

The NSF US-Taiwan Partnership for International Research and Education

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In the US, floods annually cause an average 89 fatalities and \$8.2 billion in damages. In Taiwan, flooding has led to nearly 1,000 fatalities and over \$12.8 billion NT in damages since 2000 (NWS, 2014). These numbers are expected to grow due to climate change, population growth, and increased vulnerability and exposure to extreme weather events (IPCC, AR5). Coastal and inland communities both in Taiwan and the northeastern (NE) US are examples of communities that are becoming more vulnerable and exposed to increasing extreme precipitation trends associated with changing large-scale patterns. Proper mitigation could reduce adverse extreme weather impacts, particularly flood-related losses, with improved predictability of short-range and long-term forecasts, more effective warning tools, and more effective decision support for decision makers and emergency responders. Achieving research on any one of these goals particularly in a way that accounts for their interdependencies along the weather risk mitigation continuum is daunting.

The US–Taiwan PIRE seeks to address the challenges associated with extreme weather resiliency with a particular focus of research on reducing the impacts/risks of extreme precipitation through the enhancement of weather and climate prediction and a better understanding of decision-making risk and response during extreme weather events. Research among the consortium will focus on (1) better understanding of trends in weather extremes on a regional scale (particularly in East Asia and the NE US); (2) examination of NWP ensemble techniques that better capture the uncertainty of events; (3) investigation of the efficacy of decision-making and the response of emergency managers with probabilistic weather and impacts information.

US–Taiwan PIRE also seeks to prepare a cadre of US-Taiwanese atmospheric and social scientists and practitioners with disciplinary and interdisciplinary academic and research experiences geared around extreme weather and resiliency. Specifically, the PIRE: (1) Trains the next generation of scientists and experts with crosscutting knowledge, skills and understanding of regional climate and weather prediction, risk decision-making and response during extreme weather events. (2) Fosters a culture of interdisciplinary research, training, and education to advance a greater understanding of resiliency and response solutions in addressing extreme weather. (3) Advances the globalization of US and Taiwan undergraduate and graduate students by building cross-cultural literacy into the PIRE's study abroad experiences and broadens the participation of underrepresented groups through integrated, inter-institutional academic programming involving PIRE universities and practitioner partners.

A quick overview of the project will be given and its progress to date.