

## Engineering in the Age of Climate Change

As climate change and its impacts are debated in the headlines on a seemingly daily basis, we in the engineering community are faced with the hidden truth that our approach to design must be modified to reflect the new reality that climate change presents to us. The inherent challenges we face when engineering water related structures for an ever changing landscape increases exponentially when climate change is thrown into the equation.



CEI Senior Engineer Mr. David Nyman, P.E., discussed this very issue recently at the Massachusetts Water Resources Research Center, 8<sup>th</sup> Annual Water Conference held at UMass Amherst. Joined by experts across the region, Mr. Nyman presented a seminar on *Climate Change and Stream Crossing Structure Design*.

Having recently worked with the MA Department of Transportation's Highway Division on the development of their most recent statewide guidance, *Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams*, Mr. Nyman discussed how climate change presents challenges for designing bridges and culverts at New England Streams.

Traditionally, engineers design these structures for selected flood events, considering hydraulic capacity and scour protection. Changes in precipitation intensity and frequency affect extreme storm flows and also the more frequent, smaller events that shape the region's streams. Recent developments in stream crossing design standards and regulatory requirements focus on providing bridges and culverts that minimize barriers to the movement of fish and other wildlife. Changing climate may alter stream hydrology and morphology, affecting the design of structures for flood capacity, stability, and habitat continuity. Mr. Nyman discusses how stream crossing design can address the uncertainties of climate change, while providing structural and hydraulic integrity and habitat resiliency.

For more information on the design of stream crossing engineering and culvert design, please contact Dave directly at 508-281-5160 or email him at [dnyman@ceiengineers.com](mailto:dnyman@ceiengineers.com).