Editorial

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During the decade from 2008 to 2017, hurricanes and associated flooding, inundation, surge, and storm wave events have occurred on an unprecedented scale with severe effects. In 2017 alone, the major hurricanes Harvey, Irma, Jose, and Maria cost to the US economy $265B, almost three times more than the 2012 hurricanes combined (with Hurricane Sandy being the costliest that year with an estimate $70B in damages - adjusted for inflation) (Rice, 2018). Recent studies indicate that the American economy could lose up to 10% of its GDP by the end of the century due to climate change (Kahn et al., 2019). Our society lives in a new norm of natural disasters, and the new generation of geotechnical engineers must adopt a risk-based mindset to address the needs of resiliency and sustainability for larger and more frequent weather-related natural hazards (O'Brien et al., 2012).

This Special Issue of the *ISSMGE International Journal of Geoengineering Case Histories* draws from the hurricane reconnaissance efforts by the Geotechnical Extreme Event Reconnaissance (GEER; geerassociation.org) Association between 2008, when GEER initiated its post-hurricane event reconnaissance, and 2017. Post-hurricane geotechnical reconnaissance has drawn attention to impacts on foundations, earthen structures, coastal infrastructure, scour, and sediment erosion and relocation. The need for a better understanding of such impacts is urgent because of the increasing phenomena of sea level rise, storm frequency and intensity, and growing population in coastal areas. The immediate collection and documentation of perishable geo-data data is essential to advance geotechnical knowledge and further develop risk assessment and mitigation strategies. The GEER Association work, in general, is based upon work supported in part by the National Science Foundation (NSF) through the Geotechnical Engineering Program under Grant No. CMMI-1266418. The GEER Association is made possible by the vision and support of the NSF Geotechnical Engineering Program Directors: Dr. Richard Fragaszy and the late Dr. Cliff Astill. GEER members also donate their time, talent, and resources to collect time-sensitive field observations of the effects of extreme events.

The presented case studies are Hurricanes Maria (2017), Irma (2017), Harvey (2017), Sandy (2012), and Gustav (2008). The papers include distillations of the observations, lessons learned, and conclusions or recommendations from GEER missions. We have ordered papers in reverse chronological order to highlight the numerous large 2017 hurricanes and their impacts. The authors, all of whom have participated in the missions or preparation of the relevant GEER reports (available at geerassociation.org), focus on: (i) providing data and raising awareness about geotechnical impacts from hurricanes and large tropical storms, particularly considering climate change effects; (ii) informing the readers about the work and procedures of the GEER Association over the past decade on multiple hazards; and (iii) presenting the GEER work specifically on documenting hurricane and storm impacts.

It has been a pleasure and a privilege to serve as guest editors and co-authors in this Special Issue, and to be part of the groundbreaking work of the GEER Association, which has generated a major shift in reconnaissance after extreme events and in elevating the leadership of the geo-profession. We appreciate the dedication of all co-authors in this issue and are looking forward to feedback from the readers.

Reference: Stark, N., Wooten, L., and Nikolaou, S. (2020). Editorial. International Journal of Geoengineering Case Histories, https://www.geocasehistoriesjournal.org/, Vol.5, Issue 4, p. i - ii. doi: 10.4417/IJGCH-05-04-00.

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Silva-Tulla F., and Pando M. A. (2020). Geotechnical Extreme Event Site Reconnaissance in Puerto Rico after the Passage of Hurricane Maria. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 1-25, doi: 10.4417/IJGCH-05-04-01

Landon M. E., Hudyma N. W., and Sharma R. S. (2020). Hurricane Irma: Consequences of Intense Rainfall and Storm Surge from a Tropical Storm in North and Central Florida. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 26-46, doi: 10.4417/IJGCH-05-04-02

Smallegan S.M., Figlus J., Stark N., Sasanakul I., Arboleda Monsalve L. G., Shafii I., Jafari N., Ravichandran N., and Bassal P. (2020). Post-2017 Hurricane Season Assessment of Civil Infrastructure Impacts on Beach and Near-Beach Environments. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 47-61, doi: 10.4417/IJGCH-05-04-03

Stark N., Shafii I., Jafari N., Ravichandran N., Figlus J., Smallegan S. M., and Bassal P. (2020). Scour at the Seawall in Surfside, Texas, During Hurricane Harvey (2017). International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 62-76, doi: 10.4417/IJGCH-05-04-04

Wooten L., Kulesza S., El Mohtar C., Diaz B., Ilupeju O., Rasulo M., Bassal P., Hussien A., Mofarraj Kouchaki B., Little M. V., A Mert A., and Nelsen C. W. (2020). Geotechnical Effects of Hurricane Harvey in the Houston, Beaumont, and Port Arthur Areas. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 77-105, doi: 10.4417/IJGCH-05-04-05

Nikolaou S., Hashash Y. M. A., Sukumaran B., Sacks A., Burlingame M. J., Baxter C., Bradshaw A., Wooten L., Lacy H., Moss C., Daraio J. A., and O'Rourke T. D. (2020). Geotechnical Effects and a 6-Year Outlook of the 2012 Hurricane Sandy in the Eastern United States. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 106-128, doi: 10.4417/IJGCH-05-04-06

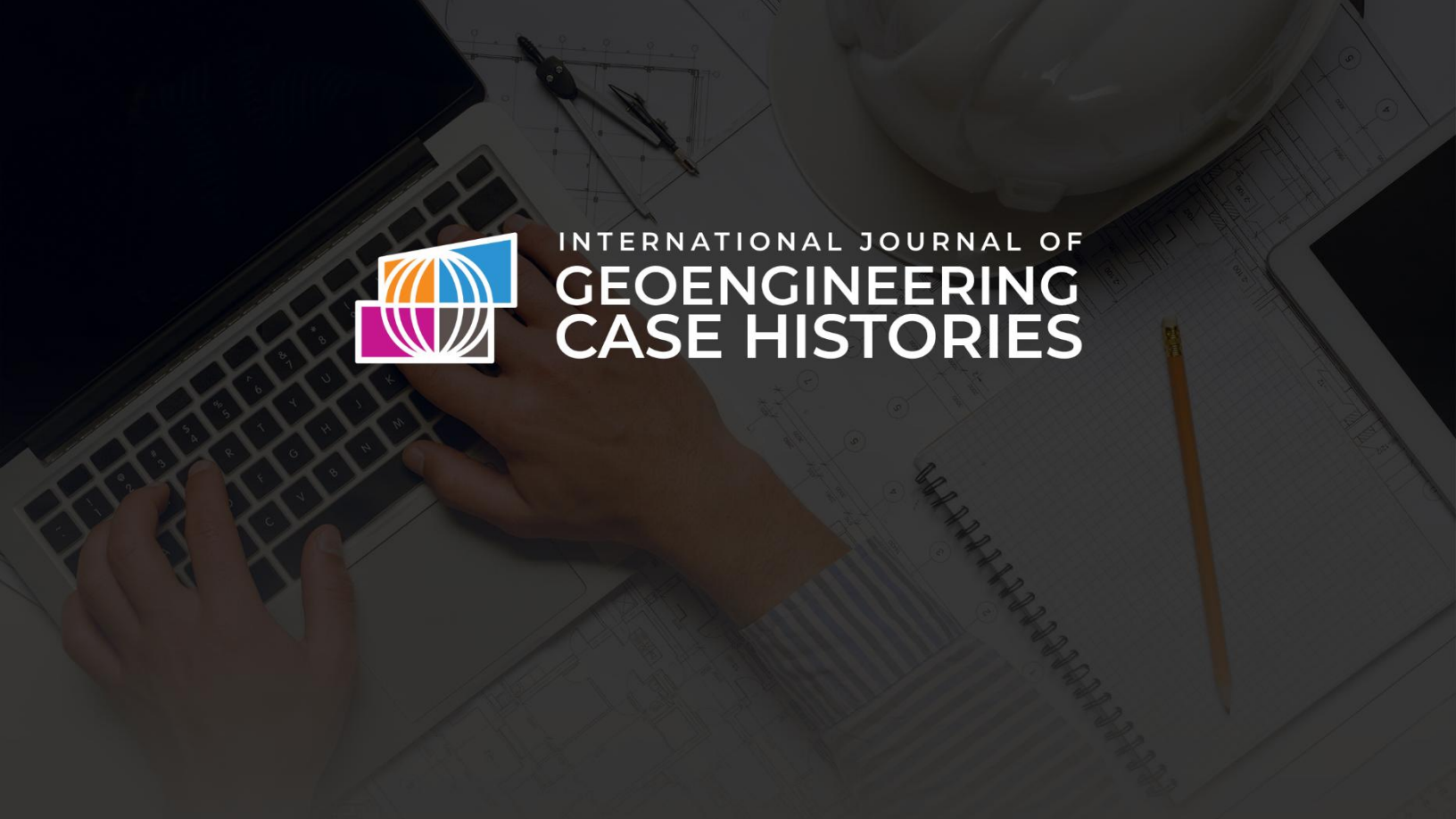
Wooten L., Gilbert R. B., Marcuson, III W. F., Harder, Jr. L. F., and Nicholson P. G. (2020). Reconnaissance of the New Orleans Hurricane and Storm Damage Risk Reduction System after Hurricane Gustav. International Journal of Geoengineering Case Histories, Volume 5, Issue 4, pp. 129-154, doi: 10.4417/IJGCH-05-04-07

REFERENCES

Rice, D. (2018). "2017's three monster hurricanes — Harvey, Irma and Maria — among five costliest ever." *USA Today*, <https://www.usatoday.com/story/weather/2018/01/30/2017-s-three-monster-hurricanes-harvey-irma-and-maria-among-five-costliest-ever/1078930001/>.

Kahn, M.E., Mohaddes K., Ng R. N. C, Pesaran M. H., Raissi M., and Yang J.-C. (2019). *Long-Term Macroeconomic Effects of Climate Change: a Cross-Country Analysis*, NBER working paper.

O'Brien, K., et al. (2012). *Toward a sustainable and resilient future. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC), Cambridge University Press, Cambridge, UK, and New York, NY, USA, 437-486.



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