



SER2011

WORLD CONFERENCE ON
ECOLOGICAL RESTORATION

Re-establishing the Link between Nature and Culture



**Book of
Abstracts**

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Can we prioritize restoring reefs to grow back beaches and protect coasts from erosion and global sea level rise?

Goreau, Thomas J.; Wolf Hilbertz, Azeez Hakeem, Thomas Sarkisian, Frank Gutzeit, Ari Spenhoff, Delphine Robbe

Global Coral Reef Alliance

Coral and oyster reefs provide the most effective shore protection because they are growing and self-repairing structures that very efficiently dissipate wave energy before it hits the shore. Beaches and coastlines grow seaward behind them, where they would otherwise retreat. Massive global destruction of most coral reefs and oyster reefs, coincident with accelerating global sea level rise and increased storm intensity, is already causing most coastlines to erode, and will get far worse in the near future. Typical costs for breakwaters and seawalls are \$10,000-15,000 per meter. These structures increase erosion in front of them, and eventually collapse and need to be completely rebuilt. We have designed and built electrically charged Biorock coral reefs and oyster reefs, composed of marine limestone rock grown directly out of seawater. These can be of any size or shape, and have turned severely eroding shores into 15 m (50 feet) of growth in just a few years by reducing wave energy before it reaches the shore, so waves deposit sand instead of eroding it. The cost of Biorock reef structures is around an order of magnitude below that of conventional rock and concrete walls, and they greatly increase fish and shellfish biomass and production while restoring biodiversity in degraded and biologically impoverished sites. Furthermore these reefs are growing and self-repairing structures that can keep up with sea level rise, and they can be readily powered by wave, sun, wind, and ocean current energy. Large-scale coastal ecosystem restoration will provide the most cost-effective future shore protection.