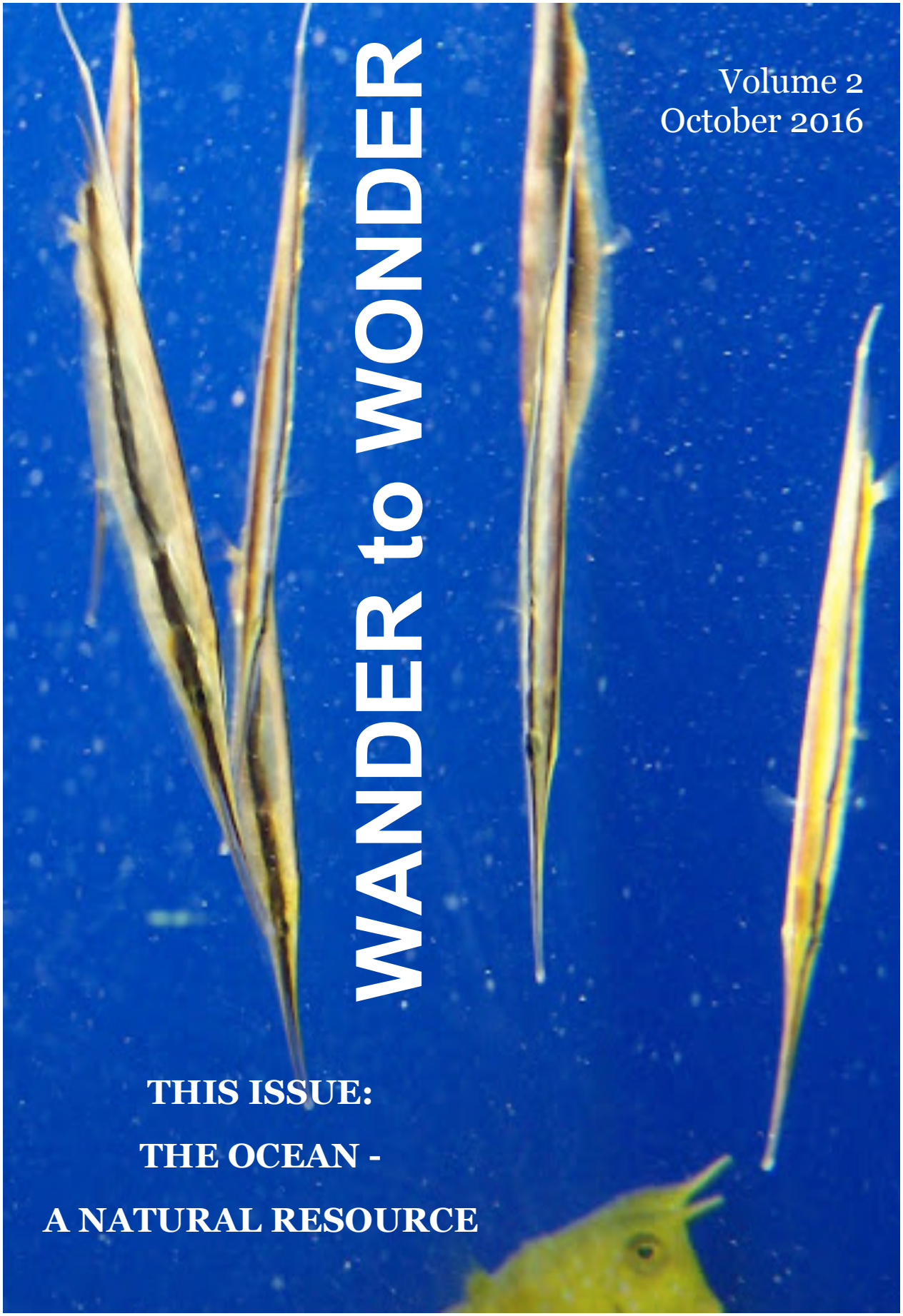

WANDER to WONDER

Volume 2
October 2016

THIS ISSUE:

THE OCEAN -

A NATURAL RESOURCE

WANDER to WONDER

by MARTINA NICOLLS

The world will never starve for wonder, but only for want of wonder.
G.K. Chesterson

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Photographs are by Martina Nicolls

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editor's note

Welcome to the second edition of WANDER to WONDER

This second edition of Wander to Wonder focuses on the ocean and its critical environmental and ecological importance in the world.

The impetus for writing a feature on the ocean was the media attention on two significant events: World Oceans Day on 8 June and Our Ocean Conference on 15-16 September in Washington DC. World Oceans Day was first celebrated in 1992, whereas the first Our Ocean Conference was in 2014. Environmentalists, such as Jacques Cousteau (1910-1997) and Sir David Attenborough (1926-), have spent their lives promoting the protection of natural habitats and resources. However, recently – with the debate on climate change – the ocean is increasingly a key focus of environmental activism. It is fitting to add to that debate.

Until next edition, with another theme,

Martina

MARTINA NICOLLS

How inappropriate to call this planet Earth when it quite clearly is Ocean.

Arthur C. Clarke

ocean facts

- an ocean is a body of salt (saline) water
- about 73,5% of the Earth's surface is water
- about 71% of the Earth's surface is ocean
- therefore the ocean holds 96.5% of all Earth's water (see table below)
- the ocean is the Pacific, Atlantic, Indian, Southern (Antarctic) & Arctic
- 4 million square kilometres of Earth is water (greater than the size of Europe)
- almost 50% of Earth depends on food from the ocean
- about 12% of the world's workforce depends on the ocean for their livelihood.

Source	Volume cubic miles	Volume cubic kilometers	% of total water
Oceans, seas, bays	321,000,000	1,338,000,000	96.54
Ice caps, glaciers, snow	5,773,000	24,064,000	1.74
Groundwater	5,614,000	23,400,000	1.69
Fresh	2,526,000	10,530,000	0.76
Saline	3,088,000	12,870,000	0.93
Soil moisture	3,959	16,500	0.001
Ground ice, permafrost	71,970	300,000	0.022
Lakes	42,320	176,400	0.013
Fresh	21,830	91,000	0.007
Saline	20,490	85,400	0.006
Atmosphere	3,095	12,900	0.001
Swamp water	2,752	11,470	0.0008
Rivers	509	2,120	0.0002
Biological water	269	1,120	0.0001

Source: Igor Shiklomanov "World fresh water resources" in Peter H. Gleick, 1993, Water in Crisis: A Guide to the World's Fresh Water Resources (Oxford University Press, New York)

http://water.usgs.gov/edu/earthhowmuch.html
http:// earthobservatory.nasa.gov/Features/Water/page2.php

world oceans day

World Oceans Day has been celebrated annually on 8 June since 1992. The annual World Oceans Day aims to raise global awareness of the challenges faced across the world in preserving aspects of ocean life. The ocean regulates the climate, feeds millions of people every year, produces oxygen, is the home to a vast array of wildlife, and provides us with important medicines. Challenges involve using marine science to understand and protect oceans in order to better manage their ecosystems and biodiversity for present and future generations.

The United Nations Education, Scientific and Cultural Organization's Intergovernmental Oceanographic Commission (UNESCO's IOC) sponsors World Oceans Day to carry on the work of the UN General Assembly for the sustainable development and management of marine resources and use.

In 2015 the theme for World Oceans Day was 'a healthy ocean, a protected climate' with the main event in preparation for the Paris Climate Conference on 8 June. The conference brings together scientists, political decision-makers, civil society, and youth to elaborate ocean-sensitive actions and strategies to mitigate socioeconomic impacts on ocean life. In 2016 the theme is 'healthy oceans, healthy planet' with a special focus on eliminating plastic pollution.

Plastic pollution is a serious threat because it degrades very slowly, polluting waterways for a long time. Plastic pollution (microbeads) impacts the health of aquatic animals because animals including zooplankton mistake the microbeads for food.

http://en.unesco.org/ocean_day

microbeads

During the 2016 UNESCO Intergovernmental Oceanographic Commission's World Oceans Day, the focus was plastic pollution, specifically microbeads or microplastics – defined as 'plastic pieces or fibres measuring less than 5 mm. Some personal hygiene products, such as body scrubs, face cleansers, and toothpaste contain microbeads – minute particles of plastic, barely visible to the naked eye (usually smaller than 1 mm). The microbeads are flushed down the drain and enter the sewer system. They are not biodegradable and wastewater treatments are not designed to filter microbeads, so they eventually enter the ocean. Sea creatures eat them, and people eat sea creatures.

Microbeads are mainly made from polyethylene (PE), or polypropylene (PP), polyethylene terephthalate (PET), polymethyl methacrylate (PMMA) and nylon. Although the full extent and consequences of microbead use is difficult to quantify, the accumulation of plastics and microplastics in the marine environment is recognized as a serious global environmental issue. Positive action by manufacturers has already reduced the amount of microbeads in products. Policy makers have also recently introduced regulations to eliminate their use in hygiene and other products.

A better way to ensure clean skin is to use natural products, such as gound nut shells, salt crystals, oatmeal, almond meal, and other biodegradable alternatives, just like people used to do before microbeads were used.

http://www.beatthemicrobead.org/en/science

2016 Our Ocean Conference

Secretary of State John Kerry hosted the 2016 Our Ocean Conference in Washington D.C. on September 15-16. The first Our Oceans Conference, hosted by the United States of America's Department of State, in June 2014 in Washington D.C., brought together experts, practitioners, advocates, lawmakers, and the international ocean and foreign affairs policy members from nearly 90 countries. The aim was to share and demonstrate effective actions on four key global issues related to oceans:

1. sustainable fisheries
2. marine pollution
3. climate related impacts such as ocean acidification, rising sea levels & biodiversity
4. Marine Protected Areas (MPA) – undisturbed areas, similar to land-based national parks and reserves.

The 2014 Our Ocean Conference resulted in partnerships and initiative valued at $800 million to conserve the ocean and its resources. The 2015 Our Ocean Conference in Valparaiso, Chile in October built upon the initial investments.

http://www.state.gov/e/oes/ocns/opa/ourocean/index.htm

sustainable fisheries

The ocean faces serious challenges that threaten the sustainability of marine fisheries. Catches of many types of fish in the ocean are declining while demand continues to increase. Overfishing harms the ecology of the ocean, while also reducing the long-term potential of fish stocks to provide food and jobs for the future. Harmful fishing practices have unintended impacts on birds, marine mammals, sea turtles, and non-target fish stocks.

Leran more at http://www.state.gov/e/oes/ocns/opa/ourocean/248161.htm

marine pollution

An estimated 80% of marine pollution originates on land – pollutants that threaten wildlife and the health and safety of humans. Nutrients, coming from sources such as agricultural runoff, sewage and wastewater discharges, create “dead zones” where fish and other marine life cannot thrive. There are an estimated 500 dead zones in the world.

Learn more at http://www.state.gov/e/oes/ocns/opa/ourocean/248163.htm

climate related impacts

The Ocean is the largest carbon sink in the world. It helps absorb carbon dioxide from the atmosphere and plays an important role regulating climate and influencing weather patterns.

Ocean-related climate change impacts, including ocean warming, ocean acidification, and rising sea-levels, threaten the world's food security, ocean biodiversity, the integrity of coastal areas, and even tourism and recreation.

marine protected areas

Marine Protected Areas (MPA) are safe havens for fish, whales, dolphins, corals, and other treasures of the sea. Many MPAs serve as living laboratories that – as undisturbed reference sites – are critical to scientific research and discoveries that benefit humankind. MPAs can also boost economic activity by increasing fish stocks' sustainably and creating new or improved opportunities for tourism.

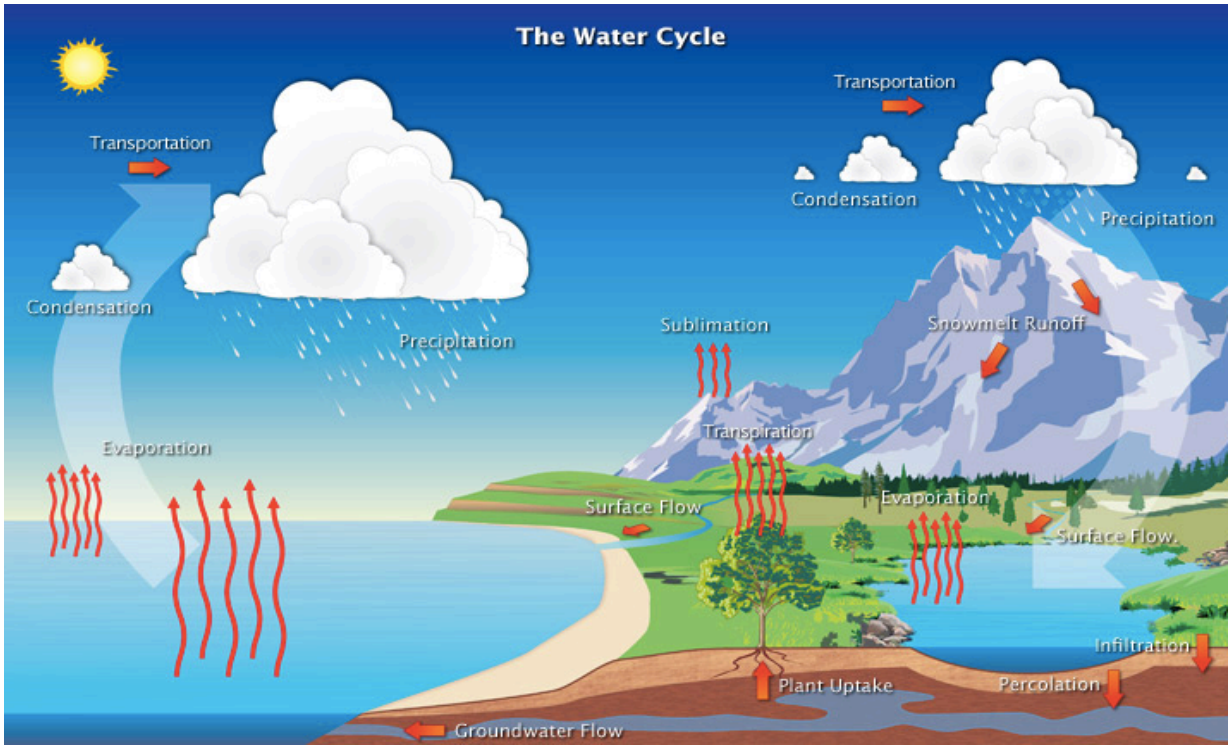
rising sea levels

Water in our atmosphere comes from evaporation, transpiration, and sublimation.

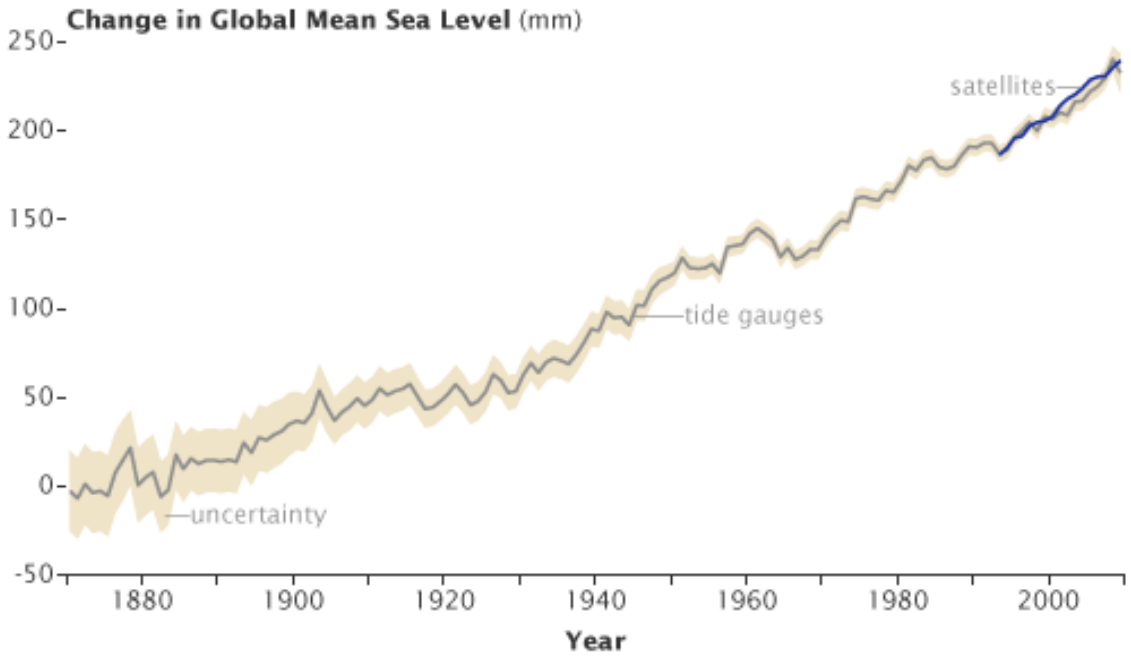
Evaporation is the process by which water changes from a liquid to a gas. Studies have revealed that evaporation from oceans and other bodies of water (lakes, rivers, streams) provides nearly 90% of the moisture in our atmosphere.

Most of the remaining 10% found in the atmosphere is released by plants through transpiration. Plants take in water through their roots, then release it through small pores on the underside of their leaves. A very small portion of water vapor enters the atmosphere through sublimation, the process by which water changes directly from a solid (ice or snow) to a gas. The gradual shrinking of snow banks when the temperature remains below freezing results from sublimation.

The most important form of water generation is evaporation. Water continually evaporates, condenses, and precipitates. Evaporation (water going up into the air) approximately equals precipitation (water coming down as rain or snow) globally and over time. However, over land, precipitation is often more than evaporation, and over oceans, evaporation is more than precipitation.



With oceans, if evaporation was continually more than precipitation the process would eventually result in empty oceans. This does not happen because the water is always being replenished. In the past 100 years, oceans have been over-replenished: **the global sea level has risen approximately 17 centimetres over the 20th century – a thousand years.**



Graph ©2010 Australian Commonwealth Scientific and Research Organization

Sea level has risen due to two main reasons : (1) warming of the oceans, causing water to expand and increase in volume, and (2) more water has been entering the ocean than the amount leaving it through evaporation.

A primary cause for increased mass of water entering the ocean is the melting of land ice (ice sheets and glaciers). Sea ice is already in the ocean, so increases or decreases in the annual amount of sea ice do not significantly affect sea level.

http://earthobservatory.nasa.gov/Features/Water/page2.php

inland seas

Over million of years the land on Earth shifted, and where once was ocean there is now land, and where once there was land there is now ocean. Where there is now a stark, hot, inhospitable desert in the centre of Australia, there was once an inland sea.

The South Australian Museum has a permanent exhibit called 'The Opal Fossils of South Australia: Life of Australia's Inland Sea during the Age of Dinosaurs.' The Opal Fossils Gallery has specimens of fossils from the inland sea near Coober Pedy and Andamooka in the north of South Australia.

The ice-cold, salty inland sea of the past once held giant marine reptiles, dinosaurs, and shell creatures. On display is the opalised skeleton of a six-metre-long Addyman Plesiosaur. It was found in an opal mine in Andamooka in 1968 and is considered to be one of the best-preserved dinosaur skeletons on Earth.

Plesiosaurs were large marine dinosaur reptiles with limbs like flippers, extremely long necks, and small heads – much like the one that Scotland's "Nessie" monster in Loch Ness is said to resemble. These dinosaurs are slow-moving, toothless reptiles that once lived in the Eromanga Sea.

Other exhibits include a piece of ancient seabed with several hundred opalised shells of Australia's inland sea, fossils from the Moon Plain, north of Coober Pedy, and the largest ammonite ever found in Australia. It was originally mistaken for a truck tyre.

Australia's inland sea, also known as an epeiric sea, was a shallow sea, of less than 250 metres deep, covering central areas of the continent. Many early Australian explorers travelled inland to find the sea during the 1820s and 30s. They never found it. British explorer Captain Charles Napier Sturt (1795-1869) led several expeditions inland, starting either from Sydney or Adelaide, with no success.

According to the National Geographic, Australia could once again have an inland sea – minus dinosaurs. If the world's ice caps and glaciers melt, lifting sea levels above 70 metres, in about 5,000 years into the future, an inland sea could occur. Scientists writing in the National Geographic said that the sea level has been rising at the rate of about three millimetres a year globally. And at that rate, where there are now fossilised shells, there could be an abundance of sea life.

www.samuseum.sa.gov.au

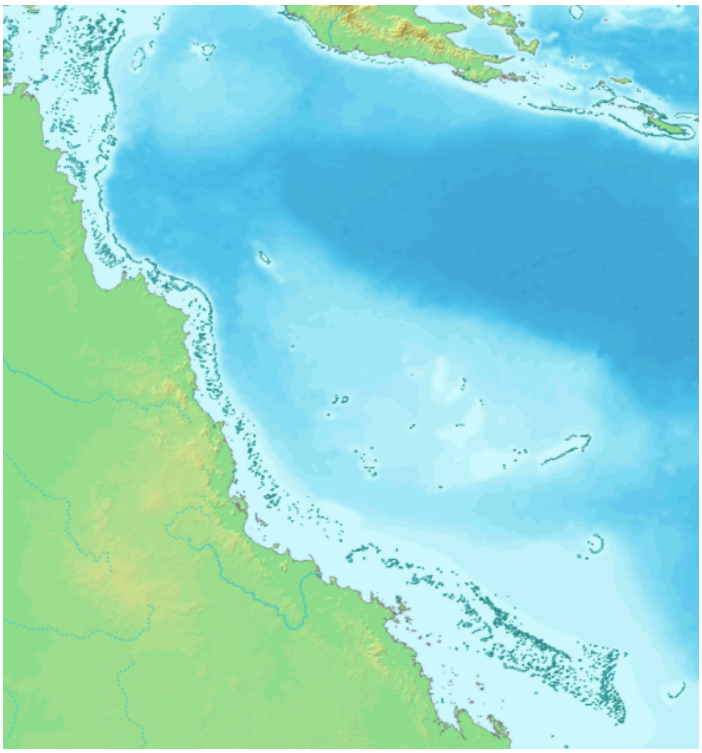
fossils from the inland sea

fossils from the inland sea

fossils from the inland sea

great barrier reef

Article by Martina Nicolls 1996, winner of the Marine Science Journalism Prize by the Cooperative Research Centre - the Reef and Rainforest Research Centre – in Cairns, Queensland, Australia (http://www.rrrc.org.au).



canaries in coal mines: corals in reefs

Corals, like canaries in coalmines, are early predictors of stress, climatic changes and the presence of chemicals within their environment. Like an army of silent sentinals, corals may prove to be more than reef architects - they may be saviours of the world's most biologically diverse area of marine life, the Great Barrier Reef.

The Great Barrier Reef, off the coast of Queensland, extends over 2,000 kilometres in a broken coral chain of reefs and cays from Fraser Island in the south to Cape York in the north. Billions of marine and coastal creatures live on and around the reef's protective islands and lagoons. The different corals that form the chain of reefs provide shelter for more fish species than any other marine habitat.

Coalmines, the major source of coal as fuel during the 1800s, contributed to the environmental, economic and social evolution of humans. However, carbon monoxide, a colourless, odourless gas formed in the mines when carbon oxidised in a limited supply of air. Starved of oxygen, the miners, deep in the coalmines, collapsed and died. The toxic fumes prevented haemoglobin from transporting oxygen to vital organs and tissues in their bodies. More devastating than carbon monoxide is methane gas, also colourless and odourless. Methane burns with a bluish flame and explodes when mixed with air or oxygen. Known as firedamp, the deadly mixture of methane, nitrogen, carbon dioxide and hydrogen is the coalminers' worst fear. Canaries, introduced into the coalmines as early detectors of toxic gases and chemicals, saved the lives of many miners.

Corals, like canaries, are early predictors of climatic changes and the presence of pollutants and chemicals, and can serve a similar function to save the reef ecosystem and its commercial, scientific and environmental viability. Corals can provide scientists with crucial information on the changing climatic conditions and the effects of these conditions on the flora and fauna of coastal and inland areas of the reef.

Corals are sedentary animals related to sea anemones and other polyps. A coral polyp is a hollow "fleshy" cylinder of tissue, typically about a centimetre in diameter, with an open mouth at one end. Opposite the mouth, the polyp tube secretes limestone that forms the skeletal framework by which new coral polyps can become attached, secreting more limestone around it. Colonies of coral polyps grow rapidly with each polyp having the ability to reproduce, asexually and sexually, as much as 25,000 new polyps in one year. The limestone deposited from this growing community builds into a reef of hard, pockmarked and angular-shaped skeletons of coral.

Marine populations can be markedly different within short distances due to different sea temperatures, wave actions, ocean depths and food sources. In these marine neighbourhoods, there are over 300 coral varieties of differing shapes and colours with names such as staghorn, brain, mushroom and red organ pipe. However, it the corals' symbiotic lifestyle that exposes a more fascinating and important existence.

The mouth with its flailing tentacles entraps plankton. But plankton and other minute drifting animals comprise only ten per cent of the coral polyp's diet. Paradoxically, though the reef supports a rich diversity of marine life, the intense blueness of the reef is caused by a lack of plankton due to low levels of nutrients in the sea water. As the oceanic surface waters are depleted of nutrients in the northward currents, the reef's plants and animals counteract the shortage by recycling nutrients within the reef.

Living in shallow tropical waters, corals have the ability to photosynthesize due to symbiotic single-celled algae, or zooxanthellae, growing in their tissue, harnessing sunlight to feed their coral hosts. It is, therefore, algae that determines the growth of the corals and provides a crucial factor in the development and function of coral reefs.

When affected by stress and pollutants, such as oil and chemical spills, corals secrete copious amounts of mucous to purge the pollutants from their system. In doing so, they may expel the symbiotic algae that are crucial to the corals' growth and existence. Continual secretion eventually eliminates the algae from their system to the corals' detriment. Corals, stressed by temperature, climatic and chemical changes, exhibit a change of colour. Prolonged loss of colour – bleaching – can result in death.

Water motion may also play an essential role in sustaining the biological production that controls the algal growth on which the corals depend. There is the belief amongst scientists that corals can sustain a level of turbulent activity. However, they are often damaged or killed by changes in water temperature, strong currents, flooding and cyclonic winds along the sometimes turbulent Queensland coast. Tourists may also contribute to coral damage by snorkelling, diving and walking on the reefs. The annual bands of skeletal limestone, similar to that of tree rings, can provide scientists with detailed information of the climatic history of the Great Barrier Reef.

Coral damage may also be caused by siltation due to the downstream effects of land clearing, dredging and mining, or from overfishing and natural predators such as the crown-of-thorns starfish. Hence, the pursuit of land development, the tourist market, and commercial fishing within the Great Barrier Reef needs to be balanced with the protection of this ecosystem.

Scientists are therefore keen to study many aspects of corals and their role in the ecosystem of the Great Barrier Reef. Areas of research include the effects of water movements, water temperatures and cyclonic activity on the corals' growth and existence. Other areas of work include the effects of coastal land degradation, fishing pressure and tourist activity. It is also important to monitor and determine the effects of pollutants and chemicals, and the rate at which algae are eliminated from the coral's system under extremes of environmental stress. Innovative technology can play a vital role in determining the degree of natural and induced coral stress caused by pollutants, temperature and climatic changes without removing coral from the Reef. Devices, used since the late 1950s, are fitted to sea vessels to research and record salinity, temperatures and ocean depths. Tracking and data recording devices also include moored buoys and submersible data loggers.

Satellites are used to track ocean currents and determine water temperatures, density and turbidity. Satellite-based remote sensing, from above the ocean, can provide scientists with information to develop and conserve the natural resources and environment of the Great Barrier Reef while reducing the amount of vessel and manual activity. It offers many opportunities to improve our knowledge of the ocean with minimum disturbance.

The future of the Great Barrier Reef can be greatly advanced through the scientific study of ocean dynamics and informed knowledge to protect the world's greatest natural resource, the 'coral' mines of the sea.

reef sea life survey

Australia's coastal fish life has been reduced in the space of a year announced the University of Tasmania's Reef Life Survey Foundation in February 2014.

the case for marine protected areas

The year-long continental reef sea life survey was a world first. The University of Tasmania (UTAS) survey of reef sea life along the entire coastline of Australia ended in Hobart on 19 February 2014.

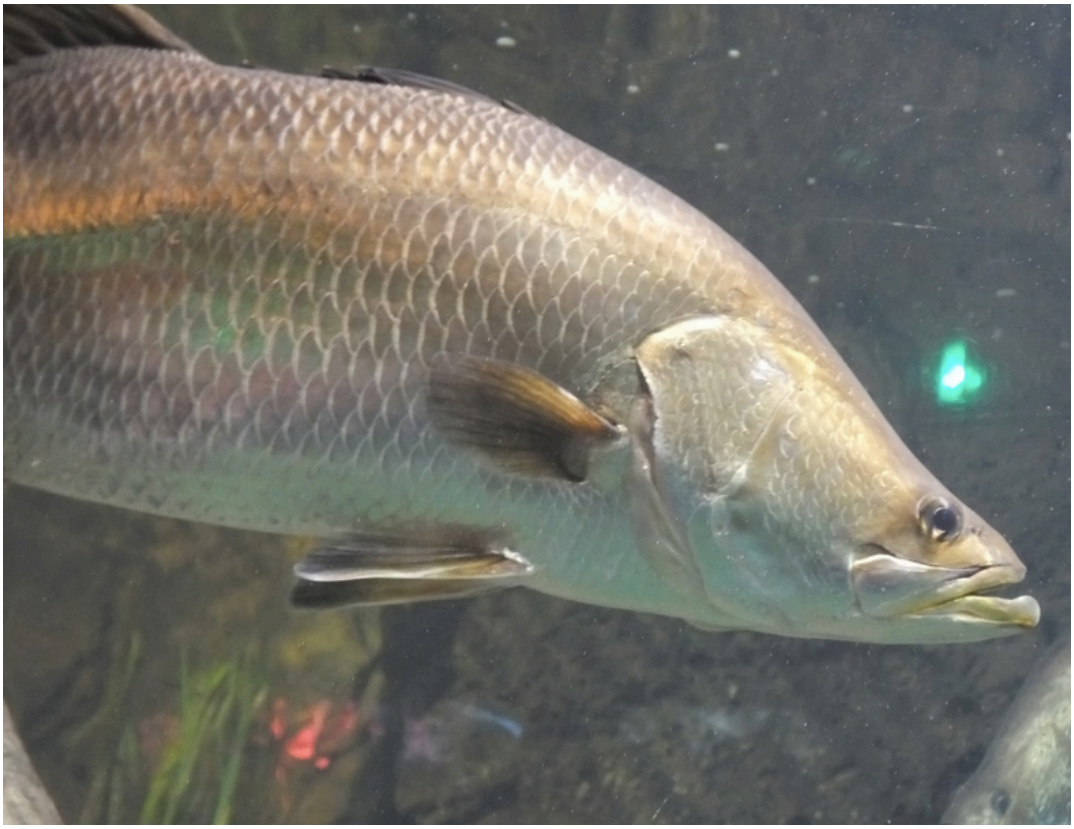
UTAS's Institute of Marine and Antarctic Studies researchers used a 14-metre catamaran called Reef Dragon to circumnavigate Australia – a distance of 12,000 nautical miles – while 75 trained volunteer divers examined the reefs up to 400 nautical miles offshore. This included the Coral Sea in the northeast of Australia and the North-West Shelf of Western Australia, finishing in Hobart, the state capital of Tasmania, in the south. Volunteer divers collected data from 700 coral and rock reef sites for the survey, making it the first comprehensive study of reef systems in any continent in the world.

The Institute revealed the biodiversity loss. It indicated that biodiversity loss is not solely the result of overfishing, but is also due to the spread of invasive species, as well as pollution near major port cities. UTAS said that some reefs were "doing really well, particularly off the North-West Shelf where there are good numbers of large fish" but elsewhere the coral reefs were being degraded by bleaching. Coral bleaching is when the colour of coral degrades due to the breakdown of the symbiotic relationship between

coral and zooxanthallae (marine algae). It's a form of starvation because most corals can't survive with the algae.

The best protection for reef sea life appears to be the well-enforced "no-take" marine reserves – Marine Protected Areas – that are more than 10 years old, more than 100 square kilometres in area, and isolated by deep waters or sand bars.

Australia has 3.1 million square kilometres of reserves (MPAs). In August 2016 the United States Government expanded the marine sanctuary in the Pacific Ocean near Hawaii. In September 2016 America announced the establishment of a unique Atlantic Ocean sanctuary off the coast of New England, totalling 12,696 square kilometres (4,902 square miles). In addition, dozens of other countries also announced new MPAs and other ocean commitments. For example, the United Kingdom designated about 830,000 square kilometres (320,465 square miles) for a marine reserve around the Pitcairn Islands in the South Pacific Ocean, and Malaysia established a 10,000 square kilometre (3,860 square mile) Tun Mustapha Park marine protected area.



reef fish

reef fish

seagulls

Paris is about 200 kilometres from the Normandy coast, so why are there so many seagulls in Paris? Why are seagulls becoming more frequent in cities, away from their usual coastal habitat? Are some people correct in saying that they are becoming more aggressive in urban areas?

Seagulls are large, common, easily-identifiable white birds that live along coastlines. Their high shrieks can be heard well before they are seen. There are several species of coastal gulls, such as herring gulls and black-backed gulls in England, and many others around the world.

However, in recent years they have begun to move inland to large urban areas. Urban seagulls are nesting on rooftops to avoid predators and are feeding on discarded food in rubbish bins where food is easily accessible. As food sources decline, sea birds are moving where human populations live in order to forage in landfill sites and city bins. Urban gull expert, Peter Rock, from England, says coastal and urban gulls are now two distinct populations that don't often mix.

Herring gulls have declined in Great Britain by half over the past 30 years. A sea bird survey in 1970 in Britain, found 343,586 nesting pairs, but by the year 2000 there were only 149,177 pairs. Fishing practices along the coast may have changed the feeding habits and patterns of sea birds. Alternatively, the population may be declining due to disease. However, scientists say that these two reasons don't explain why they move, and survive, inland, nor why the coastal and urban populations are different.

Seagulls are highly adaptable, intelligent, quick thinking and cheeky – probably strong characteristics to ensure their survival. But some people say that they are becoming exceedingly aggressive.

Are people in danger of 'killer' seagull attacks or are seagulls in danger of being demonized and culled? Alfred Hitchcock's 1963 horror film 'The Birds' was based on the 1952 story by Daphne du Maurier, set in Bodega Bay, California, where birds inexplicably attack humans. In the movie, seagulls were initially responsible for the attacks, but other birds, such as sparrows and eventually crows, were also part of the frenzied assault on people in the town. No explanation was ever provided.

Seagulls have long been a problem in coastal Britain, with many people calling them a menace. Birdwatch Ireland (BI) confirms that seagulls are scavenger birds – picking easy fish from fishery and trawler nets. Their behaviour is unlike other seabirds, such as terns and guillemots, that have expert skills in finding and catching fish. BI said people were not justified in 'demonizing' seagulls. Most seagulls – accused of being aggressive – were 'just trying to protect vulnerable chicks and had no interest in harming humans.' Gulls have learned to associate humans with food, but it is the food they want, not pets or humans.

Birdwatch Ireland said herring gulls, or seagulls, have declined by 90% in the past ten years, decreasing from 60,000 pairs to about 6,000 pairs in Ireland. The decline is due to the loss of breeding areas and botulism from rubbish dumps. Because seagulls are declining, BI says there is no need for a cull. BI is currently conducting a survey of roof-nesting gulls as part of the Dublin City Urban Birds project with Dublin City Council parks services (birdwatchireland).

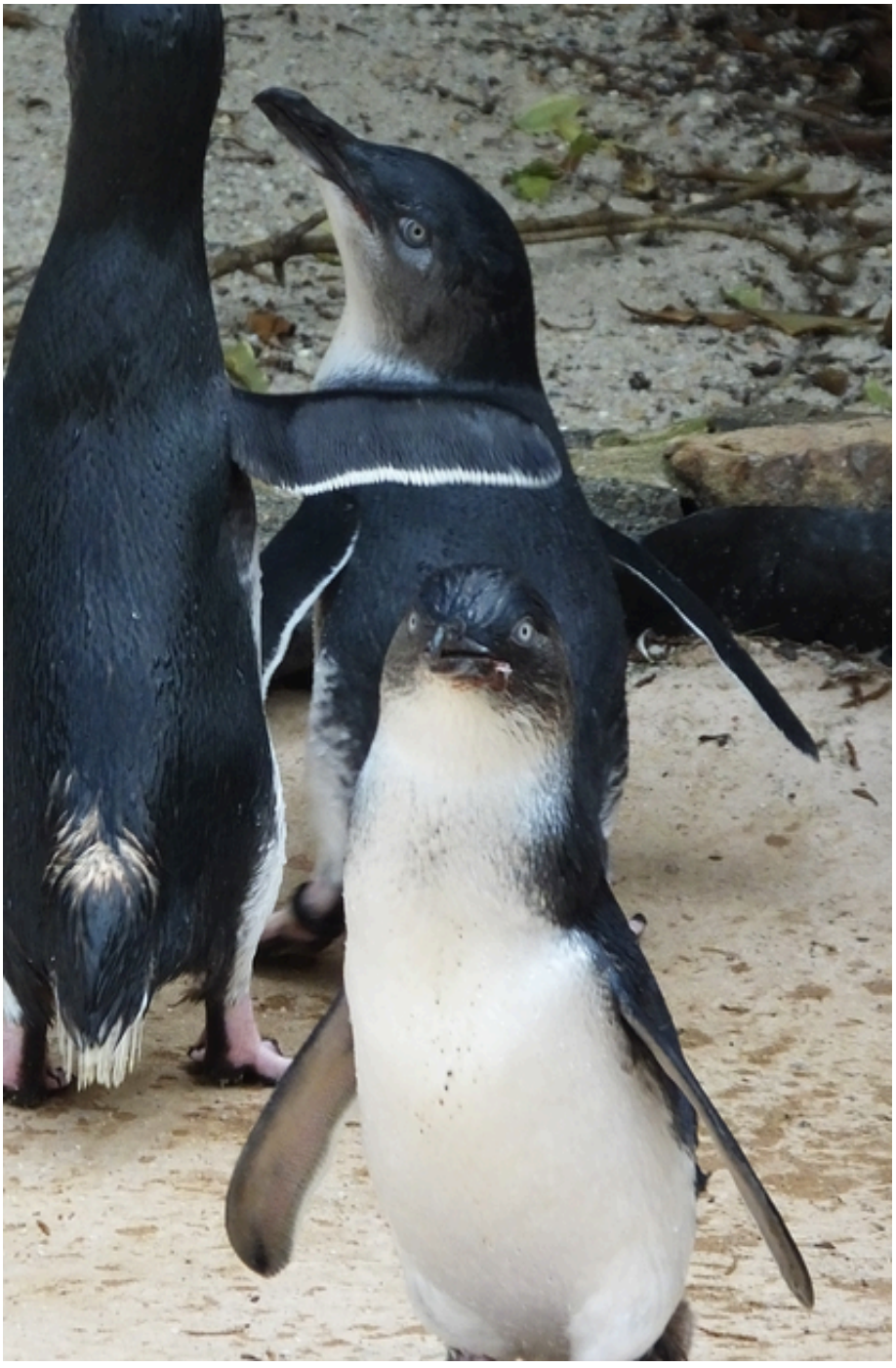
Can the seagull menace be controlled by psychology? *The Dispatch Tribunal* (23 February 2106) revealed that psychology may be the answer to the problem. Over an 18-month period to August 2017 researchers at the University of the West of England (UWE) will conduct a psychological evaluation of seagulls in order to understand their history, lives, and behaviour. They will also create a map of seagull interactions with humans in Bath and North East Somerset.

A focus of the study will be the nesting sites of seagulls, their feeding activity, and how people respond to them. Dr. Chris Pawson, head of psychology at UWE, said that council measures to detract seagulls over the past decade haven't worked in tackling the seagull menace. The councils have tried the use of special rubbish bags which prevent seagulls from scavenging. They also tried a 'dummy egg' scheme, designed to fool seagulls into thinking they are nesting – which makes them quieter. But none of these methods were effective in mitigating the seagull menace.

Therefore researchers and councils are trying a completely new approach. The approach will be based on strong evidence of seagull behaviour to gain a better understanding of their motivations for attacking pets and swooping on humans. Pawson said maybe seagulls are making decisions based on their environment, including expanded urbanisation and easy food availability near humans.

seagulls

coastal birds: penguins

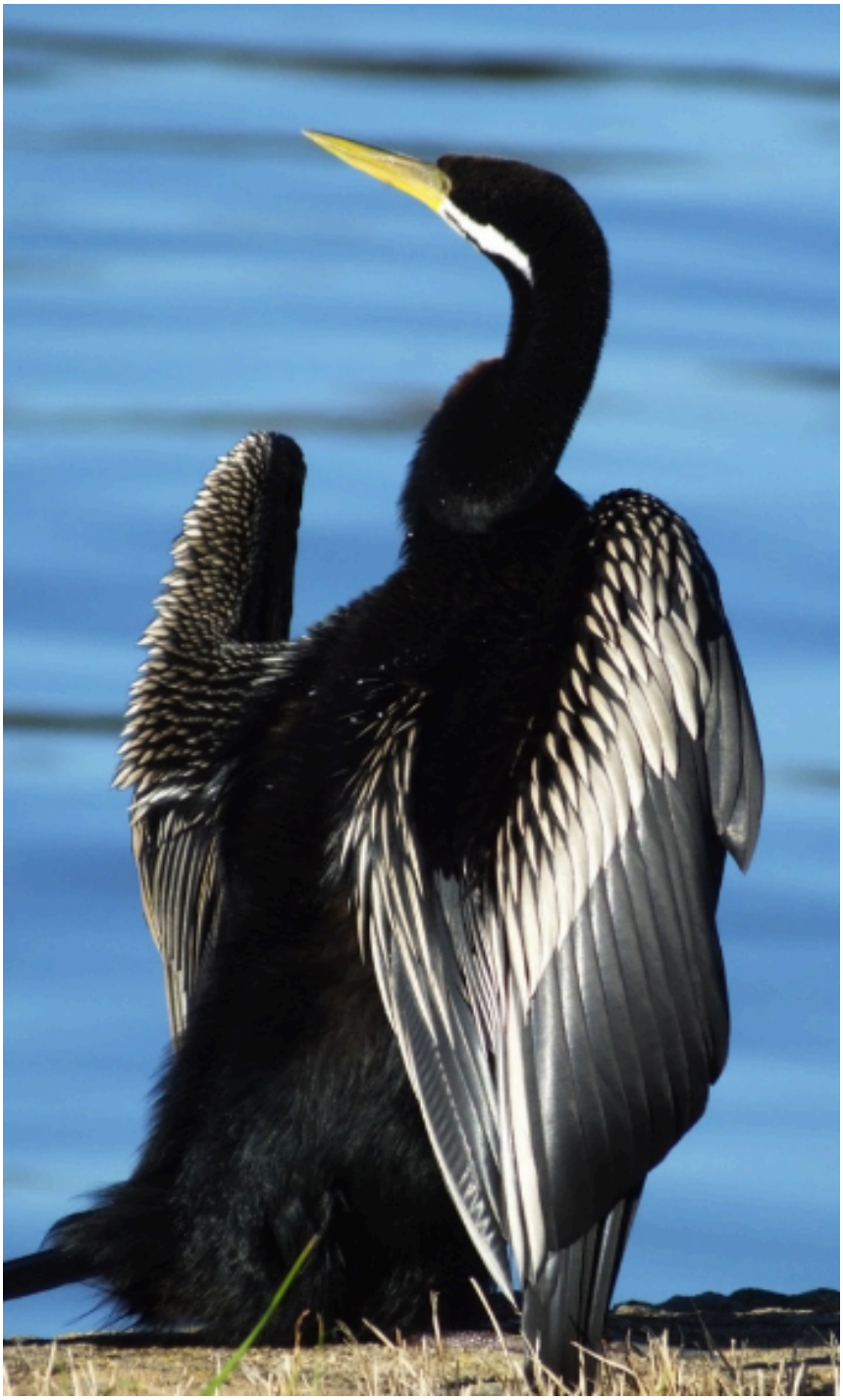


coastal birds: pelicans

coastal birds: storks & cranes

coastal birds: spoonbills

coastal birds: cormorants



seaweed

Seaweed is an plant – not a weed at all. A weed is an unwanted organism, but seaweed is a highly useful, ecologically important green, red, black, or brown marine algae, also called wrack, kelp, or Irish Moss. The 10,000 or more species of seaweed, found in temperate zones and icy polar regions, is found in oceans, lakes and rivers.

Seaweeds are also cultivated for human consumption, organic fertilizer, cosmetics, skin-care products, and medicinal use – and as emulsifiers in toothpaste, chocolate milk, yoghurt, health drinks, and fruit jelly. Full of vitamins and minerals, and a source of fibre (nutritious food), seaweed also contains anti-inflammatory and anti-microbial agents (medicinal properties).

The common genera of seaweed are *Caulerpa* (green), *Fucus* (brown), *Gracilaria* (red), *Laminaria* (brown), *Macrocystis* (brown), *Monostroma* (green), and *Porphyra* (red). Irish Moss is usually a red seaweed *Chondrus crispus*.

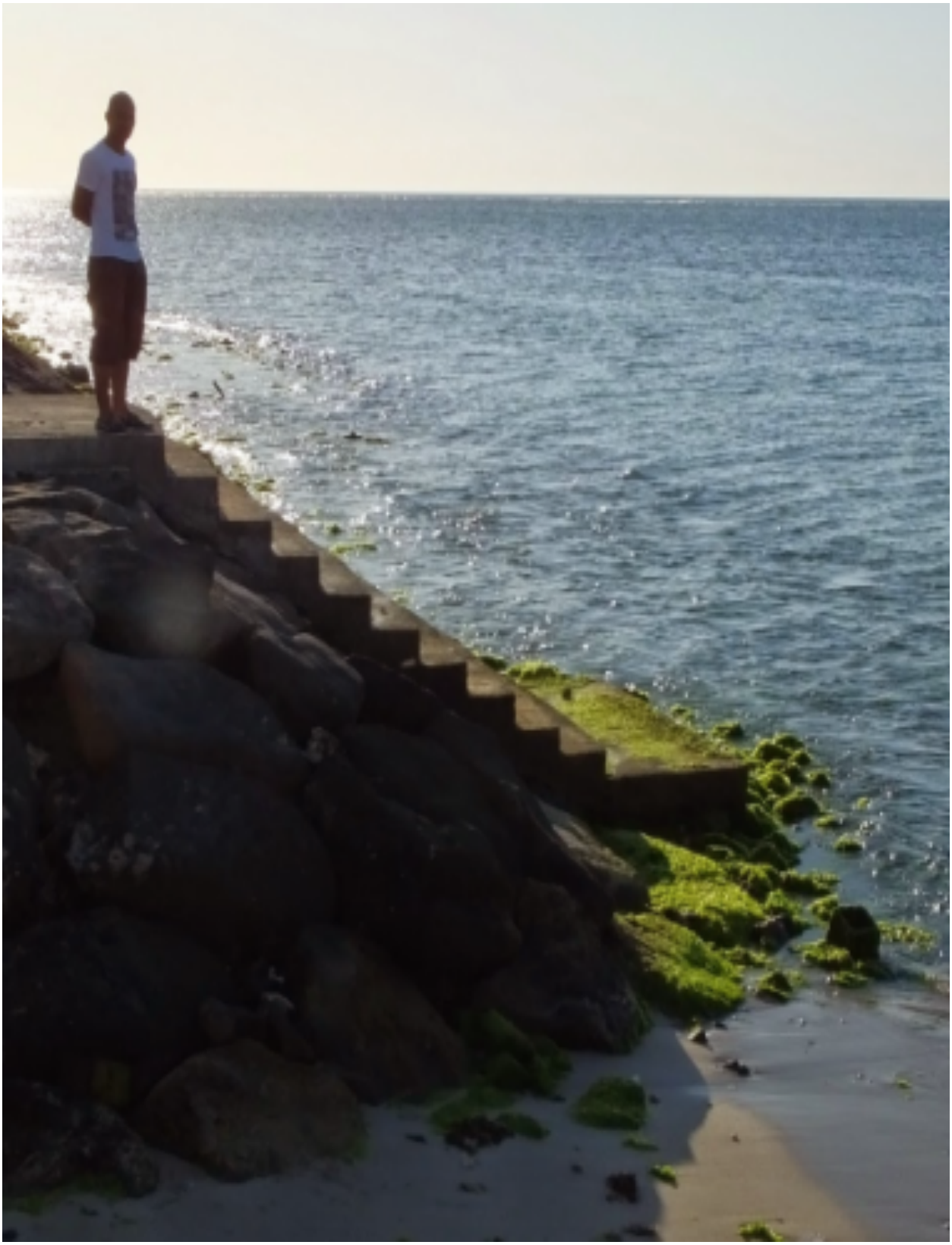
http://www.seaweed.ie

sea lions

Just as seaweed is not weed, sea lions are not lions. Sea lions are also not seals. Both sea lions and seals are pinnipeds – meaning 'wing foot' – and both are marine mammals. Both have flippers and are excellent swimmers. The difference is their ears. A sea lion has a small ear-flap on each side of its head. The opening of the ear-flap faces downwards so that water does not enter the ear. Seals have a tiny opening for their ears, with no ear-flap. Sea lions can rotate their back flippers forward to help them 'scoot' along the beach and rocks. Seals cannot do this – they wriggle or roll instead (and even slide). So sea lions are quite comfortable on land and in water. They live along coastlines and islands in the Pacific Ocean.

sea lions

sea lions



the author: Martina Nicolls

I am an author and humanitarian aid consultant with over 30 years' experience in the management, implementation, and evaluation of international aid development projects, particularly in post-conflict environments and countries with transitional governments, such as Somalia, South Sudan, Sudan and Darfur, Afghanistan, Kashmir, Pakistan, Iraq, Liberia, Sierra Leone, Georgia, Kosovo, Rwanda, and Sri Lanka, and also Mauritius, Mongolia, Papua New Guinea, Thailand, Vietnam, Cambodia – and others. I provide technical advice on areas such as peace-building and conflict mitigation, education, poverty reduction, human rights, child labour, data quality and financing models.

But mostly I am a wanderer. Wherever I am and wherever I go I take photographs and I write. My books include:

A Mongolian Lament (2015)
The Komodo Verses (2012)
Liberia's Deadest Ends (2012)
Bardot's Comet (2011)
Kashmir on a Knife-Edge (2010)
The Sudan Curse (2009)

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