

Electrical fields increase coral growth in Tobago

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Tobago coral reefs are declining with little natural recovery. Field experiments on coral growth with and without direct current electrical fields were conducted in a small protected bay on Tobago. Electrically conductive Buoyancy Test Racks (BTRs) with individual coral fragments, served as cathodes. Forty coral nubbins were attached to electrically charged BTRs and the same number of nubbins attached to BTRs with no electricity acted as controls. The BTRs allowed measurement of growth in weight and volume of individual nubbins via buoyant weighing and water displacement. Growth showed significant differences in mean weights of controls versus charged. During the 48-week time period of the experiment the controls showed a significant decrease in weight of about 50% (ANOVA $F=2.46$ and $P=0.0012$). This decrease is exceptional, and was due to very poor water quality at the site. However during the same time period the charged treatment showed a significant increase in weight by about 400% (ANOVA $F=11.54$ and $P=0.0000$). The experiment was conducted in three stages, with power on for the first and third, and off for the second period. Growth of corals on charged BTRs was rapid in periods one and three, but when the current was off they decreased in weight like the controls. Therefore the growth benefits were due to the electrical field. With some methodological adjustments this technology has the potential to restore reefs that are adversely affected by environmental change.



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