18/11/2012

Quality of water is the answer
Sun Herald, 18/11/12, General News, Page 68
By: David Lockwood

17/11/2012

Coral calls in the goby cavalry
New Scientist, 17/11/12, General News, Page 18
By: None
Continuing interview with Tim Thwaite, science commentator. Delroy says US marine biologists in Fiji found corals threatened by seaweed emit a chemical cry for help to summon fish to graze the danger away. Thwaite says the small staghorn will emit a particular chemical to summon the goby fish which will eat the Turtle Weed. He says by eating the weed which has toxins in it, the fish will be unpalatable to predators. Delroy says a Brisbane marine biologist has found part of the current problems in the Great Barrier Reef is attributed to some rural runoff. Thwaite says a team led by professor John Pandolfi from the University of Queensland has taken core samples of coral and found which ones were existing over time. He says they found the corals have been in poor shape in certain areas where agriculture has been most developed. He says the finding links with another research by Katrina Fabricius from the Australian Institute of Marine Sciences, who found runoff sediments including fertiliser promotes seaweed growth when it interacts with coral. [cont]

Interviewees: Tim Thwaite, Science Commentator
Duration: 3.59
Summary ID: L00051147528

This program or part thereof is syndicated to the following 51 station(s):
612 ABC Brisbane (Brisbane), 666 ABC Canberra (Canberra), 720 ABC Perth (Perth), 774 ABC Melbourne (Melbourne), 891 ABC Adelaide (Adelaide), 936 ABC Hobart (Hobart), ABC Alice Springs (Alice Springs), ABC Ballarat (Ballarat), ABC Broken Hill (Broken Hill), ABC Capricornia (Rockhampton), ABC Central Coast (Erina), ABC Central Victoria (Bendigo), ABC Central West NSW (Orange), ABC Coffs Coast (Coffs Harbour), ABC Darwin (Darwin), ABC Esperance (Esperance), ABC Eyre Peninsula and West Coast (Port Lincoln), ABC Far North (Cairns), ABC Gippsland (Sale), ABC Gold and Tweed Coasts (Gold Coast), ABC Goldfields WA (Kalgoorlie), ABC Goulburn Murray (Wodonga), ABC Great Southern WA (Wagin), ABC Illawarra (Wollongong), ABC Kimberley (Broome), ABC Midwest and Wheatbelt (Geraldton), ABC Mildura - Swan Hill (Mildura), ABC New England North West (Tamworth), ABC Newcastle (Newcastle), ABC North and West SA (Port Pirie), ABC North Coast NSW (Lismore), ABC North Queensland (Townsville), ABC North West Old (Mt Isa), ABC North West WA (Karratha), ABC Northern Tasmanian (Launceston), ABC Riverina (Wagga Wagga), ABC Riverland SA (Renmark), ABC Shepparton (Shepparton), ABC South Coast WA (Albany), ABC South East NSW (Bega), ABC South East SA (Mt Gambier), ABC South West WA (Bunbury), ABC South Western Victoria (Warnambool), ABC Southern Queensland (Toowoomba), ABC Sunshine and Cooloola Coasts (Sunshine Coast), ABC Tropical North (Mackay), ABC Upper Hunter (Muswellbrook), ABC Western Plains NSW (Dubbo), ABC Western Queensland (Longreach), ABC Western Victoria (Horsham), ABC Wide Bay (Bundaberg)
Professor John Pandolfi says a new study has uncovered evidence that changes to water quality caused by humans is responsible for the loss of coral on the Great Barrier Reef. The study found a historic coral collapse in the nearby Palm Islands following development on the nearby mainland.

Interviewees: Professor John Pandolfi, University of QLD
Duration: 0.46
Summary ID: M00051081529
This program or part thereof is syndicated to the following 70 station(s):- 100.9 FM (Albany), 104.7 Gippsland FM (Morwell), 105.1 FM Caboolture (Caboolture), 2BOB (Taree), 2CBD (Deepwater), 2HOT (Cobar), 2MCR (Campbelltown), 2MTM (Coonamble), 2NCR (Lismore), 2SSR (Wollongong), 2WAY (Wauchope), 2WCR (Coonabarabran), 3MBS (Melbourne), 3MGB (Mallacoota), 3REG (Bairnsdale), 3SER (Pakenham), 4BCR (Bundaberg), 4CCR-FM (Cairns), 4CRM (Mackay), 4YOU (Rockhampton), 5CCR (Ceduna), 5THE (Millicent), 6RTR (Perth), Alpine Radio (Mount Beauty), Bay and Basin FM (Nowra), Bay FM (Brisbane), Beau FM (Beaudesert), BLU FM 89.1 (Katoomba), Burnett River Radio (Gayndah), CAAMA Radio (Alice Springs), City Park Radio (Launceston), Cow FM (Casino), Encounter FM (Victor Harbor), Eurubodalla Radio (Moruya), Ezy FM (Lithgow), FM 96.3 (Tumut), Fraser Coast Community Radio (Hervey Bay), Gulf FM (Kadina), Heart FM (Deloraine), KCR FM (Perth), KRR (Kandos), NineFourOne (Wollongong), Noosa Community Radio (Sunshine Coast), Oak FM (Wangaratta), Opal FM (Lightning Ridge), Paradise FM (Ballina), PBA FM (Adelaide), Phoenix FM (Bendigo), QbyFM (Queanbeyan), Radio Mansfield (Mansfield), Rainbow FM (Warwick), Rhema FM Orange (Orange), Rock FM (Moranbah), Smart FM (Swan Hill), Star FM (St Helens), Tank Radio (Kempsey), Tasman FM (Hobart), Three Rivers Radio (Dunedoo), Triple B (Tanunda), Triple H (Horsham), Twin Cities FM (Wanneroo), UG FM (Alexandra), Valley FM (Canberra), Valley FM (Brisbane), VOX FM (Wollongong), WAR FM (Gilgandra), Way FM (Canberra), Way FM (Launceston), Yass FM (Yass), York FM (York)
© Media Monitors
The University of Qld's Professor John Pandolfi has called on the Federal Government to put more measures in place to deter Qld farmers from using chemicals and procedures to coral reefs. This comes after record coral reef losses.

**Interviewees:** Professor John Pandolfi, Marine Science, University of Qld

**Duration:** 0.50

**Summary ID:** M00051083929

This program or part thereof is syndicated to the following 67 station(s):- 100.9 FM (Albany), 104.7 Gippsland FM (Morwell), 105.1 FM Caboolture (Caboolture), 2CBD (Deepwater), 2HOT (Cobar), 2MCR (Campbelltown), 2MTM (Coonamble), 2NCR (Lismore), 2WAY (Wauchope), 2WCM (Coonabarabran), 3BBR (Drouin), 3MBS (Melbourne), 3MGB (Mallacoota), 3REG (Bairstowe), 3SER (Pakenham), 4BCR (Bundaberg), 4CCR-FM (Cairns), 4CRM (Mackay), 4YOU (Rockhampton), 5CCR (Ceduna), 5THE (Millicent), 6RTR (Perth), Alpine Radio (Mount Beauty), Bay and Basin FM (Nowra), Bay FM (Brisbane), Beau FM (Beaudesert), BLU FM 89.1 (Katoomba), Burnett River Radio (Gayndah), Cow FM (Casino), Encounter FM (Victor Harbor), Eurbodalla Radio (Moruya), Ezy FM (Lithgow), FM 96.3 (Tumut), Fraser Coast Community Radio (Hervey Bay), Gulf FM (Kadina), Heart FM (Deloraine), KCR FM (Perth), KRR (Kandos), NineFourOne (Wollongong), Noosa Community Radio (Sunshine Coast), Oak FM (Wangaratta), Opal FM (Lightning Ridge), Paradise FM (Ballina), Phoenix FM (Bendigo), QbynFM (Queanbeyan), Radio Mansfield (Mansfield), Rainbow FM (Warwick), Rhema FM Orange (Orange), Rock FM (Moranbah), Smart FM (Swan Hill), Star FM (St Helens), Tank Radio (Kempsey), Tasman FM (Hobart), Three Rivers Radio (Dunedoo), Triple B (Tanunda), Triple H (Horsham), Twin Cities FM (Wanneroo), UG FM (Alexandra), Valley FM (Canberra), Valley FM (Brisbane), VOX FM (Wollongong), WAR FM (Gilgandra), Way FM (Canberra), Way FM (Launceston), Yass FM (Yass), York FM (York)

© Media Monitors

---

**10/11/2012**

**bay of plenty**

Courier Mail, 10/11/12, Qweekend, Page 27

By: Ashley Hay

<table>
<thead>
<tr>
<th>Audience</th>
<th>Male 16+:</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female 16+:</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>All People:</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

| Advertising Space Rate | AUD: | 4.266 |

---

**Article Information**

Item ID: 00169793847
Circulation: 250,988
Number of words: 1297

| Advertising Space Rate | AUD: | 32,300 |

---

**COPYRIGHT** This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

**DISCLAIMER** The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.
Farms are choking Great Barrier Reef
New Scientist, 10/11/12, General News, Page 18
By: None

08/11/2012

ABC Far North (Cairns)
Breakfast - 8/11/2012 7:21 AM
Kier Shorey

Interview with John Pandolfi, Professor of Marine Science, University of Queensland, whose research shows a link between human development on the coast and effects on coral on Pelorus Island, near the Great Barrier Reef. Pandolfi says that at the reef around the Island they found evidence of the collapse of the acropora coral, which he says is attributed to the changes in water quality associated with European colonisation and development on the mainland. He says that partnership between the Government, the Great Barrier Reef Marine Park Authority, scientists and stakeholders are causing industry to develop better practices to increase the water quality in the reef. Pandolfi says there is now a suspected link between water quality and increase in crown of thorn starfish outbreaks. He mentions the nutrient rich water flowing to the reef from the Burdekin River, which is causing seaweed to thrive. Pandolfi says it's important that people minimise their development and impact on the reef.

Interviewees: John Pandolfi, Professor of Marine Science, University of Queensland
Duration: 5.37
Summary ID: W00051034856
© Media Monitors

ABC North Queensland (Townsville)
06:30 News - 8/11/2012 6:33 AM
Newsreader

Researchers from the University of Queensland says they've got evidence that the Great Barrier Reef's changed since european settlement. Steve Greenwood, CEO, CANEGROWERS, says farming practices have changed to reduce the impact on the reef, and he makes reference to a report put out by the Qld Government in conjunction with the Australian Government, showing movement in the right direction.

Interviewees: Professor John Pandolfi, University of Queensland; Steve Greenwood, CEO, Canegrowers
Duration: 1.16
Summary ID: W00051034466
© Media Monitors
Marine scientists from the University of Queensland believe they have found evidence that the Great Barrier Reef has significantly changed since European settlement. Professor John Pandolfi says colonies of branching coral in the Palm Island group disappeared from the region in the 1920-50's. CANEGROWERS CEO, Steve Greenwood says farming practices have changed in an attempt to reduce the impact on the reef. Greenwood says a Queensland Government report produced in conjunction with the Australian Government reveals settlement is reducing and measures are working.

Interviewees: Steve Greenwood, CEO, Canegrowers; John Pandolfi, Professor, Marine Science, University of Queensland

Duration: 1.16
Summary ID: W00051029589

Researchers say they've found evidence to show the Great Barrier Reef has changed significantly since European settlement. Cane Growers Chief Executive Steve Greenwood says farming practices have changed to try to reduce the impact on the reef.

Interviewees: Prof John Pandolfi, University of Queensland; Steve Greenwood, Cane Growers Chief Executive

Duration: 1.22
Summary ID: S00051029777

© Media Monitors
Researchers say they've found evidence to show the Great Barrier Reef has changed significantly since European settlement. Marine Scientists from the University of Qld used coral cores to study to biodiversity of the Palm Island Group.

**Interviewees:** Prof John Pandolfi, University of Qld Researcher  
**Duration:** 0.48  
**Summary ID:** S00051030666  
This program or part thereof is syndicated to the following 12 station(s):-  
ABC Central Coast (Erina), ABC Central West NSW (Orange), ABC Coffs Coast (Coffs Harbour), ABC Illawarra (Wollongong), ABC New England North West (Tamworth), ABC North Coast NSW (Lismore), ABC Riverina (Wagga Wagga), ABC South East NSW (Bega), ABC Upper Hunter (Muswellbrook), ABC Western Plains NSW (Dubbo), Radio National (Sydney), Radio National (Newcastle)

© Media Monitors

---

University of Qld marine scientists say they have found evidence showing the Great Barrier Reef has changed significantly since European settlement, with Professor John Pandolfi, Marine Palaeoecologist, University of Qld, saying colonies of branching coral disappeared during the 1920's and 50's.

**Interviewees:** Professor John Pandolfi, Marine Palaeoecologist, University of Qld  
**Duration:** 0.49  
**Summary ID:** W00051034409  
This program or part thereof is syndicated to the following 6 station(s):-  
ABC Broken Hill (Broken Hill), ABC Eyre Peninsula and West Coast (Port Lincoln), ABC North and West SA (Port Pirie), ABC Riverland SA (Renmark), ABC South East SA (Mt Gambier), Radio National (Adelaide)

© Media Monitors

---

Researchers say they've found evidence to show the Great Barrier Reef has changed significantly since European settlement. Marine Scientists from the University of Qld used coral cores to study to biodiversity of the Palm Island Group.

**Interviewees:** Prof John Pandolfi, University of Qld Researcher  
**Duration:** 0.51  
**Summary ID:** W00051037843  
This program or part thereof is syndicated to the following 1 station(s):-  
ABC Alice Springs (Alice Springs)

© Media Monitors
Interview with John Pandolfi, Professor in Palaeoecology and Marine Studies, University of Queensland about the decline of the Great Barrier Reef. McLaren talks about the Great Barrier Reef being damaged and highlights new research the damage may be a lot worse than realised as no one was watching the decline until recently. Pandolfi says they compared the reef for the last 1,000 years to the reef the last 150 years and found some fundamental changes with the arrival of Europeans which didn’t appear until the 1930’s. Pandolfi comments that since about the 1950’s the coral has not been able to recover from the fertilisers that have ended up in the water. Pandolfi says one of the reasons the coral is not coming back is because the seaweed that competes with the corals are growing faster and taking up spaces quicker than the coral can. Pandolfi notes that there research show that the seaweed is beating out the coral. Pandolfi explains the changes to the water quality which effect coral. Pandolfi talks about coral collapse were the main coral builders of the reef are going away and being replaced by slower and weedier corals. Pandolfi says a change is happening in the reef which appears to be unable to maintain a high level of biodiversity. Pandolfi explains there are some natural mortalities of corals but says now the increased input of nutrients are somethings corals haven’t been subjected to in the past. Pandolfi says there hasn't been this type of coral shift in a 1,000 years. Pandolfi talks about what steps can be done to stabilise the reef but notes action is taking place now but the effects will not be seen for ten or more years. Pandolfi comments that returning the reef to its former glory is not a smart idea noting it is not practical. Pandolfi says they can at least reverse what is going on in the reef.

Interviewees: John Pandolfi, Professor in Palaeoecology and Marine Studies, University of Queensland
Duration: 9.47
Summary ID: W00051027354

This program or part thereof is syndicated to the following 7 station(s):- ABC Capricornia (Rockhampton), ABC Far North (Cairns), ABC North West Qld (Mt Isa), ABC Southern Queensland (Toowoomba), ABC Tropical North (Mackay), ABC Western Queensland (Longreach), ABC Wide Bay (Bundaberg)
© Media Monitors

01/09/2012

ENVIRONMENT
Australian Maritime Digest, 01/09/12, General News, Page 6
By: None

Article Information
Item ID: 00161993829
Circulation: 12,000
Number of words: 722

Advertising Space Rate
AUD: 2,260
FISHING

David Lockwood

Quality of water is the answer

MORE than 2.3 million square kilometres of ocean around Australia has been proclaimed marine reserve. But the pandering to environmental groups does nothing to arrest the real cause of marine decay.

A new study states the expansion of European settlement in Australia triggered a massive coral collapse on the Great Barrier Reef more than 50 years ago.

Published in the Proceedings of the Royal Society B, the study found that runoff from farms clouded the pristine waters off the Queensland coast and killed the natural branching coral species, leaving a stunted, weedy type of coral in its place.

As a consequence, marine and fish life declined and, it has to be said, will continue to do so irrespective of the declaration of marine reserves.

"Reduce polluted run-off into the ocean," said study co-author Professor John Pandolfi from the University of Queensland. "Any kind of measures that are going to improve the water quality should help those reefs to recover."

Meantime, commercial fishers will be fighting over the $100 million in compensation, while Australians are forced to consume even more imported seafood. Of all the seafood eaten in this island nation, 72 per cent is imported. Yep, un-Australian.

"Reduce polluted run-off into the ocean," said study co-author Professor John Pandolfi from the University of Queensland. "Any kind of measures that are going to improve the water quality should help those reefs to recover."

Central coast estuaries are producing oodles of flathead and whiting. Big bream are mooching about the flats in Brisbane Water. Prawns abound at The Entrance, with Aussie bass in the feeder creeks.

Hawkesbury guide Ron Osman boated keeper kingfish in Pittwater, a 10-kilogram jewfish in the lower Hawkesbury, and says luderick are on the chew. But the flathead are laying low.

Narrabeen Bait weighed a 13.2-kilogram kingfish taken off Long Reef on Friday. Snapper to 4.1 kilograms have come in.

Narrabeen Lake is firing for big school prawns.

Meantime, commercial fishers will be fighting over the $100 million in compensation, while Australians are forced to consume even more imported seafood. Of all the seafood eaten in this island nation, 72 per cent is imported. Yep, un-Australian.

Cool, green water in the harbour has put the breaks on the fishing. The best bets are squid, the odd flathead and big luderick to 45cm.

Southside guide Scotty Lyons has been hooking decent dusky flathead on soft plastics in the Georges River, with trevally in the deep holes around the runways.

Our central coast stringer, Scott Thorrington, has been scoring kingfish over the metre mark trolling live baits on the shallow reefs.

Longfin perch are schooling on the 120-metre reefs, flathead drifts are producing off Terrigal, with snapper in 40 metres.

Central coast estuaries are producing oodles of flathead and whiting. Big bream are mooching about the flats in Brisbane Water. Prawns abound at The Entrance, with Aussie bass in the feeder creeks.

Hawkesbury guide Ron Osman boated keeper kingfish in Pittwater, a 10-kilogram jewfish in the lower Hawkesbury, and says luderick are on the chew. But the flathead are laying low.

Narrabeen Bait weighed a 13.2-kilogram kingfish taken off Long Reef on Friday. Snapper to 4.1 kilograms have come in.

Narrabeen Lake is firing for big school prawns.

COOL, green water in the harbour has put the breaks on the fishing. The best bets are squid, the odd flathead and big luderick to 45cm.

Southside guide Scotty Lyons has been hooking decent dusky flathead on soft plastics in the Georges River, with trevally in the deep holes around the runways.
Coral calls in the goby cavalry

It's not quite the Bat-Signal, but it does the trick. A species of Fijian coral summons hungry gobies to rescue it from dangerous seaweed.

When small staghorn corals are at risk of being smothered by mats of turtle weed, they send out a chemical distress signal. This calls the cavalry - in this case, broad-barred and redhead gobies - to come to their aid. The gobies eat the turtle weed, protecting the corals.

Mark Hay at the Georgia Institute of Technology in Atlanta and colleagues placed the gobies in tanks with the turtle weed. They ignored it until the coral was introduced, at which point they began eating (Science, doi.org/jp6).

In return for eating the seaweed, the corals provide the gobies with shelter. Hay also found that the gobies' skin secretions became more toxic to predators after eating the seaweed.

"It really underscores how very little we know about biological interactions on coral reefs, even when processes so integral to the resilience of reefs are considered," says John Pandolfi of the University of Queensland in Brisbane, Australia.
Who knew that Moreton Bay, just 30km from the state’s biggest city, might offer refuge and regrowth for threatened coral species?

Story Ashley Hay

I’m shin-deep in Moreton Bay off Wellington Point, 28km due east of Brisbane’s urban haze, and at my feet is something brilliantly distinct. It’s the spotted fluorescent green of the bright round coral species Acropora and, just beyond, are three frolicking baby shovel-nose sharks – remarkable things to find this close to the CBD.

This water walk is part of “Corals at Your Doorstep”, an event organised by the University of Queensland’s CoralWatch.
program for Science Week earlier this year. That there are corals on my doorstep—given my doorstep is not the Great Barrier Reef, rather Australia’s third most populous city—is something of a surprise. But here we are, near King Island—about 1 km north of Wellington Point and linked by a sandy spit at low tide—checking the colour and condition of various corals against the program’s unique Coral Health Chart. Not just the vibrant green *Acanthastrea* but the pretty, purple-flecked *Acropora* species and *Favia* too, which resembles cartoon drawings of brains.

With more than 40 different species growing inshore in its west, and more than 100 species further east, Moreton Bay hosts more coral diversity than the Caribbean. At Flinders Reef in the bay’s most easterly waters; at Myora Reef, off North Stradbroke Island, just north of Dunwich; tucked around the southern side of Peel Island (about halfway between bayside Cleveland and Dunwich on North Stradbroke) at Horseshoe Bay, and in so many places in between, Moreton Bay’s waters are lush with coral colonies, coral communities, coral assemblages and coral reefs.

“You can walk off the beach at Horseshoe Bay at low tide, stand in a foot of water, and be looking at 50 to 60 per cent coral cover,” says Andrew Olds, a research fellow at Griffith University and one of the guides for the Wellington Point walk. “It’s really shallow, it’s really bright and it’s really impressive—and I don’t think a lot of people know it’s there.”

Almost 400 km below the southernmost point of the Great Barrier Reef, these aren’t the tropical waters that we automatically associate with corals. This is a transition zone between the tropics and more temperate seas. And what this means, explains Ida Fellegara, a marine biologist at the University of Queensland, is that the Moreton Bay corals have to cope with more extreme conditions than their tropical counterparts. While the GBR’s waters sit between 22-30°C, with stable salinity and low levels of nutrients, Moreton’s fluctuate between 13-32°C, with variable salinity and high nutrients. Corals can grow here and be healthy, Fellegara says, but they’re not growing their own new substrate, the excreted solid skeleton on which subsequent corals like to build. Instead, “they’re growing on the fossils of corals that were here in a time when conditions were more appropriate”.

In recent years, says coral researcher Matt Lybolt—who recently returned to Florida from Queensland—these marginal reefs have proved to be a growth field in coral research. “Awesome reefs like the Great Barrier Reef are few and far between,” he says, “and there are thousands of people already studying them.” Looking for a different kind of site to study, Lybolt found Moreton Bay and moved to Brisbane to focus on its corals for his PhD, which he completed earlier this year. What he discovered makes up part of a larger story beyond the curiosity value of finding corals in this part of the world. And it’s as interesting for what these reefs have done in the past as for what they might do in the future.

The kind of scientific time travel required to investigate earlier, more coral-friendly eras is otherwise known as marine palaeoecology, and one of its chief local proponents is Professor John Pandolfi, head of the Centre for Marine Science at the University of Queensland. In Moreton Bay, says Pandolfi, who oversaw Lybolt’s work, “there have been discrete episodes of reefs growing when conditions here were favourable and times when we didn’t get coral growth, usually when the sea level was dropping. Then, about 200 years ago, we got a complete
changeover in the coral assemblages.” It’s a date that corresponds with European settlement on the bay, from the early 1820s.

But the story’s not that simple. Some of the worst stressors a reef might encounter – an excess of nutrients in the water, or overfishing – are directly related to human activity. But as Lybolt discovered, “around the world, there’s this series of marginal reefs – including those in Moreton Bay – that switch on and off. And each time they switch back on, the reefs look the same. If you can ameliorate those stressors, they are going to naturally revert to what they were like a thousand years ago.”

“The switch can be triggered by a slight easing in the El Niño cycle of floods and droughts, or by a slight increase in sea level – “just 20 or 50cm can be enough to spark a recovery”, says Lybolt. “For better or worse, we’re pretty much guaranteed to see a half-metre sea-level rise in the near future. And pretty much across the board, a sea-level rise is good for reefs.”

AFTER THE PERILS OF BLEACHING AND THE crown-of-thorns starfish, there is good news: a previously unknown and extremely healthy reef off Indonesia has been mapped by a large-scale marine survey; new reefs have been found off Trondelag, in Norway, and Japan’s Tsushima Island; and several species of Acropora are establishing new populations as they spread north along the coast of Florida.

But corals – like all species – do not exist in a biological vacuum: where they thrive, and why, depends on the conditions and interactions of a host of other organisms. Keeping coral healthy, explains Olds, has a lot to do with herbivorous fish. These species graze on fleshy algae “which can overgrow corals and take up the space that little baby corals would otherwise move into to replenish the reef for the future”.

Keeping algae down switches the competition for space from favouring the algae to favouring the coral. “Over the past five years,” Olds says, “the focus of many marine scientists has shifted from documenting where animals occur to examining what processes might be important for maintaining their health, or the resilience of whole ecosystems.” This kind of connectivity is well served by the marine reserves in place in Moreton Bay, Olds adds. “You get patches of mangroves, corals and seagrasses in close proximity within the no-take zones,” he says, “and certain fish species use these, day and night, over the tidal cycles and at different stages of their own life cycles. Incorporating these habitat connections has improved the ability of no-take zones to enhance fish numbers, fish grazing and coral recruitment.”

If all this sounds far more intricate than everyday life-and-death issues for coral, it is, and necessarily so. The kind of shorthand that lodges corals in the public consciousness can never tell the whole story of a species. “It becomes a subtle sort of thing to express,” says Lybolt, “but the Great Barrier Reef is not in trouble. Whatever is living in the top five to ten metres of water is, but there’s a lot of reef below that depth.” Where this intersects with Moreton Bay is in the idea of establishing refugia – refuges that may provide species whose environments are under threat with more stable alternative habitats. The distribution of some corals changes naturally as they relocate of their own accord when water temperatures and other conditions change. In which case, suggest refugia advocates, why not intervene and relocate them artificially?

Over the past 12,000 years there were more corals in Moreton Bay’s shallower waters than there are now. “And it’s those shallowest areas which are at the greatest risk in the tropics,” says Lybolt. “Having a shallow refugium like Moreton Bay is exciting – just as a small piece of the puzzle.” But there are no illusions that the bay can support as many corals as the Great Barrier Reef, nor that it can support major fisheries.

“For decades, conservation planners have been projecting which habitats will be so degraded in future that they won’t be worth preserving. This
is the flipside – which habitats are degraded now but would be worth conserving in future.”

Most of the impacts of climate change, Lybolt explains, are at their worst in the tropics, though less intense around temperate zones such as Moreton Bay and then worse again at the poles. The exception to this rule, he says, is ocean acidification. “In the temperate latitudes, it’s at its most intense. And as the ocean acidifies, it becomes harder and harder for reefs to maintain their skeletons.”

Coral is extraordinary animals, their colonies composed of millions of individual polyps that take food in via tiny mouths and excrete an exo-skeleton at their base. This forms the substrate on which the colony grows, building up its distinct shapes. A single polyp, a couple of millimetres wide, can form the basis of a whole new colony and live as long as a thousand years. And in many ways, corals are the perfect metaphor for the scientific process – as the understanding of what these creatures do, and where and how, continues to build on the layers of information garnered by earlier workers.

But reefs also provide a habitat and resources for a massive diversity of other creatures, from tiny invertebrates and fish to turtles and large marine mammals. Coral reefs cover less than 0.1 per cent of the world’s sea floor but support more than 25 per cent of its fish. Or as CoralWatch’s book, Coral Reefs and Climate Change, puts it: “For Australia, the reef is ‘apple pie’, a pleasant luxury. For most other countries with a reef, it is survival; bread and butter.”

“Moreton Bay has an incredible diversity and density of marine megafauna,” says Christine Dudgeon, a UQ researcher who studies these creatures and their interactions with reefs. “If you’re interested in rays, or leopard sharks, they are there on the Great Barrier Reef, but you won’t often see them. Here, if you know the right place and the right time, you will.”

There are 44 species of sharks in the bay, nine different kinds of marine mammals – five of which are considered rare – and a dugong population of around a thousand. Apart from scientists, the bay’s reefs tend to be the sole province of fishermen and divers, with a handful of dive operators running tours to Flinders Reef and the reefs around Stradbroke.

And it’s a double-edged sword, wanting to celebrate such little-known natural spectacles. In the end, says Ida Fellegara, “I think it’s a good thing people don’t know the corals are there, in terms of their own protection. Every time you go to see them, you know, you’re probably doing some damage.”

For more on CoralWatch or to download its Coral Health Chart, visit www.coralwatch.org
Underwater garden
… Members of UQ's CoralWatch program in the shallows of Moreton Bay during 2012 Science Week.

The fact that people don't know the corals are there is a good thing.
Farms are choking Great Barrier Reef

NUTRIENT-RICH slurry from farms has been causing coral populations on Australia's Great Barrier Reef to crash for 90 years.

The corals collapsed between the 1920s and 1950s, say John Pandolfi at the University of Queensland in Brisbane and his colleagues. The team took cores from three reefs and worked out when the corals died. Two had little coral left after the 1950s, while the third had been colonised since then by different types (Proceedings of the Royal Society B, DOI: 10.1098/rspb.2012.2100).

By the 1920s, European settlers were farming intensively near rivers flowing onto the reef, boosting agricultural run-off by up to a factor of 20. Events like cyclones kill coral, but the extra nutrients in the water help seaweed move in afterwards, preventing coral from regenerating, says Terry Done of the Australian Institute of Marine Science in Townsville, Queensland.

The reefs were already in decline again when monitoring began in the 1980s, says Joana Figueiredo of James Cook University, also in Townsville. Pandolfi's work shows that it was pristine until the 1920s.
Life in the world’s oceans faces far greater change and risk of large-scale extinctions than at any previous time in human history, a team of the world’s leading marine scientists has warned.

The researchers from Australia, the US, Canada, Germany, Panama, Norway and the UK have compared events which drove massive extinctions of sea life in the past with what is observed to be taking place in the seas and oceans globally today.

Three of the five largest extinctions of the past 500 million years were associated with global warming and acidification of the oceans – trends which also apply today, the scientists say in a new article in the journal Trends in Ecology and Evolution.

Other extinctions were driven by loss of oxygen from seawaters, pollution, habitat loss and pressure from human hunting and fishing or a combination of these factors.

“Currently, the Earth is again in a period of increased extinctions and extinction risks, this time mainly caused by human factors,” the scientists said in a news release on 21 August.

While the data is harder to collect at sea than on land, the evidence points strongly to similar pressures now being felt by sea life as for land animals and plants. The researchers conducted an extensive search of the historical and fossil records to establish the main causes of previous marine extinctions and the risk of their recurring today.

“We wanted to understand what had driven past extinctions of sea life and see how much of those conditions prevailed today,” says co-author Professor John Pandolfi, of the ARC Centre of Excellence for Coral Reef Studies and The University of Queensland, an authority on the fate of coral reefs in previous mass extinction events.

“It is very useful to look back in time – because if you forget your history, you’re liable to repeat it.”

Marine extinction events vary greatly. In the “Great Death” of the Permian 250 million years ago, for example, an estimated 95 per cent of marine species died out due to a combination of warming, acidification, loss of oxygen and habitat. Scientists have traced the tragedy in the chemistry of ocean sediments laid down at the time, and abrupt loss of many sea animals from the fossil record.

“We are seeing the signature of all those drivers today – plus the added drivers of human overexploitation and pollution from chemicals, plastics and nutrients,” Professor Pandolfi says.

“The fossil record tells us that sea life is very resilient – that it recovers after one of these huge setbacks. But also that it can take millions of years to do so.”

The researchers wrote the paper out of their concern that the oceans appear to be on the brink of another major extinction event.

“There may be still time to act,” Professor Pandolfi says. “If we understand what drives ocean extinction, we can also understand what we need to do to prevent or minimise it.

“We need to understand that the oceans aren’t just a big dumping ground for human waste, contaminants and CO2 – a place we can afford to ignore or overexploit. They are closely linked to our own survival, wellbeing and prosperity as well as that of life on Earth in general.

“Even though we cannot easily see what is going on underwater, we need to recognise that the influence of 7 billion humans is now so great it governs the fate of life in the oceans. And we need to start taking responsibility for that.”

He adds “The situation is not hopeless. If fact we have seen clear evidence both from the past and the present that sea life can bounce back, given a chance to do so.

“For example, in Australia we have clear evidence of that good management of coral reefs can lead to recovery of both corals and fish numbers.”


For further information contact Professor John Pandolfi, CoECRS and UQ, phone (07) 3365 3050, mobile 0400 982 301, email j.pandolfi@uq.edu.au. Website: www.coralcoe.org.au.