

## **Drivers of benthic community structure at hydrocarbon seep communities along the western Atlantic margin**

Jill Bourque, Amanda W.J. Demopoulos

Wetland and Aquatic Research Center, U.S. Geological Survey, Gainesville, FL, USA;  
jbourque@usgs.gov

The recent discovery of hundreds of methane seeps along the US Atlantic margin, ranging from New England south to the Blake Ridge Diapir, has prompted multiple investigations to characterize these habitats. Limited visual surveys have confirmed seep communities, including deep-sea mussels and microbial mat habitats, which often represent different chemical environments related to variation in the flow of methane through sediments. However, infaunal communities have only been characterized at three sites, leaving gaps in our understanding of the broad-scale relationships between benthic communities and localized geochemical environments, as well as regional connectivity among taxa. In 2015, in situ sediment cores were collected from deep-sea mussel and microbial mat habitats at eight sites along the western Atlantic margin, including five which have not been previously sampled, encompassing a depth range of 376-2163m. Sediments were assessed for benthic macrofaunal abundance, diversity, and community structure, and sediment geochemical properties, including grain size, stable isotopic composition, and organic content. This is the first large-scale study to investigate microbial mat and mussel habitats across a latitudinal and depth gradient. Patterns of community structure related to depth, geographic separation, habitat heterogeneity, and geochemical parameters will be discussed. This work will enhance our understanding of the geochemical controls on diversity and community composition in deep-sea mussel and microbial mat habitats and the regional connectivity among seep environments, which will ultimately help inform effective management and conservation strategies for these unique environments.