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Coral Reef Targeted Research & Capacity Building for Management

A Presentation to the 14th USCRTF Meeting in Palau, November 2005, by Richard Dodge, NCRI

A Program of Coral Reef Research

Coral Reef Targeted Research & Capacity Building for Management

SPONSORS:

- World Bank (WB)
- The Global Environment Facility (GEF)
- NOAA
- International Oceanographic Commission (IOC UNESCO)
- The Queensland Government
- The University of Queensland (UQ)

Triggers: climate change, SST increases, and effects on the health of the world's coral reefs.

Project: high priority global initiative to accelerate and refine understanding of the underlying science and to manage these triggers on coral reefs.

Participation

- **80 international scientists**
- **6 working groups**
  - Bleaching and local ecological responses
  - Disease
  - Connectivity and large-scale ecological processes
  - **Restoration and remediation**
  - Remote sensing
  - Modelling and decision support tools
- **at international Centres of Excellence & leading international research institutes**

Centres of Excellence

Remediation and Restoration Working Group

Coral Reef Targeted Research & Capacity Building for Management

Restoration & Remediation Working Group Members From:

UNIV. NEWCASTLE, UK
UNIV. PHILIPPINES
UNIV. SINGAPORE
NOVA SOUTHEASTERN UNIV. NATIONAL CORAL REEF INSTITUTE (FLORIDA)
AUSTRALIAN INSTITUTE MARINE SCIENCE
JAPAN WILDLIFE RESEARCH CENTER
UNIV. CALIFORNIA SANTA BARBARA
AKAJIMA MARINE SCIENCE LABORATORY JAPAN
NATIONAL INST. OF OCEANOGRAPHY, HAIFA

Dr Alasdair EDWARDS, Chair (University of Newcastle, UK)
Prof. Edgardo GOMEZ, Co-Chair (University of the Philippines, Diliman)
Prof. CHOU Loke Ming, (National University of Singapore)
Drs Richard DODGE & Richard Spieler (Nova Southeastern University, Florida) NCRI
Dr Andrew HEYWARD (Australian Institute of Marine Science, Fremantle)
Dr Tadashi KIMURA (Japan Wildlife Research Center, Tokyo)
Dr Aileen MORSE (University of California, Santa Barbara)
Prof. Makoto OMORI (Akajima Marine Science Laboratory, Japan)
Prof. Buki RINKEVICH (National Institute of Oceanography, Haifa)

Restoration & Remediation WG: RATIONALE

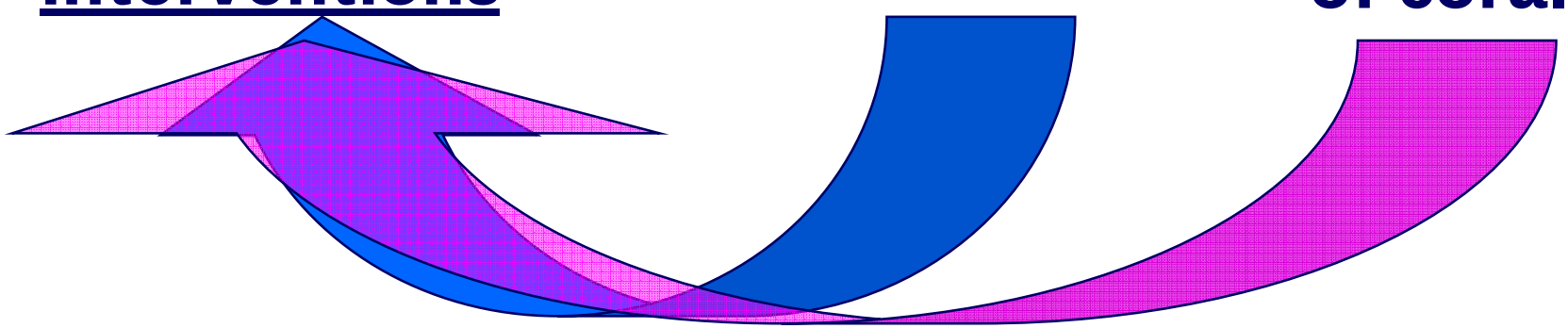
- **World-wide degradation prompted study.**
- **Reef remediation and restoration to have increasingly important future role.**
- **Viable approaches and technologies in early development; often difficult to implement large spatial scales.**
- **Loss of biological and economic services from degraded reefs emphasize the need for (1st) maintaining the ecosystem and (2nd) restoring to a level where significance can again be realized.**
- **RRWG is examining the state of restoration and remediation techniques and targeting investigations on efficacy of potential applications.**

General plan

Programme 1:
Long-term efficacy & cost-effectiveness of restoration <u>interventions</u>

Programme 2:
Enhancing larval recruitment

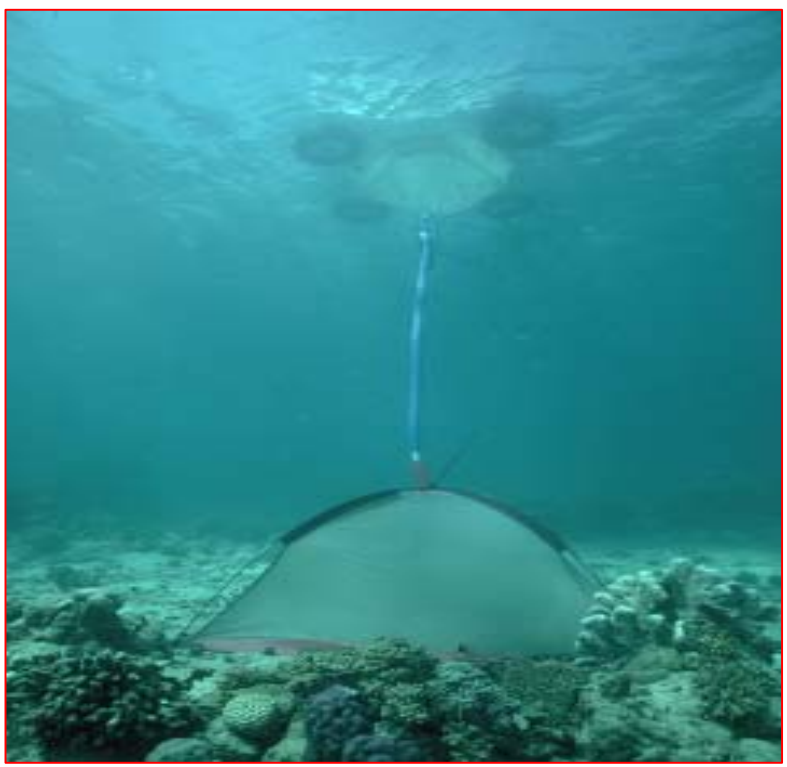
Programme 3:
Enhancing recovery by culture and transplantation of corals



Prog. 2. Enhancing larval recruitment:

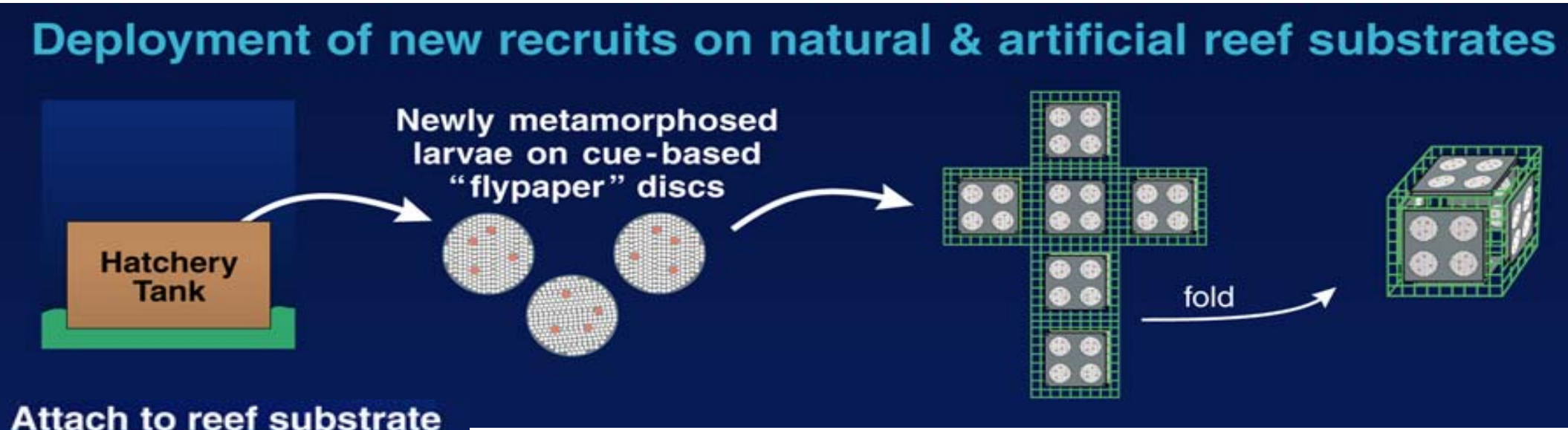
PALAU A (collaboration with PICRC)

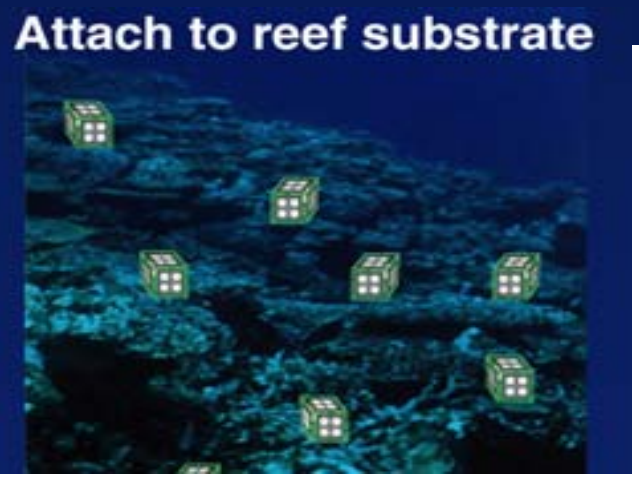
- Hold mass-spawning slicks. Guide coral larvae to settle on injured reef areas.



- Effective (long-term) given high post-settlement mortality?

PALAU B: LARVAL FLYPAPERS





Evaluate differential growth & survival

- Habitat
- Environmental conditions
- Out-planting techniques

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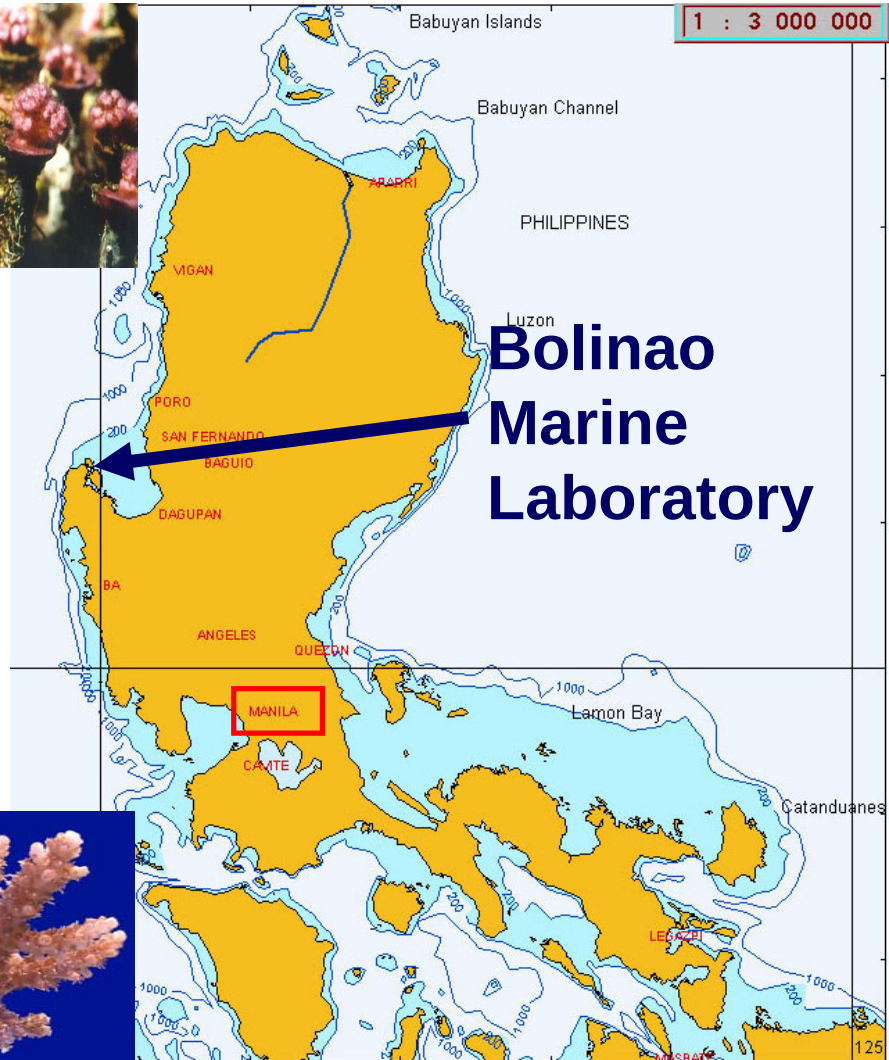
***PALAU C:* Mass culture of juvenile corals with juveniles of grazing snail, *Trochus niloticus*, in mid-water nurseries. Transplantation to the reef after one year.**

Prog. 3. Culture and transplantation of corals

- **Health of transplants, effects on donor colony**
- **Density effects on overall success of restoration**
- **Transplantation of a range of species**
- **Costs of nursery rearing and limited source material versus transplant survival**
- **Technology for mass production of coral colonies for efficient restoration methodologies**



Prog. 1. Restoration Interventions: Long-term efficacy & Cost-effectiveness

- **Integrated experiments to find long-term cost-effective interventions (5-10 years)**
- **Augment larval recruitment**
- **Transplantation**
- **Comparison to natural recovery**
- **Expectation of benefits over and above) natural**
- **Ecological criteria for recovery**

PALAU, BOLINAO, MEXICO, (& USA)
Intervention Experiments

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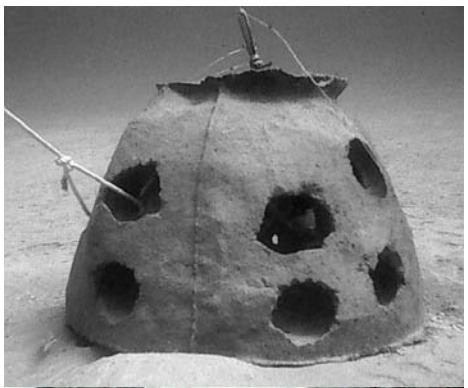
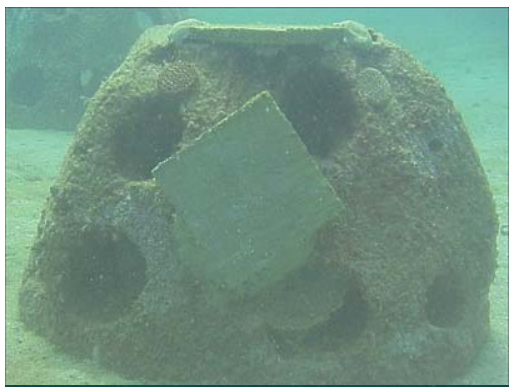
Module:

Transplants



Substrate Type



Invertebrate settlement enhancement

NCRI NATIONAL CORAL REEF INSTITUTE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