



Uncertainty, Climate Science, and the Divine: Interdisciplinary Understanding of Blue Holes in The Bahamas

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This paper addresses the role of interdisciplinarity in mitigating uncertainty within scientific research. Using the example of aquatic cave exploration in Andros Island, The Bahamas, I argue that the ways in which interdisciplinary research is conducted can mitigate or contribute to uncertainty within particular areas of research. This paper is based on ethnographic research conducted in conjunction with a high profile interdisciplinary project examining geo-chemical and biological conditions of Bahamian aquatic caves (commonly known as blue holes). Blue holes are tidal caves, sometimes reaching 100s of meters deep, found on land and in the sea throughout the Bahamian archipelago. Blue holes are valuable sites for knowledge production for natural, social, and climate scientists, as well as Bahamian residents. Natural scientists are interested in blue holes because of their unique geo-chemical, biological, and ecological characteristics. Climate scientists examine the material evidence of long term climate variation. Highly stratified and anoxic water conditions in some blue holes are ideal conditions for fossil preservation informing natural and human historical records. Our team of social scientists and students documented stories, uses, and meanings of blue holes in Andros Island using a mixed-method approach including semi-structured interviews and participant mapping. This paper reflects on two findings of that research with respect to the dynamic process of interdisciplinary research more generally. First, results of the ethnographic research indicate that the perceptions of blue holes have shifted among residents overtime—away from spaces associated with mystery and the divine, toward the mapped, measured and scientifically known world—possibly in connection with recent scientific explorations. As scientists dive 100s of meters underground to harvest stalactite formations to document rates of climate change and sea level rise, residents have historically engaged with blue holes for survival, and as community sites with supernatural and divine meaning. Aquatic caves were used by residents as geographic and social landmarks in numerous ways, such as: fresh water sources, hiding places, boundary markers, waste disposal, resource extraction, and recreation. These uses have changed as focus has shifted away from functional practice associated with daily survival, and toward commercial activities such as tourism and scientific discovery. Secondly, our research found strong opposition to the cave exploration project leading to reduced community participation and diminished trust in foreign research. While the interdisciplinary project resulted in significant contributions to climatological and biological science, our findings suggest greater uncertainty within the social science arena. Scientific uncertainty is inherent in any research process. Science relies on exploration and documentation of natural and social phenomenon with the goal of reducing uncertainty. Interdisciplinary approaches may face greater challenges with uncertainty. In some cases, interdisciplinary approaches may obscure valuable cultural and historical meanings while describing important bio-physical characteristics of the same sites, thereby only shifting the area of uncertainty. Cohesive methods, including integrative planning early on and throughout the process can more successfully mitigate uncertainty and generate richer knowledge of socio-ecological sites. This paper calls for greater collaboration across disciplines to facilitate a richer understanding of socio-ecological sites such as blue holes.