CORAL REEF RESTORATION FOLLOWING ANTHROPOGENIC DISTURBANCES

Special Session Chaired by
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Throughout human history, men and ships have interacted with coral reefs, often in a very negative way. Dredging and coastal engineering projects also degrade coral reefs. In response to chronic reef damage in Florida, federal and state agencies and consulting firms have developed techniques to restore, as best possible, reefs damaged by human insults. The financial burden for restoration is the responsibility of the vessel owner (responsible party) and or the insurance companies. If the responsible party is unresponsive to the needs, the trustees (state and federal agencies) may initiate their own restoration operation and seek damages through litigation.

Actions that are typical to large vessel groundings include removing the vessel from the reef in a manner so as not to cause collateral damage. A triage system to salvage resources is initiated at the point in time when it is safe to allow people in the area. This is often concurrent with assessment tasks. Viable corals and sponges are culled from the rubble and set aside for future reattachment. In developing an appropriate restoration design for the site, review should be made of the injuries, resources, local setting, and risks. When the reef structure has been severely fractured or scarified, projects to repair the damage include building structural replacement and stabilizing the foundation. Stabilizing rubble to keep it from moving is challenging. Covering the rubble bed with large boulders has proven to be effective. At a depth of 8 m, rubble remained in place following the passage of a moderate hurricane.

Examples of structural restoration include moving large limestone boulders on the flattened surface and repairing damaged spurs using boulders and cement. Salvaged resources can be transplanted back onto the reef after the structural reconstruction is completed. Transplanting methods include seeding branching corals and physically reattaching massive, columnar, encrusting, and foliaceous corals with hydraulic and epoxy cements.

Recent innovations use larval seeding to replace lost corals, marine nurseries to grow coral fragments to a moderate size for use in restoration, and attracting coral larvae to specific sites with chemical compounds. These techniques have been tried on an experimental basis and show promise of expediting recovery following injuries.

Monitoring a restoration to evaluate recovery and improve restoration methods is important. Comparing the restored area with a reference site provides a good gauge of recovery. The monitoring should be able to answer questions regarding attachment, growth, health of the transplants, and recruitment. Evaluating different types of materials, structural components, and methods is another focus of monitoring.

The Proceedings offers details on specific projects and we [the session chairs] hope that they stimulate others to consider doing research in coral reef restoration.

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