Printed on recycled paper using soy-based inks.

Issue 10.3, September 2007

10 Year Anniversary

Reef WATCH South Australia

Reef Watcher Production Team

Editor & layout: Alex Gaut
Distribution: Steve Leske
Contributions welcome:
info@reefwatch.asn.au
All contributions are subject to editing.

Deadline for next issue: 15th November, 2007

Reef Watch wins another award!

The launch of National Science Week saw Reef Watch receiving it's second award. In October 2005, Reef Watch received a Civic Trust award in the 'Natural Category', recognising the significant contribution that Reef Watch has made to the civic environment.

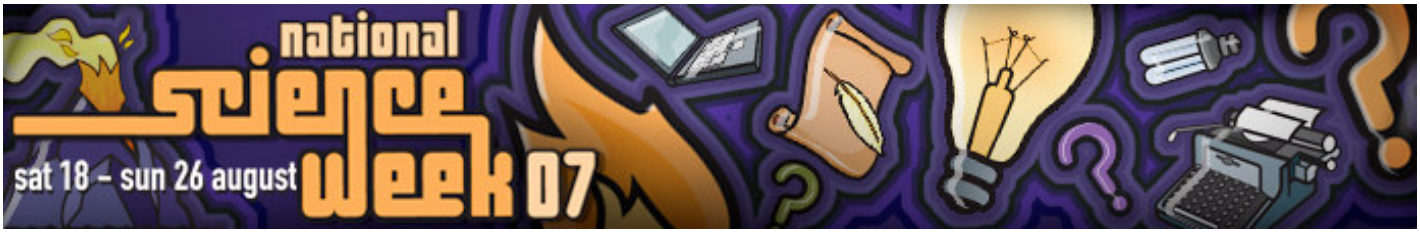
This year, the award is for **'The Unsung Hero of South Australian Science'**. Reef Watch was one of two who received an award of 'High Commendation'. The other winner in this category was Terry Reardon of the South Australian Museum, a renowned bat expert who gives tirelessly of his time and expertise to community groups.

We are proud that this award recognises the many long voluntary hours that have been given by some of South Australia's top marine scientists into developing the science behind Reef Watch. The prestigious scientific committee that regularly reviews the Reef Watch monitoring techniques give freely of their skills and knowledge to keep Reef Watch techniques in line with internationally recognised standards. In some cases, Reef Watch has led the way for other groups such as the Australasian Institute for Maritime Archaeology (see back page of this newsletter) and Western Australia are also interested in our monitoring techniques.

We wish to congratulate and thank the scientists who have given so generously of their time and skills over the last ten years. We look forward to working with you for many more years to come.

We would also like to thank and recognise the input of many dedicated volunteers who have been involved in so much work behind the scenes supporting Reef Watch in numerous ways over the last decade. Your input is tremendously important and without you, Reef Watch could not exist.

Reef Watch volunteers with project officer, Steve Leske (right in yellow and red).



It's monitoring season again!

Calling all Reef Watch volunteers!

We need your help once again, now that another busy monitoring season is about to commence.

For all those seasonal divers, it's time to dust off your dive gear, gather up your Reef Watch monitoring kits and prepare once again to survey South Australia's reefs.

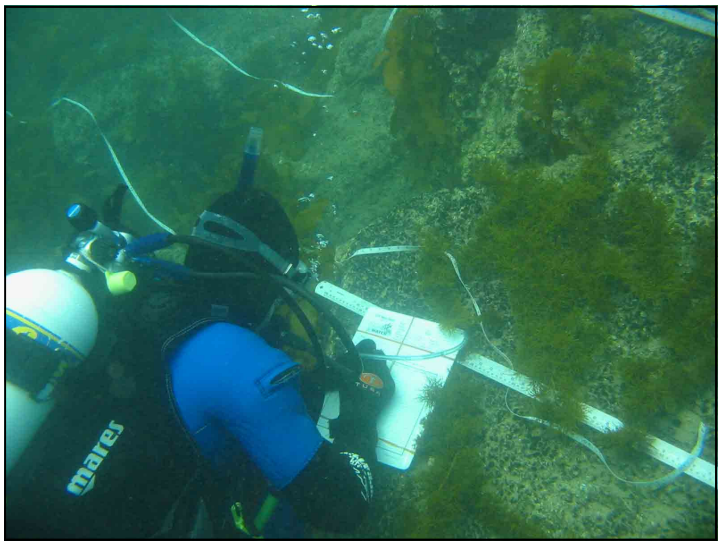
For the Intertidal monitoring program, we aim to have a core group of members for each reef but everyone is welcome and you do not need to be from the area to join the group, alternatively you can change the reef you monitor every month. Each group will get a monitoring kit, which includes all the equipment you will need to undertake intertidal monitoring.

There is some flexibility in the proposed dates so when we meet I am happy to discuss any changes that will make it easier for a group to meet. Please note I have alternated between Saturdays and Sundays for all regions for those who can not make it on only one particular day. Reminders and details of what to bring will be sent out prior to each monitoring day. Here is a list of dates for **Intertidal monitoring** until the end of this year, so you can plan well ahead:

Snapper Point, Aldinga

Date	Meeting Time	Tide time & height
Sun. Sept. 16th	10:30 am	0.40 m @ 12:31 pm
Sat. Oct. 13th	9:30 am	0.21 m @ 11:27 am
Sun. Nov. 11th	10:30 am	0.17 m @ 12:17 pm
Sat. Dec. 8th	9:30 am	0.28 m @ 11:24 am

Where to meet: Snapper Point car park, Esplanade, Aldinga Beach. It is opposite a group of shops.



Lady Bay, Normanville

Date	Meeting Time	Tide time & height
Sat. Sept. 15th	9:30 am	0.06 m @ 11:16 am
Sun. Oct. 14th	9:30 am	0.03 m @ 11:21 am
Sat. Nov. 10th	9:30 am	0.11 m @ 11:36 am
Sun. Dec. 9th	9:30 am	0.14 m @ 11:45 am

Where to meet: If coming from Normanville turn right at the Lady Bay sign on Main South Road. It is not far after the bridge. The Reef Watch logo will be placed on the turn off sign.

Yilki Beach, Victor Harbour

Date	Meeting Time	Tide time & height
Sun. Oct. 28th	9:00 am	0.36 m @ 10:45 am
Sat. Nov. 24th	10:00 am	0.13 m @ 12:18 pm

Where to meet: Franklin Parade, Victor Harbour. We will meet near the shops.

If you would like more information or if you wish to join us on one of the dates above, please do not hesitate to contact me:

Agnès Cantin
Reef Watch Intertidal Project Officer
Email: intertidal@ccsa.asn.au
Mobile: 0427 183 734

Reef WATCH
South Australia

10th Anniversary Quiz Night

A NIGHT OF FUN, FRIVOLITY, FICTION AND FACT!

The Reef Watch 10th Anniversary Quiz Night will be a night to remember! Not only will there be another sensational quiz, but we hope to have special guests, raffles and more to celebrate our 10th Anniversary.

Book a table (8-10 people) or let us find you a seat. There will be something for everyone. You do not need to be a diver, marine biologist or involved in Reef Watch.

There are many different kinds of prizes including lots of diving related gifts, wine, books and more!

Date: **Friday, 12th October**
Time: **7 for 7.30 pm**
Venue: **Reedbeds Community Centre, Fitch Road, Fulham**
(enter via Pelps Court)

Cost: **$5 ($2 unwaged)**, pay on the night
Catering: **BYO food & drinks**

To book, email: alex.gaut@ccsa..asn.au or call 8223 5155

More info: www.reefwatch.asn.au

Photo: Paul MacDonald

2007 Eureka Prize nominee - toxicology of drugs

Transcript from Catalyst (2/8/07):

Growing up in the lake district of northern Italy, Dr Francesco Pomati always had a passion for water. So, it came as no surprise when he decided to research the toxicology of pharmaceuticals in aquatic environments.

We excrete 95% of our administered dose of pharmaceuticals, most of which ends up in Australian waterways and oceans. While the effects of individual drugs are well known, the interaction and combined effect of pharmaceuticals in the environment is not.

Dr Pomati's work has shown that human, as well as fish cells, are affected by drugs at the concentrations routinely detected in surface waters. This has implications not only for the health of aquatic life, but also for humans, potentially through drinking recycled water.

Dr Pomati: "Pollution is one of the problems of our day and I reckon we should all be concerned with pollution of our waterways. The research work for which I have been nominated for a Eureka prize deals with the toxicological effects of drugs as environmental pollutants in our waterways.

If we take a sample … we are probably able to detect every single drug that people take ... they end up in surface water because they are not degraded in sewage treatment plants.

In the laboratory we reproduced exactly the same mixture of drugs and then we studied them on human embryonic kidney cells and zebra fish liver cells.

I think the most important thing is to put particular drugs especially antibiotics and some anti-inflammatories in the list of priority chemicals to be monitoring in the environment."

For more information:
http://www.cwwt.unsw.edu.au/trace-organics.html
Source:
http://www.abc.net.au/catalyst/stories/s1995242.htm

The three piece rule

Whenever I go to the beach for a stroll, to take my dog for a walk, or for any reason I always pick up at least three pieces of plastic rubbish. I usually take a bag or two with me and pick up as much as I find along the way. However, because I do not want my trips to the beach to become a chore, and so I don't spend the whole time at the beach looking at rubbish rather than the ocean, and even if I am feeling not 100 percent inclined to pick up other peoples rubbish, (which, I must admit, I sometimes do feel,) I always pick up at least three pieces. I look at it as my entry fee to our beautiful beaches.

I recently had visitors from Mozambique stay with me, and they we amazed at how clean our beaches are, compared with what they have back home. But with the population growing like it is and the careless way people throw away their plastic rubbish, it really won't be long until our beaches and marine life will really experience a problem that is as out of control as other countries. I find the usual things, such as plastic bags, plastic bottles, straws and lolly wrappers, but have also found things like buckets and disposable nappies. Some people even use the plastic bags provided for their dog's droppings and then leave them on the sand dunes. I would rather they just left the droppings on the sand, than leave a plastic bag there too! Some of the smaller more durable plastic items, such as the plastic rings that hold beer cans together, and obviously fishing line, can do the most damage to our sea creatures.

When I first started doing this, I felt quite self-conscious, thinking the other beach goers would think I was a bag lady, searching for bottles and cans, but last weekend, I met another couple of people doing the same thing and I was thrilled to find that there are like-minded people out there. After getting the email asking for articles for the Reef Watch newsletter, I couldn't think of a better medium, or a more like-minded group of people with whom to share my idea, and hope that some, if not all of you, might take on 'The Three Piece Rule', whenever you go to the beach. Why just wait for Clean Up Australia Day?

By Michelle Treloar,
Reef Watch volunteer

Northern and Yorke Region

Well, spring is on its way and soon will follow our Reef Watch trainers, Steve Leske and Mark Kaehne. We hope to be able to continue to keep in touch with many of you who have been involved with training around the peninsula last summer, including the indigenous community at Point Pearce.

A timetable will be out on the Reef Watch website very soon, so keep an eye out for new training and monitoring dates in the new season. It will be a very busy summer.

Eyre Peninsula Region

Once more we ask the Eye Peninsula dive community to don their wetsuits and come with us into the beautiful world of temperate reefs. Of course, those who do not dive are also very welcome to participate in our Intertidal Program, which can be done by everyone!

We hope the summer will bring some calm weather to access the peninsula's waters for further training and development sessions, and to be able to do some actual monitoring and start generating lots of data about the region's reefs.

Keep an eye on the Reef Watch website for new dates.

Parazoanthus sp. This & photo left by Vicki Billings.

Fuel cells to clean up shipping

A group of north European companies aims to show how fuel cells can clean up ship engines, which now use filthy fuels such as oil refinery residues and can spew out hundreds of times more pollutants than cars.

The companies plan to install a clean fuel-cell engine aboard a supply ship in 2008 and believe that a large share of the marine world will follow suit within 25 years.

"Green" engines for ships will gain footing in the fiercely competitive global shipping industry, they say, as technology advances and relatively lax environmental norms toughen.

"Stricter regulations coupled with policies favouring green solutions will in future years more than compensate for the higher initial investment costs of fuel cells" said Tomas Tronstad, who heads the cross-industry fuel cell project for Norwegian company DNV.

Iceland already plans to convert its entire fishing fleet to hydrogen fuel cell engines as part of its environmental drive.

The heavy fuel used in shipping emits 700 times more sulphur dioxide than diesel exhausts from road vehicles. DNV estimates that fuel cells now cost about 6 times more than diesel generators. But the technology can be up to 50% more efficient and much cleaner, helping to curb high fuel costs. When powered by liquefied natural gas (LNG), as the first full-scale test model will be, CO_2 emissions are cut in half compared to diesel engines. Sulphur and nitrogen oxide exhausts are nearly eliminated. Fuel cells also have no moving parts, slashing maintenance needs and making them inherently silent and vibration-free.

Plans are to install a fuel cell system on an oilfield supply vessel next year. LNG tanks take up precious onboard space and need to be filled relatively often, about once per week, limiting the ships' range to coastal waters of regions with LNG infrastructure.

"These engines will be best suited for short-route shipping and vessels with predictable operational patterns, such as supply vessels and ferries" said Kjell Sandaker, fuel cell project developer for Norwegian company Eidesvik Offshore.

LNG is preferred to hydrogen fuel cells (whose only exhaust is heat and water) because of the problems in storing large amounts of hydrogen and high costs of production.

Iceland's idea is to use its cheap thermal energy and hydropower to produce hydrogen that would drive its fishing fleet, one of the world's biggest.

Other options for ship-based fuel cells, said DNV, could be methanol or biofuels, which are liquids at normal temperatures and more readily available throughout the world than LNG.

Source: http://www.planetark.com/dailynewsstory.cfm/newsid/43453/story.htm

Edited from story by W. Moskwa.

Reef Watch at Science Alive!

If you were one of the ~20,000 people who came to 'Science Alive!' at the Wayville Showgrounds in August, you may well have seen and visited the Reef Watch display.

We had a large booth displaying South Australian marine species. Visitors were encouraged to use the intertidal slates to identify shells in quadrats and to sign up for Reef Watch training and monitoring in the new season.

We had the new 'Beyond the Coast' DVD showing on a screen, which provided an excellent backdrop to the display.

Most fascinating to the younger visitors was the microscope and television setup. This was absolutely engrossing to most of the children who visited the stall and many adults made the right kinds of noises too. Under the microscope, the polyps of the beautiful coral, *Mopsella zimmeri*, were clearly visible, as were the zooids of a hydroid. Also of interest were the mouth parts and teeth of two different species of brittle stars.

This was great exposure for Reef Watch and we had a steady stream of people throughout both days at the event. Many thanks to the volunteers who helped with this event - Amanda, Rex and Ali. Once again, Reef Watch could not have done it without you.

Left: Reef Watch volunteer, Amanda Haller, talking to visitors about the South Australian marine specimens on display.

Right: Visitors use the intertidal slates to identify mollusc shells in the quadrats.

Sea sponge toxicity - warning

The following story highlights the need to be wary of even the most innocuous looking marine organism - the simple sponge.

Last month, Tanunda couple Brad and Sally Collings, were in shock after their two dogs died within hours after playing on Couch's Beach, Yorke Peninsula. The two golden retrievers had been innocently investigating what the tide had brought in after a storm and king tides.

Corny Point vet, Dr Bev Elsom thought that the dogs may have been bitten by a blue-ringed octopus, as the dogs "appeared cyanotic and with a progressive paralysis", a normal reaction to a strong toxin. After examining what was in the dogs' stomachs, however, Bev changed her mind. The dogs had eaten sponges, and, although she is considering that it could have been something else, the volume of sponge material in the stomach leads her to believe that this is what killed them.

This may seem far-fetched, but it is a possibility. Marine sponges use chemicals as a defence mechanism to protect themselves against predation by fish and other marine animals, and to stop them being overgrown by encrusting organisms. As well as chemicals, most sponges have tiny glass spicules that make up their internal skeleton; these can stick in the skin and cause irritation. Trawler fishermen have long known that handling sponges, which come up in their nets, can cause itches and rashes.

Some sponge-produced chemicals have been shown to be highly toxic. In fact, sponge chemistry is a 'big ticket' item in the search for novel compounds that may have benefits for humans - in pharmaceutical terms (for example, anti-cancer drugs), and in industry (for example, natural antifouling paints for ships hulls and jetties).

Although these dog deaths are highly unusual, Bev sees several milder cases each year, so it seems wise to keep a very close eye on what your dogs are nibbling if you take them to the beach.

A sample of the sponge from the dogs' stomach is now lodged at the South Australian Museum and we are searching for similar examples of this type of toxicity reported in literature, as well as trying to pinpoint the species name of the sponge.

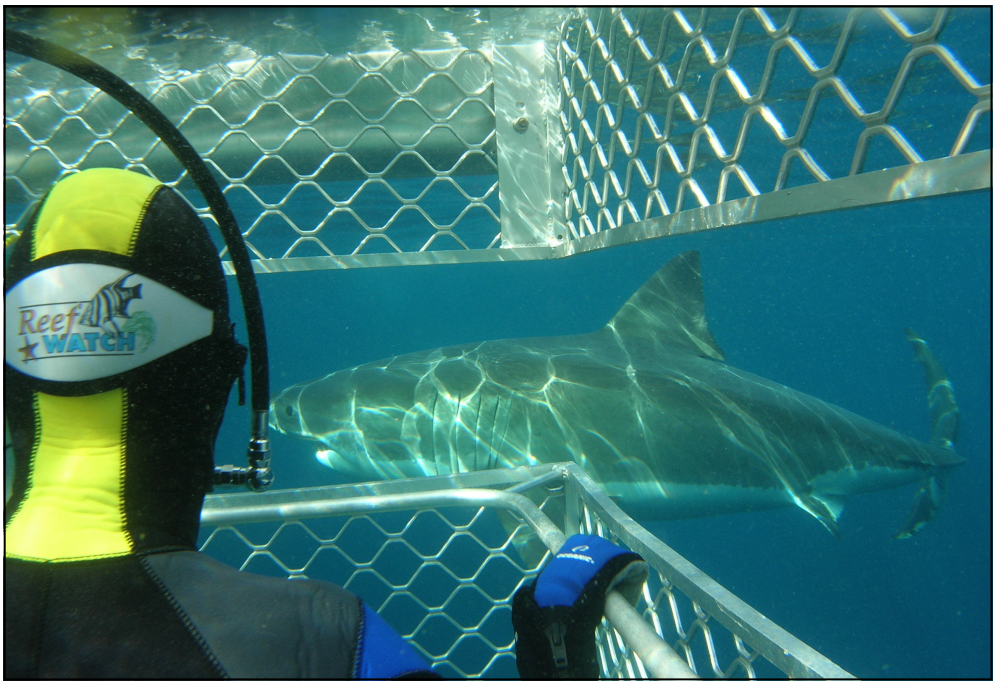
Story by Shirley Sorokin, SARDI Aquatic Sciences

What a ripper!

What a fantastic shot!! Strange thing is we do not know who took the photo or who is in the photo!

The mysterious diver must be close to Reef Watch because we usually give these mask straps to Reef Watch divers. It looks like you had a grand time with this white shark, what a thrill! If the photographer or the diver are reading this newsletter, we would love to hear from you, so we can credit you.

We still have quite a few of these mask straps to give away if you would like one. Or we might use them as prizes at the Quiz Night and you could end up with one anyway!



Yankalilla Bay conservation diving

Normanville Beach at Yankalilla Bay, South Australia, is home to some of the highest pipefish diversity in the world. These pipefish have proven a bonus for overseas and local conservation divers, who have delighted in the experience. There are two large species that inhabit the sand flats very close inshore: the Brigg's crested pipefish (*Histiogamphelus briggsi*); and the closely related Rhino pipefish (*H. cristatus*). These species are among a number of exciting discoveries by members of the newly formed Seadragon Foundation Inc., during biodiversity surveys. The Normanville site is the first conservation dive site we are promoting.

The close inshore aggregations of pipefish mainly occur during the warmer months, an ideal time for even casual divers and beach lovers to see these unique creatures. Pipefish are smaller and less spectacular than their close relatives the leafy seadragon and weedy seadragon. Nevertheless, the delightful and beautiful pipefish are as mysterious and appealing as they are exotic.

If divers want to observe and photograph non-seadragon Syngnathids including pipefish and maybe seahorses they will be hard pressed to find a more genial, convenient and accessible site than Normanville Beach. Yankalilla Bay is remarkable in that timid shore divers and snorkelers can sometimes see these pipefish in standing-depth water in sandy areas. These are the very areas preferred by summer recreational paddlers and swimmers. So Yankalilla Bay can offer both beginner and experienced divers a unique experience.

If early indications of the number of unrecorded species we have found are a guide, perhaps divers photo collections and experiences might never reach 'full house' with regard to the southern Australian pipefish species. Over recent years we have described one new species of pipefish and have found several other new types that we are investigating. Who would think that a frontier in marine biodiversity discovery would be at Normanville Beach?

Story by David Muirhead.

There is more information on pipefish available the Inshore Fish Group website:
http://www.ifg.bioteck.org/Fish%20species/Species%20Table.htm
- which has a pipefish species profile section.

More information on the pipefish at Normanville can be found in the Marine Life Society of South Australia August newsletter. Notes on a Recent Dive *(David Muirhead):*
http://www.mlssa.asn.au/

Close-up of a Brigg's crested pipefish by Graham Smith. This head is about 2 cm long.

Desalination research

Desalination has prominently featured as a potential solution to addressing severe water shortages in urban centres around Australia. Previously in Australia, large desalination plants were used only in the mining and power generating industries. Desalination for urban water use was restricted to small isolated urban communities such as Kangaroo Island, which had limited access to a reliable water supply.

With the recent commission of the Perth desalination plant at Kwinana, seawater desalination is now seen as a viable long-term and practical option to maintaining water supplies for urban needs. Large scale desalination raises a set of sustainability issues different from those associated with established urban water supply systems. It is very energy intensive, which raises the question of greenhouse gas emissions. There are also a number of environmental issues to take into consideration.

There are two types of processes used to desalinate water: reverse osmosis (RO) and distillation (thermal). Thermal plants are designed to remove salt from the water by heating, which can be an extremely inefficient process if powered by fossil fuels rather than solar energy. The RO technology, which is predominantly used in Australia, forces seawater through a thin membrane to filter out the salt and thus separates 'fresh' water from brine. Both processes generate a hypersaline brine solution, which is generally discharged back into the sea. It is the environmental ramifications of this discharge that are the focus of this article, with a focus on the RO process.

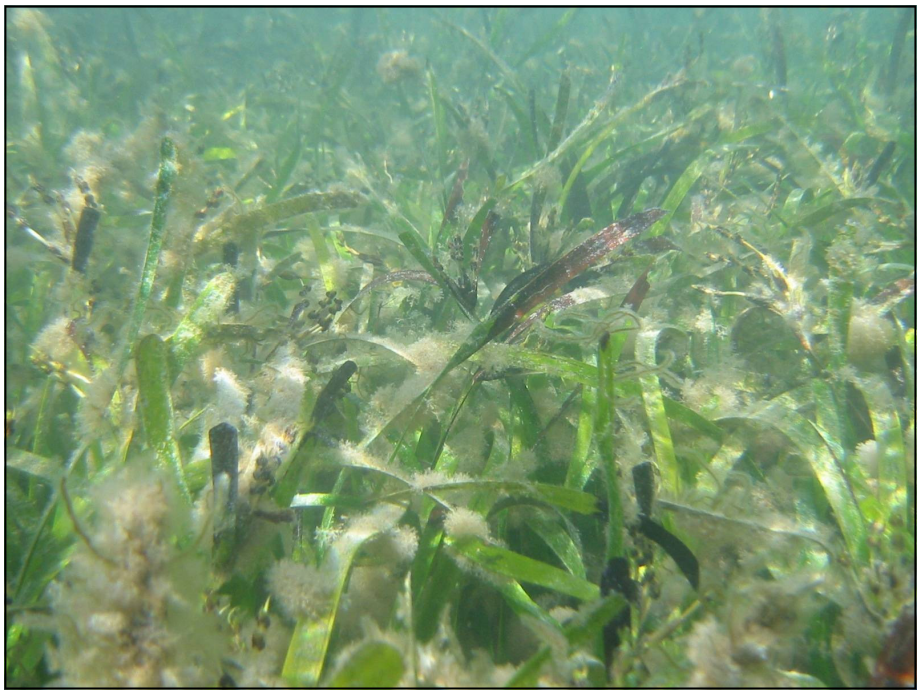
The salt concentration of the brine is 30 - 70% higher than that of original seawater, dependent upon the efficiency of the RO process. In addition to the high concentration of salts, the discharge water contains various chemicals used in pre-treating seawater. The quantity and composition of the chemicals used is dependent on the required quality of the product water. Potential chemicals found in the brine discharge may include anti-scalants, surfactants and acids (Einav, Harussi, Perry, 2002).

In general, a brine discharge from RO desalination plant may have the following constituents and qualities:

- A salt concentration 1.3 - 1.7 times that of the original seawater (seawater salt concentration is about 35 ppt; desalination plants discharge brine with 46 - 60 ppt). Salt concentrations may be reduced by mixing desalination plant discharges with other discharges, such as treated wastewater;
- Chemicals from pre-treatment of the feedwater; these may include chlorine, iron chloride or aluminium chloride, sulphuric or hydrochloric acids, and sodium hypochlorite;
- Chemicals used in flushing the pipelines and cleaning the membranes in RO plants; these may include sodium compounds, hydrochloric acid, citric acid, alkalines, polyphosphate, biocides, copper sulphate, and acrolein;
- Chemicals used to preserve the RO membranes (e.g., propylene glycol, glycerine, or sodium bisulfite);
- Organics and metals that are in the feedwater and concentrated in the desalination process;
- Metals that are picked up by the brine in contact with plant components and pipelines; and
- Turbidity levels above those of receiving waters (Einav, Harussi, Perry, 2002).

The main expected impact is from the continuous discharge of concentrated brine to the sea. The magnitude of any impacts will be related to the total volume of brine released, the constituents of the discharge, and the amount of dilution prior to release (Einav, Harussi, Perry, 2002). Rapid dilution to return salt concentrations to normal or background levels is going to be dependent on the engineering features of the discharge pipe and the mixing characteristics of the area. The dilution will be dependent on a number of environmental and hydro-geological factors of the region such as bathymetry, waves, currents, etc (Hoepner, 1999). These factors will determine the extent of mixing of the brine and therefore the overall geographical range of the impact.

Despite the growing number of desalination plants in the world there have been very few studies examining the ecological effects of discharging hypersaline brine into marine ecosystems (Raventoc, Macpherson, García-Rubiés, 2006). Those studies that do, generally do not examine ecosystems before and after the disturbance, and as a consequence find it difficult to prove that observed



Seagrass (Posidonia spp.). *Photo by Josh Coates*

Desalination research cont.

changes are directly related to the hypersaline brine solution. Available evidence suggests that brine discharges have led to:

- Reductions in fish populations and plankton (Mabrook, 1994)
- Coral die-offs (Mabrook, 1994)
- Mangrove and marine angiosperm mortalities (Vries, Delvigne, Thabet, 1997)
- Build up of high concentrations of copper and nickel in sediment (Chesher, 1975)

Ecotoxicological studies examining the toxicity of hypersaline brine on fish, suggest that it is juvenile fish and planktonic larvae that are more susceptible to changes in water quality than adults (Walsh, Haney, Timmerman, Dorazio, 1998). The implication is that hypersaline brine discharges have the potential to impact on sensitive nursery areas (Vega-Cendejas, Hernandez-Santillana, 2004)

A comprehensive study of a site in the western Mediterranean found lower growth and higher mortality rates for the seagrass, *Posidonia oceanica*, at salinity levels above 39.1 ppt (Raventoc, Macpherson, García-Rubiés, 2006). *Posidonia* species are found throughout Australia, but whether these species are susceptible to high salinity concentrations is not known. The upper gulfs in South Australia are reverse estuarine environments, in which the salinity concentrations can reach as high as 40 ppt. Seagrass meadows, mangroves and samphire marshes are found in these high saline areas. The problem is that desalination plants operating in this region have the potential to discharge hypersaline water 1.3 - 1.7 times greater than ambient concentrations, and this may have important ecological consequences for seagrasses.

There are studies that observed no detectable impact from the brine discharge. Perez-Talavera and Quesada-Ruiz (2001) examined the effects of a RO desalination plant on *Cymodocea nodusa* and *Caulerpa prolifera* meadows (seagrass and macroalgal species respectively; the families of these species are also found in Australia) off the coast of the Canary Islands and did not observe marked changes to the macroalgal and seagrass meadows. Equally, a study examining the possible effects of a brine discharge on macrobenthic communities, by observing changes in abundance of animals such as starfish, hermit crabs, polychaetes between two control locations and one putatively impacted location, could not detect any significant differences between sites (Raventoc, Macpherson, García-Rubiés, 2006). It was concluded that no differences were detected either due to the high natural variability of the community making it difficult to discern significant differences between locations or that the rapid dilution undergone by the hypersaline brine upon leaving the discharge pipe minimised the impact to the region. Equally a study by Azis et al. (2003) found no discernable affects on phytoplankton species composition close to a desalination discharge, although the study did note extensive phytoplankton blooms in the region. This may have been due to the concentration of nutrients in the brine solution, triggering an increase in phytoplankton growth. This could potentially be a problem dependent on the species composition of the algal bloom.

Concern over the potential adverse effects to marine resources of desalination plant discharges is tempered by the following factors: the total volume of brine being released; the constituents of the brine discharge; and the amount of dilution prior to release. For example, the potential for environmental damage from small amounts of brine discharge (less than 1000 $m^3 d^{-1}$) may differ considerably from the potential impacts associated with discharges greater than this amount (Einav, Harussi, Perry, 2002). Discharge of concentrated brine in large amounts requires more careful consideration of potential environmental impacts than do smaller brine discharge volumes.

The severity of the impact is a function of the level of disturbance to the environment and of the natural sensitivity, which in turn is dependent on the specific nature of the habitat and on the specific communities (Höpner, Windelberg, 1996). To put it simply, to define the potential impact of a discharge requires knowledge of the marine communities present in the region.

The problem with ecological studies is that high variability is an intrinsic part of marine ecosystems. This high variability can often cloud the ability to discern changes to the natural ecosystem that are a direct result of anthropogenic influences.

Höpner and Windelberg (1996) divided global coastal marine habitats into 15 categories according to their sensitivities to the effects of desalination plants (Table 1). The sites most suitable for desalination plants are by shores of high-energy oceanic coasts. The most sensitive areas are mangrove and samphire ecosystems. Dilution is not necessarily the solution to minimising an impact from a discharge, but high-energy oceanic coasts will have a better ability to disperse a hypersaline plume than for example a shallow water, semi-enclosed coastal lagoon.

The choice of a desalination site will be critical in minimising or avoiding environmental damage. Furthermore, due to paucity of information on direct effects of brine on marine ecosystems, particularly in Australia, it is clear that further research is required in assessing the potential impacts of brine discharges on marine organisms and habitats. Finally, monitoring of desalination discharges is important as the cumulative long-term effects of brine on receiving environments are not known.

Story by TK, edited by Alex Gaut. If you would like the reference list for this article please email us: alex.gaut@ccsa.asn.au

Many thanks to our generous sponsors and supporters

Reef Watch currently receives most of its funding from the Adelaide and Mt Lofty Ranges Natural Resources Management Board through the Natural Heritage Trust.

Additional support is provided by the Kangaroo Island, Eyre Peninsula, Northern and Yorke NRM Boards.

Other supporting organisations include:

- Primary Industries and Resources SA via SARDI Aquatic Sciences
- Department for Environment and Heritage
- National Science Week

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

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Adelaide and Mount Lofty Ranges Natural Resources Management Board

Natural Heritage Trust

Government of South Australia

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Maritime archaeology survey based on Reef Watch

The September 2006 issue of the Australasian Institute for Maritime Archaeology (AIMA) Newsletter , Volume 25, Number 3, included an article by David Steinberg titled "Cyclone Tracy and the Schooner Booya".

The Booya went missing during cyclone Tracy in 1974 and was only discovered in 2003. Steinberg reports that 14 volunteers from the local Northern Territory diving community are participating in a project aimed at mapping the wreck of the *Booya*, and recording its fish and benthic life. These divers will also work towards identifying and interpreting evidence that may tell us about the events surrounding the *Booya*'s sinking. The marine survey is based on the methodology developed by the Reef Watch Program of South Australia. He says that the results of the wreck survey will be reported in a future AIMA newsletter.

The newsletter is available here: http://www.aima.iinet.net.au/publications/newsletters/docs/NLv25n3y06.pdf

Source: Steve Reynolds, MLSSA