

UTC Project Information	
Project Title	MPC-645 – Seamless Comparative Modeling of Natural Hazards Using the Material Point Method
University	Colorado State University
Principal Investigator	Paul R. Heyliger, Ph.D.
PI Contact Information	Professor Dept. of Civil and Environmental Engineering Colorado State University Phone: (970) 491-6685 Email: prh@engr.colostate.edu ORCID: 0000-0001-6884-6967
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Start and End Dates	November 11, 2020 to July 31, 2022
Brief Description of Research Project	<p>At present, there are a wide variety of modeling approaches used to simulate and represent the threats of natural hazards on transportation infrastructure. One disadvantage of this approach is that direct comparisons between both methods and disparate threats lack consistency and continuity. Hence, practitioners hoping to determine levels of threat and system response must use a specific method depending on the system and the type of hazard. Clearly, input parameters for varying threats are part of the inherent nature of the hazard. But the modeling approach should be consistent.</p> <p>In this work, a seamless modeling approach will be used to develop what amounts to a single modeling tool that can represent soils, fluids, solids, and their combination including concepts, for example, as fluid-structure interaction. The Material Point Method (MPM) has seen limited but successful development in modeling these types of systems but in this work the natural threat rubric will be incorporated under a single modeling domain. This will allow for consistency threat assessment, the development of a single computational tool, and the ability to effectively rank the seriousness and potential damage caused using a single platform.</p>
Describe Implementation of Research Outcomes (or why not implemented)	
Place Any Photos Here	

Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links <ul style="list-style-type: none">• Reports• Project Website	