# Ciguatera in the Seaflower Biosphere Reserve: Projecting the Approach on HABs to Assess and Mitigate their Impacts on Public Health, Fisheries and Tourism

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**Abstract**

Microalgae constitute the basis of marine food webs. However, the massive growth of some species and the toxicity of others may represent a serious threat to human health, fisheries, mariculture and tourism. Evidence shows that global warming, climate change, nutrients and sewage discharge favor microalgal blooms, which are becoming more frequent, intense and lasting. In the Caribbean Sea, ciguatera poisonings, one of the syndromes caused by toxic dinoflagellates, has increased its incidence in the last three decades. Despite the potential risks, there is no management plan for this and other harmful algal blooms (HABs) in San Andrés. We analyze the presence of toxic dinoflagellates along with the incidence of ciguatera in the Seaflower Biosphere Reserve (SBR). Considering that effective climate change adaptation and mitigation decisions are based on relationships between science and society, involving a wide variety of analytical methods to evaluate associated risks and benefits, we propose to evaluate the potential effects of HABs, focusing on the economic value of their impacts on fishing and tourism. We propose an early warning system conceptual model, based on a monitoring program, as a strategy to contribute to the governance and the management effectiveness of the different institutions of the SBR.

Keywords: Climate change. Marine microalgae. Ciguatera. HABs Early Warning Systems.