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Evaluating the anthropogenic impact on karst environments: Karst Disturbance Index applied to West-Central Florida and Southeast Italy

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Due to its high fragility, that derives from the intrinsic geological and hydrogeological characteristics, karst is extremely vulnerable to degradation and pollution. Although the carrying capacity of these natural environments is low, a variety of human activities is implemented on karst settings generating impacts at the surface and subsurface. The human-induced effects in karst can be assessed by applying a recently developed Karst Disturbance Index (KDI). The KDI consists of 31 environmental indicators contained within the five broad categories: geomorphology, hydrology, atmosphere, biota, and cultural. The purpose of this research is to apply the KDI to two distinct karst areas, West Florida, USA, and Apulia, Southeast Italy. Through its application, the utility of the index can be validated and other important comparisons can be made, such as differences in the karst legislations implemented in each region and the effect of time exposure to human occupation to each karst terrain. Humans have intensively impacted the karst of southeast Italy for thousands of years compared to only decades in west-central Florida. However, west-central Florida's higher population density allows the region to reach disturbance levels comparable to those reached over a longer period in Apulia. Similarly, Italian karst is more diverse than the karst found in west-central Florida, creating an opportunity to test all the KDI indicators. Overall, major disturbances for southeast Italy karst include quarrying, stone clearing, and the dumping of refuse into caves, while west-central Florida suffers most from the infilling of sinkholes, soil compaction, changes in the water table, and vegetation removal. The application of the KDI allows a benchmark of disturbance to be established and later revisited to determine the changing state of human impact for a region. The highlighting of certain indicators that recorded high levels of disturbance also allows regional planners to allocate resources in a more refined manner.