

**Discussion on vulnerabilities/risks: What are the key focus areas for vulnerability and risk caused by climate change?**

**Storm events:**

- Flooding impacts the built environment, including: bridges, culverts, pavements, port facilities, highways, railroads.
  - Older/urban communities are at greater risk—more impervious surfaces. Having to pay for the costs of flooding consumes revenue that would otherwise go to maintaining/improving/replacing existing infrastructure, building new infrastructure or investing in green infrastructure.
  - Greater frequency of extreme storm events impacts siting of infrastructure, how many times we rebuild existing infrastructure before relocating it, and how we assess when to relocate entire communities that are particularly vulnerable to flooding.
  - Dam spillways are undersized, openings on bridges and culverts may be inadequate for future storm events pointing to the inadequacies of much stand alone hard infrastructure to manage water resources.
- Combined Sewer Overflows allow water to bypass and overload water treatment plants during storm events. Increases in storm events will increase the number of CSO violations at a time when localities are struggling to eliminate the discharges.
- Non-point source runoff pollution increases loads on CSO systems, impacts aquatic life and stresses drinking water treatment infrastructure. Increased storm events will increase runoff from agricultural and urban non-point surfaces.
- Pavement/soil concerns—with the increased potential for water in the soil, pavements will lose the support provided by the soil and prematurely fail. Wetter winters mean greater and more frequent damage, failure and pot holes of the pavement due to the freeze/thaw cycles.
- One solution is green infrastructure for more retention. ARRA funding existed for green infrastructure and set asides continue in SRF appropriations. EPA promotes green infrastructure, including through its Climate Ready Utilities Workgroup. Green infrastructure is becoming a mandate for discharge permits. One concern is that there will be more demand for funding to reduce non-point source runoff than there will be supply. Funding and DEP permits are issues. EPA distribution of SRF and 319 is funding source (50%).

**Warmer temperatures:**

- Warmer water temperatures will impact how permits are issued to industries for water withdrawal and discharge. The receiving waters at discharge points will be warmer over time thus discharge permits will have more stringent temperature criteria. Technology limitations or costs may necessitate operations to relocate or modify. For power companies, this could result in reduced/a loss of power generation.
- Sea level rise: Salt line in Delaware River affects drinking water intakes. Water intakes & discharges are impacted by sea level regardless of salt line. Also impacts concrete and steel causing premature failure of transportation infrastructure such as bridges and roads.
- Invasive species/vegetation management.

- Chesapeake Bay strategy: Higher temperatures = an increase in nutrients that leads to a greater burden on the treatment infrastructure.

**All/Other:**

- In order to assure healthy minimum instream flows, permits issued for water withdrawals will need to be adjusted during low flows or periods of drought.
- Long range planning needs: energy grid planning process; funding from PennVest and other sources; transportation planning by regions and municipalities.
- Energy: weather changes will cause higher overall demand and higher peak demand – requiring more generation. There is currently a difficulty siting new generation because of the economy, AQ issues and water use demands. As weather events cause higher T and more winter storms and higher wind events, demand will increase and there will be more outages – both brownouts (voltage drops) and blackouts.
- Energy distribution network: Lines sag as T increases; shorter life for poles; overheated transformers. Pipelines/underground lines vulnerable to freeze/thaw and flooding impacts.

**Thoughts on priorities:**

- Drinking water and wastewater
- Stormwater – flooding; erosion & sedimentation
- Power outages
- Structural integrity/reliability of infrastructure

**Next steps** – send resources and data to Kim Hoover to compile. [khoover@state.pa.us](mailto:khoover@state.pa.us)

**Future Meetings are confirmed on these dates:**

**July 12, Sept. 13, and Nov. 8 from 9:00am – 12:00pm.**

**The July and Sept. meeting location is Rachel Carson Building, 12<sup>th</sup> floor conference room, 400 Market St., Harrisburg. The Nov. meeting location is Fish & Boat Commission, Susquehanna Room, 1601 Elmerton Ave., Harrisburg.**