

From Streets to Seas

Continuing ideas for exploring the environment in all its meanings by Jeanie Clark

In the last couple of months, plastic pollution, with actions to reduce it, has hit the headlines. Have you been surprised, like me, that the focus has been only on what we carry our supermarket shopping in, but not where plastic rubbish goes?

If we refuse what we don't need, reuse what we can and responsibly dispose of what is left, is that all we need to know about plastic rubbish? This article adds to that where such rubbish goes: stormwater; ponds; streams; seas.

Stormwater

Where plastic (and other) rubbish can end up and how is a part of understanding 'Stormwater pollution'. It works like this: Rubbish dropped in streets can drift into gutters and then pass into stormwater drains. Their eventual outlets may be a local stream, lake or sea, like the plastic bottle in the photo below. So stopping littering, everywhere, matters.



If you are interested in learning about this topic, the Victorian Waterwatch *Stormwater Education Manual* is an excellent resource, available at the Victorian Waterwatch Website (look for the resources button, almost at the bottom of the page). This ready-to-use resource is aimed at middle primary to middle secondary years, but could easily be used at all levels. The '[Statewide Section](#)' is the most useful part. It has activities, lessons and resources that cover issues and understandings for stormwater and reducing its pollution. This content is highly relevant as issues continue today, but this resource's 2002 curriculum statements have not been updated to the latest Victorian ones – they are still basically the same.

The ultimate aim of Stormwater Education is to reduce what is going from the streets to the 'creeks'. While governments may do their part in putting 'socks' onto stormwater outlets, it is up to us to keep them just collecting leaf litter, and not plastics, like the one in the photo here.

If you are interested in doing some local field work,

you could consider a Stormwater Walk.

After considering any risk this might involve, simply follow the gutter in front of your

house and see where the water drains to and what litter is in the gutter that it might take with it. Note that dirt and deciduous leaves are pollutants in water places. Is there any neighbourhood behaviour that needs changing, or are you proud of yourselves? Try this at a park or shopping centre then – again addressing safety first.

Where does the drain go? (Do NOT get in any!) Go to your local government for a map of where their drains go. There are incredible hidden networks below the urban surfaces. Melbourne Water has an online overview map of some newer drainage schemes in its '[Planning and Building](#)' section, then under '[Developer Guides and Resources](#)'. Click on an area or go to the alphabetical list to choose one.

The plastic bottle in the first photo is circled here. Can you tell where it came

from and how it got there? See the drain opening? That has come underground from a street drain to empty into this wetland. Wetlands have two functions: firstly, nature reserves, and secondly stormwater management- filtering dirt out from water to pass on cleaner water downstream- often from their ponds to a river, and finally a sea. This [amusing student video](#) covers this journey clearly.

Port Phillip Bay

Is stormwater pollution a problem around Melbourne and its Port Phillip Bay? '[Bag's Revolt](#)' shows photos of plastic pollution in 2013 in three main





streams and three beaches. There is still enough of this pollution for Melbourne's Beach Patrol to conduct frequent beach clean-ups which you can [join](#).

Once in the sea, where does plastic go? It's not just the beach! Plastic drifts on the surface, in the water column and falls onto the seabed. It becomes traps and 'foods' that kill sea creatures, e.g. in this 2012 '[Marine litter](#)' video. Where can microplastics move to? [Everywhere!](#)

Underwater reefs are places where marine life is likely to be concentrated. Do you know where these are in Port Phillip Bay? By ticking only the 'Reef dive' icon on the [Scuba Doctor Australia](#) webpage, a map is created that shows the location of these reefs. By zooming the map out a little, Phillip Island's reefs are also shown. The Melbourne Reef Dives page describes each of these sites. There are a couple of beautiful videos here showing their underwater life. Notice the different life forms - then consider any threats plastics may pose.

Plastic is not the only pollutant moved by stormwater. Dirt can be a huge one, especially at flood times or where there are no wetlands. This 'silt' may cover underwater habitats near outlets of natural streams and following any underwater channels. Consider the ancient stream channels still on the seabed of Port Phillip Bay at this [map](#). What effect might these channels have on the movement of pollutants in PPB today?

Shellfish can filter this silt. To discover what they do and why they have been missing from PPB, see [Shell Fish Restoration](#).

Coral Reefs

The Melbourne Reef Dives page also points out key differences between our cool temperate reefs and the warm tropical ones which people mostly think of as 'reefs'. While people often value reefs for their nature and beauty, they may not be aware that reefs use and store carbon in their structures. In temperate reefs, their visible macro-algae do this directly onto rock. In tropical reefs, their tiny micro-algae live in corals and sponges and do this within the coral, which makes limestone.

What is coral: rock, animal, or plant? What gives it its colour? The video "[Coral- What does it eat?](#)" answers this and describes the links between coral and its algae, zooxanthellae.

A more detailed video of the coral-algae symbiosis is '[Coral Biology and Zooxanthellae](#)'.

This year has a global focus to "strengthen awareness globally about the value of, and threats to, coral reefs and their associated ecosystems". It is the first of four aims of the [2018 third International Year of the Reef \(IYOR\)](#). A lot more good information about reefs can be found on the [About Coral Reefs](#) page.

What coral reefs does Australia have? Not just the Great Barrier Reef! Find the others on the map halfway down the [Earthy Issues](#) webpage along with many facts about our Great Barrier Reef. It then describes the corals' three main threats:

- 1 Siltation – drowning in dirt! The second satellite photo on this page shows the extent of plumes of silt (in this case 'soil' eroded from farmland) which settled over the sea bed and its living things following a 2007 high rainfall event.
- 2 Acidity- More acidic seawater dissolves coral structures. Warmed seas have more acidity.
- 3 Bleaching- The final satellite images show the extent of hot sea water and coral bleaching in 2006. When the water gets too hot, the coral loses its hold on its micro-algae, zooxanthellae. Without this, the coral has no source of carbon, and dies – becoming white, or 'bleached'. This [Great Barrier Reef Marine Park video](#) explains this and also includes simple actions that can reduce the climate warming at the base of this problem.

The Australian effort for this IYOR comes from the Great Barrier Reef Marine Park. There is a wealth of information at this website: lessons by year level, videos, explanations of issues and suggested actions.

Managing our plastic responsibly is a good local and global action. Learning about stormwater develops awareness of wider local/global issues.