

Assessing the impact of climate change predictions on the hydraulic vulnerability of coastal bridges

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With the reality of climate change now widely accepted the world over by recognized scientific organizations and governments, bridge owners are beginning to consider how climate change predictions may affect the safety of their bridges. In a study of bridge failure causes in the United States, over 60% were due to hydraulic factors. Changes in sea-level rise, precipitation, and storm frequency are likely to have important implications in the hydraulic design, analysis, inspection, operation and maintenance of bridge structures. Climate change predictions for the northeastern United States are particularly alarming since many densely populated coastal cities would be affected. Regional climate models for the New York City coastal region predict sea level to rise as much as 12 - 55 inches (30 - 140 cm), possible precipitation increases of 5 to 10% and an increase in the frequency of storm events such as the 100-year storm by the year 2080. Incorporating climate change predictions in the hydraulic analysis of bridge structures will be discussed using the New York City coastal region as a case study.