NCCARF
National Climate Change Adaptation Research Facility
Adaptation Research Network
MARINE BIODIVERSITY AND RESOURCES

Convenor's Spot

Welcome to the second issue of MAB! In this issue we announce two important upcoming Marine Adaptation Network organised events. These are the First National Marine Climate Change Adaptation Summer School for Honours, postgraduate students and Early Career Researchers (4 December 2009), and a national workshop for the development of principles and guidelines for assessing and reducing vulnerability to climate change in Australia's marine systems, intended for marine stakeholders, managers and researchers (15-16 February 2010) (for details, see p.2). We take a look at the Western Australian Marine Science Institution (WAMSI) and the CERF Marine Biodiversity Hub – both philosophically aligned to the Marine Adaptation Network in recognition of the need for collaboration in order to enhance our chances to better adapt to climate change. Aside from the Marine Adaptation Network website, to be released shortly, the interactive Range Expansion Database and Mapping Project (REDMAP) website under development is also discussed in this issue. REDMAP is an initiative of the Tasmanian Fisheries and Aquaculture Institute to monitor range shifts in marine species.

As introduced in the first issue of MAB, the Marine Adaptation Network includes five interconnecting themes – Integration, Biodiversity and Resources, Communities, Markets and Policy – designed to consider the feedbacks that occur within the social (socio-economic, policy) -ecological system in a holistic way. To improve our understanding of, and enhance, adaptive capacity of the various sectors within the marine space, we believe it important to adopt an integrative approach of collaboration, engagement and cooperation that cross-cuts between these themes. In this issue of MAB, we feature the Communities Theme of the network. We look at some of the activities proposed by this theme, and note that the development of these activities is being undertaken in close consultation and collaboration with the Network Policy and Integration Themes.

Neil Holbrook

Inside this issue:

At a glance

The Adaptation Research Network for Marine Biodiversity and Resources will foster an inclusive collaborative and interdisciplinary research environment that generates outputs relevant for policy-makers and managers to develop appropriate climate change adaptation responses.

FUNDING

$1.6m direct funding
$1.9m cash and in-kind partner contributions

INVESTMENT

Australian Government Department of Climate Change through the National Climate Change Adaptation Research Facility (NCCARF) hosted by Griffith University

FRAMEWORK

Five themes (integration, biodiversity & resources, communities, markets policy)

HOST INSTITUTION

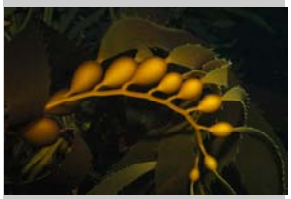
University of Tasmania

CONVENOR

Associate Professor Neil Holbrook

TIMEFRAME

2009-2012



Featured Theme: Communities

Adaptation of marine-dependent industries and communities to climate change occurs through social processes (e.g. the most efficient adaptation strategy may be ineffective if there are counter values and cultural norms that preclude its implementation). Similarly, assessing the vulnerability of marine-dependent industries and communities to climate change requires understanding of both the sensitivity of those industries and communities to climatic changes, as well as their capacity to respond to those changes (adaptive capacity).

The overall aim of the Communities Theme is to better understand and address the barriers and opportunities to adapting to climate change among conservationists, marine resource users and the industries that depend on them.

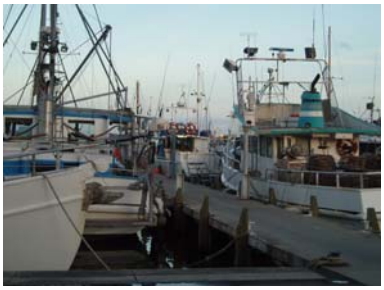
Apart from dissemination of information, the Communities Theme is actively working on several major initiatives to help build the capacity of marine researchers, communities, decision makers, and industries to respond to climate change. Among these initiatives are:

- development of an on-line social and cultural meta-database of relevant climate change adaptation research nationally and internationally;
- a toolkit for participatory marine research projects – including protocols for participatory research; case studies; and other examples of "how to" undertake participatory research with marine resource users; and
- a searchable calendar of events (e.g., workshops, conferences, and forums) relevant to Network stakeholders.

While many studies have focused on the adoption of new technologies and practices of marine industries, few activities have focused on the ability of marine-dependent industries and communities to adapt to climate change.

The Communities Theme provides a mechanism for marine researchers, communities, decision makers, and industries to access the tools and information needed to better respond to climate change.

To engage with the Communities theme, please forward your contact details to arnmbr@arnmbr.org



Conferences/Workshops

10th International Congress of Ecology (INTECOL) 'Ecology in a Changing Climate - Two Hemispheres - One Globe'

16-21 August 2009, Brisbane, Queensland, Australia
www.intecol10.org

4 degrees & beyond International Climate Conference

28-30 September 2009, Oxford, United Kingdom
www.eci.ox.ac.uk/4degrees

Society for Conservation Biology - Oceania Section Meeting

30 November-3 December 2009, Hobart, Tasmania, Australia
www.cdesign.com.au/scboceania2009

First National Marine Climate Change Adaptation Summer School

4 December 2009, Hobart, Tasmania, Australia

For more detail see article page 3 in this issue

2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change 'Earth Systems Governance: People, Places, and the Planet'

2-4 December 2009, Amsterdam, The Netherlands
www.earthsystemgovernance.org/ac2009

Principles and guidelines for assessing and reducing vulnerability to climate change in Australia's marine systems: a workshop for stakeholders, managers and researchers

15-16 February 2010, Hobart, Tasmania, Australia

More detail available on our website soon

2010 International Climate Change Adaptation Conference 'Climate Change Adaptation Futures: preparing for the unavoidable impacts of climate change'

29 June-1 July 2010, Gold Coast, Queensland, Australia
www.nccarf.edu.au/conference2010

Call for abstracts will be made shortly

Australian Society for Fish Biology 2010 Annual Conference

12-14 July 2010, Melbourne, Victoria, Australia
www.asfb.org.au

Climate Change Effects on Fish & Fisheries: Forecasting Impacts, Assessing Ecosystem Responses, & Evaluating Management Strategies

26-29 April 2010, Sendai, Japan
www.pices.int/meetings/international_symposia/2010

Registration and abstract submission opens 1 July 2009

First Marine Adaptation Network Summer School

The first National Marine Climate Change Adaptation Summer School for honours and postgraduate students and Early Career Researchers (ECRs) will be held in Hobart, Tasmania on 4 December 2009, following the Society for Conservation Biology - Oceania Section Meeting (30 November-3 December 2009).

The summer school will be a one-day intensive program including lectures and workshops. The school will include topics covering aquaculture, fisheries, biodiversity, and tourism, including the identification of vulnerability indicators and the generation of adaptation options with the use of a case-study.

The Marine Adaptation Network will make a number of bursaries available to honours and postgraduate students and ECRs travelling to this summer school up to $1,500 each for travel and accommodation. To be eligible to possibly obtain a bursary, students must complete an application. Applications should be no more than two pages in length providing an outline of the applicants' research, the benefits of participating in this Summer School, and a budget and justification. Applicants must also attach a current CV.
For further information, please contact arnmbr@arnmbr.org.

Challenger VR2 moorings

WAMSI: Better science means better decisions

It's a motto taken up by the Western Australian Marine Science Institution (WAMSI) where 16 State and national research organisations, including four WA universities, have joined forces to deliver quality marine science.

In 2006 WAMSI received $21 million funding from the State Government for a five-year program. Partners provided an extra $66 million in matching investment to address questions on climate change, aquaculture and the basic understanding of marine biodiversity and oceanographic processes. This has included work on ecosystem-based fisheries management and an increased understanding of Ningaloo Reef.

WAMSI scientists at work in the Kimberley

WAMSI's partners now work on 87 projects across the state, combining 250 researchers into collaborative teams to study across the three integrated themes of ocean systems forecasting, biodiversity conservation and natural resource development management.

Research covers many areas – ocean flow rates, biotechnology, conservation, coastal engineering, fisheries and social impacts.

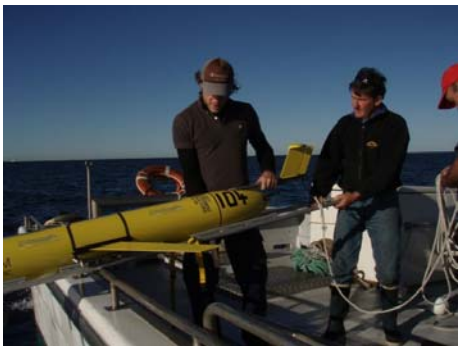
As examples, Woodside Energy Ltd and The University of Western Australia (UWA) work together on the predictions of climate change and altered ocean movements on gas and oil pipelines in the North West Shelf.

WA's Department of Environment and Conservation, CSIRO, the Australian Institute of Marine Science, the Bureau of Meteorology, UWA and three other Perth universities – Murdoch, Curtin and Edith Cowan – work together studying biodiversity at the iconic Ningaloo Marine Park. The 270-kilometre reef has approximately 250 coral, 500 fish and 600 mollusc species where whale sharks, humpback whales, dolphins, manta rays, turtles and dugong are frequently sighted.

WA's Department of Fisheries works with Murdoch University and others on ecologically sustainable fishing and the social impacts of fishing changes.

Initial findings emerging from WAMSI's projects are now being used by decision-makers in management and policy roles as a basis for decisions while a range of organisations are using information from WAMSI's research databases.

WAMSI recognises the importance of adaptive response strategies for the effective management of marine biodiversity and oceanographic processes under climate change. Both the Marine Adaptation Network and WAMSI agree that both networks provide crucial knowledge in these areas and that close collaboration is required to achieve this goal.



Ocean gliders dropped into the ocean on the North West shelf

WAMSI's partners are the Bureau of Meteorology, CSIRO's Wealth from Oceans Flagship, the Australian Institute of Marine Science, the WA Chemistry Centre, the Western Australian Museum, Edith Cowan University, Murdoch University, The University of Western Australia, Curtin University of Technology, Western Australian Global Information Observing System, Woodside Energy Limited, BHP Billiton Petroleum and the WA departments of Fisheries, Environment and Conservation, Commerce, and Planning and Infrastructure.

For more information on the Western Australian Marine Science Institution, please contact

-WAMSI Chief Executive Officer, Dr Steve Blake on 0409 183 277 or (08) 6488 4572
-WAMSI Communications Manager, Sue McKenna on 0424 196 771 or (08) 6488 4574

Science in a Changing Climate

Climate change is an immediate challenge confronting our marine environments, fisheries industries, and decision makers. In Tasmania, temperature monitoring of coastal waters at Maria Island has recorded a warming of over 2°C in 62 years, more than 3 times the global average warming rate. This is already changing local marine ecosystems, leading to redistribution of marine species as they either extend or shift their geographic ranges polewards with warming waters. Range extensions on the east coast of Tasmania have already been recorded in coastal snails, barnacles, fish, and sea urchins.

There is a scarcity of monitoring programs that would inform us of changes in the distributions of our marine species – a necessary precursor to developing an understanding of what impact 'new' species may have on our existing ecosystems. To address the lack of information available to create baselines for the distribution of species, the Tasmanian Aquaculture and Fisheries Institute, TAFI, has begun developing an innovative 'citizen science' project.

The Range Expansion Database and Mapping Project (REDMAP) will be an interactive website where members of the public submit data on catches or observations of species that may be undergoing range shifts. Tasmanian commercial and recreational fishers, scuba divers, marine naturalists and beachcombers are encouraged to log on to the REDMAP website and record sightings of species that occur outside their 'normal' or known ranges on an interactive map. Scientists, members of the community and school groups can then create maps to see what species have been recorded in an area, or how many sightings of each species have been logged. The website will also feature fact-sheets on our marine environments and climate change, activities for school classes and information on climate change research projects. If you have an exciting climate change project, or an idea for a class-room activity you would like us to feature on the site, then please let us know!

REDMAP will be the beginnings of a community-driven record of variations and changes in species over time. It is expected that the data collection undertaken by Tasmanians, although not traditionally scientific, will be an excellent way to enhance already existing research programs and capture important information within much shorter time frames and with less expense than any traditional scientific program can realistically expect. Although the site is not yet live, REDMAP has already been receiving many new and interesting observations through their many community partners, like a blue groper at St Helens and a dolphin fish (or *Mahi Mahi*) all the way down the Tasman Peninsula!

The website will also have the capacity for observers to upload photos, allowing for verification of the data.

TAFI was recently awarded a grant from the Tasmanian Community Fund to develop the REDMAP website, expected to be online in August 2009. The ultimate goal is to develop REDMAP as a National project, using the eyes of Australia's many fishers and divers all around our coastline to help inform us of the changes occurring in the distribution of our marine species.

For further information please contact:

- Rebecca Brown (TAFI) REDMAP Science Communication Officer (03) 6277 7257 or r.a.brown@utas.edu.au

- Dr Gretta Pecl (TAFI) 0408 626 792 or Gretta.Pecl@utas.edu.au

redmap
WWW.REDMAP.ORG.AU

Summary 'A place at the table?' an article by Dulvy, N. and Allison, E.

Fisheries are a vital source of protein for millions of people worldwide, and make up more than half of the essential protein and mineral intake for millions of people in some of the poorest countries in the world.

Due to the global dependence on fisheries, the impact of climate change on these systems is becoming increasingly apparent. For example, coral reefs are bleaching and their associated fisheries are rapidly collapsing. Fisheries have always been an unpredictable way to make a living, but this may be compounded by changes in migration routes, and changes to spawning and feeding grounds in response to climate change. Since the majority of fisheries exist in developing countries there is the potential that the consequences will be dramatic.

Four key areas have been identified by the authors where changes to policy and increases in research efforts should be developed.

These are:

- carbon credits given to fisheries in response to a reduction in non-essential fleet sizes;
- policy altered to avoid subsidies that artificially sustain the profitability of severely depleted stocks; instead management that allows fishing fleets to adapt to changes in stocks should be encouraged;
- a need for adaptation approaches that encourage integration of natural resources; and
- increased infrastructure and social services for fisheries industries to avoid economic, social and political marginalisation.

The authors suggest that the fisheries industry should be given consideration by decision makers participating in the UN Framework Convention on Climate Change this December.

For full paper, please visit www.nature.com/reports/climatechange

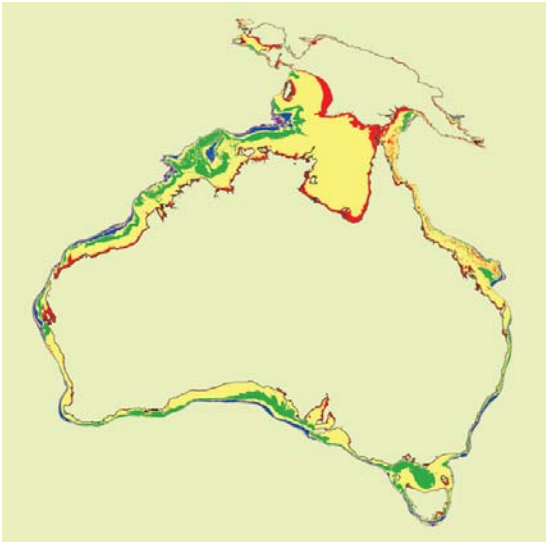
CERF Marine Biodiversity Hub

The Commonwealth Environment Research Facilities Program (CERF) Marine Biodiversity Hub (MBH) is developing knowledge and techniques for predicting the distribution of marine biodiversity in Australia's oceans, and novel options for its management. This capability will complement Australia's National Representative System of Marine Protected Areas (NRSMPA) due to be in place by 2012. Together, the NRSMPA and off-reserve management provide the best option for long-term protection and sustainable use of marine biodiversity in light of competing demands on the marine environment.

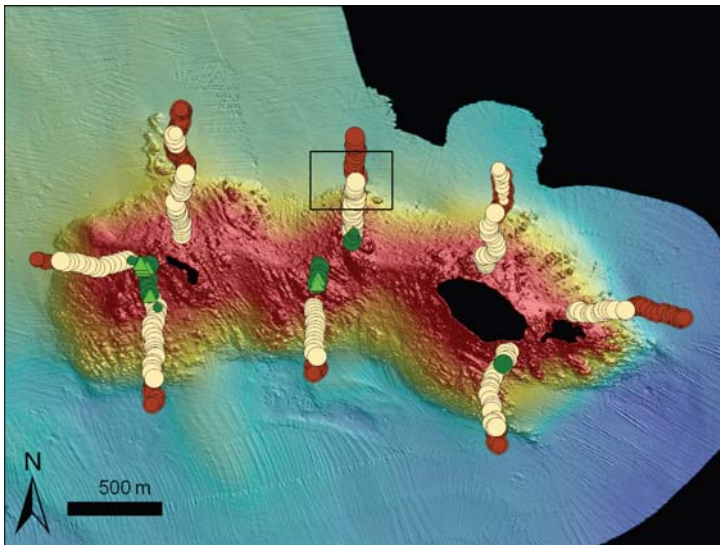
The CERF MBH four research areas are:

- patterns in Australian marine biodiversity, its origins and present-day connectivity;
- physical predictors of marine biodiversity especially at fine scale in inshore waters;
- predicting biodiversity around Australia on a 1 km^2 national grid; and
- managing biodiversity outside of reserves, through incentives and offsets.

The CERF MBH has developed new national physical and biological datasets on a 1 km^2 grid, and is using these data to provide biologically informed analyses of physical data in support of regional marine planning. The CERF MBH has updated the national bioregionalisation for shelf fish and shown the presence of consistent depth structure (biomes) around Australia. In separate projects, it has been demonstrated that fish and at least six megabenthos groups have similar distributional patterns, supporting the use of fish as a surrogate for patterns in biodiversity more generally. High resolution near-shelf surveys off Southeast Tasmania, Carnavon Shelf (WA) and in Jervis Bay are being used to develop new surrogates at very fine spatial scales.



Continental shelf biomes of Australia developed in bioregionalisation research by the CERF Marine Biodiversity Hub.



This high-resolution multibeam bathymetry map of the Hippolyte Islands off south-eastern Tasmania shows the distributions of dominant biological assemblages. The yellow circles are sponges extending over mobile sediments stabilised by the invasive screw shell, *Maoricolpus roseus* (brown circles). The green circles are kelp, *Ecklonia radiata*, and the green triangles are *Caulerpa* species. (Source: Geoscience Australia.)

The CERF MBH is working with stakeholders in the Eastern Tuna and Billfish fishery developing incentives to redistribute effort and reduce threatened species bycatch, and offsets to reduce mortality at other life stages to compensate for unavoidable bycatch.

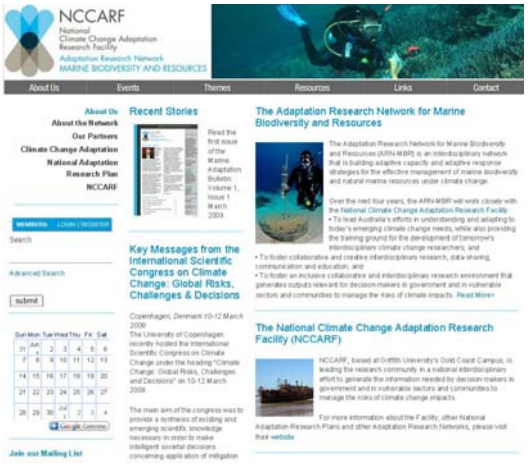
The CERF MBH recognises the importance of building adaptive capacity and adaptive response strategies for the effective management of marine biodiversity and natural marine resources in a changing environmental, economic and management environment. Both the Marine Adaptation Network and the CERF MBH agree that both groups provide crucial input and knowledge in this area and that close collaboration is required to achieve this goal.

The CERF Marine Biodiversity Hub was formed in 2007 and is administered by the Department of the Environment, Water, Heritage and the Arts (DEWHA) and hosted by the University of Tasmania. Research partners are CSIRO, GA, AIMS, and Museum Victoria. Stakeholder partners cover representing fisheries, oil and gas exploration, environmental management, tourism and conservation include AFMA, CFA, APPEA, DAFF, DEWHA, STCRC and WWF.

For more information and contact details see the website at marinehub.org.au

The Marine Adaptation Network Website

The newly developed Marine Adaptation Network website will be launched shortly; Wenneke ten Hout has been working with Paul Raffety (website developer) to set up a user friendly website that will be centrally managed by the Integration Theme. The site will use a Content Management System that allows the network themes to update their information.



Over time we aim to include searchable on-line databases, case studies, links to research projects, toolkits for stakeholders and researchers, updates on conferences, workshops and other events related to climate change and adaptation in the marine biodiversity and resources field. The website will outline the marine adaptation network's activities and provide access to its publications, such as fact sheets and the Marine Adaptation Bulletin.

The network website will be one important mechanism to help foster collaborative and creative interdisciplinary research, data-sharing, communication and education, and advance and document climate change adaptation knowledge.

For more information please email arnmbr@arnmbr.org

Contact us

Adaptation Research Network for Marine Biodiversity & Resources
School of Geography and Environmental Studies
University of Tasmania, Private Bag 76
Hobart, TAS 7001
Australia
Phone: 03 6226 2027
Fax: 03 6226 7628
E-mail: arnmbr@arnmbr.org
Website: Launched shortly

THEMES

Integration
Associate Professor Neil Holbrook
Neil.Holbrook@utas.edu.au

Biodiversity & Resources
Dr Alistair Hobday
Alistair.Hobday@csiro.au

Communities
Professor Tim Smith
Tim.Smith@usc.edu.au

Markets
Professor Quentin Grafton
quentin.grafton@anu.edu.au

Policy
arnmbr@arnmbr.org

If you would like to submit an article to the MAB, please send this to arnmbr@arnmbr.org.

This issue of the Marine Adaptation Bulletin has been compiled by Wenneke ten Hout.
Featured Theme: Communities article was written by Prof Tim Smith.
Images were provided by Tasmanian Seafood Industry Council, CERF Marine Biodiversity Hub, WAMSI, Dr Gretta Pecl, and Dr Graham Edgar

Marine Adaptation Network Partners:

The Adaptation Research Network for Marine Biodiversity & Resources is an initiative of the Australian Government Department of Climate Change being conducted as part of the National Climate Change Adaptation Research Facility www.nccarf.edu.au