



# **International Coordination of Coral Reef Research**

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## **in the beginning...**

- **Coral reef science has traditionally been done at a local scale, by single investigators**
- **New questions demand regional-scale, interdisciplinary research**
- **Management of reef resources needs new scientific answers if it is to be sustainable**
- **How do we build the kind of science that is needed?**

An aerial photograph of a coral reef system. The water shows various shades of blue and cyan, indicating different depths and reef structures. There are several large, irregularly shaped islands or atolls with brownish-green vegetation. The overall scene is a complex, textured landscape of marine and terrestrial environments.

**some of the problems...**

**Overfishing**

**Uncontrolled coastal development**

**Global climate change**

**Pollution**



# **some of the problems...**

## **Overfishing**

**Multi-species, multi-gear**

**Some destructive methods**

**Enormous bycatch**

**Little enforcement of regulations**

**Employment of last resort**



**some of the problems...**

**Overfishing**

**Uncontrolled coastal development**

**Erosion, sedimentation, nutrification**

**Direct damage during construction**

**Mining of reef rock for construction**

**Long-term pollution**

**Increased people pressure**



**some of the problems...**

**Overfishing**

**Uncontrolled coastal development**

**Global climate change**

**Warming .... coral bleaching**

**Sea level rise .... reef drowning**

An aerial photograph of a coral reef system. The water shows various shades of blue and cyan, indicating different depths and reef structures. There are several brownish, sandy or coral-covered islands and reefs scattered across the water. The overall scene is a vast, natural marine environment.

**some of the problems...**

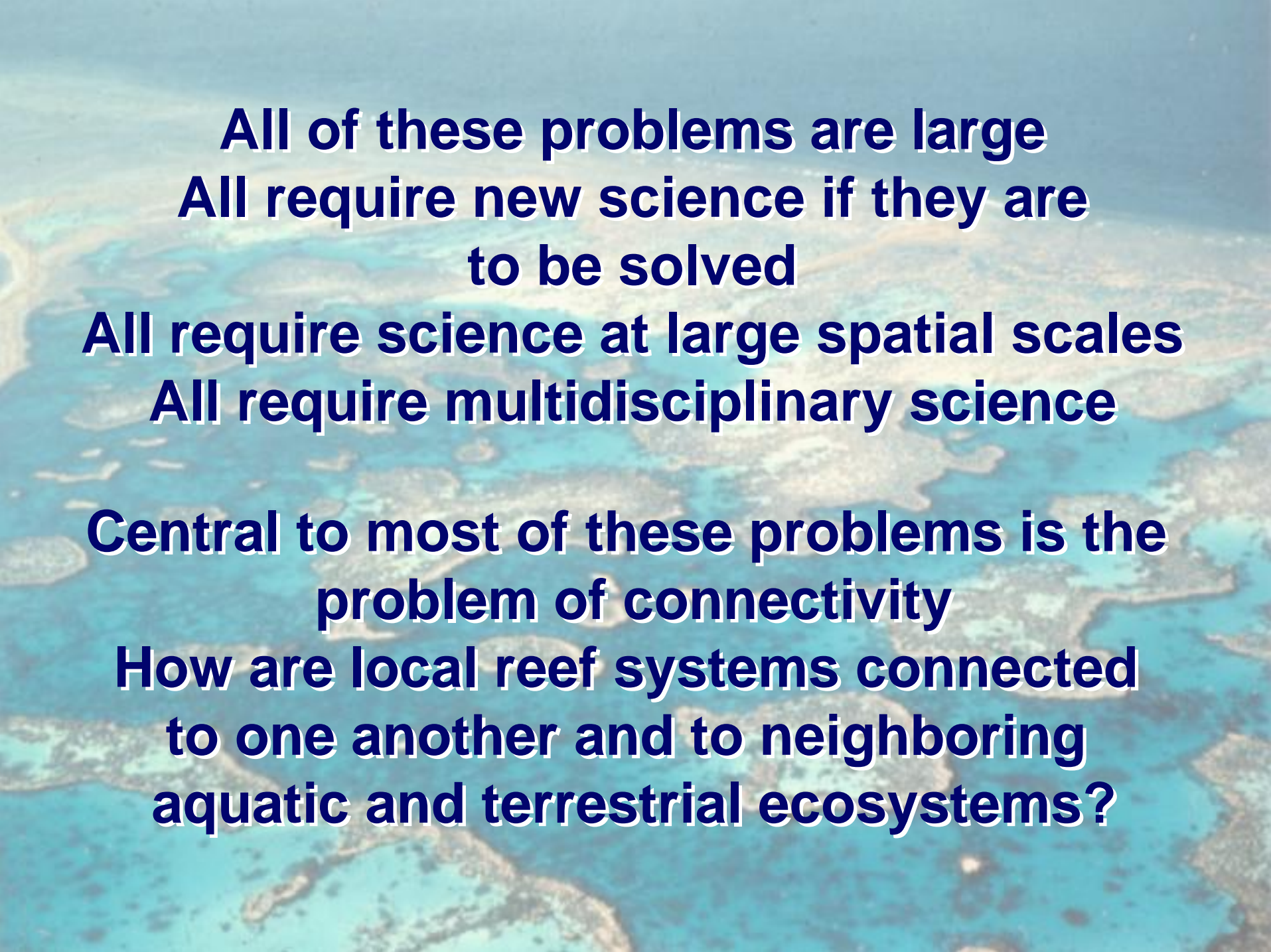
**Overfishing**

**Uncontrolled coastal development**

**Global climate change**

**Pollution**

**Agricultural, Industrial, Domestic.....**



**All of these problems are large  
All require new science if they are  
to be solved**

**All require science at large spatial scales  
All require multidisciplinary science**

**Central to most of these problems is the  
problem of connectivity**

**How are local reef systems connected  
to one another and to neighboring  
aquatic and terrestrial ecosystems?**

# **What prompted the effort?**

- **we had to build larger projects**
- **there was little time to waste**
- **but how fund \$millions projects in a system used to \$thousands?**
- **few developed countries have coral reefs – why spend \$millions on projects with no national payoff?**

# **The Targeted Research Project**

- **World Bank, Environment Department, includes people who are concerned about the fate of coral reefs**
- **healthy reefs are of immense economic benefit to the developing countries that have them**

# **The Targeted Research Project**

- **discussions began during a conference in Fort Lauderdale in 1998**
- **what are the most critical science questions to tackle in order to enhance reef management?**

# **The Targeted Research Project**

- **they continued via e-mail over the next two years**
- **1998 el Nino caused massive bleaching across the Indian Ocean – giving added impetus**
- **6 core topics were identified... including connectivity... and bleaching**

# **The Targeted Research Project**

- **by late 2001.... a plan**
- **Targeted Research for Sustainable Management of Coral Reefs**
- **6 components ... 6 critical topics ... replicated studies in several reef locations around the world**

# **The Targeted Research Project**

- **at this point, the World Bank approached the Global Environment Facility**
- **a project unlike any previous GEF project ... global in scope, focused on research rather than development**
- **The TR project entered Phase B ... detailed planning**

# Phase B - Planning

- **six scientists were invited to convene working groups to plan the six components**
- **Connectivity WG: I convened 12 scientists from 8 countries**
- **5 USA, 2 Canada, 1 ea Mexico, Ireland, France, Hong Kong, Malaysia, Australia**
- **with collaborators, ~22 involved**

# **Phase B - Planning**

- **Sept 02 to May 03, three working group meetings, in Miami, Akumal MX, Washington DC**
- **thousands of e-mail messages**
- **hundreds of phone calls**
- **we built a proposal for a five year interdisciplinary research project**

# Current status

- **GEF has given preliminary approval for funding**
- **final decision 06/04 pending satisfactory administrative and co-funding arrangements**
- **Implementation in late 04**

# **Structure of the TR Project**

**Synthesis Panel**

**(WG chairs, other experts)**

**6 Working Groups**

**(variable size, all international)**

**Regional Centers of Excellence**

**(Mexico, Philippines, Australia, Tanzania)**

**Other collaborators**

# **How well has structure functioned?**

## **Within Connectivity WG**

- **I chose skilled scientists who would be interested in non-traditional project**
- **Buy-in strong, but varying because lots of work with no guarantees in an unusual funding environment**
- **Not a project for the untenured!**

# **How well has structure functioned?**

## **Among WGs and Synthesis Panel**

- Most of us are overcommitted**
- People vary in their effective use of e-mail**
- The Synthesis Panel met too seldom (3 times since 6/02)**
- Integration among WGs has lagged**

# **How well has structure functioned?**

- **e-mail and the web are rudimentary tools for effective collaboration**
- **made little use of conference calls, but have limitations too**
- **we are all struggling to learn how to use them effectively**
- **people vary in their capacity to perform in this distributed collaboration**

# **My dream...**

**A web-based, virtual reality, real-time environment in which geographically distant collaborators can talk, can work on documents, can share a cup of coffee, and can reach consensus**

**One that costs no more than a phonecall**

# What worked?

- **lead people were strongly committed to the project**
- **WG members saw an opportunity to do some real science in a different way**
- **GEF saw a novel approach**

# What worked?

- **funds were available to support the planning process (~\$400K in 02-03)**
- **participants gave immense amounts of time at no cost**

# **What might not have worked?**

- **The TR project asks a lot of participants**
- **Components depend heavily on matched funds**
- **It is difficult to keep a unitary focus if money comes from many sources by many routes**
- **If participants take the money and run.....**

# **Are there better approaches?**

- I think we underestimated the difficulties in maintaining participation by a large globally distributed set of scientists**
- Some early decisions trapped us in unanticipated ways because ramifications unappreciated**

# **Are there better approaches?**

- **Our approach dictated by the funding sources we targeted**
- **Approaches to NOAA or NSF would necessarily be different**
- **Don't neglect the cost and time required for planning and securing commitment to fund**



**Has it all been worthwhile?**

**We think so...**