Prospects for Pacific maritime security co-operation 'of coral made'

Diving in Australia's Great Barrier Reef. NICHOLAS FLOYD

Australian marine refugia research offers an opportunity to make Pacific regional maritime security co-operation more effective, writes **NICHOLAS FLOYD**, a visiting scholar of the Lowy Institute 2009–10. With marine resources in countries in the vast bioregion of the Pacific under increasing environmental and financial stresses, Australia could help both itself and other countries by providing funding, expertise and technical support to assist its Pacific and South-East Asian neighbours prioritise conservation efforts and secure their marine areas in troubled times.

Defence matters were uniquely linked with ecological concerns at a Maritime Advancement Award[1] presentation in January 2010 at the Royal Australian Navy's Sea Power Conference[2] in Sydney. Dr Alison Jones' presentation on world-leading research on marine 'refugia' in the Great Barrier Reef, recently completed at Central Queensland University stimulated thought on maritime security co-operation at national and international levels.

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This research provides Australian policy-makers in fields as diverse as environment, primary industry, recreation and natural resources with quality analysis on how best to husband biosystems, which are crucial as marine refuges for ecological preservation and for sustainable tourism and professional fishing industries, as well as for recreational fishing. Dr Jones' and Dr Ray Berkelmans' research is also valuable at the international level, with its potential as a marine and fisheries resources management tool for Australia's Pacific and South-east Asian neighbours to help them secure their marine resources.

For these nations, maritime eco-sustainability is synonymous with economic survivability: a sobering observation when considering that five of Australia's nearest neighbours, Indonesia, the Philippines, the Solomon Islands, Papua New Guinea and Fiji, together comprise over twenty-five thousand islands. Also, as humans increasingly occupy, urbanise and exploit these coastal regions, they will become increasingly crucial for other nations' interests and for the global community. For this reason, there is real benefit to be gained in Australia offering assistance and, where appropriate, providing aid in managing the sustainability of their marine resources.

Over months of fieldwork, study and analysis, Dr Jones and Dr Berkelmans assessed both the survival and regeneration potential of specific coral species and their *zooxanthellae*[4] (algal) symbionts. The study area concentrated on the island fringe and bommie reef complexes in and around the Keppel Group, off Yeppoon on the central Queensland coast. Their research sought to determine which reef habitats and coral communities offered the best investment to protect for future proofing the wider reef's viability by assessing a range of key datasets.

Marine 'refugia' research

The analysis and biochemical architecture of the research deserves more detailed treatment than given here, but this article explores the science's application to wider foreign policy options.[5] Yet it is important to understand some parameters and objectives of the research.

Currently, many reefs around Australia, and elsewhere, are exhibiting periodic notable changes in seawater temperature and salinity, at different depths. Similarly, data from numerous sites reveal that increases in dissolved inorganic nitrogen (or DIN) from land runoff continues to occur at unprecedented rates, here in Australia and globally. As many readers will be aware, it is the rate of change of these factors, not necessarily their magnitude which makes such changes a killer of marine biosystems.

'Many of the world's marine reserves have been chosen to protect fish populations rather than to protect the structural coral species that underwrite the entire reef system,' says Dr Jones. 'Unfortunately many of the current system of marine reserves are now threatened by degradation from temperature stress and acidification. Protecting vulnerable reefs from anthropogenic impacts will help the regeneration process following climatic disturbance, but these reefs are unlikely to act as arks that seed regeneration elsewhere if they are already struggling to survive. It is important to choose marine reserves very carefully now to plan for future catastrophic collapses.'

Marine 'refugia' research therefore seeks to isolate and compare select criteria that determine which coral reef areas are most resilient to change in the environmental conditions listed above; which areas possess the greatest coral biodiversity; and which areas are most productive for coral growth. This research offers a sound scientific basis for Australia's partners in international co-operation to help countries conserve their vital marine resources at a time of increasing environmental stresses.

Policy: prioritise resources

The research can be used to prioritise resources and protect reefs that will act as 'stationary arks' for the anticipated climatically grim futures facing Pacific and South-east Asian nations. It can also inform other relevant stakeholders such as littoral farmers, local councils and tourism and fisheries organisations to make important decisions about concerns such as land use, conservation and navigation areas for recreational and professional boating. The research can be applied more widely to other marine biosystems.

Many Pacific Island and other South-east Asian region nations have insufficient maritime security resources to patrol their entire reef space, let alone the full extent of their 200-nautical-mile Economic Exclusion Zones. They operate few, if any surface patrol vessels, possess minimal if any maritime aerial surveillance, and face a variety of challenges in networking and information communications and technology co-ordination for fisheries and sovereignty protection efforts.

Additionally, many of the world's other reefs, in the Caribbean and the Middle East, for example, have been irreparably damaged. This means the Pacific's coral reef communities now have a truly global importance, at a time when some of them have the highest proportion of species facing extinction,[6] and when research also indicates coral reefs are as important in moistening the air, as trees are considered to be the 'lungs' of the earth.[7] Regional security frameworks like the *Niue Treaty*

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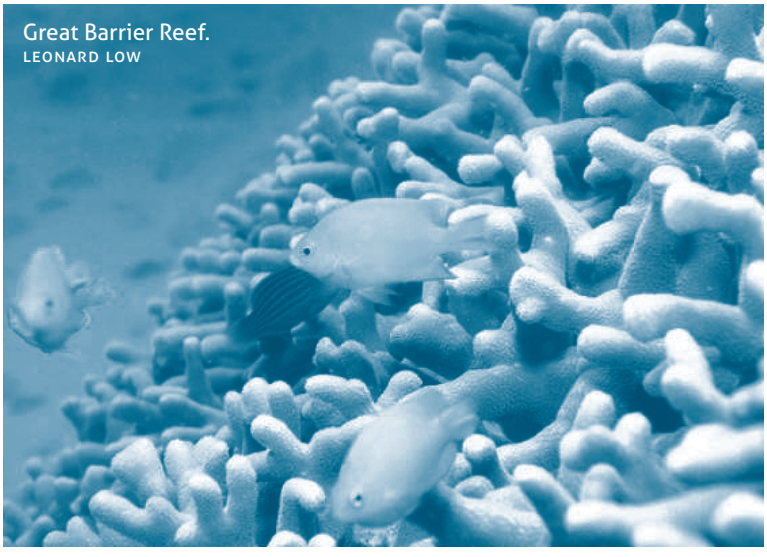

Great Barrier Reef.
LEONARD LOW

The need to understand where and how to apply chronically insufficient resources, highlights the importance of a collaborative approach between Australia and its Pacific neighbours

Subsidiary Agreements (as reaffirmed by Pacific Island Forum members at Cairns in August 2009),[8] are co-operative approaches for fisheries and sovereignty protection efforts, allowing signatory nations to help police and protect their neighbouring countries resources. Even with such innovative strategies however, the fact is there is simply too much area, too many vulnerable sites and too few surveillance and constabulary resources to protect everything.

However, the research of Dr Jones and her associates provides a welcome opportunity for Australia to help the nations in our region to protect their marine resources from over-fishing and habitat degradation, by prioritising their scant resources to protect the reefs that are the 'key terrain' for their marine ecology. This would be additional to any development assistance strategies currently in train with many partner nations in the region.

This initiative should not be seen as a proposition inspired only by Australian neighbourly *bonhomie*. The macro-interrelationship between marine biosystems is often symbiotic at several levels. For instance, many South Pacific island archipelagos sit astride the East Australian Current as it approaches Australia from the Equator, linking the food chains and life cycles on the Great Barrier Reef with the rest of the South Pacific, at levels of inter-connectedness we still do not understand. So a catastrophic collapse in the biodiversity of a neighbouring marine space might equally remove a vital hatchery, breeding site or migratory stage point of one or several key links in marine food chains here in Australia. It's therefore in Australia's direct interest to help prevent such collapses.

As a focus for development assistance, Australia could do a lot worse than provide funding, expertise and technical support on marine refugia analysis to nations who would benefit and whose sustainability as a viable country might depend on such analysis.

Initiatives like this could offer as many opportunities for host-country development as for Australian participants, through deepening the local research base and generic understanding of the bioregion. Furthermore, Australia's development initiatives could link with those of similar bodies, like the *Secretariat of the Pacific Community*,[9] the Nouméa-based *Institut de Recherche pour le Développement* (IRD)[10] and the Forum Fisheries Agency.[11] The Asian Development Bank/Global Environment Facility's joint-sponsored Coral Triangle Initiative[12] or perhaps even the Pacific Patrol Boat Program,[13] a long-standing plank in the Australian Defence Force's Defence Co-operation commitment to the region, might potentially have the capacity to materially support or assist in broadening the investment return.

The changes we see today in climate and weather patterns, and increasing human exploitation and other challenges for marine biosystems present risks not yet fully fathomed by either Australia or its South-east Asian and Pacific neighbours. The need to understand where and how to apply chronically insufficient resources, highlights the importance of a collaborative approach between Australia and its Pacific neighbours.

Central Queensland University's work on how to assess and select which marine refugia must be protected, and which can be risk managed, in this time of unprecedented environmental and resource challenges, has the potential to be a vital part of the nations in our region's marine management policies and procedures. The research can be applied not only for fisheries protection, but also for improved information sharing and decision-making on maritime resources more broadly. Australia should carefully consider this opportunity to 'suffer a sea change' in its regional development assistance programs, and lay down the bones of a program of maritime security co-operation, 'of coral made.'

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