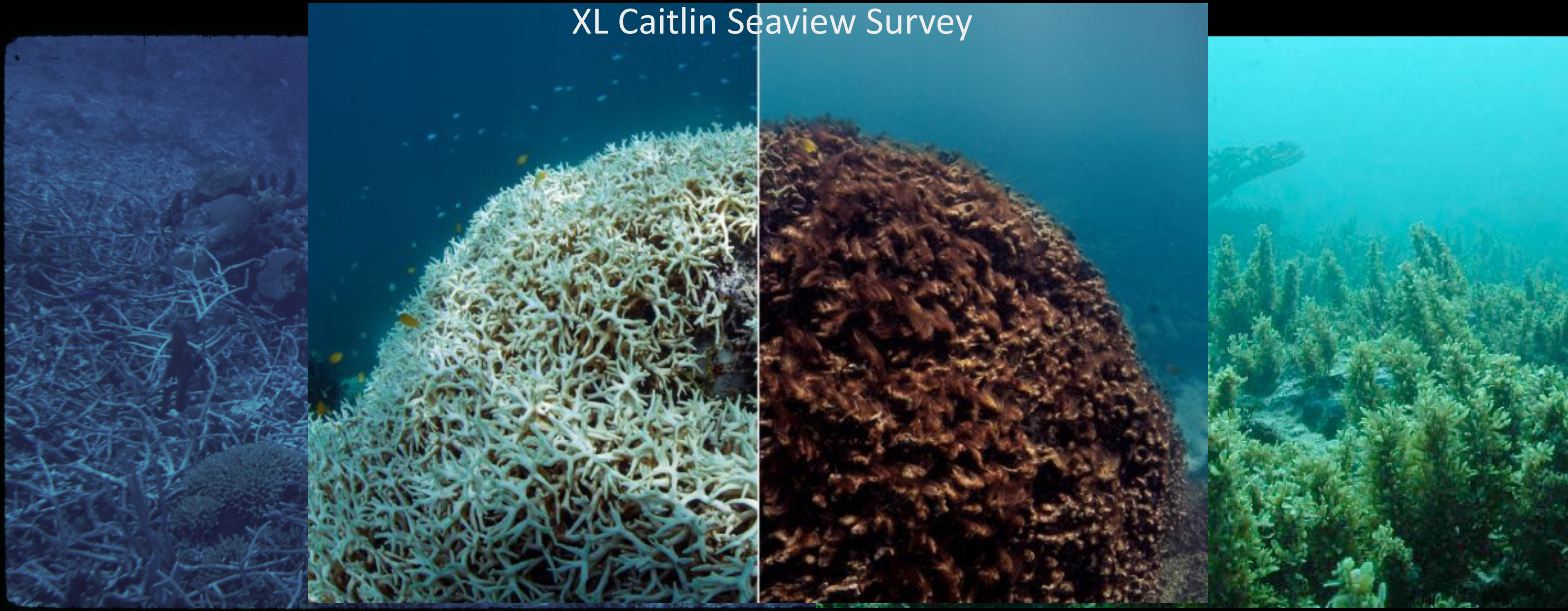
Restoring Coral Reefs

Nancy Knowlton @SeaCitizens Smithsonian

Bad News for Reefs Began Long Ago

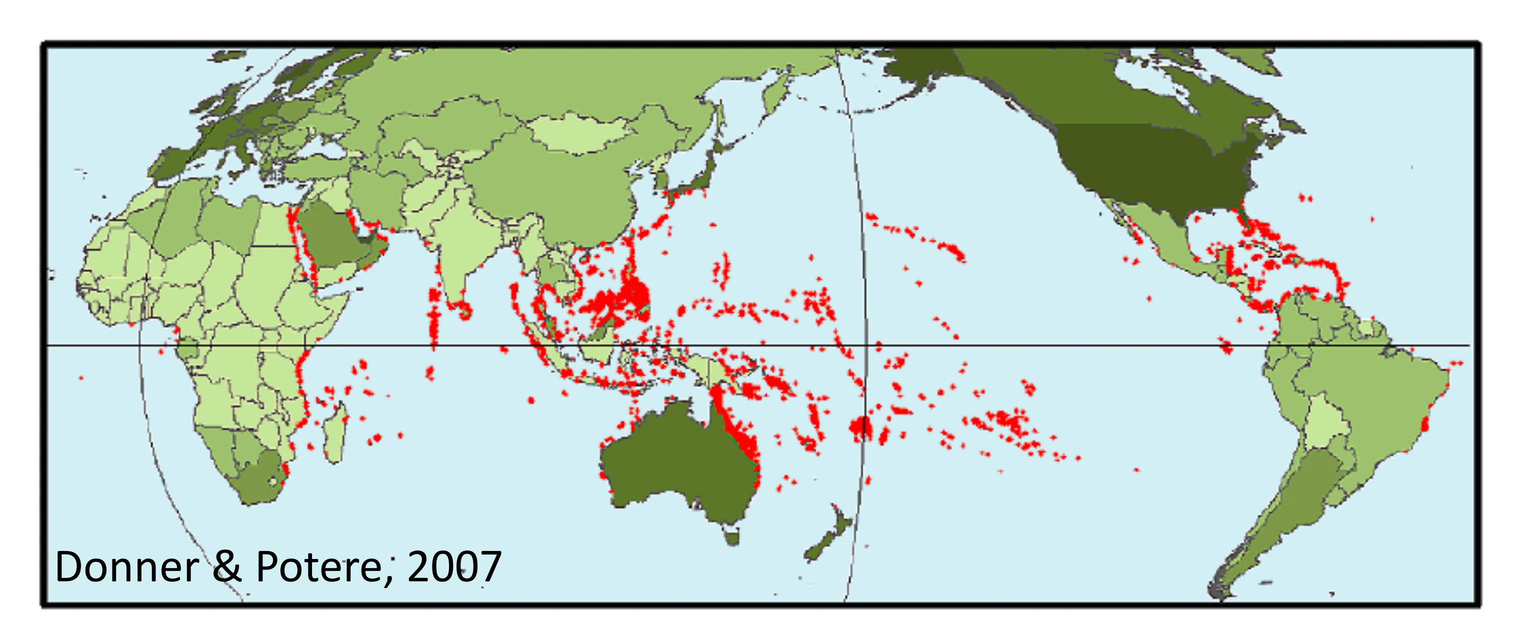
Discovery Bay, Jamaica

And Just Keeps Coming

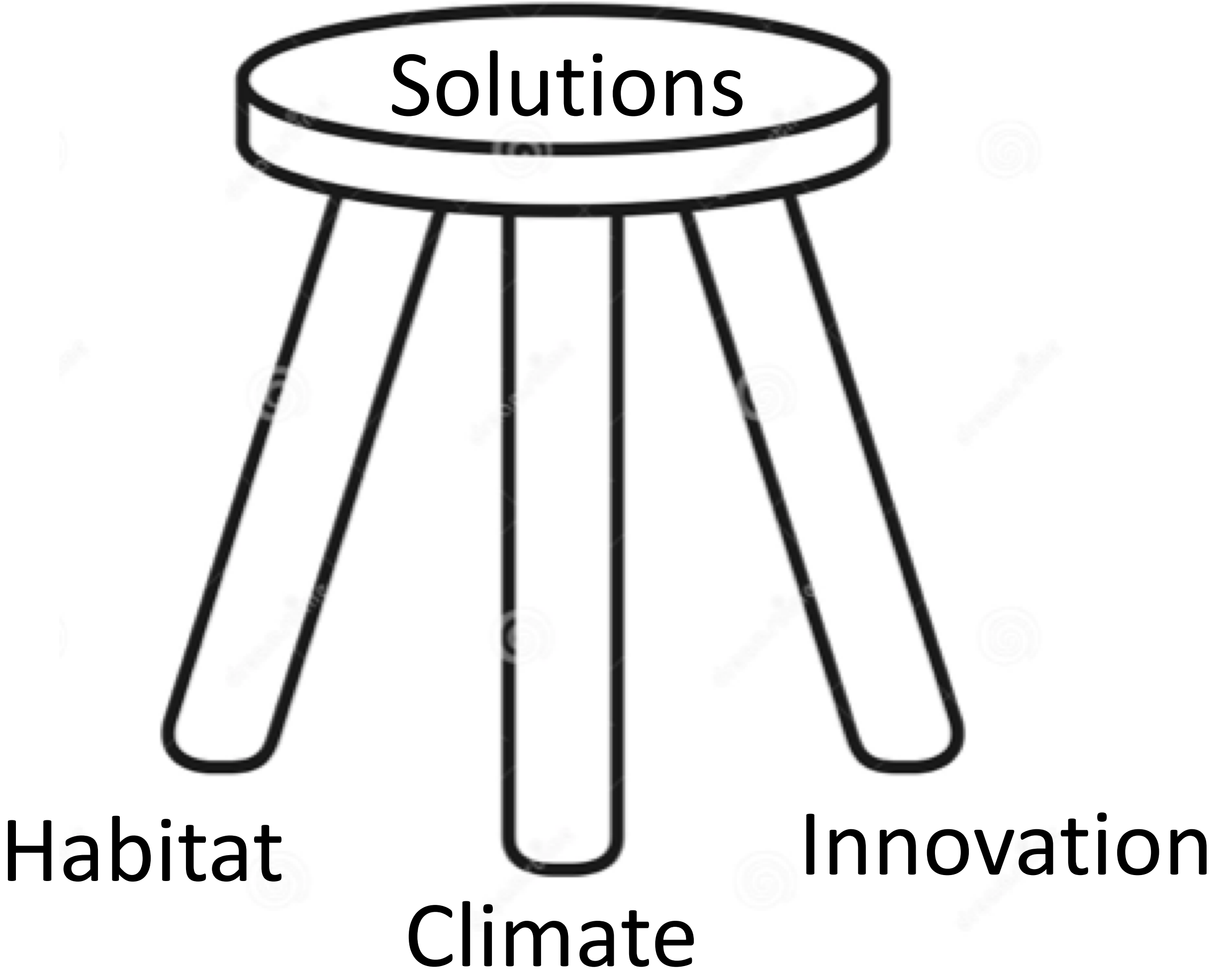


Great Barrier Reef 2016-2017

A Global Tragedy



Jobs, food, shoreline protection,
recreational & cultural values, biopharmaceuticals
25% of all marine species


Solutions
Habitat
Climate
Innovation

Habitat

Healthy Fish Communities	Clean Water	Reef Restoration
MPAs Managed fisheries	Reduce pollution Watersheds	Jumpstart recovery

Innovation

Automation

Remote sensing
A.I.
eDNA
Reef-bots

Coral Biology

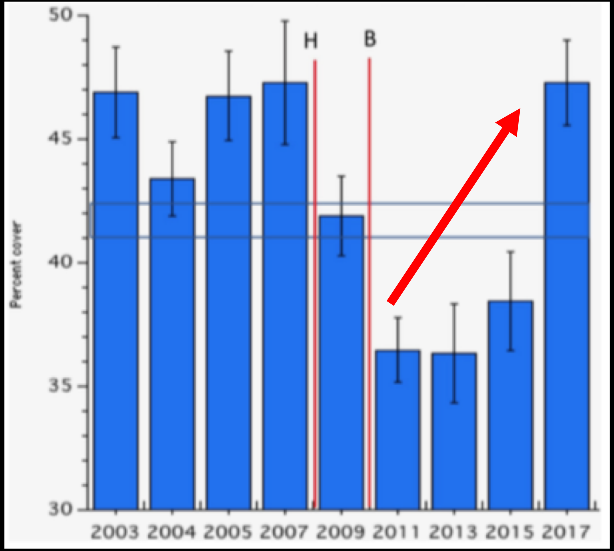
Artificial selection
Pathogen control
Cryopreservation

Social Sciences

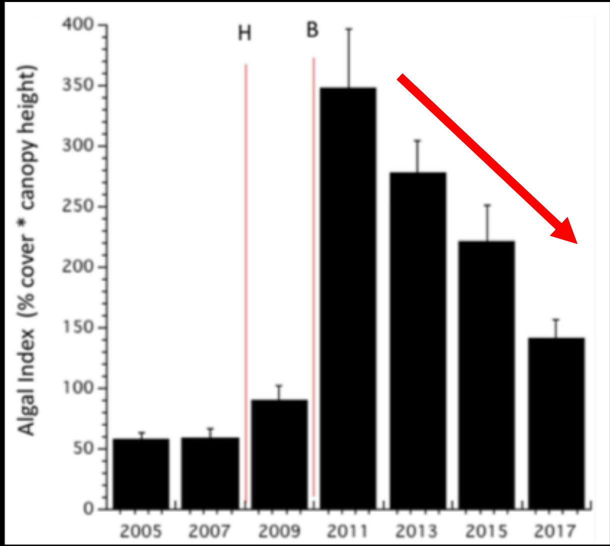
Finance
Indigenous knowledge

Recovery of Bonaire Reefs after Hurricane and Bleaching

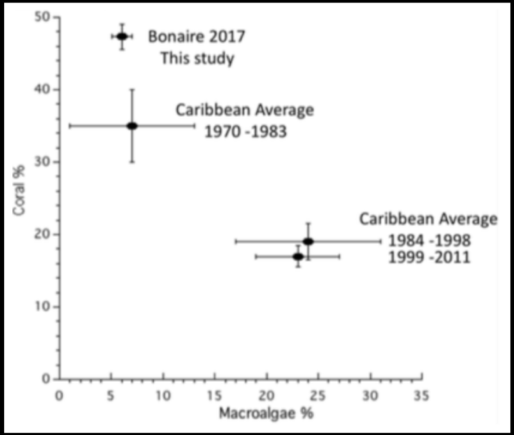
Steneck et al. 2019



Coral Cover



Macroalgae



Bonaire National Marine Park

No spearfishing

No parrotfish fishing

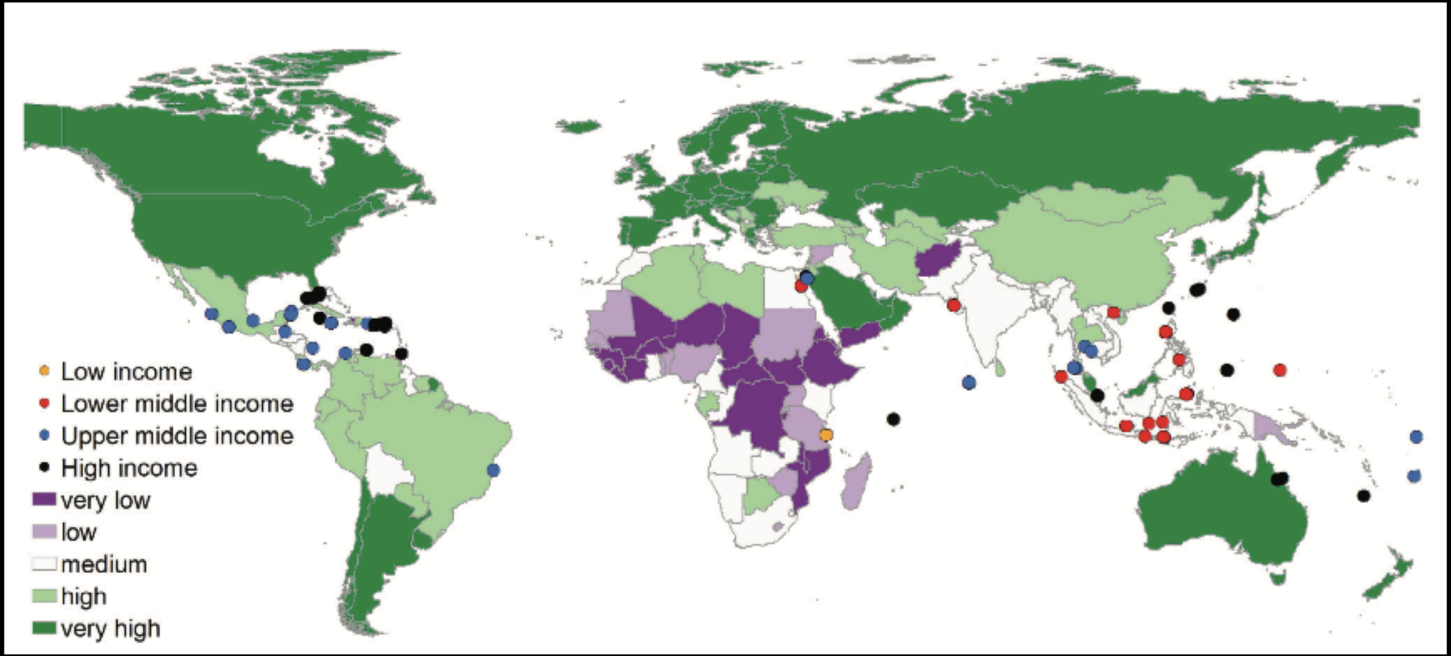
Fish traps phased out

Regulated anchoring

User-funded management

Regular monitoring

Coral Restoration Project Statistics (n=59)

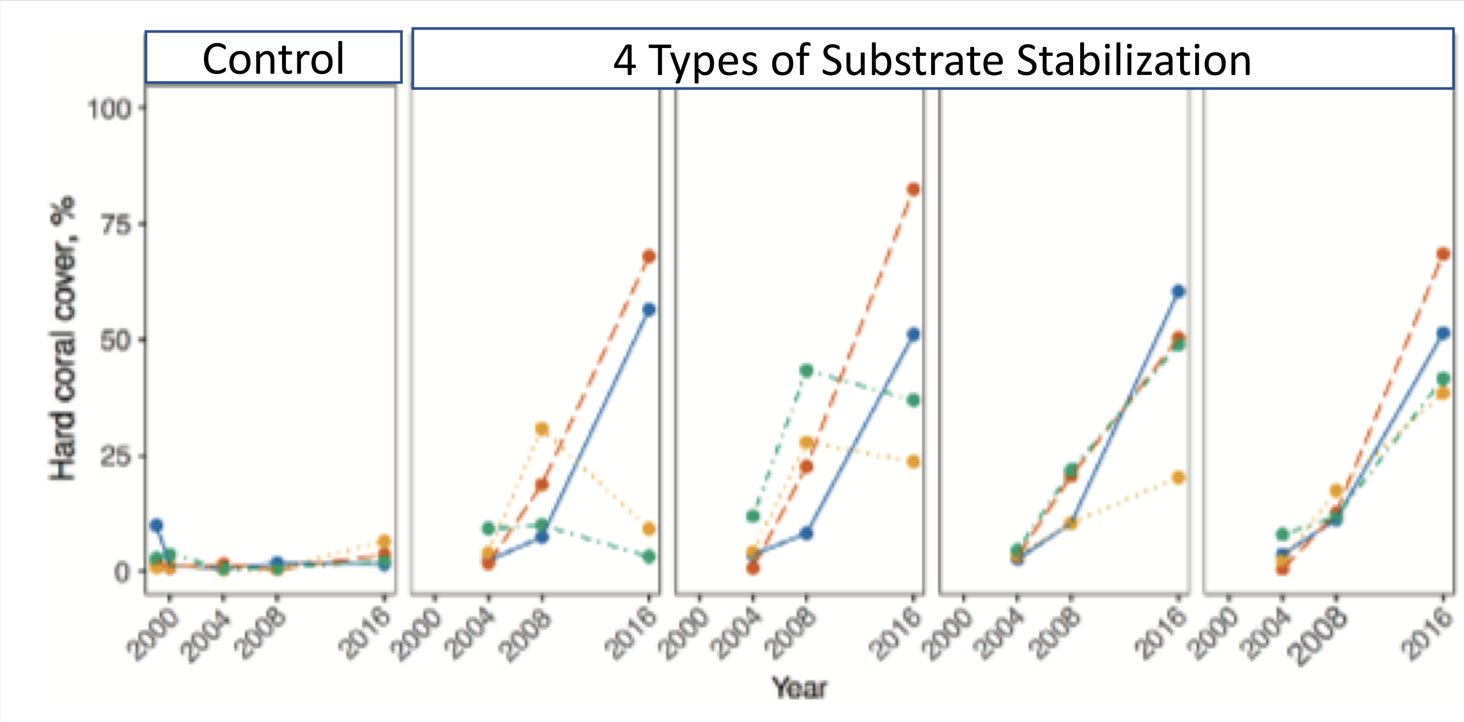


Median cost: 404,000 US$
Median duration: 1 year
Median area: 108 m^2
Median survival: 61%

Area of GBR = 35 million ha
Median cost to restore 1% = 141,400,000,000US$

Reef restoration following blast fishing

Fox et al. 2019



From 0% to up to 82% coral cover in 16 years

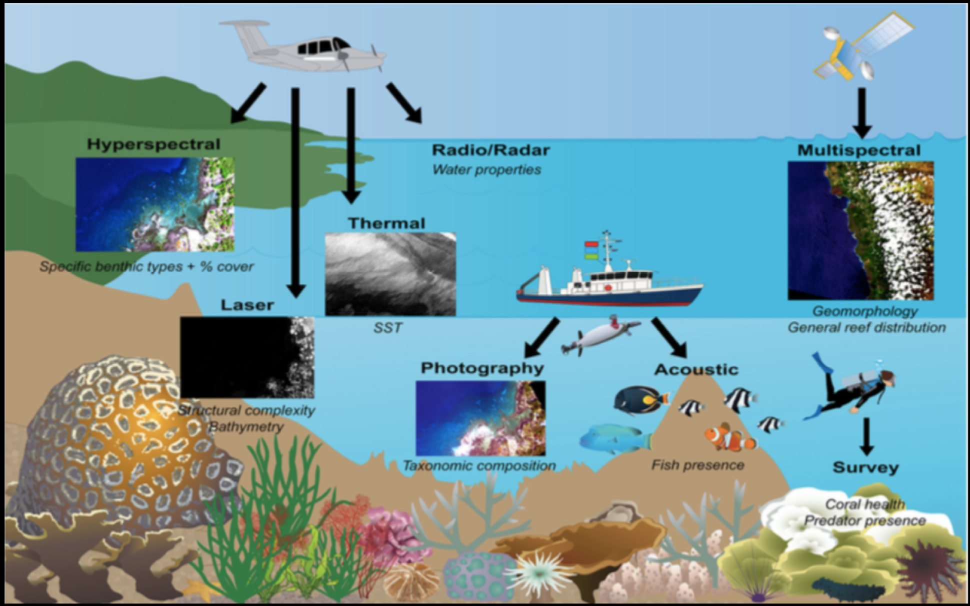
New Technologies

Reef-Bots

Gary Cranitch

Cryopreservation

Foo & Asner 2019



Remote Sensing

New Financing

Finance Tools