build on this work and implement the programs and projects to both “build back better” AND make proactive investments that enhance resilience.

- To my mind, this work can be organized into four broad categories:
  - Investing in nature-based solutions
  - Floodproofing and hardening existing infrastructure that needs to remain in vulnerable locations
  - Designing and maintaining reliable infrastructure, not only in current but also future climate conditions
  - Being ready with fast, effective response and recovery
- Providing a little more detail on each of these:
  - **Nature-based solutions** focus on the conservation and restoration of different areas of the landscape ... actions like protecting and restoring wetlands and floodplains... and giving rivers more room to spill over their banks without causing catastrophic flooding. As well as conserving strategic large, woodland tracts to ensure forests remain forests –both soak away stormwater and protect biodiversity.
  - Importantly, many nature-based solutions really pull “double duty” in our clean water work, and as a result we have made significant investments in these types of projects over the last 8 years.
    - Replanting an estimated 328 acres of forested riparian buffers
    - Restoring 109 acres of floodplain
    - Purchasing easements of nearly 1,500 acres of riparian corridors, and
    - Conserving and restoring almost 1,200 acres of wetlands
    - Supporting the conservation of more than 26,500 acres of land with explicit natural resource protections
  - A specific example of this type of work is the Water Street River Park in Northfield.

- Flooding along the Dog River during Tropical Storm Irene damaged 18 homes in Northfield’s Water Street neighborhood. The Town worked with effected property owners and FEMA to secure flood buy-outs that both
  - Helped landowners to move out of harm’s way; and
  - Allowed the town to acquire and restore a five-acre contiguous area of floodplain – right outside Northfield’s downtown
- That five-acre area is now known as the Water Street River Park and it has walking paths used by community members and their dogs, as well as access to the river for wading and fishing.
- The park has reduced flood risk and enhanced the downtown.
- **Floodproofing or hardening infrastructure** are changes made to reduce or eliminate flood damage to buildings, including things like water and wastewater facilities, in areas where it is impractical to relocate to a less vulnerable location.
  - An example here is investments made in the Waterbury State Office Complex following Tropical Storm Irene
    - Specifically, all mechanical, electrical and plumbing systems in the complex were moved from basement areas to higher floors, and the basement was then filled and structurally reinforced, so that the lowest floor elevation of those historic buildings is now above the 500-year flood level.
    - As a result, the Waterbury State Complex experienced minimal damage from the July 2023 flooding and was fully open and operational within two weeks’ time.
- Making **infrastructure design decisions** with not only current but also future climate conditions in mind... and keeping up with needed maintenance and improvements. Things like ensuring the reliability (or removal) of the hundreds of dams throughout Vermont, as well

as replacing undersized culverts and bridges with wider – sometimes referred to as bankfull width – structures that, in turn, limit damage during flood events.

- One need not look any further than Vermont Routes 100 and 107 in the Bethel - Killington - Stockbridge area. Following Irene, these roadways needed to be fully reconstructed, and as part of that work damaged or destroyed bridges were replaced by new structures with increased waterway openings.
- In addition, hundreds of tons of large diameter rock was used to reinforce particularly vulnerable sections of the roadway.
- And although 100 and 107 required temporary closures during the July (and early August) rains due to flooding, the roadways reopened quickly and required relatively modest repairs.
- And finally, **fast and effective response** is essential to supporting the safety and wellbeing of Vermonters in the face of climate change
  - Some of the best examples here can feel relatively mundane, but are important – things like established, collaborative relationships between ANR River Engineers and town road foreman, and developing emergency permitting guidelines and the ability to waive the 30-day public comment period during a declared state of emergency.
- Ultimately, we know we need to continue to work to curb our greenhouse gas emissions AND invest in the programs and projects that will make Vermont more resilient.
  - The team at ANR, including our Climate Action Office, helps improve resiliency through science-based monitoring and analysis, information sharing, public outreach and technical assistance, and providing grants and cost-share to support the implementation of sustainable and effective projects.

- We know that we can't simply snap our fingers and become resilient... it requires a long-term commitment and a workable plan
- This afternoon you will hear from key program leaders at ANR, and our strong partners at VEM, who will share more specific information, from their vantage points, about how we identified and have systematically worked to address impacts from this summer's floods – including issues related to rivers, dam safety and landslides.
- And then you will hear about on-going work to further enhance landscape-level resilience, the importance of which was further emphasized by the floods – including hazard mitigation work led by VEM and tools being developed by the Climate Action Office to help Vermont municipalities better identify and address their vulnerabilities.
- Although there are days where it can certainly seem like a small silver lining as communities continue the hard work of recovery, the impact of the coordination, education, planning and implementation that Vermonters engaged in since Irene was validated during this summer's flooding – reinforcing the value of our approach to improving and enhancing resilience across the Vermont landscape.