



Presenter

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When and How to Modify Stormwater Design Standards for Climate Resiliency

The conveyance and management of stormwater runoff from developed areas are intrinsically linked to climate. Design storms, which typically specify a storm depth for a given duration and recurrence interval based on analysis of historical precipitation data, are central to the engineering analysis and design of stormwater infrastructure throughout the Carolinas. For stormwater conveyance infrastructure, larger design storms associated with climate change could require larger conveyance pipes and increase the prevalence of existing infrastructure classified as deficient. For stormwater control measures (SCMs), larger design storms will generally require larger facilities to store more runoff and could influence the type of SCM implemented. In both cases, there are clear connections between design storm depth and construction costs. With some inherent uncertainty in climate projections, municipal officials are faced with challenges in determining the extent to which design standards should change to provide climate resiliency.

Using the SWMM Climate Adjustment Tool and similar tools within the US Climate Resilience Toolkit, an analysis of climate projections for locations throughout North and South Carolina provides perspective into the range of potential design storm changes and their impact on the sizing of stormwater infrastructure. Combining this sizing analysis with an evaluation of construction costs provides insight into the potential near term economic impact of these design standard changes. In some cases, the range of projected changes is relatively narrow, simplifying justification of near term cost increases. In cases where projected changes are significant or highly variable, more careful consideration of the costs and benefits is often required. These benefits may include improved performance under current climate conditions and avoided costs of future retrofits, as demonstrated through a hydrologic and hydraulic simulation example.

Many of the challenges associated with stormwater design standard changes lie not in the technical analysis, but in stakeholder priorities and input. To facilitate an understanding of these issues in the Carolinas, audience interaction throughout the presentation using interactive polling and direct audience input will consider the following questions:

- Does your community utilize stormwater design standards that account for climate change?
- Do you think design standards should be more conservative (larger design storms)?

- What is the most significant hurdle to revising design standards?
- What are the benefits of revising design standards?
- What could be done to better facilitate improvements to design standards?