PHASE 1

Advances in reef resilience science and its application to conservation require an integrated study of healthy reef systems in addition to degraded reefs. Initially, our project will focus on existing theory and data sets from Palmyra Atoll and elsewhere, novel baseline measurements of Palmyra's healthy, intact reef system, and synthesis of local information needs for conservation

YEAR 1

YEAR 2

YEAR 3

ECOSYSTEM DATA

Initial Research & Development

Syntheses of Existing Data

MODELING

Initial Model Synthesis

CONSERVATION APPLICATION

Information Needs Assessment

Solicit local knowledge from reef managers and other conservation practitioners to influence data collection and model development - thereby maximizing management and conservation applicability

Novel Field Data Collection

(A) BENTHIC DYNAMICS

(B) CONSUMER & MOVEMENT ECOLOGY

(C) PHYSICAL OCEANOGRAPHY

Partnerships

establish global partner sites

Refined Models

Based on a explicit manager-based needs assessment, use a set of hierarchical models to synthesize results from components 1, 2, and 3 and identify the sensitivity of benthic dynamics to the single and interactive effects of the biophysical forcings

PHASE 1 OUTCOME

By developing a novel reef resilience model – based on syntheses of existing data and targeted new observations, and informed by a systematic analysis of management and conservation needs – we will fill a critical gap in coral reef science while laying the groundwork for future application to conservation and management

PHASE 2

PHASE 2

Building on previous syntheses of reef patterns, processes, and information needs for better management, we will invest in new observations across a wider range of biophysical forcings, experiments for improved mechanistic understanding, and collaborative conservation applications

YEAR 3

YEAR 4

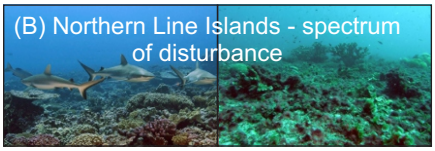
YEAR 5

ECOSYSTEM DATA

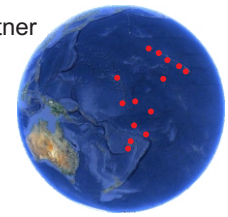
MODELING

CONSERVATION APPLICATION

Observations across three spatial scales



(C) Global Partner Sites



Partnerships
local capacity building, data collection & model beta testing

Refined Models
Increased explanatory power
Mechanistic understanding
Application to management & Conservation

Scientific Outputs
Key scientific findings
Novel dynamic models
Predictive capabilities

Conservation Outputs
Scenarios tool
Communication materials

PHASE 2 OUTCOME

By combining information from manipulative experiments and observations across multiple gradients in biophysical forcings at multiple spatial scales, we will for the first time, provide an interactive, user-friendly coral reef resilience management scenario tool; an essential necessity for the successful management of coral reefs worldwide