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**PH.D. DISSERTATION PRESENTATION
& DEFENSE**

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Tsunami and Storm Wave Impacts on Coastal Bridges

Wave loads on coastal bridges due to tsunami and storm waves are studied through a set of laboratory experiments and numerical calculations. Effects of wave nonlinearity and entrapped air on wave loading under conditions where the bridge may be partially or fully inundated are of particular interest. In addition, effects of compressibility and scaling are investigated through numerical calculations. With the destruction of bridges during recent events such as the 2011 Tohoku tsunami and hurricanes Katrina in 2005 and Ivan in 2004, this highlights the importance of this research in understanding the mechanisms of failure during such events to prevent future coastal bridge failures. Destruction of these bridges is not only financially costly, but can prevent emergency services from reaching coastal communities, thus potentially contributing to loss of life. Along with the bridges, this research is applicable to other coastal and offshore structures, such as piers, submerged breakwaters and offshore platforms, in which wave loading or entrapped air is of concern.