

MARINE *Life*



Oct Nov 2016 ISSUE 45

Our Goal

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

The Crew

Michael Jacques, Editor
SA Advisor – Peter Day
Media Monitor – Alison Triffett

Disclaimer: The views expressed in this publication are not necessarily the views of the editorial staff or associates of this publication. We make no promise that any of this will make sense.

Cover photo, Andrew Newton, Jervis Bay



We are now part of the wonderful world of Facebook! Check us out, stalk our updates, and 'like' our page to fuel our insatiable egos.

Contact us: marinelifetassie@gmail.com

Features and Creatures

Climate change survey and cats	3
ETS/ Carbon scheme summary	5
Estuaries	8
GBR AIMS Report	12
Bleaching affects Coral Sea	13
Shark drums/ Neville Coleman Reef	14
NSW shark protections no easy solution	15
Bleaching and GBR tourism	16
Sydney Harbour coral bleaching	17
Big thinking on CO2	18
Perfect North Korea	19
Hardworking sea slug	20
Turtle hatchlings and artificial lights	21
GBR Marine reserves succeed	23
Sydney's scuttled WWII fleet	24
Tassie marine farms	26
Weird NT fishes	27
Arctic Terns	28
Colourful Antarctic amphipods	29
Magnetic Island holidays	30
Magnetic Is seaweeds	37
'Mad' scientists and bad journalists	39

Distracting cat story – Surf Cat



Things must be dire as we flock to another distracting cat story.

11 million people forgot budget repair, refugees and global warming to log in and hear about the Australian cat who surfs. OK I do get it, a

cat can't whine like Christopher Pine, and the whole family will get more out of a chat with a cat than doggerel from Bob Katter.

Our cat Rory would surf too, if only I could get him to like getting wet, and wear that jump suit without first taking chunks out of my arm. I could hardly blame him. It is cool to be engaged with animals but they aren't meant to be like us, and isn't there a shard of cruelty in all this? [*What a spoilsport*]

If I use cat pictures, can I get a million plus in circulation too. I'm ready to sell out.

Surf cat not entirely distracting

About 15 million of us appear to want to do something about climate change, and we are more interested in it than surf cat, sorry puss.

Per ABC News

A survey of more than 2,000 Australians by the Climate Institute has found 77 per cent believe climate change is occurring and 90 per cent believe the Federal Government has a responsibility to drive action on it.



Acting on climate change can make the world safe for cute fluffy kitten-based emotional catmail.

The research showed most Australians trust the scientific evidence of climate change.

Climate Institute CEO John Connor said it was vital politicians and businesses applied this

information to create change immediately.

"I think this sends a very important signal to politicians and business that the Australian community now is actually solidly supporting action and have great expectations on both politicians and business that we get on with it," he said.

Mr Connor said this year's results were the strongest in eight years, due to the public being able to witness changing temperatures and weather events.

Mr Connor said Australians expected the Federal Government to join the international community in leading action on climate change.

"We're also seeing international action, US and China working together, but importantly, people are seeing and literally can touch and feel and kick the tyres of cheap and accessible clean energy, clean transport," he said.

"I think we are seeing a steady rebound from the lows of 2012 and the carbon price scare campaign and support for climate change, and renewable energy in particular, is as strong as it's been since 2008," he said.

Saving the Planet and Pricing Carbon in a single bound



Let's start by trying to make some moderate economic detail appear slightly less tedious than reading your insurance or super policy.

What are all these carbon schemes, and is anyone thinking seriously about them?

I went to a left-dominated social event lately. It was slightly less scornful of economists than a gun lobby sponsored conference might be about them. In fact, could the current economic system and the people who manage it, be harnessed to a CO2 reductions economy, rather than to uncapped endless emissions? Can we keep watching "The Batchelorette" on a big plasma and still keep the planet alive? If we can, one day we may see a 21st Century Marvel Comic called 'Economist Nerds save the Planet, one corrupt balance sheet at a time'.

OK, read on, but be warned the rest may contain traces of Maths [I'm innumerate too]

What are we after?

This runaway train is already building up speed, the best we can probably hope for is to finally brake warming to below 2°C and if possible below 1.5°C.



Australia went along with the Paris Conference Pledge to reduce emissions from 19%-22% of 2000 levels by 2030 (actually stated as 26-28% of 2005 levels). The ALP commitment is even higher to 45% emissions reduction on 2005 levels by 2030. The Greens have made previous statements of a very high 60 to 80 per cent reduction on 2000 levels by 2030.

A solution requires innovation and some risk

Ok, that's already too boring? Just summarise it Marine Life!

Summary

- Both major parties are drawing slowly together on the method for fixing a carbon price, the ALP wants a mixed Baseline and Credit/ETS, the LNP a baseline and credit scheme.
- Both systems can be 'set up to fail' by setting too many exemptions and high baselines/permit caps.
- More important is how committed our polities are to the necessary cuts, as opposed to defusing the issue politically with an impotent smokescreen.
- The LNP is now strengthening its system, but it's very doubtful that will be enough, but there is a further review in 2017. It's a long wait and we have to hope that moderate LNP members carry the day
- A commitment to meeting the Paris Agreement cuts will force them to beef up any scheme. It is political pressure from us that will make them stick to the program.
- There will be a backlash when the system inevitably impacts on prices and politicians get easily frightened.

The Schemes

In Australia we are currently thinking about different structured schemes for dealing with carbon emissions. A carbon tax was never the best way of doing it, and after the political backlash

that saw Abbott government elected, no-one will be mentioning the "c" word, carbon tax, again.

Instead the financial penalties come from needing limited number of permits to pollute, which can be traded to set a 'price' on carbon emissions.

Every slight variation in the mechanism is given a different name, creating a confusing proliferation of labels. The main types currently being proposed are an Emission trading scheme ETS (which is a "cap and trade" scheme) and the Emissions Reduction Scheme ERF (a "baseline and credit" scheme). Both are capable of working if implemented in a firm way.

"Both schemes are market based instruments and therefore are likely to be equally efficient" (Climate Institute). "A mandatory emissions trading scheme (similar to the EU, China, California) is likely to be most effective, but a broad based baseline and credit scheme, similar to the government's safeguard mechanism, could also be implemented." (Katherine Lake, University of Melbourne).



Party policies currently borrow bits from both schemes. Some commentators think the major parties' policies are starting to converge.

However, agreeing on the mechanisms doesn't always lead to CO2 reductions. You can fiddle the baselines, caps and credits so that the same system can produce both a huge reduction in carbon, or happily oversee a dramatic increase. "The problems come when applying the schemes in practise". (Climate Institute)

Australia will ultimately need a price on carbon, supported both parties and which gives a bit of certainty to industries wanting to trade in the carbon market.

ALP policy

- The ALP policy is currently to end up with an ETS.
- An ETS sells a limited number of permits to pollute and can restrict the permits numbers to a CO2 target.
- a factory has to hold permits to cover all their emissions
- They can increase emissions only if they buy more permits in a carbon credit market.
- The ALP will allow permits to be bought overseas from people who have created credits elsewhere, like forest owners.
- People no longer needing permits can sell them at a profit. The idea is that a factory will use better machines and processes so they can sell excess permits and make money.
- It gets more costly to buy permits if they are in short supply, this will encourage switching to low CO2 technology earlier. The government can buy back permits to slowly increase carbon reductions.
- It doesn't involve huge inputs of public money to get it working.
- The costs will most probably get passed on, so consumers will get a price signal when buying goods with big CO2 footprints, and perhaps use less as a result, or perhaps vote the government out of existence.

- They will start with a simple, temporary 'baseline and credit' scheme for most polluters that will morph into a more stringent ETS for most of the economy except electricity.
- They already exist in Europe, California, NZ. The US also has a similar system for acid rain and nitrogen oxide emissions.

The critics,

"An ETS is only as effective as the price and clearly we are not going to achieve a high enough price where an ETS alone will drive the transition that is necessary." (Senator Di Natale. The Greens). "The low carbon price expected, and the heavy reliance on international permits will severely limit the amount of revenue from carbon pricing for some years. This denies the government a potential revenue source to fund other climate action". Alan Pears, Senior Industry Fellow, RMIT

Another disadvantage of the ALP proposals is that, as they didn't get elected, it is a long wait before a Labor ETS could be up and running. Then again, next week we could have a new government.

LNP Policy

- The LNP government's Emission Reduction Fund (ERF) is a type of baseline and credit scheme.
- A baseline is set for each industries emissions
- It is nearly always set at current emissions meaning that the scheme produce slow changes only, and this is what has happened in Australia too.
- The LNP have been buying carbon savings from carbon-reducing projects in their initial 'auction' scheme, but that will change.
- the "safeguard mechanism" started on 1 July 2016, which involves regulations requiring Australia's largest emitters to keep emissions within their baseline levels.

- Any credits created can be bought by polluters affected by a CO2 restriction
- The safeguard mechanism will apply to direct large emitters (emissions above 100,000 t CO₂-e). This will cover around half of Australia's emissions.

To make it more saleable the government will,

- Allow similar baselines for new investments at existing facilities or at new facilities.
- A facility can exceed its baseline in one year, so long as average emissions over two or three years meet the baseline.
- exceptional circumstances can be taken into account, such as a natural disaster or criminal activity.
- There will be a range of "discretionary, graduated enforcement options" that the Clean Energy Regulator will be able to apply to deter non-compliance. Which sounds like there will be a lot of explanation and not much litigation (to a degree that is normal with all laws).

I sense that this LNP carbon reduction system intends to give an economy a 'soft landing'. It is slow-acting, "Big polluters suffer no particular pressure and there is often a weak price signal to consumers". It is also more costly to administer each activity and it is more open to rorting (Climate Institute).



RepuTex estimates that only 85 facilities, run by 30 companies, that will exceed their historical baselines. "It is unlikely any of Australia's current top 20 emitting facilities (which includes a number of electricity generators) will face penalties under the Safeguard Mechanism, even with forecasted increases to their



CO2 emissions over the next decade". For example, "...due to the increased threshold for baseline setting, it is unlikely that many waste facilities will be subject to the Safeguard Mechanism in the short term". This seems inadequate, although I am aware of one that will be and that isn't so large.

There will be a review of the Government's Direct Action Plan commencing 30 June 2017, with a final report by 15 November 2017. The Government will review the

effectiveness of the Safeguard Mechanism, as well as the prospects for allowing purchase of overseas credits.

Reputex states, "Given Australia's intention to reduce emissions by 26-28% below 2005 levels by 2030, there is the possibility that the Safeguard Mechanism could be tightened - imposing more stringent and decreasing baselines on designated large facilities. This could ultimately result in the scheme operating as an effective baseline-credit trading scheme in the future." [my emphasis]

Greens Policy

The system the Greens intend to use to effect a carbon price isn't well detailed in my view and there seems to be more emphasis on specific measures like taxes on coal, and promoting home electricity generation (they have a 90% renewable electricity target by 2030). Their renewable energy strategy is at least a little better spelled out. Big renewable targets have been rolled out by the ALP too (50% by 2030) with no real detail on "how".

After the "carbon tax", electricity prices have become politically hyper-sensitive, but they must form a large part of the answer, "In Australia, emissions from energy make up 75% and agriculture 15% of total greenhouse gas emissions, so climate

policy should be primarily about reducing the combustion of fossil fuels". (Molyneaux et al, UQ)

Concluding remarks

It seems we are running out of time for pussy-footing around and too soft a landing. Leaving it any longer just makes the climate impacts, and the impacts of the system needed to correct it, disproportionately more severe. As a big polluter we have to at least keep pace with, but preferably push, the international policy agenda.

Then again, there is no reason why the current government's policy can't be made tougher, although I confess that sounds a little naïve perhaps. As the only scheme with conservative support, it might be the imperfect 'bipartisan' solution we end up with after a bit more wrangling. The oldies might remember the saying that 'only Nixon could go to China'. Maybe only conservatives can get away with a policy as suspiciously left-sounding as CO2 reduction?

Conservatives are not strangers to radical market-based policies. The moderates get the concept of climate change creating future economic risks. Pricing in the cost of a CO2 impact can logically be reflected in changing the 'true' price of a product. This is a form of radicalism they could embrace if we can break the social deadlock that stymies everything presently. There is a mental association in the 'dry right' that action on CO2 = pandering to bleating chardonnay-swilling urban greenies that they hate. However, it is a sideshow. That passion won't make the atmospheric CO2 concentration go down one jot. The future of the planet depends on these 'uncompromising voices' being smothered out of the debate by practical solutions.



Ocean Habitats – Estuaries

www.duadepaton.com



Estuaries are water bodies in some way affected by the mixing of salt and fresh water.

In the upper reaches of a river this influence can be minimal but as the river water flows downstream it encounters a denser layer of salt water and it begins to flow over the top of it. This is the "salt wedge" and this mixing zone will move up and down a river depending on rainfall and the tides. A swimmer or diver can see this layer called a halocline and it appears as a shimmer effect near the surface.

Estuaries and lagoons are by definition mainly about salinity and this physical feature has a lot to do with deciding the biodiversity of an estuary. The ocean has salinity measured at about 35 grams per litre, but a few marine animals have adapted to low salinity and can cope with 25 g/L, provided that the water

temperature is moderate. Some more primitive animals like mussels can survive in 5g/L. Plants are primarily affected by available sunlight, so areas of cloudy water represent the major challenges.

Rich blooms of plankton can attract fish, but if they bloom in great numbers as the nutrient levels and temperature rise, it can cause summer fish kills. This low oxygen environment means the algae can also be dominated by toxic blue green algae, this irritates the skin of swimmers and poisons marine life.

Although Australian estuaries are flushed by relatively small rivers by world standards, these estuaries are still charged with nutrients washing from the land and they support a huge range of biodiversity. Even small coastal lagoons without major rivers tend to accumulate vegetation debris and the sediments they create cause mangroves and salt marsh to sprout on what otherwise might be barren sand.

In coastal lagoons and lakes the freshwater outflows are unpredictable. Smaller creeks entering the sea near a sandy beach often have insufficient outflows of fresh water to keep pace with the accumulation of sand. The mouth becomes blocked and the water body becomes less saline, or in the case of smaller bodies in arid areas, even more saline as the water evaporates. Decaying matter can deoxygenate a smaller lagoon and a burning sun can raise the temperature causing algal blooms and cyclical fish kills.

The largest estuaries are drowned river valleys flooded by changing sea levels 7000 years ago, when sea levels rose by as much as 150 metres. They flooded the coastline, leaving behind deep offshore submerged canyons and shallower coastal estuaries. The flooding created a mix of landscapes behind, so some of the larger estuaries are surrounded by a complex set of waterways, embayments, mudflats, sandbanks islands and sheltered embayments. Sydney Harbour, Moreton Bay, and the Derwent are noted for this.



They have complex habitats to brackish and muddy bottoms, mudflats, rocky shores and eventually, the coarse sands and saline waters of the ocean as the river reaches the sea. Port Phillip Bay was also created by the flooding of the Yarra valley but the water spread out across a flat plain surrounding the river and gradually filled it with silt over a huge

area. The water body is so large that the salinity rarely varies from the open sea. The inflows and the outflows were enough to keep the river mouth and channel open through the narrow gorge that we now call the Rip. This is a coastal embayment, noted for having animals similar to the open sea inside a sheltered lagoon. The bottom is mostly sand near the sea and more nutrient laden sediments lie in the back of the bay where the flushing effect of the tide is weakest.

The Swan estuary is another example of a permanently open barrier estuary. However, its shallow sand bar has long since been removed by mechanical dredging and it behaves now more like a sheltered embayment. In the Blackwood River WA the river changes seasonally and turns it into a freshwater river in winter, but it totally dries out in summer and becomes the same salinity as the sea. This creates very challenging conditions for species trying to live there year round.



Other bodies that can close up for long periods and become saline coastal lagoons include Lake Conjola in NSW and the Peel Harvey estuary in WA. Chances are there is a smaller closed lagoon near your favourite beach spot. Sea grass beds and salt marsh forms in these shallow lagoons and they then attract bird life and fish.

After a long dry spell a wide range of species get established, but floods tend to change all this. They flush the narrower sections of river systems of pollutants and anoxic waters. The animals right down to the plankton head for the seabed where they hope to find refuge from the rush of fresh water at the surface. Most are swept away or killed by the low salinity. The species evolved to live in estuaries will breed quickly and survive in enough numbers to quickly repopulate the riverbanks. A pulse of nutrient-laden water out of the rivers is a bonanza for marine animals waiting offshore for just such an easy feed. The species more mobile animals adapted to high salinity quickly swim back into the rivers.

Basically, no two estuaries or lagoons are the same and even within the estuaries there are very substantial changes in the environment that provide many micro habitats for a range of species.



Larger estuaries are particularly popular places for human development. Estuaries often have access to fresh water, deep navigable channels for shipping and good protection from the weather. They were early focal points for European settlement. They have often become urbanised and industrialised, often with negative impacts for the environment. Places like Sydney Harbour and the Derwent are heavily modified by human behaviour.

Excessive nutrient in waterways is a common problem after rainfall events, especially in areas where humans are fertilising fields and discharging sewerage into restricted waterways. Even the rainwater off our roads has enough oil and other nutrient particles in it to smother the area around outfall pipes with

smelly algae. Bacteria can still thrive in very adverse conditions and loves these nutrients, but it strips oxygen from the water as it eats, killing other marine life.

Land clearing has also increased sediments loads, swamping popular riverside beaches and rocky foreshores with sediment. These mud banks are often laced with pollutants including a legacy of heavy metals from our unregulated industrial plants of the 1960s and 70s.



As a consequence of these changes large areas of our major estuaries are smothered in mats of anoxic and contaminated sediments that support little life other than a few relatively primitive worms and other simple invertebrates. the sludge can be seen on the riverbanks of places like the Derwent above the Tasman Bridge, the backwaters and rivers feeding Sydney harbour, and in upper Port Phillip Bay around the mouth of the Yarra.

We can also love smaller lagoons to death. Soon people build homes near placid lagoons with soothing views of trees and bird life. They clear the trees, pollute the water and begin to complain when lengthy sanding up of the lagoon mouth which naturally causes closure of waterways, bad smells and cyclical fish kills. The end result is that even some small lagoons get artificially manipulated by humans.

Due to natural factors and human disturbance, at any time there may be unoccupied 'niches' awaiting exploitation. As sea levels rise and fall quite quickly in a geological time scale, estuaries are often dried out or drowned every 10000 years, not enough time for a full range of species to develop that are well adapted to these fluctuating conditions. There is generally an ecological niche somewhere that can be filled by a new species.



Large ocean going vessels dock in the harbours and discharge ballast water. These contain exotic species and at least 150 species have now become established in Australia. Because local predators are not adapted to deal with them, the end result is often a population

explosion that strips the bottom of many native species. A survey of the Derwent at Lindisfarne found NO native animals in its transects, all were imported species from the northern hemisphere. Pacific sea stars have denuded the bottom of invertebrates and affected the survival of the endemic spotted hand fish.

The introduction of live oysters from New Zealand in the 1900s probably saw an end to the Derwent sea star, when the NZ cushion star larvae was also imported in the crates.

Although estuaries tend to have low species numbers the quantity of life is exceptional, 3 grams of plankton is produced in

a square metre of sea water, only mangroves, forests and grassy paddocks produce more (4 grams). It will support three times the invertebrates of an open coast and ten times the quantity of fish. Some fish species are totally dependent on estuarine waters for part of their lifecycle and would die completely without access to estuaries for their eggs and larvae. Estuary dependant fish are estimate to make up 60% of the NSW fish catch by weight. This also attracts birds to shallow mudflats and there is so much food that many species migrate to southern Tasmania from as far away as the Bering Straits in the northern hemisphere, just to take advantage of this bounty.



AIMS Report on the State of the GBR



The Australian Institute of Marine Science have been monitoring the state of the Reef, and the Reef has been in serious decline.

This is most clearly demonstrated by the loss of half the coral cover since 1985. We know this from 2,258 reef surveys covering 214 reefs over a 27 year sampling period.

The known causes of the observed decline in coral cover since 1985 were storm damage (48%), crown-of-thorns starfish (42%), and bleaching (10%) from extended periods of increased sea temperature. The Reef has been impacted by an unusually high number of severe storms over the past decade. Other impacts, like dredging, are not well understood.

Some reefs are doing better, some are doing worse, and coral reefs go through cycles of disturbance and recovery. But the general trend over the past three decades shows that coral

cover, the number of juvenile corals, and other important processes for coral reefs such as calcification, have been decreasing.

The rate of growth of Porites coral (measured by calcification) declined by 11 per cent between 1990 and 2005, a slowdown not repeated in at least the past 400 years of coral core records. The recent slowing of coral growth rates has also been reported for several other reef locations around the world, likely to be due to warming seas. Laboratory experiments indicate that future declines in calcification will be driven by ocean warming and acidification.

A new outbreak of crown-of-thorns is developing now (mid 2015). The reefs between Cairns and Cooktown are currently carrying millions of adult crown-of-thorns. Water quality is the number one suspect for crown-of-thorns starfish outbreaks, the availability of more nutrients increases the amount of plankton for the larvae of crown-of-thorns to feed on. Flood events are more frequent, more extreme, and they're impacting on the mid-shelf reefs. The frequency of large river floods affecting the central Great Barrier Reef (GBR) has increased since the late 19th century. High flow events are now occurring on average every six years (1948-2011), compared with every 20 years in the period 1748-1847.

Rising carbon dioxide in the atmosphere will lead to ocean acidification and other changes in the seawater chemistry. Such acidification can reduce coral calcification and



growth, and lead to a decline in coral diversity. Fish behaviour and mortality is also affected in some species. Ocean acidification may also encourage the growth of seaweeds, which compete for space with corals. The growth of seagrasses also benefits from ocean acidification.

As the data is still being collated, this report doesn't incorporate the consequences of the massive warming event in the summer of 2015/16. It appears that coral mortality in the reefs of the previously remote and pristine far northern reefs may approach 50%, and not just in the shallows.

Inner reefs have shown some recovery, perhaps due to low rainfall and recovery from Cyclone Yasi. In the past two years, coral decline on the inner Reef has paused but its condition is still 'poor'. In a parallel study, James Cook University researchers found that inshore seagrass has started to recover. These results may indicate that land management changes are working. Historically the focus on monitoring on the Reef was on the mid- and outer-reef systems so we know less about changes on the inner-reefs and their causes.

The Great Barrier Reef can recover - given time and a reduction in the cumulative impacts of cyclones, acidification, crown-of-thorns, hotter oceans, etc. Coral cover on the Reef could recover on average by nearly three per cent a year. Reefs with tabulate (plate-forming) Acropora corals recover faster from storm damage than massive corals. But they're also more vulnerable to damage. The recovery potential of the Reef in the future will depend on many things, but the speeding up of damaging processes due to climate change impacts must ring alarm bells. I can foresee the reef-based resorts shrinking and retreating southwards, following a front of declining coral cover, with visitors travelling ever further and searching harder to see that isolated spot of 'pristine' coral. Bad news for Cairns, good news for Townsville, then 20 years later Gladstone, after that there is no GBR.

Bleaching affects Isolated Coral Sea Reefs

Scientists say the effect of coral bleaching in the Coral Sea is similar to that recently experienced in the Great Barrier Reef.

The ARC Centre of Excellence for Coral Reef Studies spent the past month surveying coral bleaching at 21 sites across seven reefs in the Coral Sea Commonwealth Marine Reserve. These included Saumarez, Wreck, and Kenn (southern reefs) and Mellish, Coringa-Herald, Lihou and Holmes (central reefs).

While all central reefs assessed showed degrees of stress not all coral colonies within those reefs were affected. Preliminary advice suggests between 10-35 per cent of the Central reefs have been heavily impacted.

At Mellish Reef in the far east, coral bleaching was observed on 45% of corals surveyed and of those <10% were fully bleached or dead. At Lihou Reef in the middle of the Coral Sea Commonwealth Marine Reserve, approximately 60% of corals were bleached and of those 20% were fully bleached and 10% dead. At Coringa Herald, in the same area, approximately 70% of corals were bleached, and of those 35% were totally bleached and 20% dead.

Holmes Reef, the most northern of the reefs surveyed, is also on the itinerary of many liveaboard dive expeditions from Cairns. Almost 80% of corals show some sign of bleaching, and of those 40% were fully bleached and 25% dead. It lies approximately 200 km east from some of the worst affected reefs of the Great Barrier Reef.

There was a clear north - south gradient in the severity of bleaching across these reefs which is similar to what has been reported in the Great Barrier Reef. The reefs in the southern section were unaffected by coral bleaching.

Shark drum lines installed off Perth to protect LNP Government

OK, that headline is 'race to the bottom' cheeky. Another fatal attack has reignited the debate over WA shark culls, as WA's spate of anomalous shark attacks continues.

Sixty-one shark sightings of varied species were made in one month between Mettams Pool and Watermans Bay along a two-kilometre stretch of the coastline.

The Department of Fisheries has installed drum lines off the coast of Trigg following another fatal attack, and news of these numerous shark sightings.

Is that the answer? Obviously not. The solution is to find out why it is occurring, as it is a statistical impossibility that this many attacks occur only because there are too many sharks.

Drum lines are only a public confidence measure as, even if you support a shark cull, they have proved ineffective at catching the 'problem' great whites.

With Labor closing in on the divided State LNP government to the sound of "Jaws" music [OK that's also a cheap shot] carnivorous fish are growing into a giant political issue.

ALP fisheries spokesman Dave Kelly said the drum lines were a pointless waste of time and money. "If the beach has been closed there is no threat to public safety, so what is the point of wasting money deploying drum lines?" he told the ABC. "There's no evidence that the drum lines make our beaches safe so why waste time and money?"

You're just not getting it. Drum lines can offer the quick gratifying image of the 'murderous' fish hoisted up at the wharf in retribution. Conducting painstaking research, to find the real solution, can't get you the same political 'kill'.

Neville Coleman Honoured

The vast size of the Great Barrier Reef is summed up by fact that a large number of reefs are still only known by their number. The life of underwater explorer, publisher and educator, Neville Coleman OAM is being celebrated with a reef being named in his honour. Neville passed away in 2012.



Great Barrier Reef Marine Park Authority Chairman Dr Russell Reichelt said, "Recognising a gap in science at the time, Neville collected live marine animals he found so future scientists could identify living marine animals without killing them.

"He discovered more than 450 new ocean species and travelled 64,000 kilometres around the Australian coast observing, recording, photographing and collecting thousands of marine creatures. "Following this work with the Australian Coastal Marine Expedition, Coleman later established the Australasian Marine Photographic Index and catalogued more than 12,000 species.

Photographer, author and friend Nigel Marsh put forth the reef naming nomination, "Neville first dived on the Great Barrier Reef in the 1960s, and during his lifetime explored all parts of the Marine Park during thousands of dives."

"I decided on Reef 20-389 as I had dived this large reef, found in the Pompey Complex, and it was also very rare, being the location of a spectacular blue hole, one of just four blue holes known to exist on the entire Great Barrier Reef." The newly named Neville Coleman Reef, reef number 20-389, is approximately 235 kilometres east of Mackay.

Stay the course says Premier - setbacks for new shark defences



There is no magic bullet for NSW north coast shark attacks.

A shark eco-barrier trial at Lighthouse Beach was scrapped in

August due to ongoing rough conditions. A similar but smaller enclosure with a slightly different design, off nearby Seven Mile Beach at Lennox Head, was also declared unworkable.

The trial was announced last year as part of a \$16 million State Government package in response to a spate of shark attacks in the region. The State Government has also installed listening stations along the NSW coast which monitor the movement of sharks and tweet warnings to beachgoers. A drone is being used to track sharks on the NSW north coast at Coffs Harbour.

High-tech drum lines using GPS buoys to alert monitoring staff when sharks have been hooked will be deployed, so sharks can be tagged and released in a different area. It is said that the high-tech drum lines are more humane than the traditional lines that have



been used in Queensland and Western Australia. "They're like a baited hook that has technology connected to it so when the bait is taken, a message is sent to our vessels and they'll attend those lines immediately,"

Premier Mike Baird said the Government's approach was based on science, not emotion. "The experts have told us these are the technologies that have the potential to lead to a long-term solution to keep our beaches safe and minimise the impact on marine life."

Since then, there has been a fourth serious shark attack along the one-kilometre stretch of beach at Ballina in less than two years. A 17-year-old surfer was bitten on the upper-thigh while surfing at Lighthouse Beach. "There has been [a] sighting of a great white, a four-metre shark, further off the shore but no-one actually saw which shark it was that's bitten him,"

NSW Premier Mike Baird said "We need to continue to do exactly what we're doing and that is a whole range of technologies we are trialling".

"There is already drone technology that is working ... and we'll look to get that there which will provide increased surveillance. "We can't guarantee, clearly, at any beach, that people will be safe. But, we'll do everything we can to ensure that we do that."

Ballina Mayor David Wright said he hoped the attack would not impact on tourism and called for a 4G shark listening station to be installed at the beach.

"We'll also be asking for the towers to give that warning and it will come up on the [listening station] it will flash on the headlands."



GBR coral bleaching impacts tourism

Continued coral bleaching on the Great Barrier Reef could see international and domestic visitors to the region plummet by more than a million people a year.

Research by the Australia Institute warns 10,000 jobs and \$1 billion in tourism income could be at risk. The institute surveyed more than 3,000 Chinese, US and UK visitors, as well as 1,400 domestic tourists. The Great Barrier Reef and the Sydney Harbour Bridge were their top Australian tourist attractions.

One of the survey questions asked "If the Great Barrier Reef continues to experience severe bleaching and some of the reef dies completely, would you be more likely to choose an alternative holiday destination?" More than one-third of Americans answered yes, as did 27 per cent of UK tourists and 55 per cent of Chinese.



"Across those three countries there are 175,000 tourists who risk not coming to Australia at all if the reef continues to be bleached," the Australia Institute's executive director Ben Oquist

said. The research states that nearly 900,000 Australian tourists would most likely choose somewhere else to visit if the reef continues to experience bleaching.

In addition to the severe damage north of Lizard Island. Bleaching has damaged selected reefs further south. One reef off Townsville is severely damaged, while two tourist reefs off Cairns, Hastings and Saxon Reefs, are also severely damaged. Adverse publicity has scared some people off visiting the still large acreage of healthy reefs that remain.



John Rumney has been running reef tours off far north Queensland for 40 years, "As soon as the reef passes that critical point, that tipping point, and we don't have something nice to show people, they'll stop coming."



Sydney Harbour reefs recover from coral bleaching

Source UTS



Marine scientists say coral that was damaged by a bleaching event in Sydney Harbour earlier this year are "starting to show good signs of recovery".

For the past 12 months a team of marine scientists has

been examining the little known coral reefs of Sydney to try and understand more about coral survival. Coral bleaching was discovered in Sydney Harbour for what is believed to be the first time.

Marine biologists found up to 45 per cent of corals at certain sites were bleached. "It's kind of constricted to the upper surface of boulders which to us tells us it's a combination of high light levels and also bleaching, so maybe we had some clean water that came through at the same time.

The team from the University of Technology in Sydney (UTS) and Macquarie University believed above-average sea temperatures caused by an El Nino weather event caused the damage.

"This is the first time, to our knowledge, there has been such an event in Sydney Harbour, so we monitored that and now we are at the point the corals are starting to show good signs of recovery". Ms Goyen said the research could "teach us a lot about coral resilience and coral survival into the future with a changing climate".

Ms Goyen is hoping the information could help to inform scientists about other reefs elsewhere, as they work to understand what enabled the reef to recover.



Before and after

Big Thinking on Climate Change –Do we need it?

I have been ear-bashing anyone who will listen, about an ETS. Instead, I have heard a huge collection of alternative ideas, some really very sexy and exciting.

Making the incredible assumption that anyone reads this magazine, and also taking the liberty of presuming that you now understand the urgency of the issue, I thought you might want to do something about CO2 right now? Maybe not.

1. Let's wait for the second coming

I had the genuine pleasure of talking to a very positive man who attempted to force me to read the biography of a noted environmental entrepreneur. Whenever I probed him about issues he referred me to the book and said "he will fix it". If relying on the Bible instead, read about Pontius Pilate. When a decision was a bit hard he washed his hands of it too.

2. Blue Sky thinking – the weather is lovely

OK, so the human population has crashed and we have reverted to cannibalism, but the gamefishing below 40 degrees south has improved out of sight, and the cobia really love the new shelter offered by those flooded libraries and art galleries. A fishing magazine recently reported that the East Australian Current (EAC) has strengthened by 20 per cent over the past 50 years and is likely to strengthen by another 20 per cent by 2100, "...resulting in more warm water subtropical species in parts of Victoria and improved prospects for offshore recreational fishing". And I was worried! Another variation is "well I like the warmer winters" [thanks Dave].

3. Escape to Utopia - The Star Trek solution

A very knowledgeable fellow said that humans would survive by blasting off and settling other planets. Nice idea but my stepdaughter and her children want a solution that saves their

lives NOW. A *Dr Strangelove*-like variation is waiting it out in a bunker stocked with booze and beautiful women. We do understand that Star Trek was an escapist utopian fantasy, right?

4. The political system is to blame

Where did capitalism come from? Apparently it's an easily knocked over social anomaly. Just with persuasion, and within the next 5 years, we will abandon our plasma TV, reject greed and live in harmony with Gai. Just show Donald Trump the benefits of recycling and the world will be saved. We will drive our cars to the recycling meeting though won't we? One problem with finding solutions to climate change as an URGENT issue, is to stop people from loading it up with broader criticisms about humans and their society. The ambulance has a flat tyre, fix the tyre now, don't waste time trying to reform Ford.

5. The ostrich approach

I won't comment in detail, we have heard it all before SOOOOO many times. Apparently it's not really happening, properly trained people have it all wrong and your illiterate hillbilly Uncle Kev has all the answers. I understand why people are distrustful of elites, and the far right wants to exploit that diffidence politically. However, this b*****t has been going on for way too long. Giving an extremist mug a microphone is not balanced reporting of 'both sides of the issue'. It's happening!

6. The Chinese did it

Another blame-shifting strategy. Apparently if only the Chinese had refused to make fridges and washing machines for us, and agreed to live in interminable poverty, none of this would have happened. A lot of CO2 emissions in China are a problem we exported with the industrial activity we use to do here. Incidentally the Chinese are currently at the forefront of trying to address the issue. Prior to that Australia was the world leader in CO2 treaty obfuscation, and now Donald Trump wants to rip up the Paris Accord, effectively our last hope.

7. Hip pocket nerves - I was keen but then I got the power bill.

The bill from a collapsing world ecosystem will make the extra 2 per cent per kwh look like child's play. Many people have good reason to be fearful about their immediate needs, but its short term thinking. Fixing climate change is every family's immediate problem. I reckon you remember the carbon tax. But do you also remember the large compensation package that came with it and was more than the price increases for the average Joe or Jane? I doubt it. The silly thing is that you can ask to have your cake and eat it too. A climate change regime can be made to be soft on the budgets of the cash-strapped, if you demand it.

8. The combo – It's business as usual

Why have one excuse when we can use them all. Because other people hold these unhelpful ideas, it's hopeless. We can just go back to day to day things, including wondering if Pauline Hanson's rights (rather than her facts) are being patiently considered.

Actually, you don't have to stop feeding the children and picket Parliament. The solutions are out there and are practical. Reading a news service occasionally, ticking a box in a polling booth or survey once every few years, and talking to your friends about the issue at a BBQ is enough if you don't want to do more.

I know first hand that many of our politicians are terrified of every small mum and dad protestor, which is the way it should be. Our political elites are not scheming, deaf and indifferent egomaniacs. They are often scheming, sycophantic and nervous egomaniacs. Any threat to all that 'glory', acclaim and the chauffeured Comcar is taken very seriously indeed. If you want a climate change system you only have to ask (well complain and complain again actually). Being in a big group of Mr and Mrs Averages, especially with a logical and sustained message, really scares them.

A Working Low-emissions utopian society

I have worked out a way that we could copy an existing model society that would meet all of your varied requirements for action on CO2, a low carbon footprint, a Messianic leader, non-capitalist, denialist, blame-shifting, with rockets, and an out of this world experience...North Korea.

North Korea is about the only country to have met all of its CO2 targets, if you ignore the huge coal exports (that is easily enough done if you switch a few figures, just like an election result). There is absolutely no dissent there on the issue of climate change, or any other issue for that matter.



North Korea "aims to reduce CO2 emission by 37.4 percent by 2020", but I have my doubts about how this is to be achieved unless the glorious leader is going to agree to turn off a bedroom light or two. He'll never agree so they might as well keep on with business as usual?

The leader also advocates replanting all of the hillsides with trees to turn Korea into a "mountain of gold", and they might as well after all the crops failed.

If you are in need of morale boosting leadership how about some of these speeches, "*The year 2015 was a year of gigantic struggle recorded with significant events and eye-opening*

successes and a year of victory and glory that strikingly demonstrated the dignity and might of socialist Korea".

Without capitalism (except at the party member-only stores), we are told that North Korea is the envy of the world with the highest quality of life, while South Korea is poor and ruled by nasty American invaders. The annual income of a North Korean is a whole \$1800. Think of how many wheat bags that could buy, if only there was wheat to buy.

North Korea would very much like to send away a rocket, and start to terraform far off lands. In particular, they want to make Tokyo look more like revolutionary North Korea.



My idea is not to mock your ideas, but to ask you to indulge in the long-term ones after the crisis is over. For now, we need to get our heads around reigning in CO2 emissions, by switching away from high emission technology in a way that doesn't cause a crash in the world economy and widespread misery. This could be done effectively by an ETS or some other measures if we act urgently. It may be difficult to comprehend, and a bit boring sounding, but boring is what is needed.



You can still have your revolution, but can you please do it later?

Come up with any scheme you like to get the girls but a boring and incomprehensible global emissions scheme can get the planet back on track.

Radio National's nudibranch competition a hit



In conjunction with the Western Australian Museum, ABC RN asked the public to name a species of nudibranch first discovered off the coast of Exmouth.

It has been named *Moridilla fifo*, in honour of the state's mine workers.

It was an interesting idea that attracted public attention to an otherwise little known marine animal.

The nudibranch has the amazing ability to move cells around its body to work in different places.

It gets the cells by eating Cnidaria animals, including jellyfish, which have stinging cells.

The nudibranch absorbs the useful stinging cells, which then move through the body to the end of its cerata.

The nudibranch essentially deploys the defensive worker cells of its prey to where they are useful.

The competition's winner was Patrick Dwyer of NSW.

Errr yuk, slugs! Like a lot of things in the sea, if you take a closer look, a strange and fascinating beauty and complexity is revealed.

Blinded by the light – Turtle hatchlings struggle

Source Coolum Coastcare, AIMS, Photo R. Ashdown
<http://ashdown4628.clients.cmdwebsites.com/blog/?p=999>



Lights of Bargara compete with starlight, at Mon Repos QLD

Numerous studies have shown that artificial lights negatively impact on turtles, both female adults as they come to and go from their home beach to lay eggs, and to turtle hatchlings as they seek out the way to the open ocean.

Nesting numbers have been shown to decline on beaches which are more brightly lit, and bright lights at nesting sites can disrupt the ocean-finding behaviour of both adult females and hatchlings.

The impact on the turtles is not the lights themselves, but the effect it has of confusing turtles as to where the ocean horizon is, because the glow of the horizon is less intense than the closer and brighter lights. Female adults returning to the ocean and hatchlings head towards the stronger glow from lights on streets and buildings. Illumination from up to three kilometres away can disrupt ocean-finding behaviour. Heavy cloud cover and salt spray exacerbate the light glow.

Historically, turtles bred all along the Queensland coast, but development has led to major reduction of the breeding range. Monitoring of turtle breeding on the Sunshine Coast since 2005 has records of Loggerhead and Green turtles nesting from Caloundra to Noosa, mostly on dark stretches of beach. Recently, volunteers have observed lower nesting numbers on the southern Sunshine Coast at Shelly Beach near Caloundra, coinciding with more lighting from dwellings there.

Further north, Mon Repos beach near Bundaberg has the highest intensity of turtle breeding in SEQ. In 2014 trials were carried out using 40W (the lowest possible wattage) amber LED streetlights on a trailer, without a moon. In every case, hatchlings headed towards the light. Other tests, using plates to reduce sideways spillage from lights, still had some effect. Even more worrying was the discovery that hatchlings, having struggled through the shallow water to get beyond the waves, could still be influenced to turn around and head back to the shore if they see a glow in the distance that resembles the oceanic horizon.

At Mon Repos, street lights have been replaced by reflective markers on roads and signs, LED lights are embedded in the roads, advertising lights and light from businesses are turned off after a certain time, to ensure that maximum darkness greets emerging hatchlings. Lighting in residences, especially in highrise structures, would need to be controlled after sunset. Such restrictions would be difficult to enforce.



Light pollution may affect the survival of wild sea turtle hatchlings even after their dispersal from their hatching beaches. Using the latest micro-technology, scientists from the Australian Institute of Marine Science (AIMS) tracked the dispersal of green turtle hatchlings (*Chelonia mydas*) once they reach the water nearshore waters.

The movements of turtle hatchlings were tracked off Ningaloo Reef in Western Australia with miniature tracking devices in nearshore waters. The hatchling movements were also compared with measured ocean current patterns.

The study results, published in the journal *Royal Society Open Science* reveal that 90% of the tracked hatchlings swam towards an artificial light and spent 23% more time in the area close to shore than the hatchlings tracked without lights present.

“So, not only were the sea turtle hatchlings attracted to the light, but they also lingered longer in predator-rich nearshore waters. These changes in behaviour would subject the hatchlings to greater risk of death from predation,” explains Dr Thums.

The results have implications both for existing and future industrial developments near hatching beaches of marine turtles.



*Releasing a green turtle hatchling at Ningaloo with a tracking device attached.
Image: J.Costa*

GBR marine reserves protect more than just fish

The Australian Institute of Marine Science have shown that the reefs inside no-take marine reserves are better able to resist and recover from disturbances.

The research team examined 20 years of data from 20 reefs inside no-take zones and 26 reefs that are open to fishing and other extractive activities on the GBR. They investigated the impact of coral bleaching, coral-eating starfish outbreaks, storms and coral disease on these reefs, and how fast the reefs were able to bounce back after these disturbances.

“We found that reef communities, such as fish and corals, in no-take zones were less impacted by disturbance and recovered faster than outside no-take zones,” explains study lead author, Dr Camille Mellin. “For example, after a crown-of-thorns starfish outbreak it took nearly nine years for the coral community on reefs outside no-take zones to recover, but just over six years inside no-take zones.”

“Rapid recovery times are critically important, especially when the GBR is faced with so many different threats, but equally important is our finding that reefs inside no-take zones actually fared better during the disturbances, on average the magnitude of impacts was 30 per cent lower.”

Although there is more work to be done, the researchers believe that one reason for reefs inside no-take zones being able to cope better with disturbances is their ability to preserve and promote a wider range of important ecological functions. Where the abundances of some species are reduced outside of protected areas by fishing, some of these functions could be lost.

“The Great Barrier Reef Marine Park was rezoned in 2004 to increase the area of no-take zones from less than five per cent to cover 33 per cent of the park providing a very high level of

protection compared to most reefs worldwide. This level of protection, as well as 30 years of monitoring spanning some 150,000 square kilometres of reef, provided us with a unique opportunity to gauge the effectiveness of this rezoning. Therefore, our conclusions also stress the utility of long term monitoring programs that provide a unique opportunity to assess the sustained benefits of protection.”



Recovering coral sprouting on dead rubble

Sydney's Unwanted WWII Fleet

The Second World War had seen the biggest naval battles in history and huge shipyards had pumped out thousands of vessels. By 1945, a few smaller vessels still used Sydney Harbour as a depot but by then Australia was a backwater with most of the big fleet action occurring closer to Japan. At wars end the world was awash with unwanted weapons of war. With scrap prices depressed most surplus vessels were simply scuttled. These relics of past dark times are increasingly accessible with the spread of new deep diving recreational technology. Many are potential dive sites. They also continue to serve, but as artificial reefs on the deep seabed.

USS Craven/HMS Lewes



USS Craven just missed the First World War and was placed in reserve in 1919 and was then decommissioned in 1922. On 12 November 1939, she was renamed **Conway** in preparation for

being recommissioned. Instead she was handed over to the desperate British in 1940 as *HMS Lewes* (G68), part of a 50 destroyer exchange in return for basing rights. She had an active war and was worn out. In 1944, she went to the Pacific as a target ship for aircraft training. She was in Sydney for VJ Day and was soon struck off and ordered to be scrapped. The hull was scuttled off Sydney on 25 May 1946.

U.S.S. "Osborne"



The U.S.S. "Osborne" is one of two Clemson class destroyer wrecks in Australia, the other being the *USS Peary* sunk at Darwin.

Osborne was launched on 23 September 1919.

Under the command of Raymond A. Spruance (later a famous WWII admiral), *Osborne* steamed from Boston in 1925 to "show the flag" on an extensive year long world cruise. *Osborne* was decommissioned 1 May 1930 and sold for scrap.

The ship was sold to Standard Fruit Company of New Orleans where she was gutted to her hull and fitted with two new deck houses and electrical plant. With the new name *Matagalpa* she was capable of carrying 25,000 banana stems between Central America and New Orleans. During World War II, the ship was taken by the Navy to resupply the Philippines, as a blockade runner. While the situation in the Philippines became desperate, the three commandeered fast banana ships were forced to stop

in Los Angeles for repair. She arrived in Honolulu on 8 May 1942, too late to relieve Corregidor.



On 26 June 1942 *Matagalpa* burned at her berth in Sydney. Over one hundred firefighters worked to unload gasoline drums and fight the fire. *Matagalpa* was not repaired and was scuttled in the "disposal area" off Sydney on 6 September 1947.

Vendetta



HMAS *Vendetta* (formerly HMS *Vendetta*) was a V class destroyer. One of 25 V class ships ordered for the Royal Navy during World War I, *Vendetta* entered service in 1917.

During World War I, *Vendetta* participated in the

Second Battle of Heligoland Bight, and operated against Bolshevik forces during the British Baltic Campaign. Most of the ship's post-war career was spent operating in the

Mediterranean.

In 1933, *Vendetta* was one of five destroyers selected for transfer to the RAN. Over the next six years, the ship was either involved in peacetime activities or was in reserve. When World War II started, she was assigned to the Mediterranean as part of the 'Scrap Iron Flotilla'. During the Greek Campaign, *Vendetta* was involved in the transportation of Allied troops to Greece, then the evacuation to Crete. After, the destroyer served with the Tobruk ferry service, and made the highest number of runs to the besieged city of Tobruk.

At the end of 1941, *Vendetta* was docked for refit in Singapore, but after the Japanese invaded, the destroyer had to be towed to safety in Australia. After the refit, *Vendetta* spent the rest of World War II operating as a troop and convoy escort around Australia and New Guinea. *Vendetta* was decommissioned in late 1945, and was scuttled off Sydney Heads in 1948.

HMAS *Kianga* was an auxiliary minesweeper operated by the Royal Australian Navy (RAN) during the Second World War. She was launched in 1922 by R. J. Lacey at Narooma. The ship operated as a coastal cargo steamer and was requisitioned by the RAN in 1941. She was not returned to her owners and was scuttled off Sydney Heads in 1946.



RHEA

This wooden 135' long barge was used by the U.S. Navy. Some sources

say she was formerly a wooden minesweeper of 260 tons. On Sept

20, 1945 she was loaded with mines and depth charges and scuttled. She is a surprise awaiting an unsuspecting deep sea trawler somewhere.

HMAS STRAHAN

HMAS *Strahan* was one of sixty Australian Minesweepers (commonly known as corvettes) built during World War II in Australian shipyards as part of the Commonwealth



Government's wartime shipbuilding programme. Twenty were built on Admiralty order but manned and commissioned by the Royal Australian Navy. Thirty-six (including *Strahan*) were built for the Royal Australian

Navy. *Strahan* commissioned at Newcastle on 14 March 1944.

Following a period of trials, *Strahan* proceeded in May 1944 to the New Guinea area where she was employed on escort and anti-submarine patrol duties.

After the war, *Strahan* went to Hong Kong where she was engaged in minesweeping and anti-piracy patrols as a unit of the 21st Minesweeping Flotilla. Whilst on patrol on 26 September she struck an old WWII mine and had to be towed into Hong Kong Harbour. *Strahan* was paid off into Reserve at Sydney on 25 January 1946. Her partly scrapped remains were scuttled on Jan.7, 1971.

Fish Farm Fights

A planned fish farm on Tasmania's East Coast is attracting protest. Tassal wants to install 28 new pens holding 800,000 fish at Okehampton Bay near Triabunna within two years.



It shows the extent to which scepticism about fish farms is growing as the operations expand. The Minister was offering to get the Marine Farming Planning Review Panel to revisit the State's marine farming plan, "Community confidence has to be maintained – we have learnt a lot from the argy-bargy around forestry through the '80s, '90s and 2000s," Mr Rockliff said. "I'm convinced [Tasmanians] .want to see this industry grow, but they want to see it grow sustainably with the appropriate checks and balances."

It sounds responsive, but environmentalists are concerned the process may just be a rubber stamp for the industry.

In my opinion, Okehampton isn't a particularly biologically unique area, or a particularly productive fishery. The foreshore area is cleared farming land and it is in an out of the way spot away from other ocean users and major tourist vistas. The farm is big, that's about it. The current research shows the site has relatively poor water exchange, meaning it will foul more quickly, but that also reduces the likely impacts as it seems to have limited biodiversity.

Hopefully, the review process might lead to a more detailed appreciation of the impacts. Then we can make a more informed judgement. Right?

Weird fishes of the NT - Nurseryfish

The male nurseryfish, carries the egg mass on a hook on his head. In the Adelaide River, there is a 7 metre difference between high tide and low tide. If the fish's eggs were on the bottom they might get covered with sediment or washed away.

This species occurs in central southern New Guinea and northern Australia. The fish that inhabits slow-moving, muddy waters. It is found most often in the brackish lower reaches of large rivers, and in coastal mangroves. In Australia it is found in the Pentecost (Western Australia), East Baines, Daly, Finnis, Adelaide, Wildman, West, South and East Alligator (Northern Territory), Leichhardt, Saxby and Norman (Queensland).



Lipstick Goby, *Eugnathogobius polylepis*

There isn't much information on this fish, but who needs it with a face like that.



A Lipstick Goby from Rapid Creek, Darwin. Source: Dave Wilson.

Migration of the Arctic Tern

Reproduced from Hunter Birding Digest No.2306

Photo Benjamin Van Doren, <https://warblings.wordpress.com>



A tiny bird from the Farne Islands off Northumberland has clocked up the longest migration ever recorded. The Arctic Tern's meandering journey to Antarctica and back saw it clock up 59,650 miles, more than twice the circumference of the

planet.

The bird, which weighs just 100 g, left its breeding grounds last July and flew down the west coast of Africa, rounded the Cape of Good Hope into the Indian Ocean and arrived in Antarctica in November. Its mammoth trek was recorded by a tiny, chewing gum sized geolocator tagged on the bird's leg to track location by recording light levels and time; the geolocator weighs 0.7 g — too little to affect its flight. 'It's really quite humbling to see these tiny birds return when you consider the huge distances they've had to travel and how they've battled to survive,' said Richard Bevan at Newcastle University, who is part of the tracking team.

The birds survive the vast journey by dipping down to the sea surface to catch fish and other food as they travel. They live in the fast lane all the time, constantly on the move, said Bevan. They have to flap all the time. It is an incredibly energetic lifestyle.

Like all migratory animals, the birds travel to take advantage of food that is available in particular seasons. Arctic Terns perform the longest migrations, but another bird, the Bar-tailed Godwit, completes its marathon from the Arctic to New Zealand in eight days straight, without stopping to feed. Whales undertake the longest mammal migrations and Leatherback Turtles and some dragonflies also travel over 15,000 km.

More than 2,000 pairs of Arctic Terns breed on the Farne Islands, where they feed on sand eels in the sea. The terns are not globally threatened but are thought to be declining in number.

Colonies in the Shetlands and Outer Hebrides have been producing far fewer chicks than normal, possibly because the sand eels are moving northwards as climate change warms the oceans. Terns are incredibly sensitive to changes in the marine environment, said Bevan. They are the classic canary of the seas.

Scientists attached tags to 29 birds and 20 are known to have returned. Some may have died or it may be that the terns do not return every year to the UK to breed. Further analysis of the data from these trackers will allow us to get a better understanding of how the Arctic Terns organise their migration and how global climate change may affect their routes, said Bevan.

Arctic Terns can live for 15 to 30 years, meaning the the record-breaking tern could fly as far as 3,000,000 km over its lifetime, the rough equivalent of four round trips to the moon. We are just scratching the surface about this bird and its capabilities, said Bevan.

Colourful Antarctic Amphipods

www.natuurwetenschappen.be

These large Antarctic species (up to 70mm long that is), live near the bottom in anything up to 500m or water and ambush small invertebrates (worms, hydroids, echinoderms, crustaceans). The picture shows one Epimeriid amphipod attacking a small brittle star. It will also scavenge for anything lying dead on the bottom. Empimerea are also then preyed on by



fish and squid

Epimeria robusta



Epimeria rubrieques



Echiniphimedia hodgsoni

Magnetic Island

Primary source, magneticisland.com.au, [Aquasearch](http://Aquasearch.com.au), Qld Govt,pleasuredivers.com.au



Magnetic Island is one of the more accessible and affordable holiday islands on the inner reef.

Its large size and close proximity to Townsville has meant that it has been heavily developed, although 70% of it is still national park. Twenty-four kilometres of tracks cater for walkers and allow visits to thickly wooded bushland, dry wattles, stunted eucalypts and moist forested valleys. The tracks, beaches and headlands are also popular with birdwatchers. The short forts walk is very popular, offering koalas, an old WWII fort and impressive views to the south. Magnetic Island is a haven for the bush stone curlew, koalas, rock wallabies, echidnas, possums

and over 187 birds. If you had to nominate a classic Magnetic Island's view, it is of a hoop pine rising above granite boulders near a picturesque beach. Some beaches are easily accessible by road, other more secluded beaches are only accessible by sea or by foot.



The island has a lot of eco attractions, playgrounds, pubs, restaurants, canoe hire and other family activities. It has been a popular budget travel destination and more recently, skyrocketing land prices have seen it slowly dotted with grander retirement homes.

Although it is near the Wet Tropics, the Townsville/Magnetic Island area is in a rain shadow which makes it the sunniest area on the Queensland coast. It never gets too hot or cold, the average maximum temperature is 28.7C with the minimum 19.5C. The beaches are idyllic, but look out for stingers in November to April (Wet season). Stinger nets are available at Picnic Bay and Horseshoe Bay.

Just 8 kilometres off-shore, Magnetic Island is a short trip across the sheltered waters of Cleveland Bay. Access is by passenger ferry and by car/passenger ferry. The passenger ferry makes up to 19 return trips daily and the car/passenger ferry up to 7 return trips daily. The permanent population of the four towns that service the island - Picnic Bay, Nelly Bay, Arcadia and Horseshoe Bay is around 2,500.



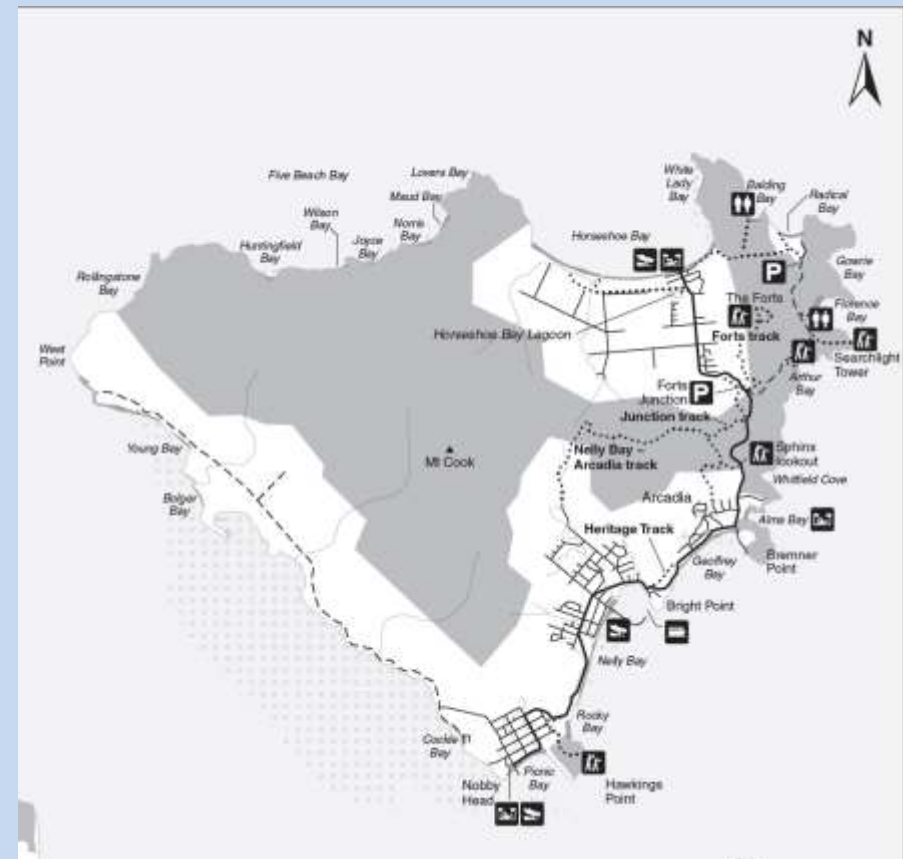


Magnetic Island is part of the Great Barrier Reef Marine Park. Fishing, diving, sailing or scenic cruises are all available from the island. The fringes of the island can be silty until you get a little way from the shore, but there is still plenty to see. Most of the shore dives are on the often sheltered eastern side of the island adjacent to the main towns. Its healthy activity only a stones throw from a coffee or cold drink. It is a popular snorkelling location with nice sites in the relaxed and idyllic bays.

There are dive shops on the island at the time of publication, mostly serving international backpackers enjoying the sun and the island's 23 beaches. The dive shops will also take you to the Yongala wreck or the GBR if you are up for a long boat ride and the weather cooperates.

Visibility is usually limited to from 5 m to 15 m depending on the weather. The water temperature ranges from between 22°C (July) and 28°C (December and January). From April to July,

there is a lot of wind and the sea can become rough. The best conditions for water activities are from August to December, although it is starting to warm up if you aren't use to the tropics.



Florence Bay

3-15 metres.



This bay offers a lovely sandy beach for the family and easy snorkelling or diving on the northern side. It lies just beneath the forts walk in an area accessible by car on an unsealed road, but still having a quiet feel to it. There are some nice coral bommies out

toward the northern point or in the centre of the bay. The rocky southern end also has a few caverns and swimthroughs. Fish life is good. It can be one of the deepest sites on the island with the best time to dive being early in the morning or in the late afternoon.

Arthur Bay snorkel

2-10 meters

Arthur Bay a favourite popular dive and snorkel site. In deeper depths there are swim throughs and caverns, bombies, coral, turtles and varied marine life. The snorkelling is best on the shallow left hand side of the bay as the reef has good coral cover.



"Platypus" (actually the "Octopus") Wreck, Arthur Bay

3 to 8 metres



The wreck is encrusted with hard corals. The huge steam boilers are still intact. Large schools of angelfish, sergeant majors, parrot fish, bat fish, trevally are common. She lies on the left hand side of the bay out towards the point in a rocky cove. She is encrusted with

hard corals and patrolled by angelfish, parrot fish and batfish. Access is from Arthur Bay or by boat. Being a fair way out she is rarely visited.

I only have one pedantic problem with this site, the wreck is called the 181 ton, 189 foot long iron dredge "Platypus" I, but this "Platypus" is on Peel Island in Moreton Bay, with the Platypus II also ashore at Tangalooma. I have a suspicion this is dredge "Octopus" that was built in 1882 by R. Smellie & Co. in the U.K. She was scuttled in an "eastern bay" in 1928 after being beached in Nelly Bay for many years (Townsville Daily Bulletin 26 March 1928).





**The Coral Gardens, Alma Bay
10 metres.**

On the northern side of the bay divers there are good corals and fish life in a relatively accessible and safe spot. Corals include large brain, staghorn and plate, as well as colourful soft corals. Fish life varies from six-banded angelfish to trevally, blue spotted lagoon rays, wobbegongs, epaulette sharks, bat fish, coral trout, box fish and nudibranchs.



**The Canyons,
Alma Bay**

10 metres.

The Canyons provide the novice or experienced diver with the opportunity to explore it's many swimthroughs and caverns. This area

provides a home for parrot fish, bat fish, surgeon fish and smaller reef fish. The lucky diver may see turtles, moray eels and unicorn fish. Blue spotted rays and goat fish can be found on the sandy bottom. Corals include stag horn, plate and brain corals as well as sea whips and anemones. A nearby dive shop makes this one of the most visited areas on the island. It is also good for a night dive.

Geoffrey Bay Snorkel Trail



Permits were granted to construct trails at Nelly Bay and at Geoffrey Bay. The Geoffrey Bay trail was installed on 14 July 2012. Swim cards (A5 size laminated) are said to be available from a number of locations on the island for \$5 each.

More recently 14 giant clams were relocated to the snorkel trails. The 27 yr. old ex-aquaculture farm giant clams are the largest species of mollusc on the planet. This site is marked by both



surface and sub-surface floats. The trail is currently in good condition but will require regular maintenance. Geoffrey Bay is easily accessible from the terminal because of a \$4 million walkway recently built here.

The Molke lies near a car ferry terminal with a wooden pylon marking the stern. A mooring buoy is also attached to the bow.



Used as a student dive, it is usually accessed from the car ferry ramp. The foreshore rocks can be tricky in full gear and you have to watch out for nearby vehicle ferry movements. It needs to be dived on a calm day at slack water as the tide will draw divers into the shipping channel. It is an excellent night dive. Guided tours are available from the local dive shops. This area can be current affected and suffer from poor visibility at times. A guided tour is a safer option.

The Moltke Wreck

8-10m



The Magnetic Island Shipwreck Trail has provided on-shore information plaques describing the history of the island's many wrecks. The most well-known and popular wreck on the island is the German barque Moltke. Built in Hamburg, Germany in 1870, the sailing vessel was named after a famous

German General. In 1890 she arrived in Townsville and was considered a very fine vessel. By 1913, she was old and obsolete and was scuttled 100 metres off the shore in Geoffrey Bay. The 50 metre long wreck is encrusted in soft and hard corals and is home to many fish including sweetlips, batfish, barramundi, blue spot lagoon rays, epaulette sharks, tropical rock lobster, blue spot tusk fish and nudibranchs.

Nelly Bay Snorkel and Dive trail

10 metres



The southern end of the bay in front of Coconuts Beach Resort offers a very easy beach entry for divers. Large porites coral and plentiful small reef fish are common.

The Nelly Bay trail (near Base Backpackers) was installed on 4 June 2012 and it has also received translocated giant clams. This is marked by both surface and sub-surface floats. It is currently in good condition but will require regular maintenance.

The bay is also an excellent site for a night dive when turtles and painted crayfish may be sighted.



Curtiss Falcon Aircraft wreck, Nelly Bay

8m



feature is the engine and propeller.

The Falcon was designed in the 1930s as a training and general purpose military aircraft. It was unwisely used by the Dutch in Indonesia as a fighter, in efforts to resist the Japanese advance

In the middle of Nelly Bay and 140m from the wreck of the "Moltke", lies the scattered remains of a Curtiss Falcon aircraft. The main remaining

during WWII. Whenever they were sent up against Japanese Zero fighters they were quickly shot down.

Later shipments were diverted to Australia and relegated to the role of a squadron "hack", doing deliveries and running messages. CW-22B Curtiss Falcon, Serial No 3771 was assigned to the 45th Service Group USAAF based in Townsville. She ditched into the sea on 5 December 1943 after the engine failed. Captain Richard Alan Sansing and his passenger were rescued from the water by the fishing boat "Manlen".



Wreck of the SS City of Adelaide, Cockle Bay



Cockle Bay has a mangrove environment, and extensive mudflats at low tide and fringed with a sandy beach. Not really a dive wreck, the abandoned hulk of the *City of Adelaide* dominates the bay and is a photogenic spot at

low tide. The *City of Adelaide* was a passenger steam ship launched on 22 December 1863 for the Australasian Steam Navigation Company. She was built at Govan, Glasgow by J & G Thomson. In 1890, the vessel was converted to a sailing barque, then in 1902 into a coal hulk at Townsville. In 1912 the vessel was gutted by fire, and in 1916 the burnt hulk was run aground in Cockle Bay, Magnetic Island, to provide a breakwater for a jetty.



On Christmas Eve 1971 Cyclone Althea struck, causing the partial collapse of part of the hull. The sunken vessel has become an artificial island hosting a variety of plant and bird life approximately 300 meters offshore of Cockle Bay.

Wreck "George Rennie", Hawking Point



This is located in the intertidal zone suitable for a kids snorkel and it actually dries at low water. The *George Rennie* was a 151 gross ton steel hulled paddle steamer built in 1885 at Middlesex in the U.K. In 1896 it was converted into a lighter, transporting coal

to Townsville harbour. It was scuttled in 1902 to serve as a breakwater for a small jetty in the bay. The hull outline, although collapsed, is still visible.

I've visited "Maggie" a couple of times as a teenager and a 'Family Guy' and never regretted it. It is one of my stepdaughter's enduring childhood memories.

Magnetic Island smothered by seaweed

Source GBRMPA, Reef Ecologic

Some inshore reefs around Magnetic Island are showing depletion in the variety, brightness and colour of the fringing reef.



"Many of us who have been around for a long time were quite used to coming places like Picnic Bay and seeing really healthy coral [with] diverse shapes, sizes, colours." "Some of the tourists are saying the diving is not as good as it used to be," he said. "Now if you snorkel in some locations, it's like a monoculture — there's just tons of one species and that species is brown sargassum." Long-time local marine biologist Dr Daniela Ceccarelli said "In the last 10 years or so, it's become more dominated by macro-algae...". "There are patches of reef on the

island that are still good, but you really have to go searching for them these days."

The Whitsundays and Great Keppel Islands also have concerns about algae. The reason behind the abundant seaweed growth was unknown. A GBRMPA report dated 2008 states the causes of marine algae overabundance as "reductions in herbivory due to overfishing, and increases in nutrient and sediment inputs causing eutrophication".



Coral disturbances such as bleaching, crown-of-thorns starfish outbreaks, extreme low tides, coral diseases, cyclones, all kill corals. These dead areas are rapidly colonised by diverse algal communities. "On healthy reefs, dominance by algae may be gradually reversed, as corals recover and recruit into the disturbed area. But on reefs with reduced resilience, macroalgae may develop into thick mats, which overgrow coral remnants,

exclude coral recruitment, favour pathogens that damage corals, and decrease the aesthetic value of reefs". Basically this kind of change doesn't occur on a healthy reef.

The Reef Recovery Project hopes to restore health to "smothered" coral reefs by removing 500 kilograms of macroalgae, or seaweed and see if a small scale program can make a difference. Alongside local researchers, the project team has employed international university students. "We're attracting around 60,000 young people from around the world annually, and they're looking for a purpose, they're looking to actually do something beyond just lying on a beach," Mr Victory said. He said the opportunity to plant coral, remove algae, and clean snorkel trails in a bid to experience the reef in a different way would be great for the tourism market.

Dr Smith said while the trial was only small, he hoped it would encourage people to look at the way they travelled in a different light. Dr Smith said the next step of the trial was to investigate seaweed as a biofuel.



“Great Barrier Reef: scientists ‘exaggerated’ coral bleaching”

This was the headline chosen by Graham Lloyd, Environment Editor for the Australian. He is on the climate change denialist ‘watch list’ and seems determined to make a career out of misrepresenting what scientists say to fit in to an extreme right world view.



Firstly, the headline seems to suggest that ALL reef scientists misrepresent, then he clarified in the article, “Activist scientists and lobby groups have distorted surveys, maps and data to misrepresent the extent and impact of coral bleaching on the Great Barrier Reef”. This is also wrong as it suggests there is less of a REAL problem.

Surveys ARE showing severe recent coral bleaching, particularly in the far north.

He cited his source as the chairman of the Great Barrier Reef Marine Park Authority, Russell Reichelt. Dr Reichelt had been trying to clarify wildly varying mortality percentages quoted by both journalists and lobby groups. They have often not been accurately describing the percentages or the geographically varying nature of the impacts across the reef. Former climate change commissioner Tim Flannery was obviously one of the ‘activists’ targeted by Lloyd, but not the particular focus of Dr Reichelt’s concerns.

Dr Reichelt did criticise these misleading statements, but the story in the Australian didn’t pick up any of the nuances, Dr Reichelt said “I can’t control how writers package up a story, I accept there are people campaigning for environmental causes and they play an important role to emphasise the seriousness of the event. I’m friends with some of them. What I’m concerned about is misleading the public on what is actually happening through misinterpretation by the media. Such misinterpretation has been frequent in the past few months.”

There was the expected on-line reaction from eco-friendly readers, and quite a few of the more conservative readers also understood the distinction between the statements of a few lobbyists and ALL scientists that was suggested by the headline.

However, the usual extremist denialists also got fired up, and I won’t bore you with the irrational monologues that followed.

Just for the record, Dr Reichelt was firm that the bleaching event was "strongly linked" to global warming. He is not a denialist by any means.

There was an important story to tell here, about the accurate reporting of a very real and serious environmental issue. The warning from Dr Reichelt was merely that everyone double check the facts on percentages and spread of the damage before going to print. This was turned into a shrill load of partisan nonsense by the “The Australian”.

I’m not claiming to be a news professional or a credible journalist, surprisingly it appears that Mr Lloyd and I have something in common. It is a silly, puerile joke that this person is an environment editor.

But then again, they did get us looking at their column, and was that the simple motive for exaggerating the exaggeration of coral bleaching.