

## CURRENT PROJECTS – UPDATE

Coastal – LOOKING BACK TO THE FUTURE: With the GOaL to gain insight on Anthropocene beaches from Holocene and Pleistocene shorelines

Scientists recently concluded that we have entered a new geologic period, termed the Anthropocene, starting in the mid-1900s when multiple indices including CO<sub>2</sub>, temperatures, and sea level exceeded previous Holocene measurements. Climate change models forecast accelerated rates of sea-level rise and increased storm intensity in the future. In order to determine how vulnerable sandy beaches will respond, we must determine: If coasts are already being impacted by anthropogenic climate change? How coastlines evolved during higher sea-levels in the past? What is the frequency of erosive 'super' storms?

This research addresses these and other questions by combining state-of-the-art Ground-penetrating radar, Optically-stimulated luminescence and Light detection and ranging (GOaL) techniques on sandy barriers that have built seaward, or prograded, (as opposed to the more commonly studied eroded barrier islands). This approach enables analysis of shorelines back through time, by comparing behaviour since the onset of anthropogenic global warming to that in the preceding millennia. In coastal systems that prograded during the Holocene and Pleistocene GOaL can extend the Anthropocene record back over 100,000 years to when seas were known to have been higher than today. Ultimately, deciphering the past will provide insight on future impacts and mitigation options necessary to prepare coastal communities for this new era of human-induced climate change.

This study, led by Amy Dougherty, synthesized research completed using 2015 and 2016 GeoQuEST grants with 20 years

of data spanning from North America to the South Pacific. Some rare opportunities arose from the presentation of this synthesis at the 2017 European Geoscience Union Meeting. The abstract was selected for a talk at an inaugural coastal dynamics session sponsored by the Commission on Coastal Systems. This garnered the attention of a Review Papers Coordinator for Elsevier's Earth Science journals, who invited Amy to write a research paper for Marine Geology and manuscript for Earth-Science Reviews. The authors were also contacted by the Senior Commissioning Editor from the Institute of Physics Publishing to write a text for their award winning eBook series. Subsequently, Amy was asked to give an invited talk in a special session at 2017 American Geophysical Union Fall Meeting. Additionally, Amy placed in the top-five of the 2017 Peer Prize for Women in Science on Earth, Environmental, and Space Research, with the third most views (exceeding 1,600). Please visit the following website for more information on this unique competition and scroll down for a detailed description of this research with a teaser trailer video: <https://medium.com/thinkable-blog/announcing-the-winners-of-the-2017-peer-prize-for-women-in-science-ae2b93c84306>.

