



Reef Watcher Production

Contributions welcome: [intertidal@ccsa.asn.au](mailto:intertidal@ccsa.asn.au)  
All contributions are subject to editing.  
**Deadline** for next issue: 14th February, 2010

# Forecasting and mitigating climate change on the ecology of Adelaide's rocky coast

By Sean D. Connell—The Southern Seas Ecology Laboratories, University of Adelaide

The Adelaide Metropolitan coast is a beacon for researchers from Europe, USA and Asia that study coastal ecosystem disruption and restoration. We offer the world a model system that assists forecasting the consequences of coastal management (e.g. do nothing or plan alternate mitigation strategies) of what are normally robust ecosystems.

Our metropolitan coast is internationally recognised for the loss of canopy-forming algae and its replacement by low-lying turf-forming algae. It offers answers to such questions as: is this loss reversible? Will it accelerate under climate change? Can we mitigate the ecological effects of a rapidly changing climate? The answers to these questions are currently under investigation by the Southern Seas Labs at the University of Adelaide.

We recognise that climate-driven change represents the cumulative effect of global impacts through local-scale conditions. We show that understanding their manifestation at local scales can empower local management. Our diving and experimental work in the field shows that change in the dominance of habitats, such as shifts from canopy-forming algae (e.g. kelps) to low-lying turf-forming algae, is

often the product of local water pollution that occurs at relatively local scales (i.e. catchment scale). Our mesocosm experiments reveal that forecasted global-scale change (e.g. elevated carbon dioxide (CO<sub>2</sub>) and subsequent ocean acidification) and local stressors (e.g. water pollution) combine to accelerate change faster than those predicted from mathematical-models. The reality is that the combination of local and global stressors creates a synergy; their combined effect is greater than the sum of their individual effects. The very important and positive result was that a reduction in local stressors (water pollution) substantially reduced the effects of climate change.

The effects of climate are also reduced where kelp forests are intact and not fragmented or reduced by local human activities. Currently, we

are developing restoration techniques for lost South Australian habitats with Dr Choi from Korea. Dr Choi has restored lost kelp forests in southern Japan to restore their

fisheries and aquaculture. We hope to restore the lost forests of Adelaide's metropolitan coast not only for ethical reasons, but also for ecological conservation reasons that will benefit future managers and users.

These findings empower local managers because they show that policies of reducing local stressors (e.g. water pollution) can reduce the effects of global stressors not under their governance (e.g. ocean acidification and rising temperature). The connection between research and government policy provides an example whereby knowledge (and decision making) across local through global scales provides solutions to some of the most vexing challenges for attaining the goals of sustainability, biological conservation and economic development.



Healthy kelp forest



Kelp forest replaced by turf-forming algae

# Reef Watch Quiz Night 2009

About 150 people attended the 2009 quiz night. From the feedback everyone had a great time. Many prizes were won from air fills, boat dives, lots of chocolate, t-shirts, hats, wine, movie tickets, dive equipment and lots more. Here are the results:

Maurauders — 42  
Internationals — 40  
Conservation Council of SA — 39  
Glenelg Scuba — 38  
MLSSA — 38  
Quincy's — 37  
Underwater Explorers — 36  
Adelaide Uni Scuba - 34  
Wooden Spooners — 33  
Incredibles — 32.5  
Wrecks — 28  
Oceans 7 — 25

Congratulations and thank you to all those that participated and made the annual Reef Watch quiz night another successful event. We hope to see you all again next year.

We would like to thank all our generous supporter and sponsors for the night who donated much of the prizes:

Divers Delight, Adelaide Scuba, Kangaroo Island Dive and Adventures, MLSSA, Underwater Sports Diving Centre, Adventure Blue, Scuba Commercial and Wholesale, Alex Suslin, Caring for Our Country, Adelaide and Mount Lofty Ranges NRM Board, and Primary Industry and Resources SA .

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## Intertidal Program Road Show

From Mt Gambier to Pt Lincoln the intertidal monitoring program has reached many new volunteers. On a sunny day at Port Macdonnell about 25 residents from Mt Gambier and surrounds enjoyed a morning on the reef. The following day a training session was held at Southend. All participants were rewarded with a great BBQ thanks to Skye McPherson (Coastal, Estuarine and Marine Planning Liaison Officer, South East NRM Board).

Next stop on the road show was the Tumby Bay Area School, on the Eyre Peninsula. A class of year 6/7 students spent a morning indoors learning about intertidal reefs and how to monitor. The following day the class was very happy to spend a few hours practicing what they had learnt, so we headed out to Tumby Point to search for molluscs and algae.

A very busy three days was spent on Kangaroo Island. We worked with around 115 junior primary and secondary students at Kingscote , Penneshaw and Parndana Campuses. Many hours were spent indoors on our “fake rockpools” identifying snails and learning about their habitats. Unfortunately, the heat prevented us from going outdoors. As environmental education is being implemented in school curriculums this was a great opportunity to introduce Reef Watch to budding young scientists.



Image: B. Jackson

Reef Watch volunteers enjoying post-monitoring BBQ at Port McDonnell



# Clean Up Australia Day

## Sunday 7<sup>th</sup> March

### Coming to a jetty near you

Come along for a snorkel or SCUBA dive, help pick up rubbish and look for feral marine species

BYO snorkel or dive gear, including gloves, catch bag and knife (if you have one, to cut fishing line). Feral or In Peril slates provided free.

#### For more information:

**Steve Leske** (Reef Watch Project Officer): [info@reefwatch.asn.au](mailto:info@reefwatch.asn.au)

0400 272 177

**Carl Charter** (Feral or In Peril Project Officer): [feralperil@conservationsa.org.au](mailto:feralperil@conservationsa.org.au)

0417 808 419

[www.reefwatch.asn.au](http://www.reefwatch.asn.au)

#### Reef Watch

The Reef Watch *Feral or In Peril* program has been designed to help keep track of a number of marine organisms that are of special concern. As its name implies, *Feral or In Peril* monitors life forms that are a potential threat to the marine ecosystem as well as local species that are of conservation concern.

#### Clean Up Australia

Every year hundreds of thousands of Australians get stuck in and clean up their local environment by collecting and removing rubbish on Clean Up Australia Day. It's fun, easy and everyone can get involved.



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# Marathon Fish Count

Come and count fish for fun!

**April 25th Noarlunga Reef**

Dive or snorkel a designated section of the reef and count and record the fish you see on the slates provided.

ID training will be provided on the day and boats will ferry divers to the outside and southern end of the reef.

BYO dive & snorkel gear – identification slates & data sheets provided for free.

Followed by free BBQ for all volunteers.

Also on the day – displays, t-shirts for sale, staff available to answer your questions about the marine environment.

If your dive club is interested in doing a fish count at another site, please contact Steve for some fish identification training.

**PLEASE register to attend this event.**

Contact: Steve Leske 0400 272 177

Email: [info@reefwatch.asn.au](mailto:info@reefwatch.asn.au)

[www.reefwatch.asn.au](http://www.reefwatch.asn.au)



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# In search of dragons – from the USA

**R**eef Watch has been communicating with a senior aquarist from the New England Aquarium for about six months and in November he finally made it to Australia.

Jeremy Brodt (pictured) is one of more than 50 aquarists in the USA keeping both species of sea dragons in captivity. In early 2008, there was a dedicated sea dragon husbandry symposium in the USA where all of these aquarists and some international aquarists got together to discuss and learn about all aspects of keeping captive sea dragons. It turns out that not a single one of them had ever seen a wild sea dragon. So that motivated Jeremy to apply for grants to fund a trip to Australia and learn more about these enchanting creatures.

He first went to visit Pang Quong in Melbourne, who is Australia's only supplier of sea dragons to the aquarium trade. There he did many dives at Flinders Jetty where he saw 10-20 weedy sea dragons on each dive. Then he headed to Tasmania where he went diving to look at habitat structure and also observing more weedies. However, up until this point he had not yet seen a leafy.

Then he came to South Australia, where ConservationSA hosted Jeremy and facilitated meetings with marine ecologist Janine Baker, and divers such as our own Steve Leske, Carey Harmer and Anthony King. He dived at The Bluff, Rapid Bay and Edithburgh with some success, seeing at least four leafies (two with eggs) at Rapid Bay.

Jeremy is keen to learn more about sea dragon reproduction because the aquarium is interested in captive breeding, but the main problem seems to be in the egg transfer process. Many of you would know that female sea dragons transfer the eggs onto the tail of the



male, who subsequently looks after the eggs until they hatch. For some reason, captive sea dragons are unable to make the eggs stick onto the male's tail. They do not know what causes this and are hoping to keep talking with us about a joint research program, combining research with wild sea dragons here and captive research programs in the USA.

Jeremy also gave a presentation about why he was here and answered many questions. The night was well attended with about 40 people turning up to hear and talk with him. It is good to know that there is still such an active interest in sea dragons in South Australia and it was great for him to meet some of the ex-Dragon Search team.

We hope to keep talking to Jeremy and we look forward to perhaps developing some research ideas. We will keep you posted.



To see pictures from Jeremy's visit, you can see his blog here: [http://www.neaq.org/education\\_and\\_activities/blogs\\_webcams\\_videos\\_and\\_more/blogs/seadragons\\_expedition\\_blog/index.php](http://www.neaq.org/education_and_activities/blogs_webcams_videos_and_more/blogs/seadragons_expedition_blog/index.php)

# Australian water-rat - our native “otter”

By Geoff Williams, Australian Platypus Conservancy

The Australian water-rat (or rakali) *Hydromys chrysogaster* is a top predator in aquatic habitats, including some estuarine and coastal areas. This role is equivalent to that of otters on other continents. It also has many otter-like features including thick, soft fur, densely bewhiskered muzzle, partly webbed hind feet; and furry, tapering tail.



Water-rats are often glimpsed swimming in lakes or rivers, especially early morning or evening. However, they also emerge from the water to eat or search for food along the bank. They can grow to 40 centimetres in length. They may be nearly black in colour (with golden-yellow belly) or brown or grey (with fawn- to cream-coloured belly) with a conspicuous white tail tip.

The water-rat has formidable teeth to kill and eat fish, crabs, crayfish and other aquatic invertebrates and even ducks. The presence of water-rats is often detected by the remains of yabbies and mussel shells, usually left at feeding “platforms”.

Australian water-rats are widely distributed but appear to be relatively uncommon along many waterways and numbers seem to have declined in some areas. They are warm-blooded carnivores, requiring a lot of food to fuel their active lifestyle. The main problem facing the species is likely to be habitat degradation, because this reduces food supply (especially fish and aquatic invertebrates).

Because water-rats have a short lifespan (around 3-4 years), local populations may decline and even disappear if females fail to reproduce for several years in a row - for example,

due to the combined effects of poor habitat and drought.

Water-rats are protected by law but many are killed by human activities, such as yabbing with “opera house” traps (which drown water-rats and other species including platypus and turtles).

Little is known about the current status and distribution of Australian water-rats so it is important to report all sightings to improve understanding of conservation needs. Recent sightings can be sent to the Australian Platypus Conservancy: [platypus.apc@westnet.com.au](mailto:platypus.apc@westnet.com.au)

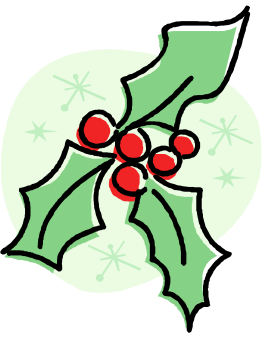
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## Merry Christmas and Happy 2010

To all our volunteers and supporters—  
Have a fun and safe festive season

Thankyou for all your support  
throughout 2009

We look forward to another successful and  
busy new year



# Many thanks to our generous sponsors and supporters

This project is supported by the Conservation Council of SA, through funding from the Australian Government's Caring for our Country and the South Australian Government.

Reef Watch also acknowledges the generous support of the diving industry for Reef Watch events.

Supporting organisations include:

- Adelaide and Mount Lofty NRM Board
- Primary Industries and Resources SA
- SARDI, Aquatic Sciences
- Department for Environment and Heritage



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**Be a part of Australia's largest day of  
community action on climate change**

**11 am Saturday 12th December  
Victoria Square—Tarndanyangga**

**Register now! [walkagainstwarming.org](http://walkagainstwarming.org),  
8223 5155, [walk@conservation.sa.org.au](mailto:walk@conservation.sa.org.au)**

