

Coral Reef Restoration Monitoring Guide

Methods to evaluate restoration success from local to ecosystem scales

Why restore coral reefs? Coral reefs are important to coastal communities worldwide and serve many cultural, commercial, and ecological purposes. As coral reefs continue to decline around the world, more people are using restoration to help corals and coral reefs.

Why a Monitoring Guide? This Guide provides standardized scientific monitoring metrics to facilitate consistent, effective evaluation of coral reef restoration success. Both Universal and Goal-based Performance Metrics are described with key points, suggested methods, reporting guidelines, and criteria.

Universal Metrics are recommended as basic monitoring for all coral restorations.

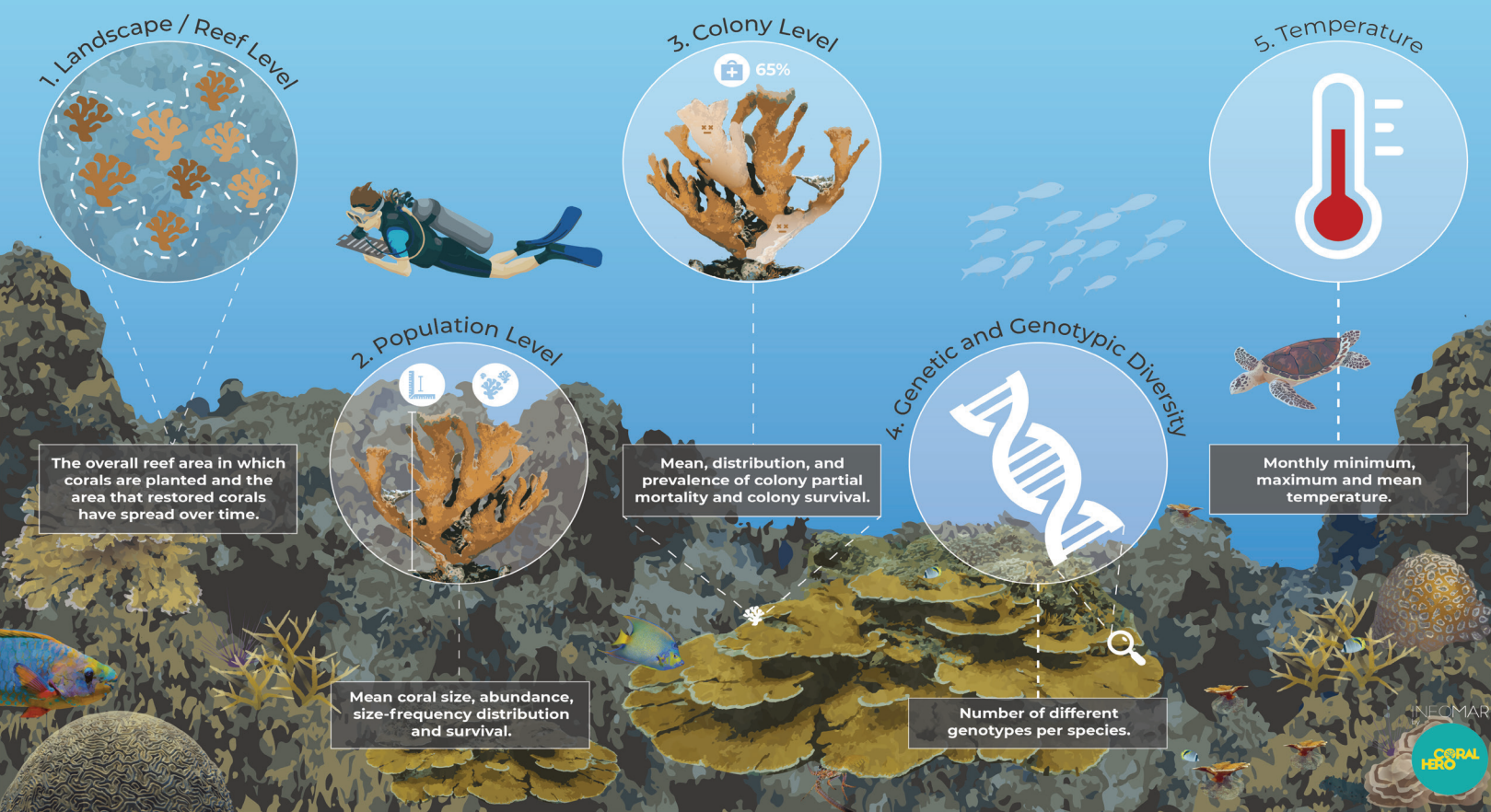
Universal Metrics evaluate restoration at different scales (Landscape, Population, Colony, Genetic), and the Environment.

Universal Metrics provide data on the size, growth, condition, and diversity of the corals used for restoration, and on the water temperature of the restoration site.



Universal Metrics for Monitoring Coral Reef Restoration

Universal metrics are the basic level of information that should be collected on all coral restoration projects. These metrics allow for comparative evaluation of the status of the coral reef restoration over time.



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Goal-Based Performance Metrics are recommended for evaluation of progress towards meeting specific restoration goals.

Definitions of restoration success can be different depending on the program or project goals.

Restoration goals are defined herein as Ecological, Socioeconomic, Event-Driven, Climate Change Adaptation, and Research.

Goal-Based Performance Metrics should be used in addition to the Universal Metrics to evaluate the goal-specific success of a restoration project or program.

ECOLOGICAL

Planting corals goes beyond the coral, it creates reef community, reef structure, and function. This can be measured by changes in corals, invertebrates, fish, and reef structure; coral health, reproductive capacity, recruitment, and disease; and improvements in water quality, algae, and sedimentation.

Goal-Based Performance Metrics for Coral Reef Restoration

SOCIOECONOMIC

Restoration can make more of an impact if the community is involved. This can be measured by contribution to local tourism economy, reef-user satisfaction, coastal protection, education and outreach, and capacity building.

EVENT-DRIVEN

The success of restoration following unplanned disturbances, such as disease, bleaching or physical impacts, can be measured by how much coral, structural complexity, and ecosystem function are restored.

CLIMATE CHANGE ADAPTATION

Interventions and manipulations that focus on improving reef resilience, assisted evolution, and stress hardening.

RESEARCH

Learning from restoration can improve restoration efficiency and success.

Goal-Based Performance Metrics are designed for monitoring a restoration project or program with a specific goal or objective in mind. Five goals for restoration are defined herein. These metrics should be assessed in addition to the Universal Metrics in order to gauge the goal-specific success of a restoration project or program.



INFOMAR
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The Monitoring Guide and this Summary are products of the Coral Restoration Consortium's Monitoring Working Group, NOAA's Coral Reef Conservation Program, and NOAA's National Centers for Coastal Ocean Science

