

A Light Pollution Assessment in the Fringing Reefs of San Andrés Island: Towards Reducing Stressful Conditions at Impacted Coral Reefs

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Abstract

The degradation of the night sky's quality due to artificial light sources negatively affects marine environments, because many organisms use natural light as cues for reproductive and dispersal behaviors, find favorable habitats and for the biochemistry of their symbiotic microorganisms. Despite the tremendous effect on marine life, measuring the effects of artificial light pollution is difficult because our understanding of natural light brightness coming from celestial bodies like the Moon is minimal. Here, we fill this gap by quantifying the sky's brightness and Artificial Light Pollution at Night (ALAN). This study assessed light pollution along the reefs around San Andrés island, which Hurricane Iota significantly impacted. We modified and installed Sky Quality Meters (LU-DL) at both leeward and fringing reefs, down to 11m depth. The results indicate the highest ALAN values in the area of Johnny Cay (18msas) compared to Acuario (20msas) and West View (21msas). Additionally, National Oceanic and Atmospheric Administration NOAA and Unihedron databases show an increase in artificial light on land, where constant artificial light and coastal vegetation loss due to Hurricane Iota (between 15th and 19th November 2020), are the main factors that may be generating this increase in artificial light.

Keywords: ALAN. Chronobiology. Light pollution. Coral reefs. Sky Quality Meter.

LIGHT POLLUTION IN SAN ANDRÉS AND PROVIDENCE CORAL REEFS

