

*Cambiando esquemas de
referencia, impactos locales, y
cambios del clima global para los
arrecifes de coral*

Jeremy Jackson

Instituto de Oceanografía Scripps

Y

Instituto de Investigaciones Tropicales Smithsonian,
Republica de Panama

La cultura de fallo en la conservacion de los arrecifes

1. Talk, initiatives, and paper parks as a substitute for demonstrable conservation success
2. Science based on studies of varyingly degraded reefs with little historical perspective and management that typically lacks the authority and resources to treat the root causes of reef decline
3. Deep sense of doom and gloom and powerlessness in the face of the inexorable forces of climate change

Blanqueamiento de corales

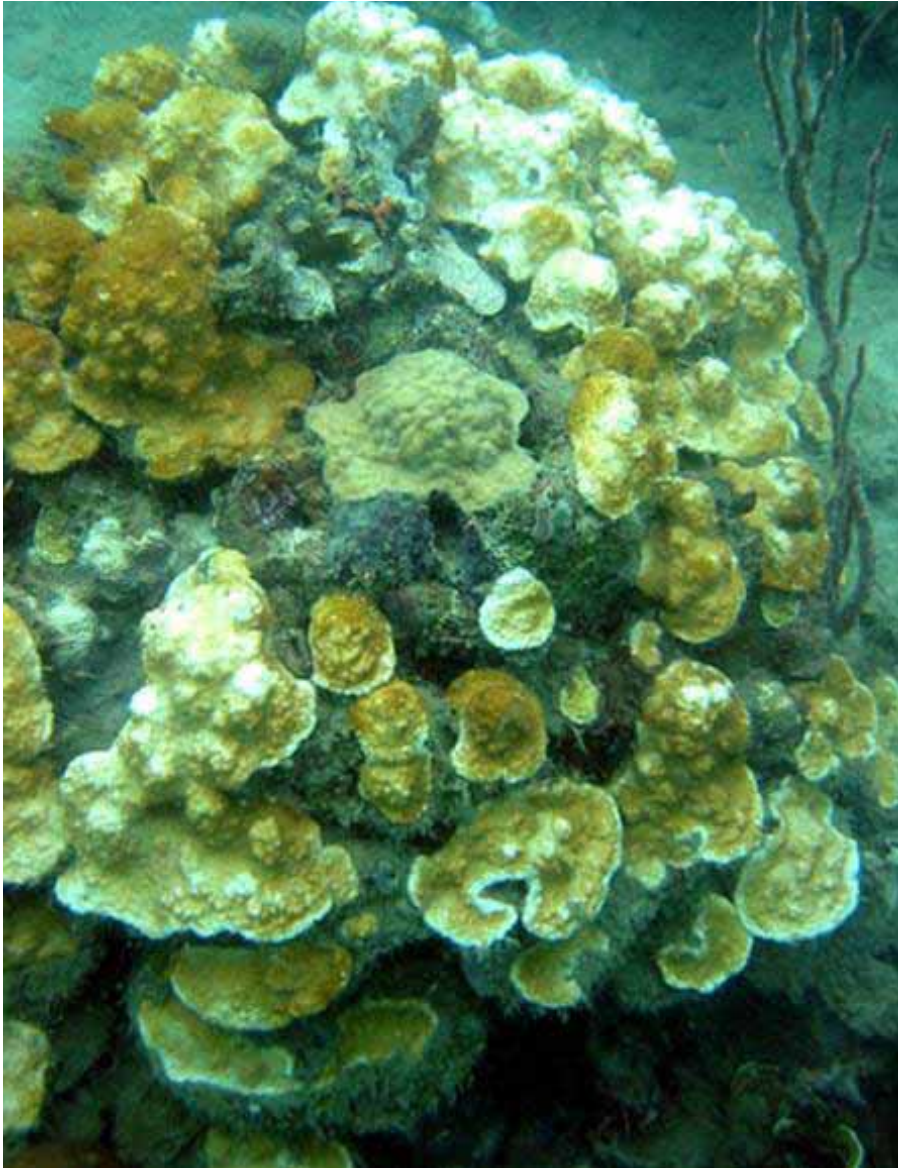


Image courtesy of David Kline.

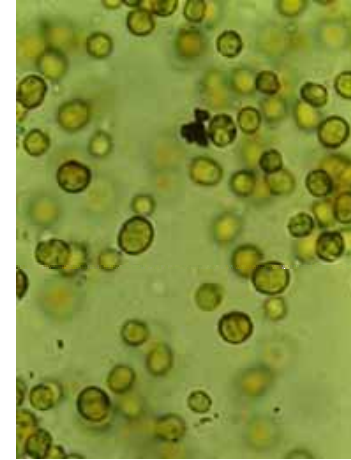


Image courtesy of Scott R. Santos
Auburn University

- Breakdown in symbiosis between coral and symbionts caused by high temperature
- Highly variable response depending on species, environment, and history



*Y la evidencia para el catastrófico descenso de los corales **es aplastante***

QuickTime™ and a decompressor are needed to see this picture.

QuickTime™ and a decompressor are needed to see this picture.

Caribbean
(Gardner et al. 2003)

IWP
(Bruno & Selig 2008)

Entonces, tenemos que preguntar si hay excepciones a la regla de la perdida de corales? Y si existen excepciones, porque?

1. New insights in science commonly arise from the exceptions to general patterns rather than the norms (which is the fundamental problem with meta-analyses)
2. Need to look at places that have suffered minimal human impacts to help unravel the causes of degradation.

KINGMAN REEF 0 people



PALMYRA ATOLL



**TABUAERAN
2,500 people**



5,100 people

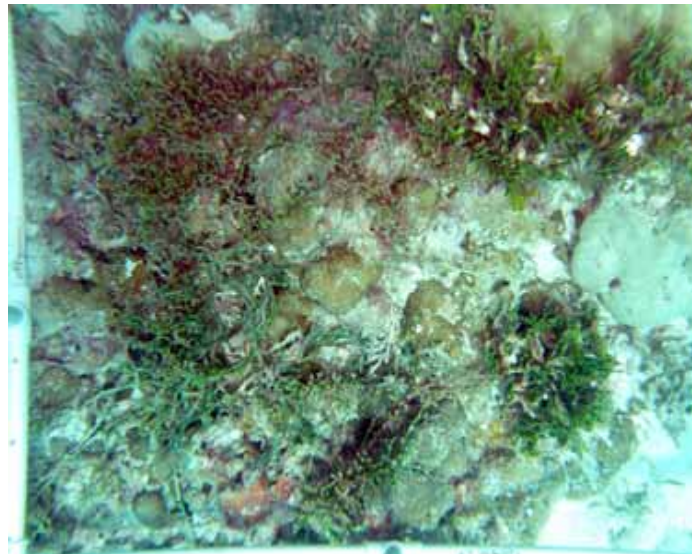


Northern Line Islands Expedition 2005

(Sandin et al. 2008 *PLoS One*)

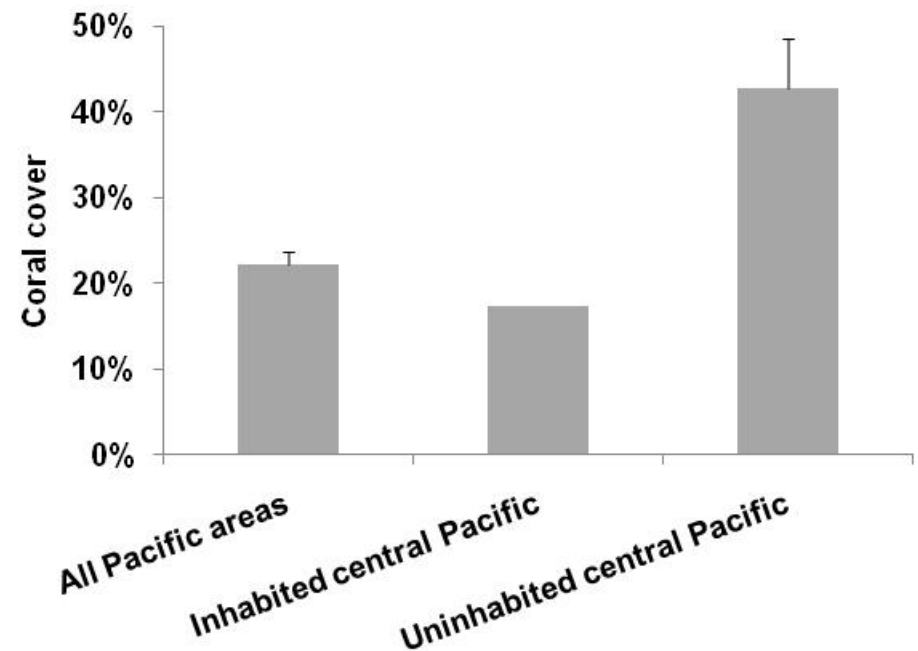


Kingman
Reef
(uninhabited)



Kiritimati
(>5,000
people)

La cubierta de corales en las islas deshabitadas del Pacífico central es dos veces más grande que el resto del Pacífico



‘All Pacific’ data from Bruno & Selig (2007) *PLoS One*; central Pacific data from Sandin et al (2008) *PLoS One*

Que son las características ecologicas comunes de las islas deshabitados?

1. Huge biomass of fish and sharks dominated by apex predators
2. High coral cover in spite of evidence of recently severe coral bleaching
3. Abundant crustose coralline algae and coral recruits (K&P)
4. Low incidence of coral disease (K&P)

But they are profoundly different in oceanographic conditions, nutrients, and primary productivity

Importancia de la cubierta alta en las islas deshabitadas

1. Apoyo para la hipótesis que protección local puede dar tiempo para adaptación de la simbiosis entre corales y algas al calentamiento global
2. Dar un modelo para entender los mecanismos fisiológicos y ecológicos de la supervivencia alta de los corales
3. Dar apoyo fuerte para la necesidad de protección local y los muchos beneficios que proveería
4. Herramienta comunicativa para mostrar como eran los arrecifes de corales antiguos y porque vale la pena salvarlos

1. Buys time for adaptation

Increases the chances that acclimation and/or adaptation of corals to rising temperatures and acidification may occur on ecologically significant scales.

Suggests that MPAs can make a real difference in buying time if they are enormous and genuinely protected ($\ll 1\%$ of all MPAs).

2. Biological mechanisms

Corals on uninhabited islands are the genuine canaries in the coal mine and we need to understand why they are doing so well. This should include:

- Detailed demographic censuses of corals in a network of reefs to track winners and losers
- Assessment of the relative importance of resistance to warming and acidification versus heightened recruitment, growth, and resistance to other sources of mortality to explain high coral abundance.
- Development of the tools for intervention and restoration including genetically resilient stocks

3. Heightened protection

Clear justification for stronger measures for local protection of reefs, including much larger areas protected from exploitation and pollution.

There is no excuse for failing to adopt draconian measures of local protection of reefs in developed countries (e.g., protection of all U.S. coral reefs should be at least as stringent as for the GBR).

4. Communications tool

1. Probably 75% of the attendees at this meeting and virtually no politicians have ever seen a healthy coral reef.
2. Consequently the shifting baselines syndrome severely distorts our goals and expectations for conservation.
3. The simple existence of such healthy reefs in the face of climate change has enormous potential for motivation and inspiration to do much better than we have.