

MARINE *Life*

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Our Goal

To educate, inform, have fun and share our enjoyment of the marine world with likeminded people.

The Crew

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Cover photo, Michael Jacques, shorebirds at Carpenters Rocks SA



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Dead sharks to give up population information

An international study led by University of Queensland wants to know how white and tiger shark populations have changed over time.

DNA extracts from shark jaws held in museum and trophy collections around the world will be analysed, along with tissue samples from living and recently catches of sharks.

“Using DNA, we can get a more complete picture of shark populations...Satellite tagging provides information about a few individuals for a short period of time, however genetics provides information about all individuals in a population over much longer timeframes,” Associate Professor Ovenden said.

Professor Bennett said the study would provide valuable insights into the different biology of both species.

“The two species have different distributions worldwide, different modes of reproduction and have experienced different levels of interaction and impact with humans,” he said.

“We expect to find signatures of adaptive evolution which have come about as a result of global change and exploitation.”

“We will be tracking down some long-time, dedicated recreational fishers who are very good at keeping records of where and when sharks were caught – their information will be invaluable,” said Professor Bennett.

Professor Einar Nielson in Denmark will conduct a concurrent study which will assist in providing a global overview of shark populations in both northern and southern hemispheres.

Readers Photo

Greg Close of Ulverstone sent in this photo of yours truly in the Comet Hole at Lord Howe.



I was going to have a big spread on our recent LHI holiday, but lost a bit of stuff when my remote drive crashed. It will be in sometime. We have also had so much news on apocalyptic heatwaves and climate politics, that I haven't had the room for cheery things.

Our thanks to Greg

New Abrolhos Park?

The Houtman Abrolhos are a network of 123 islands off the coast of Geraldton, 400 kilometres north of Perth. WA Premier Colin Barnett has unveiled a plan to create a national park that stretches across about 90 per cent of the islands

Per ABC News, Photos Chris Lewis



For the first time, camping will also be allowed at select sites. It will leave out the 21 islands occupied by fishers shacks and private jetties. But only the land, and none of the waters around the islands, will become national park, meaning recreational and commercial fishing, including the rock lobster fishery, will remain unchanged.

Geraldton Mayor Shane Van Styn said the plan was a "big deal" for attracting tourists. "For a long time there's been talk about opening up the islands to tourism and now it's great to see that the Premier is personally taking on this initiative," he said.

Dr Nic Dunlop from the Conservation Council of WA said nature-based tourism could encourage conservation. Dr Dunlop believes Rat Island would be the obvious place to increase the tourism infrastructure. "Rat Island already has an airstrip; it's already got anchorages, jetties and lobster shacks [and] many are going to have to be removed in the next few years anyway," he said.

"One of the problems with the Abrolhos [is that] over a long period of time, apart from the fishing industry, access to the Abrolhos has been extremely limited.

"People don't value things that they have no experience of, so nature-based tourism properly introduced can be a real bonus in terms of getting the right kind of conservation action occurring."



Fishers are flagging "inevitable" conflict between industry and tourists. Butch Maddren, who has been fishing at the islands since the 1970s, said tourism did already exist to some degree,

with luxury yachts and boats often visiting the area. "Since I've been there, [it's] more the wealthier people and their luxury boats come and stay there and their friends fly over and all that sort of thing," Mr Maddren said. He said the islands have a fragile ecosystem.

In the 19th century the islands were heavily mined for guano with thousands of tonnes exported. This left very little soil on the islands and rats and cats were also introduced to the islands.



This led to a significant decrease in seabirds populations. The rats were removed by 1992 and by 2000, the last of the cats was gone.

The birds have been making a steady comeback to the island following restoration of the islands' ground cover.

Also a problem on the island is a weed known as the ice plant, a spreading succulent with small, white flowers. It is thought to

have been introduced by guano miners and has since spread rapidly across the island.

The restoration project at the Abrolhos has been running for the past three years. The project provides hands-on experience at the islands for those studying land and conservation at TAFE's Batavia Coast Maritime Institute.



Big Rat Island

Local fishermen are also playing a role, "They give us jetty access, they let us use their rainwater from their tanks and when they have time they come out with us and assist with beach clean ups."

The Abrolhos Island restoration project finishes in June 2017 but the group is looking to continue the restoration works.

Climate Change Policy – What Policy?

We are now entering what Guardian journalist Lenore Taylor calls "the stupid barren years of the carbon wars".



Have a look at a Google search and it will show a summary of the current government's track record on climate change, 9 September Turnbull sympathises with Pacific Island leaders, 22 September Turnbull praises the UN for progress on climate change, 10 November Turnbull ratifies the Paris Accord, then in December the wheels fell off.

The Liberal Government had long promised a policy review and some hoped it might lead to a more non-partisan stance on carbon pricing. The Government released terms of reference for the review — which did not rule out a type of carbon price on emissions-heavy power generators. Immediately there were signs of disunity on the far Right of the party.

Announcements by Minister Josh Frydenburg that a price on carbon would be considered had to be immediately and humiliatingly retracted. It was a crushing blow for Liberal moderates, and has far-reaching importance for Australia's climate future.

The Australian's environment editor Graham Lloyd, hardly a Greenie, said "Australia will still have a review of government climate policy next year but the most meaningful reform tools, which put a price on carbon to encourage behaviour change by electricity generators, have been well and truly taken off the table following an intra-party and public revolt".

"A sector-based carbon pricing scheme — or emissions intensity trading scheme, which allows electricity generators to trade among themselves — has wide support within the industry, academia and business. Many believe an emissions intensity trading scheme would actually reduce electricity prices rather than lift them."

Climate -Institute chief executive John Connor said "...ruling out options before this review even begins is -irresponsible." Connor says the government approach would heighten, not decrease, risks to energy security and electricity prices, because it adds further policy uncertainty.

Ruling out any kind of ETS limits the LNP Coalition's policy options so severely, that pundits are struggling to see what policy levers could be pulled now to realistically reign in emissions at the required level. Turnbull is now making disparaging remarks about renewable energy, after power system issues in South Australia. Another example of making political decisions on the fly without creating a policy to deal with a known and foreseeable problem.

The Liberal Party material states, "We are on track to beat our 2020 target by 78 million tonnes, and have set an ambitious target of reductions of up to 28% by 2030 based on 2005 levels." Those targets now seem unachievable, and with One Nation, the Liberal Right and a Trump Presidency now lining up against climate policy, there are more powerful obstacles than ever to a sensible climate change policy response.

Australia's greenhouse gas emissions rising

Australia's greenhouse gas emissions are continuing to go up, but the Government insists Australia can still meet its climate change targets.

The latest report card from the Environment Department shows emissions rose by 0.8 per cent for the year until June.

The Government said the results support its climate policies. "These figures show that Australia's emissions per capita and emissions per unit of GDP are now at their lowest level in 27 years," Environment Minister Josh Frydenberg said.

"It demonstrates that we are able to meet our climate targets without a carbon tax which Bill Shorten and the Labor Party want to bring back."

But Professor Will Steffen from the Climate Council said the Government should not divide the results by the population. Australia's climate change targets are not on a per-capita basis. The quarterly results show between 1990 and 2016, emissions from electricity have had the largest growth, dumping 59.5 megatonnes into the atmosphere, an increase of 49.2 per cent. 'Stationary energy' in manufacturing, mining, residential and commercial sectors increased emissions by almost 4 per cent.

"While many other countries now are reducing their emissions, ours still are going up, I think it's a dreadful outcome," Professor Steffen said.

Despite the rise in emissions in the year to June, the report from the same department concluded that the country is on track to meet its 2020 target based on projections, strangely mimicking to the Government's policy statements.

India and China our last Hope?

Are the poorest people in the world, the ones we often blame for rising CO2 levels, now responsible for all the heavy lift on resisting climate change?



It seems now that the richest countries will default on their share of the serious emissions reductions when they are the major beneficiaries of those emissions. The only bright light was a renewed commitment from India to support growth through renewable energy sources. More than 300 million Indians live without electricity so the need is great. The country needs US\$250 billion of investment in energy infrastructure in the next few years.



India has often changed its mind about the future energy mix, but has announced a determination not to rely on more coal-fired power stations. The countryside is already dotted with forests of wind farms. The government is aiming to generate 175 gigawatts (GW) of renewable power by 2022 including 100GW of solar power.

The Indian Adani company, controversial here for investing in the controversial Galilee Basin coal mine, is a leading player in Indian renewables. Adani wants to add 10,000MW of solar capacity in India by 2022. It is planning a solar park in Rajasthan, in the north. It is also developing a solar panel factory in Gujarat. The Adani Group has opened a 648 megawatts (MW) solar plant in Tamil Nadu, south India. It is the world's largest solar plant in a single location.

The biggest world issue, even above Trump's future intentions, is whether China will pick up its climate change response. According to *climateactiontracker.org*, China's national actions are better than Australia's but not yet consistent with limiting warming to below 2°C. Just like Australia it will meet its initial low-level targets, but struggle afterwards. China is aiming to

restrict coal consumption, which may well have already peaked for other reasons. Chinese overall CO2 emissions could peak around 2030, mainly due to coal consumption efficiency improvements. However, *climateactiontracker* surprisingly concluded that "China will achieve both its 2020 pledge and its 2030 plans. The announcement that China will peak its CO2 emissions will have a significant impact on global CO2 emissions in the period after 2030, as most projections foresee increasing emissions for decades after that".



So perhaps there is still hope after all, even if we are going to be part of the problem rather than the solution.

If anyone says that Australia has the policy settings of a Third World country, that clearly isn't true.

Marine Habitats - Worm and Snail Reefs

There is a big difference between worm reefs and wormy reefs. Worms and snails are voracious and are considered a threat to many types of reef. The world's first reefs were stromatolite cyanobacteria reefs, but the evolution of worms and snails saw an end to them, except in rare places like Shark Bay where they still survive.

In modern corals, a damaged section can allow room for certain types of worms to get a foothold, so much so that they can eat out struggling coral and undermine reefs.

But worms can also be reef builders and were a major reef builder in earlier geological times. Massive worm reefs still survive in isolated spots today.

Honeycomb Reef



There are thousands of species of worms, most worms are loners rather than living gregariously in colonies. Only a few species create reefs. The honeycomb worm *Sabellaria*

alveolata, creates rock-like sediments with a honeycomb pattern.

There are honeycomb worm reefs growing in the intertidal zones in the USA, the Mediterranean and the U.K. The worms remain in

their tubes and are almost never seen at low tide. When submerged, they extend their tentacles out of the tube to catch food particles and sand grains. The grains are sorted, with the best ones used to keep the colony in repair. Fatty acids built in to the tubes of adult worms attract other larvae of the same species to settle nearby and add to the colony. Scientists have analysed the glue that the worms secrete and use to stick sand grains together underwater. They believe the glue to have applications in medicine like fixing broken bones. It takes 50 million worms to make a teaspoon of glue.

They grow quickly, after dying out in North Wales 60 years ago, perhaps because of pollution, within 2 years they had recovered.

Sandcastle reefs



The sandcastle worm (*Phragmatopoma californica*), also belongs to the family Sabellarididae. The worm inhabits the Californian coast, building tube reefs similar to sandcastles on rocky beaches at medium and low tide. The sandcastles can cover an area of up to 2 meters in any place that provides some

shelter, such as rock faces and overhanging ledges.

Vermetid snail reef

Vermetids look like worms but they are snails distinguished by their coiled shell. They are actually called “worm snails”. Hated by aquarium keepers, they readily drill through coral when their numbers are out of control. They spread out a mucous feeding net that interferes with the feeding of neighbouring coral polyps.

Again, some of the colonial species also create reefs. Many millions of years ago, vermetids of the genus *Petalocochus* developed huge long, flat structures along the coasts of the world’s seas. Today the genus *Dendropoma* still does the same thing, but on a reduced scale in the Mediterranean, Red Sea, Indo-Pacific and Atlantic Ocean.



They like very high energy coast. Snail reef is usually within the intertidal or upper subtidal zone, in a few cases it has been found at a depth up to 14 m. Exposure to wave action ensures food supply, carries away wastes and reduces the number of competitors. The irregular coiling and the

intergrowing of *Dendropoma* shells produce highly chaotic frameworks which can easily tolerate the high energy of the intertidal zone.

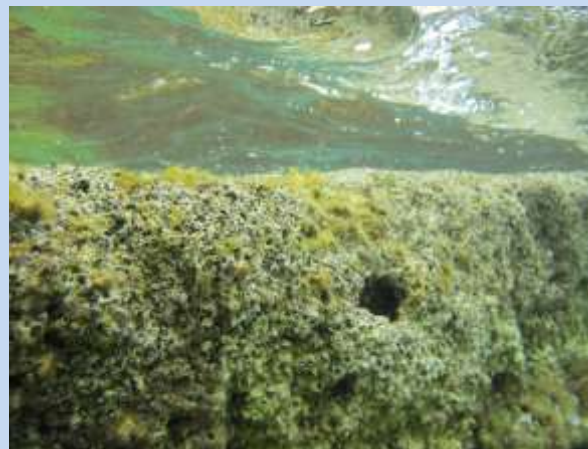
They often live in association with mussels, oysters and other encrusting animals, and in the process of welding a reef together, they will add a mix of cemented shells– vermetid boundstones. They mainly develop in subtropical conditions, close to the edge of the range of coral reefs, Bermuda, Cape Verde, Fernando de Noronha in Brazil, and the Mediterranean Sea. They have a broader tolerance to cooler temperatures.

Corals reach their survival threshold at 18 °C while vermetids can stand a minimum sea surface temperature of 14 – 16 °C.

At first blush they seem quite resilient, the vermetid *Petalocochus varians* actually likes the outfall of a nuclear power plant in Brazil, and now dominates the inter-tidal zone of the nearby bay. However, as the oceans acidify we are looking at a wipeout of reef-building animals, even the ‘pest-like’ snails and worms.

A recent study in Israel found that the gastropod *Dendropoma petraeum*, has recently become extinct, its place taken over by algae. It won’t recover, “There is only slim chances for *Dendropoma* recruitment from adjacent healthy reefs” says Dr. Marco Milazzo from the University of Palermo, “since these snails brood their young and the hatchlings crawl only a short distance before becoming a sessile individual”.

This may be linked to ocean acidification. No animal with a shell or a calcium-based framework will thrive in this altered environment.



Tube Worm Mounds



The empty tubes of annelid worms are easily confused with vermetid snail worm tubes. Solitary annelid worms are often seen on tropical reef burrowing in to corals. They are favoured by photographers as these "christmas tree worms" often come in a spray of primary colours.

In Florida, tube worms can create reef-like accretions on the sand. In other places the tubes form a tangle of 'roots'. These mounds are usually no larger than a metre high and are often helpful in binding sediments in seagrass areas. Some gregarious tube worms will



quickly encrust a rock, an old beer bottle, or even a mooring buoy.



Tube worms can create large mounds as shown on this picture of a deep ocean vent, taken by Monterey Bay Aquarium

Ficopomatus enigmaticus is a serpulid polychaete worm believed to be native to Australia and regions of the Indian Ocean. *F. enigmaticus* is very tolerant to salinity and temperature variations. The species is also tolerant to certain types of pollution. They occur naturally in the Coorong in South Australia in tube densities of up to 180,000 worms m². In formations at least 700 years old, a conglomeration of bryozoans and serpulid worms, have created mounds up to 40 cm in diameter and 30 cm in height, extending for many hundreds of metres.

They have travelled around the world and caused problems in fouling cooling intakes of power plants and ships hulls. They form large intertwining reef-like aggregates that may exceed 7m in diameter. In deep areas worms can build cauliflower-like forms reaching up to 3 m in height (e.g., Albufera of Menorca, Spain) *F. enigmaticus*. It has established populations worldwide and is an aggressive species that dominates habitats.

Hervey Bay's Forgotten Deep Worm Snail Reef



A little known and very unique boundstone site can be found in Australia, but it's almost completely unknown and was only recently protected by a marine park.

I picked up an old book, John Wright's "Diving Southern Queensland" and in his notes about the diving around Hervey Bay he mentions the "Rooney Point" site. This is a relatively rarely visited dive site in 30 metres, about an hour from the ramp at Urangan. The site was first found by fishermen and word got around out of a deep hole filled with large fish.

A few divers visited it, although it is tricky to find. It has to be dived on calm days at slack water. Divers noted large brown "rocks" sitting up off the sandy bottom, about 3 or 4 metres wide. Some were scarred by anchors and reveal that the dark rock is a maze of worm tubes. Apparently the bommies were identified in 1988 as vermetid worm mounds.

They lie in a shallow depression about 80-100 metres long about 3 or 4 metres deeper than the surrounding seabed. They have holes and ledges in them occupied by wobbegong sharks, olive

sea snakes and moray eels. There are lots of fish, with the bommies attracting plenty of pelagic school fish. Resident smaller fish include colourful Moorish idols, scribbled angels and butterfly fish. The site is exposed to currents of up to 4 knots and is open to any adverse weather. The currents allow the worm snails to sift food out of the water column and grow more quickly. The mounds may be a hundred years old.

The Great Sandy Marine Park's 'green' zones were recently extended to protect this area, and an important breeding aggregation for loggerhead turtles off Rooney point. A boating 'go slow' area has also come into effect from 15 October to 30 April each year to protect the turtles.

While this site is obviously well-known to Queensland Parks, it is interesting that this unique site isn't better known more broadly. Recent scientific publications on these types of reefs don't refer to any modern living vermetid "boundstones". They also say living vermetid 'reef' finishes at 17M tops. Both these assertions are obviously wrong. There is no on-line published material about the biology of this site, and only scant reference in Great Sandy MP management publications.

If the site has been previously studied, but since 'forgotten' internationally, this is a good indication of how quickly studies get buried in "grey" cabinets when they don't deal with matters of perceived economic value.

I'd love to show you a picture of the reefs but there don't appear to be any.

Port Phillip's potty pollution problem

Flash flooding on 29 December has recently closed Melbourne beaches as raw sewerage washes ashore.

Beaches from Werribee South to Frankston in Melbourne were declared unsuitable for swimming. EPA Victoria said 21 of the 36 beaches it monitors in Port Phillip Bay were affected. "We have indicators we look for which is an indicator of faecal contamination, which is a nice way of saying poo". Dr Boxshall said the swimmers or other beachgoers who ingested contaminated water were at risk of getting gastroenteritis and other illnesses. Children and the elderly were most at risk of falling ill from contaminated water.

Frankston's beaches were affected by a sewer spillage at Kananook Creek works. Werribee South is close to the city's biggest treatment works. The beaches were given the all-clear on 7 January.

Melbourne Water says that the sewerage system is only built to cope with rainfall from a 1-in-5 year storm (which is the national standard). The recent rains were way bigger than that, "Very heavy or prolonged rain can fill sewerage pipes. So that sewer levels don't rise too much the system is designed to automatically overflow stormwater/sewage into rivers."

Stormwater can get into the sewerage system through cracks in old terracotta pipes or illegal connections to the sewerage system. Fixing this, as expected, may come down to how much you want to pay in water bills, "... it would cost of a lot of money to completely protect the city against the most extreme events, which is why we balance this by creating a system with fail-safes", Melbourne Water said.

It should be noted that, overall, Port Phillip Bay authorities have been gradually improving water quality and sewerage treatment.

Freaks

Light Bulb Tunicate (*Clavelina lepadiformis*)

These small 20mm colonial sea squirts are transparent and show off their internal organs. They are also capable of bioluminescence so that their 'innards' glow.



They are a common European animal that can be found from the low water mark to about 50m depth. It has been introduced to the Azores, South Africa, South Korea, and the US East Coast. The introduction of this species is probably a result of ship fouling. No adverse impacts have been reported so far.

Sand Mining ends on Stradbroke Island

The Queensland Government has decided that sandmining on North Stradbroke Island will be phased out by 2019.

Photo: coastalcare.org



The huge white dunes on picturesque North Stradbroke Island have been subjected to extensive sandmining since the 1940s. That's now coming to an end, and jobs are leaving too.

Sandmining company Sibelco has announced it will restructure its workforce ahead of 2019. Some locals worry about the future of the island, and whether it can be economically viable after the sand mines shut down. Others are confident that tourism can pick up the slack. It will cost \$4 million worth of lost wages and its expected that the ferry company will lose around \$5 million a year in income. On the upside the environmental damage from

shifting 50 million tonnes of sand per annum to recover 500,000 tonnes of minerals will stop.

Colin Battersby, head of the local Chamber of Commerce said, "This has been going for five or six years, on again, on again, off again," Mr Battersby said. "So now at least we know there's certainty working towards 2019, a lot of things to do and put in place.

The Queensland Government has allocated \$20 million in an economic strategy to help North Stradbroke Island's transition away from sandmining, and focus more on tourism. Mayor Karen Williams said \$20 million is nowhere near enough, "Ten times more money for North Stradbroke Island probably still wouldn't go far enough but to do it in such a short period of time," she said.

"I don't know if tourism will ever replace the jobs that the mining industry had for North Stradbroke Island."

Representatives of the traditional owners, the Quandamooka Aboriginal people, said while mining had brought economic benefits to the island, but it had also come at an environmental cost, and it was time to give the island a break. "It was good for its day, you know you can't deny the value the mining had for our Aboriginal community, it gave Aboriginals a lifestyle that people could only dream of and supported our Aboriginal community right through to these recent times and put the Aboriginal community in the good stead it's in. "It's just in this day and age ... even a lot of the miners agree that it's time to move on."

Many other residents are also looking forward to new tourism possibilities.

New Images of Life beneath the Antarctica ice

Australian scientists were working on the ice at O'Brien Bay near Casey Research Station. They sent down a ROV (remotely operated vehicle) with a camera and lights to record the mission and found instead a colourful wonderland of marine animals.



The robot was looking in 30 metres of water for a SeapHox pH data logger, which has been recording the acidity, oxygen, salinity and temperature of seawater on an hourly basis since November last year. When both devices resurfaced the camera had recorded a lush seabed field of urchins, starfish, worms, algae and sponges.

Australian Antarctic Division (AAD) biologist Dr Glenn Johnstone said, "All of the colour in Antarctica, all of the diversity, is actually on the sea floor," "It's an area that we have been working very close to for a long time, but we've never actually dived or put any cameras down," he said.

These communities live in water that is -1.5°C all year round and covered in 1.5 metre thick sea ice for 10 months. "Occasionally

an iceberg may move around and wipe out an unlucky community, but mostly the sea ice provides protection from the storms that rage above, making it a relatively stable environment in which biodiversity can flourish," says Dr Johnstone.



The Australian Antarctic Program project is the final field component of an experiment designed to determine the impact of ocean acidification on Southern Ocean sea-floor under increasing carbon dioxide emissions. A quarter

of the carbon dioxide emitted into the atmosphere is absorbed by the ocean which increases its acidity. Antarctica may be one of the first places where the detrimental effects of ocean acidification are measured.



Update on Coral Bleaching

The ARC Centre of Excellence for Coral Reef Studies has released new survey information. Two-thirds of the corals in the northern part of the Great Barrier Reef have died.

Again the reporting has been pretty wild and inaccurate, but it is hard to be alarmist when the figures are actually pretty alarming.

The Great Barrier Reef bleached severely for the first time in 1998, then in 2002, and now again in 2016. This year's event was more extreme than the two previous mass bleachings

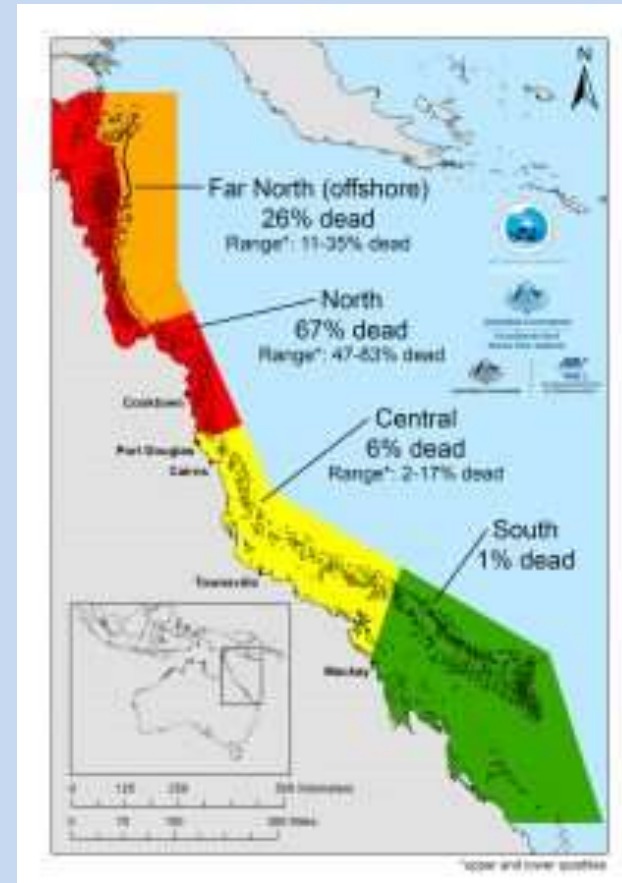
On some reefs in the north of Cairns, nearly all the corals have died. However the impact of bleaching eases as we move south.

In the northern third of the Great Barrier Reef, we recorded an average (median) loss of 67% of coral cover on a large sample of 60 reefs. On 25% of the worst affected reefs (the top quartile), losses of corals ranged from 83-99%. When mortality is this high, it affects even tougher species that normally survive bleaching. Bleaching and mortality decline with depth, and some sites and reefs had much better than average survival.

In the eastern Torres Strait and outermost ribbon reefs in the northernmost part of the Great Barrier Reef Marine Park, large swathe of reefs escaped severe bleaching and mortality, compared to elsewhere in the north. Nonetheless, 26% of the shallow-water corals died.

This has happened quickly and in the most pristine areas, and is on top of the slow damage that has occurred in the south from other causes like sedimentation. Over the 27 years from 1985 to 2012, scientists from the Australian Institute of Marine Science measured the gradual loss of 51% of corals on the central and southern regions of the Great Barrier Reef.

The southern third of the Reef did not experience severe heat stress. In the central section of the Reef there was widespread but moderate bleaching, comparable to the 1998 and 2002



events. On average, only 6% of coral cover was lost in the central region in 2016.

Many central reefs are in good condition, and they continue to recover from Severe Tropical Cyclones Hamish (in 2009) and Yasi (2011).

“Over the coming months and for the next year or two we expect to see longer-term impacts on northern corals, including higher

levels of disease, slower growth rates and lower rates of reproduction. The process of recovery in the north – the replacement of dead corals by new ones – will be slow, at least 10-15 years, as long as local conditions such as water quality remain conducive to recovery.” “As global temperatures continue to climb, time will tell how much recovery in the north is possible before a fourth mass bleaching event occurs.” Said David Wachenfeld, Director for Reef Recovery at the Great Barrier Reef Marine Park Authority.

Northern Territory bleaching noted by Aboriginal rangers



Per ABC News

In April 2016 indigenous rangers from the Crocodile Islands were shown a photograph of a coral reef damage off the coast of Arnhem Land. It was the first time Yolgnu people had seen the coral bleached white at that reef. Leonard Bowaynu had seen small patches of white coral before, but never anything this big. "We used to go out, catch fish from the reefs. I never seen coral turning to white, like around the island or reef," he said. Rangers travelled to the area with a drone and GoPro camera to collect further evidence, "At Murrangga [Island] we never seen white coral there before, during the 50s, 60s and 70s. But we seen it

now, 2016." "We need scientists to come here and do research in the Crocodile Islands," Mr Mungula said.



This image of white coral prompted indigenous sea rangers to investigate.

Meanwhile, around Groote Eylandt, Indigenous Rangers were also watching their cultivated giant clams turn white. It was first time the clams had bleached since the trial farm was established in 2011. Significant dieback of mangroves in the gulf has also been reported by scientists.

"Our families, relatives, elders, they never told us about the coral bleach. It's happening now and we're worried ... because there's big feeding there for turtles and fish and we want the scientists to tell us what is wrong," Michael Mungula said.

WA also feeling the heat

There has reasonably been a lot of focus on the huge damage done to the GBR north of Cairns, but parts of Western Australia were affected by the same event, were also damaged by earlier events, and are just as vulnerable to future events.

Much of the coral in WA is found in isolated spots. They support huge biodiversity, even though they often back on to bare and arid desert.

Scientists recently undertook surveys of reefs from the Dampier Archipelago and Montebello Islands to the Muiron Islands. "...what struck us most was the depauperate state of the reefs. We saw a mosaic of impacts depending on where we surveyed".



Source: Morane Le Nohaic, Kimberley' supercorals' are adapted to survive drying out at low tide, but even these were killed by the 2016 heatwave

Some places are still recovering from the 2010-11 heat wave and the 2013 Pilbara heat wave.

Ningaloo normally avoids bleaching as it usually receives cooler water welling up from the deep, and from a cool northward flowing current. But even Ningaloo experienced massive bleaching in 2011 at Bundegi, on the western side of Exmouth Gulf. Live coral cover crashed from 80% to 6% – almost all the adult coral was killed. Other places were damaged by crown-of-thorns outbreaks, and dredging projects.

The same 2011 heatwave that killed the kelp in central WA. A combination of the 2011 heatwave and massive rains also killed up to 90% of seagrasses in WA's World Heritage listed Shark Bay. This has since recovered only 7–20% of its historical averages. The scientists also warn that predicted sea level increases of around 7 cm under climate change might lead to a salinity drop in the hypersaline Hamelin Pool, with results that, could affect the unique stromatolites that are only found there.

Well offshore (250kms), AIMS researchers found that 'extreme' bleaching had occurred in the shallow coral communities across Scott Reef. In 1998, the reef suffered moderate to severe bleaching during the first global bleaching event. Over 80% of coral cover was lost during this period. It took 12 years to recover.

This high level of recent bleaching in 2016 (50%) was not restricted to the shallow reef flat (3m) and reef slope (6m), but was also observed in the normally cooler, deeper waters over 20m. Camera surveys of communities in 40m in the deep Scott Reef lagoon revealed 'major' bleaching at approximately 50%. The temperature even at this depth was 30.5°C. During the last severe bleaching at Scott Reef in 1998, these coral communities did not bleach.

Bleaching was also widespread and severe at the remote Seringapatam Reef. 60-90% of the coral community of the outer slopes and inside the lagoon were bleached ('extreme' category). Rowley Shoals escaped bleaching due to its colder waters and more frequent cloud cover.

Almost all surveyed inshore Kimberley reefs had about 50% bleaching after the 2016 event. These included Montgomery Reef, Australia's largest inshore reef, which covers 380 square kilometres. Vast areas of coral reef are now dead and overgrown with algae, both at the inshore and offshore Kimberley reefs.



CSIRO, coral killed by the 2014 Pilbara heat wave, Sholl Is

While the damage in WA is more patchy than the GBR it is still widespread and severe. This has gone on largely unnoticed. There isn't much public awareness of the problem and support for protection from environmental pressures isn't always consistent.

Tracking Macquarie Island's grey petrels

Satellite tags have tracked the foraging behaviour of a threatened sea-bird, the grey petrel, for the first time.

Per AAD; Photos Marcus Salton



The grey petrel is a burrowing seabird which breeds on Macquarie Island. Parks Wildlife Ranger, Marcus Salton, said researchers have been studying the birds on the Island for the past 16 years but until now knew nothing about their at-sea foraging behaviour and habitat use.

“Over winter for the first time we attached a small satellite transmitter to ten adult grey petrels to track their movements over more than 100 days,” Mr Salton said.

Some flew as far as 3000 kilometres east of Macquarie Island past New Zealand, while other birds foraged several thousand kilometres northwest near to Australia.” “The tags also show the



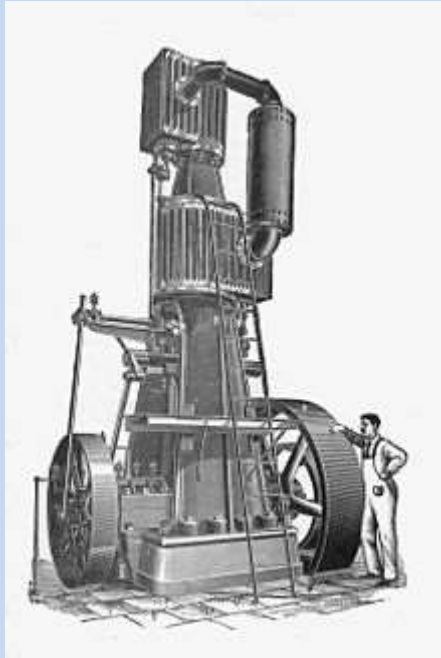
birds regularly return to their burrows on the Island during the breeding season,” Mr Salton said.

“This at-sea foraging data will help identify key feeding grounds for grey petrels during their breeding season.

The grey petrel is currently listed as a threatened species due to impacts on the birds on land and at sea. Removal of pests on the island has improved their numbers.



Steeple-engined paddle steamers and their surviving relics



The steeple engine, sometimes referred to as a "crosshead" engine, was an early attempt to break away from the primitive beam engine design. Ship owners needed something smaller and more efficient. In a beam engine a large horizontal rod drives the paddles. In the rocking motion steeple engine, the piston moves an assembly, of crosshead and rods vertically, which rotates the crankshaft. The triangular assembly above the engine cylinder gives the engine its characteristic "steeple" shape, hence the name. Steeple engines were tall but much narrower, saving space and weight. Steeple

engines began to appear in steamships in the 1830s and the type was perfected in the early 1840s by the British shipbuilder David Napier. The steeple engine was gradually superseded by various types of direct-acting engine but they remained popular for inshore paddle steamers.



DAVID NAPIER

Pirate



The oldest steamer wreck in Tasmania is also one of the least well-known. She was also anonymous and attracted little attention in her day, coming just after the first pioneering paddle steamers and just before the bigger and more elegant auxiliary screw steamers of the 1860s. S.S. Archimedes was the world's first screw steamer in 1840 and Pirate wasn't far behind, and was also one of the earliest iron screw steamers.

The Pirate is also hard to research, any internet search by name brings up every pantomime and kids birthday ever undertaken.

The Pirate was launched at the Smith & Roger yard, Govan in January 1848, for the Glasgow & Liverpool Steam Ship Co. She was an iron screw steamer of 393 gross tons and was 139.2 feet in length. She was launched only three years after the Clyde's first iron screw steamer. She was fitted out with a 2-cyl 60nhp steeple type engine. It was probably in the UK that she was lengthened to 166.5 feet long and her cargo space was now measured as 406 tons, as these are the measurements shown when she was first sold in Australia.

In 1851 Lewis & Alexander Potter of Glasgow sent her out to the colonies searching for a premium buyer. She arrived in Melbourne in May 1853. She was advertised as having "Three hold pumps, and one bilge pump, worked by the engines-winch can also be used to supply water to any part of the ship-with leather hose complete. There are two fresh water tanks, holding about 900 gallons water. Two engines of the very highest character, 30-horse power-each. They are in perfect working order, and fit for immediate service. Each cylinder is fitted with four piston rods, insuring security against accidental breakage. Diameter of screw 9 feet; worked by wheel and pinion; multiplying power 24 to 1. The shaft is endowed in a fire-proof casing. The hold is lined throughout with hardwood plank, and dunnage. She can stow 120 tons coals in the bunkers, and burns only 7 to 8 cwt. per hour".

In 1854, she was sold to John Thompson of Launceston for the Sydney, Geelong-Launceston run. Shortly afterwards she broke her prop shaft and had to sail from Geelong to Launceston. In May 1854 she was noted as lying hard on the riverside at George Town having her hull worked on prior to an engine refit. From Feb- May 1856 she was up for auction without reserve, and a very detailed account was given of her dimensions (ship modeller's take note).

She went through a few owners, suggesting she might have been far from efficient. In 1858 she made a trip from Melbourne to Rockhampton with a group of ambitious goldminers.

In 1859, she was owned by MacAndrew and Co, Melbourne & Otago. When she won a mail contract for Otago, she was put on the run to the NZ goldfields,

On October 16 1861, she ran high and dry onto a beach between Long Point and Falmouth on the east coast of Tasmania during a thick fog. All hands were saved, with the passengers landed at Falmouth and then forwarded to Launceston. She had on board 12 passengers, all returned diggers, and general cargo (other accounts say she was in ballast) from New Zealand to

Melbourne. Heavy gales eventually broke her back. The schooner *Native Youth* was sent to recover the gear and fittings. The *Pirate* appears to have been a total wreck, "the whole of her lee side carried away, and is rapidly crumbling to pieces, as is generally the case with iron vessels when once they get on shore". She was advertised for sale for benefit of the underwriters. Mrs Thomas Paterson, bought her for the sum of £127 12s. 6d., including all her cargo and stores ashore or on board. The crew were on site and already salvaging items from her and it's likely that all but the heaviest items were recovered.

Her location was described as near Piccaninni Point, but O'May refers to her bell as being used in the "Chain of Lagoons" homestead for many years, suggesting her likely landfall was nearer the Chain of Lagoons beaches.

Happy Hunting!

Early paddle steamers

Grasshopper (side lever) Engines

Source J.Riley DEH

The grasshopper or 'half-lever'-engine was a more refined variation of the older side-lever engine design. The engine had a similar motion to the grasshopper insect, from which it derived its name. Chief advantages of the grasshopper engine were cheapness of construction and toughness. Another advantage was that the engine could be easily started from any crank position. This gave paddle tugs more manoeuvrability than newer screw tugs. The engine was perfected for paddle tugs and some survived in use until the mid twentieth century.



ps

Yarra Yarra

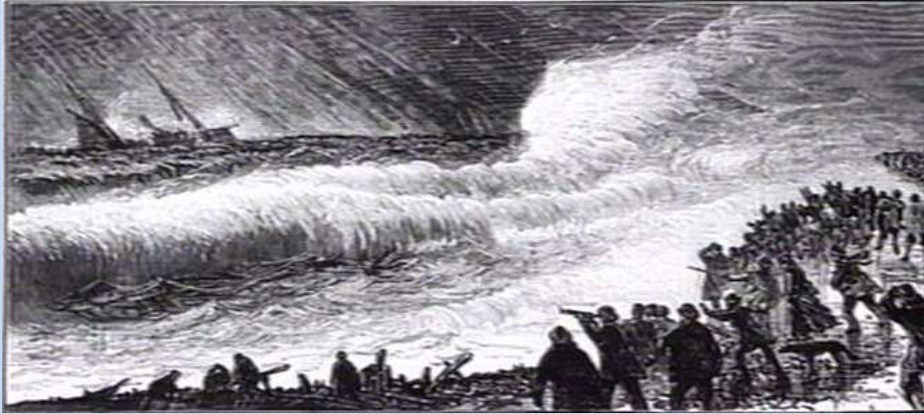
The Yarra Yarra was built by W. Denny and Brothers at Dumbarton, Scotland in 1851 for the Australasian Steam Navigation Company. The 337 ton steamer had a length, when built, of 166' 5" (50.72m). She was fitted with a two cylinder Caird and Company side lever "grasshopper" engine generating

200 horse power, the vessel could carry enough coal for seven days continuous steaming. Initially intended for the passenger trade, the Yarra Yarra had accommodation for 50 passengers in the saloon, 30 in the forecabin and 20 as steerage in the forecastle.

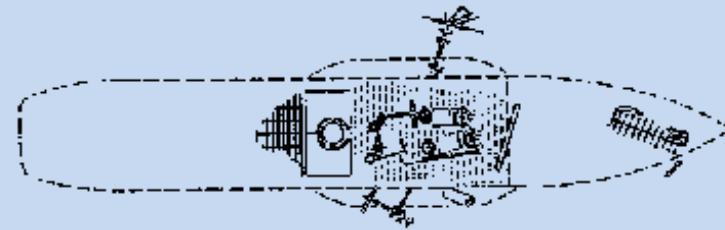
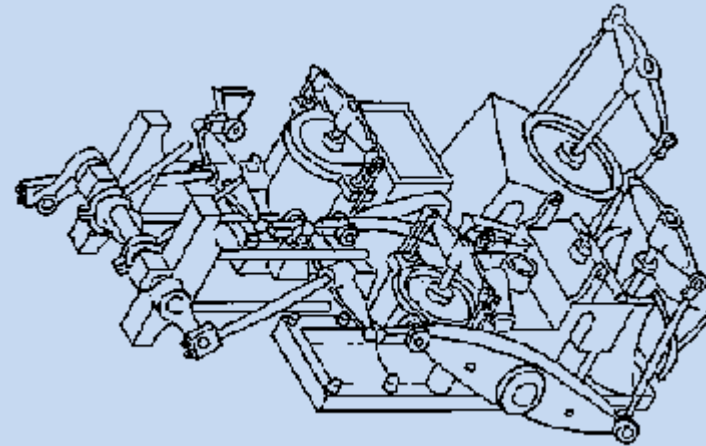
The vessel's maiden voyage to Sydney was completed on 4 April 1852. The Yarra Yarra began a service that same year between Sydney and Launceston, via Melbourne. Cargoes at this period reflected the vessel's association with the growing gold rushes of the 1850's. On one voyage to Melbourne, the Yarra Yarra carried 51 cabin class passengers together with 360 in steerage. Cargoes comprised basic foodstuffs and the necessary means of transport to the fields, including horses and boots. The steamer performed well on the Melbourne - Sydney service and could make up to twenty return trips in a single year.

The vessel was re-directed to the Sydney - Brisbane service in 1854. By the end of the decade, this service had been extended to Rockhampton with occasional trips to Melbourne. Lengthened by 17 feet (5.18m) in 1862, the Yarra Yarra, now 555 tons gross, remained operating on the Queensland coast for most of the 1860's, spending some time in the Grafton service during 1871.

In 1874, the Yarra Yarra was sold to Captain Summerbell of Newcastle who re-plated the hull and converted the vessel into a collier. Re-registered in Sydney, the steamer carried coal from Newcastle to Sydney with occasional intercolonial voyages.



On Saturday 14 July 1877, the Yarra Yarra left the safety of Newcastle Harbour with 500 tons of coal bound for Sydney. The weather deteriorated, turning into a full gale by evening. The steamer was forced to return to Newcastle early next morning, however the harbour now offered no safe haven. Huge waves were being whipped up and breaking across the entire entrance. The Yarra Yarra was headed for disaster when severe seas struck the vessel near the Cawarra Buoy. The signal man on shore, anticipating the danger, fired the gun to get the life boat ready. It was probably too late, the vessel appeared to lose steerage and turned broadside to the waves. A tremendous wave then struck the ailing steamer, carrying away the foremast. The Yarra Yarra heeled over and sank by the stern taking all eighteen on board to the bottom. Recently relocated the small and sometimes dark wrecksite is dominated by her surviving engine.



Albatrosses - Wandering Albatross

NZ Govt, AAD



If there is a pile of seabirds following your boat, and a huge white bird glides over them and dwarfs the others, chances are it is a Wandering Albatross. There is some disagreement about whether the Antipodean and Gibson's Wandering Albatross are sub-species of Wanderers or not.

They breed on the cool, wind-swept islands of the Southern Ocean, Indian Ocean and South Atlantic. They also live 'nearby', on Macquarie, Auckland, Antipodes and Auckland Islands.



However, distance means nothing. They will travel thousands of kilometres from the Antarctic Circle to the equator. Birds caught off New South Wales regularly appear at

South Georgia in the South Atlantic. They can be also seen from Fremantle to Brisbane, more often during the summer but mostly on offshore boat cruises. They decrease in numbers the further north you go.

Seeing them involves an offshore cruise, SOSSA on the South Coast of NSW goes on regular counting expeditions.

Off Kaikoura on NW of South Island NZ, the locals have branched from whale watching in to sea bird cruises too, and attract swarms of albatross by feeding off the back of boats.

The young will have various degrees of extra brown colouration. They can be easily confused with Royal Albatross. They mature at about age 9 and breed every 2 years. There may be 26,000 birds left.



The track of 40 albatross tagged on Possession Is

Royal Albatross



This is almost a dead ringer for the Wandering Albatross, but this species breeds only in NZ. One sub-species breeds at Dunedin (Taiaroa Hds) and Chatham Is. Another similar species or subspecies breeds near Auckland Is and Campbell Is.

This albatross commonly visits SE Australia. Close up they can be separated from Wandering albatross mainly by a very thin black line along the bill, which is also a slightly different shape. They are also less likely to follow ships, so are less often seen. They are very white (except for the upper wing) even as juveniles.



The obvious place to see them is in the summer at Dunedin, where about the only accessible albatross breeding site is located. The area includes an old Maori fort, views over the entrance to Otago

Harbour, a lighthouse, 1880s underground fort, WWII fort as well as albatross. For \$50 you get a 1.5 hour guided tour, a little pricey but the guide 'hez a funny exccent' but that is included in for free. There are only 60 pairs of birds at Dunedin.

There may be 20,000 birds left of the northern species and 30,000 of the southern. Past hunting, pests and weeds that impact on their breeding islands. The southern species is now extinct on Auckland and Enderby Islands. Overall they may be slowly recovering.



Mollyhawks

This is a generic name given to some of the smaller albatross species.

Black-browed albatross

The Black-browed is about the most common albatross in SE Australia. It often prefers narrow ledges on grassy sea cliffs. They have a bright yellow-orange bill and a noticeably serious looking dark 'eyebrows' like many other mollyhawks. The vast majority nest on the

Falklands and Chiles and while there may still be 1.2M, in some areas they have declined by 67% since WWII due to long-line fishing.



Shy Albatross

This is the largest of the mollyhawks and breeds only in Australasian waters. It breeds on Albatross Island and the Mewstone off the Tasmanian coast, and Disappointment Island and Auckland Islands in NZ. It can be identified by the larger size, all-white underwings and the dark 'armpit' mark. Like the Wandering, it is an effortless glider. It has been split in to several species in recent years with all very similar in appearance.



End of the Supertrawler, for the second time



Geelong Star has left Australian waters, and will not be returning.

The departure coincided with Labor and Greens members on a Senate committee calling on the Federal Government to ban all factory freezer trawlers from operating in the

Commonwealth Small Pelagic Fishery regions. Liberal Senators dissented and said the Government was "committed to maintaining a balanced and science-based approach to all decisions regarding access to Commonwealth fisheries".

The Dutch owner then announced they would leave because, "... we cannot achieve a financial commercial agreement with the local partners in Australia". That is a bit opaque, but a reasonable conclusion would be that the fishing regime here was too tough and politicised for them. Despite their long support for the trawler, the Government must be glad to see the back of the issue.

After a massive protest by recreational fishermen about the supertrawler "Margiris", in 2012 super trawlers were prohibited from fishing in Australian waters. The ban only applied to vessels over 130 metres. Geelong Star was obtained instead as she was 95 metres.

The trawler attracted ongoing attention due to her seal and dolphin by-catch, in a way that other smaller trawlers like the prawn trawling fleet didn't. Despite high population numbers, further fishing of the small pelagic stock looks unlikely without the economies of scale offered by a larger vessel.

Climate change and Sea Mammals

In Marine Climate Change Impacts and Adaptation Report Card for Australia 2012
www.oceanclimatechange.org.au



There are currently 52 recognised marine mammal species around Australia's coast, including its subantarctic islands, for at least some part of the year. Of these, 44 are whales, dolphins and porpoises, six are seals and sea lions and one the dugong. Sei, Blue and fin whales and Australian sea lions are considered threatened species. Sperm whales and dugongs are classified as vulnerable and Indo-Pacific humpback dolphins and Australian snubfin dolphins are listed as near threatened. However, due to insufficient data, the conservation status of 25 other cetacean species is unknown.

There is currently little hard research on the predicted effects of climate change on Australian marine mammals. For most species, almost nothing is known of the distributions, population sizes or ecologies of many species.

The Southern Ocean ecosystem has been profoundly affected by human harvesting of marine mammals, possibly producing changes in ecosystem structure. This impact and other threats make it difficult to disentangle population responses to climate change from other effects. However, there is enough data to suggest what might be likely.

Effects of sea surface and air temperature change

The sea surface temperature (SST) affects the feeding locations and the reproduction of marine mammals. There is only one study providing actual firm evidence that marine mammals (dugongs) extend their range in years of warmer ocean temperatures and a single study indicating range contractions (in blue whales) due to the effects of greater temperatures on sea ice extent

Projected warmer ocean temperatures are likely to benefit some species and adversely affecting others. It is likely that marine mammals have some capacity to adapt, more than other marine species that are less mobile. Bottlenose dolphins can control the amount of blubber they retain and regulate heat by altering blood flow through their fins.

Nonetheless, increasing water temperatures are likely to profoundly change the distribution of marine mammals. Species ranges are likely to expand southwards resulting in a loss of diversity in tropical cetacean communities. For southern right whales, it is possible that the migration southward of their southern limit will be greater than that of their northern limits. This may result in longer migrations between feeding and calving grounds.

As species move into the same areas there may be competitive exclusion of species. Although studies are lacking, such changes may produce a complete regime shift. Distributional changes may also lead to the introduction of disease to previously unexposed populations.

Rising temperatures are likely to have a significant impact on sea ice extent in Antarctica. Several cetaceans, such as blue and minke whales, rely on the Antarctic pack ice. A decrease in the extent of sea ice is likely to have a detrimental impact on these species. Blue and fin whales rely on dense aggregations of krill near the ice shelf.

However, some species show flexibility in their foraging or choice of prey. For example, blue whales may be able to migrate long distances to exploit new areas. Both blue and minke whales, are Antarctic krill *Euphausia superba* specialists, but they also exploit other prey species in years when sea ice extent is low although alternative prey are not at high abundances. Modelling suggests that birth rates in blue whales may decline with reduced krill availability.

Climate change also has the potential to alter the breeding phenology (behavioural timing) of marine mammals. Critical stages in the life history of animals, such as breeding and weaning, may be timed to match peak abundances of prey. Species that undertake long migrations may be disrupted.

Many seal species have a preference for particular temperatures as that affects prey. They can alter their behaviour or diet to a degree. The diet of Antarctic fur seals and Australian fur seals on Heard Island varies seasonally and inter-annually. However, studies on Macquarie Island have shown a reduction in southern elephant seal pup survival during El Niño events and reduced breeding success in Antarctic fur seals with warmer waters. Each 1°C rise in SST coincided with a 10.6% reduction in the proportion of Antarctic fur seal females that pupped on Macquarie Island.

Like many whale species, southern elephant seals in the Antarctic are closely associated with the Antarctic pack ice and may be affected by a loss in sea ice extent with warmer air temperatures. However, elephant seals on Marion Island will simply dive to greater depths to compensate.



Source AAD

Effects of Extreme events (cyclones, flood, storms)

Several studies have provided data on the effects of cyclones, storms or floods on marine mammals. The intensity of storms and cyclones will increase with climate change. More intense cyclones, and associated rainfall and flooding, may enhance transport of pathogens and pollutants into coastal waters. Southern right whales prefer calmer inshore waters for breeding. Cyclones and storm surges are likely to increase the incidence of stranding marine mammals.

Declines in the abundance and extent of seagrass can be expected in shallow waters, due to the scouring effects of storms. Marine mammal associated with seagrass habitats, such as snubfin dolphins and dugongs are heavily dependent on seagrass. However, storm-related disturbance may actually favour pioneer seagrass species, which are preferred by dugongs.

A significant source of mortality among Australian fur seal pups is the effect of storm surges on waves, which wash pups out to sea. Thus, projected increases in storm intensity may elevate mortality rates of seal pups, resulting in reduced reproductive output.

Our knowledge about these issues isn't great. Changes to coastal water quality due to flooding is based on a single study. Similarly, information on the impact of storms and cyclones on cetacean strandings is largely anecdotal.

Ocean currents, winds and circulation

There is strong evidence of the importance of upwelling to a variety of marine mammal species. Projected increases in wind strength with climate change may result in enhanced productivity in coastal areas of southern Australia. Increased wind strength is likely to benefit species that exploit upwelling areas.

However, in Australia, this is based on few studies in two regions. A single study has investigated links between wind-driven, nutrient-rich ocean currents on cetacean strandings.

Pup production in Australian fur seals is influenced in part by upwelling in the Bonney Coast region. Stronger winds could, therefore, benefit Australian fur seals by enhancing the influx of cooler, upwelled, productive water into Bass Strait.

Sea- level rise

Predicted sea level rises could have a negative effect on species that require coastal bays or offshore rocks for breeding, such as humpback whales and seals

Ocean acidification

There is evidence of ocean acidification in the Southern Ocean. Hatching success of Antarctic krill *Euphausia superba* is known to be inhibited in acidic conditions, though it is not known how predicted increases in ocean acidification will affect krill. Ocean acidification may also produce changes in calcifying organisms, range shifts and population declines in reef fish and changes in the abundance of squid. These impacts may have flow-on effects through the food chain, ultimately influencing Australian marine mammal predators.

Adaptation responses

The various Australian marine mammal species are unlikely to be equally vulnerable to the effects of climate change. The capacity of marine mammals to adapt to environmental change depends, in part, on their ability to alter their foraging behaviour and diet. Cosmopolitan species that use multiple habitats and have diverse diets, such as some dolphin species, are likely to be more resilient. Species such as Australian snubfin, Indo-Pacific humpback dolphins and Australian sea lions.

Changes in distribution are likely, as ranges of warm-water species expand to the south, and those of cold-water species contract, though how this will affect community structure and dynamics in detail is unknown. Some species may also be limited by their inability to cross deep, oceanic waters, becoming extinct in southern parts of their range such as cold water species in Tasmania.

The effects of climate changes do not act in isolation, and other threatening processes may elevate any adverse effects of climate change on marine mammals. Marine mammals are still recovering from hunting, among other effects. Managing these threats will add resilience to species vulnerable to climate change. The development of appropriate policies is hampered by a lack of knowledge.



Jellyfish app can identify almost any jellyfish.



Two Launceston businessmen have joined forces with a jellyfish expert to create a world-first phone app that identifies jellies.

The Jellyfish App was conceived on a plane trip when Tasmanian men Neil Johnson and Ian Goninon, who were seated next to renowned jellyfish expert Lisa-Ann Gershwin. "We said we'd provide the funding if Lisa provided the science."

"It's a great app because it's user friendly, and no matter where you are in

the world you can look up what species of jellyfish you are likely to come across as well as medical information on how to treat stings."

The paid version of the app allows the users to take a photo of a jellyfish to send to Dr Gershwin who will respond with advice.

Dr Gershwin said the app listed 280 species. "So around the world it's almost all of the species you'll see," she said. "We're adding species all the time as photos become available I add them in." Dr Gershwin said the app would also be developed into Chinese languages.

<http://thejellyfishapp.com/download>

One \$billion more for GBR Plan still not enough

Australia will spend A\$1.3 billion in the next five years to improve the water quality and wellbeing of the Great Barrier Reef. This is on top of a previous \$1 billion redirected from other projects.

An independent assessment prepared by experts advised that \$8.2 billion was required in the next ten years to achieve the Reef pollution reduction targets

UNESCO has been threatening to put the GBR on the "in danger" list if more wasn't done. A negative rating might damage the tourism industry.

Environmental groups say the reef needs more investment than the government has committed to, and a lot more needs to be done on climate change if the government is serious about saving the GBR.

WWF-Australia said of Australia's progress report to UNESCO that it was "not accurate" when it claimed that 90% of actions in the Reef 2050 rescue plan are completed, underway or on track. For example, the report claimed that all water quality actions, to reduce pollution flowing to the Reef, are 'on track'. However, the most recent Reef Report Card showed poor progress for most targets. Australia has committed to reduce nitrogen pollution by 50% by 2018. That deadline is fast approaching, and so far nitrogen has only been reduced by 18%. Laws to control tree clearing in Reef catchments were rejected by the Queensland Parliament.

"This year we have had out-of-control tree clearing, continuing high polluting practices, and mass coral bleaching – to claim Australia is on track with its Reef commitments is sadly not accurate". The Government did get some faint praise, "The historic ban on the dumping of dredge spoil and the restriction on port development shows that big action can be taken to save the Reef," said Mr O'Gorman of WWF- Australia.

Seaweed threatens Pacific coral reefs

Overfishing of species that graze off algae can lead to the smothering of corals by seaweed.



University of Queensland scientist Professor Peter Mumby said, "Pacific reefs are more vulnerable to increases in seaweed than we used to think," "Seaweeds tend to bloom when too many herbivorous fish are fished heavily or when agricultural fertilizers

pollute rivers that run into the sea.

"The problems are then compounded by climate change which damages corals making it easier for seaweeds to get a foothold."

"While historically seaweeds have been scarce on Pacific reefs compared to the Caribbean, we are finding that corals are pretty unprepared to cope with some of the more insidious weeds once they get a foothold."

Professor Mumby said evidence was mounting from the Great Barrier Reef, Palau in Micronesia, and Moorea in French Polynesia that corals avoided settling on reefs with even modest amounts of seaweed.

"The ability of reefs to provide fisheries will at least halve if we lose the fabulous towers and hiding places created by corals."

Professor Mumby's group recently recommended regulations for the Caribbean and suggested that only 10 per cent of the harvestable fish are taken each year and that a minimum size of 30 cm is enforced for parrotfish.

Tourism upgrade for Whyalla's cuttlefish attraction

A \$205,000 project will give better access to the cuttlefish viewing area for divers, snorkelers and non-divers.



Whyalla is home to the largest aggregation in the world of Giant Australian Cuttlefish, providing a unique tourism experience.

The \$2 million Upper Spencer Gulf and Outback Futures Program is a one-off program, trying to assist after the closure of the Port Augusta power station and Leigh Creek coal mine. The project has also received \$40,000 support

from Port Bonython Fuels Pty Ltd.

Road upgrades and a new car park will allow a wider range of vehicles, including coaches, to access the site. New signs and a weather shelter will be provided.

You will still have to get past the oil jetty, beside the army base next to the gas plant. It is still amazing to me that the cuttles like a spot so marred by industry.

Any of this turning you on, the death and killing I mean



It might look ridiculous, but I strip down and cut some of those poses when I get the urge to kill while diving.

Snippets



Elephant seal census results from Macquarie Island show a healthy rise for the second year in a row.

<http://www.abc.net.au/news/2016-12-16/elephant-seal-census-results-2016-macquarie-island/8126774>

Spearfishing anyone? 260,000 views so far for a video of a Bull shark impaled on a speargun after charging at diver off the far north Queensland coast.

<http://mobile.abc.net.au/news/2017-01-10/bull-shark-attacks-man-off-far-north-queensland-coast/8172256>

More dead animals, Tilikum, a killer whale involved in deadly incident (well a few actually) involving trainer at SeaWorld in Orlando, dies

<http://mobile.abc.net.au/news/2017-01-07/tilikum-orca-whale-that-killed-trainer-at-seaworld-orlando-dead/8167426>

Not sick of sharks yarns yet? Lorne swim not put off when multiple sharks were sighted within 40 kms of the event. I should hope not.

<http://mobile.abc.net.au/news/2017-01-07/lorne-pier-to-pub-goes-ahead-despite-shark-sightings/8167054>

More death, a 100km long iceberg is poised to crack off Antarctica. Scientists fear the loss of ice shelves is raising world sea levels. Several ice shelves have cracked up in recent years, including the Larsen B that disintegrated in 2002.

<http://mobile.abc.net.au/news/2017-01-06/vast-iceberg-poised-to-crack-off-antarctic/8167150>

Wayward seal trashes a car in downtown Launceston, well away from the sea.

<http://www.themercury.com.au/news/tasmania/newstead-property-receives-the-seal-of-approval/news-story/9daa21eb5356d4937752d1e8e642cc25>

More on the new East Coast fish farm at Okehampton, Tas. Threats made of another "forestry war-type scenario", according to millionaire environmentalist Graeme Wood who happens to own the adjoining land. Read the full story <http://ab.co/2hBQwJH>

Colourful reef found near freshwater in Brazil

<http://www.abc.net.au/news/2017-01-31/first-images-of-coral-reef-discovered-at-mouth-of-amazon-river/8226792>