UNDERSTANDING COASTAL PROTECTION BY GRAVEL BARRIERS IN A CHANGING CLIMATE: UKGRAVELBARRIERS PROJECT

Andres Payo[1], Ken Pye[2], Angus Garbutt[3], Mike Walkden[4], Nick Dodd[5], Melanie Biausque[1], Dave Tappin[1], Vanessa Banks[1], Dave Morgan[1], Martin Jones[6], Salvatore Savastano[7], Ollie Holmes[7], Mark E. Pattle[7], Wilf Chun[4], Tom Ashby[4], James Tempest[4], Cristina Coker[4], Dave Turner[4], David Favis-Mortlock[1], Joanna Harley[3], Tarun Bisht[3], Christopher Marston[3], Paula Maria de la Barra[3], Riccardo Briganti[5], Ewan Sloan[5]
1 British Geological Survey; 2 KPAL; 3 UKCentre for Ecology and Hydrology; 4 Moffat and Nichol; 5: Univ Nottingham; 6: ARGANS; 7: iSARDSAT

Beach and barrier systems characterized by a predominant gravel fraction (encompassing 'pure,' 'compound,' and 'mixed sand-gravel' configurations, all hereinafter referred to as 'gravel barriers'), are prevalent across the UK and worldwide. It is widely acknowledged that gravel barrier shorelines provide crucial natural flood protection for numerous coastal communities. In addition, their establishment and enhancement are increasingly recognized as sustainable, nature-based adaptation measures that enhance natural capital.

Effective management is imperative to ensure their continued efficacy in mitigating coastal erosion and flooding risks. Currently, our understanding of gravel beach and barrier dynamics, and our ability to adequately model them, significantly trail their sandy counterparts.

Research questions reflecting these issues were included in the NERC highlight topics 2023 “Addressing environmental challenges” Topic F “Building understanding of natural coastal protection by gravel barriers in a changing climate”. Award details for the two selected projects can be found at the UKRI-NERC Grants with the Lead Grant Reference NE/Y503265/1 and NE/Y50323X/1 for the UKGravelBarriers and the #gravelbeaches projects, respectively. The UKGravelBarriers team was officially notified of the reception of this award on 31 January 2024; the project started on 1February 2024. Here, we will be presenting a summary of work done during the first year of this four-year project. This includes: a Rapid Evidence Assessment of the state of the art; team progress in collecting new data sets derived using both optical and SAR satellite data, focusing on gravel barrier ecosystems and biodiversity, and groundwater flows; as well as other ongoing activities.