

THREATS TO OUR

TEMPERATE REEFS

Approximately 90% of Australia's population live on or near the coast.

Our marine ecosystems are important both socially and economically, and utilisation of the marine environment imposes considerable pressures on these ecosystems.



Turbidity and sedimentation

Increases in turbidity and sedimentation commonly result from dredging, sewage and industrial discharges, stormwater, land reclamation, coastal development and erosion. Increased turbidity and sedimentation reduces the amount of light reaching algal communities, reducing photosynthesis.

Nutrient enrichment

Algal blooms and excessive epiphytes (attached plants and animals) are often a result of high nutrient levels, particularly in warmer water (e.g. the Port River/Barker Inlet area in Adelaide). This then shades the algae, lessening growth.

Invasive plants and animals

The establishment of opportunistic and exotic marine species can change habitats and reduce biodiversity significantly by smothering or shading, predation, or reducing the recruitment success of other species. The impacts of introduced species can be severe. The introduced species found in southern Australia are recognised as potential

threats to temperate reefs due to their invasive nature and are the subject of the award-winning Feral or In Peril program.

Coastal development

Coastal development such as housing, marinas, boat ramps and wharves, and dredging for various purposes has caused widespread vegetation clearance and habitat loss, both above and below water. Other impacts related to human population expansion include increased turbidity, stormwater run-off, coastal erosion and related nutrient loads due to poor catchment management.

Climate Change

Organisms on temperate reefs are vulnerable to the direct and indirect impacts of climate change, and it seems inevitable that currently projected environmental changes will continue to impact temperate reef communities. Rising temperatures will result in range-shifts of macroalgae, fish and invertebrates, with possible local extinction of species that have northern range limits along the southern coastline.

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Toxicants

Substances in the marine environment of most concern are those that are invisible but are persistent and toxic - even at low concentrations. Many inhibit growth or recruitment and are often associated with urban and stormwater runoff, and industrial discharges. The degree to which any chemical accumulates in an organism depends on the chemical and the organism; however, it may be as high as 500,000 times greater within the organism than in the surrounding seawater. Suspension feeders are at greatest risk of having high concentrations of toxicants as they filter large quantities of water, and so accumulate toxins. Bioaccumulation up the food chain is of particular concern. Carnivorous animals and filter feeders eat many times their own body weight in prey, all potentially containing the toxic substance and concentrating it, which has been observed in top marine predators such as seals and dolphins.

Extractive resource use

It has been well established that the removal of living resources is a major threat to marine biodiversity. This may occur through disruption to ecosystem functions such as competitive interactions or predator-prey relationships. Research at Leigh Marine Station, New Zealand, showed major improvements in the reef community after fishing was banned. Benthic communities shifted from being dominated by sea urchins (and overgrazed) back to a macroalgal-dominated system. This was an effect of increased predator abundance.

Fishing is the most common extractive resource use and is known to have numerous impacts on the target species including reducing average size, fecundity, and behavioural changes. In cases where levels of exploitation are high, effects can be severe. Some types of fishing equipment can also impact benthic habitats severely, such as trawl nets.

Other extractive industries such as sand or mineral extraction can also impact on reefs. For example, a study into the impact of sediment plumes associated

with near-shore sand mining on Adelaide's southern metropolitan coastline found that the sand mining resulted in a considerable level of degradation on Noarlunga and Horseshoe Reefs.

What can you do?

You can help by caring for our marine environment.

Here are some easy options:

- Don't put chemicals like oils, paints or bleach down drains and toilets
- Minimise use of pesticides and herbicides and use environmentally friendly alternatives
- Don't allow litter to enter stormwater – including cigarette butts; reduce, reuse and recycle
- Reduce runoff from your property by using rainwater tanks and clever landscaping
- Join Reef Watch and make a real difference

Reef Watch monitoring programs:

- Are award-winning volunteer-based ('citizen science') programs
- Are based on sound scientific principles and are designed to contribute directly to the management of temperate marine ecosystems.
- Provide volunteers with monitoring skills
- Raise community awareness and knowledge about reefs
- Collect and analyse ongoing monitoring data
- Collect data on invasive species, and species of conservation concern, through the 'Feral or In Peril' program

By monitoring changes over time, Reef Watch contributes to our understanding of 'reef dynamics' and assists in recognising when an ecosystem may be suffering stress. These changes are likely to be reflected in the presence, absence or abundance of species thought to be indicative of reef status and health. Information gathered by Reef Watch volunteers is an important indicator of the need for further scientific research and management actions.

Websites for further information:

www.conservation.sa.org.au/coast-and-marine-projects

<http://feralperil.ala.org.au>

www.reefwatch.asn.au