Catchments

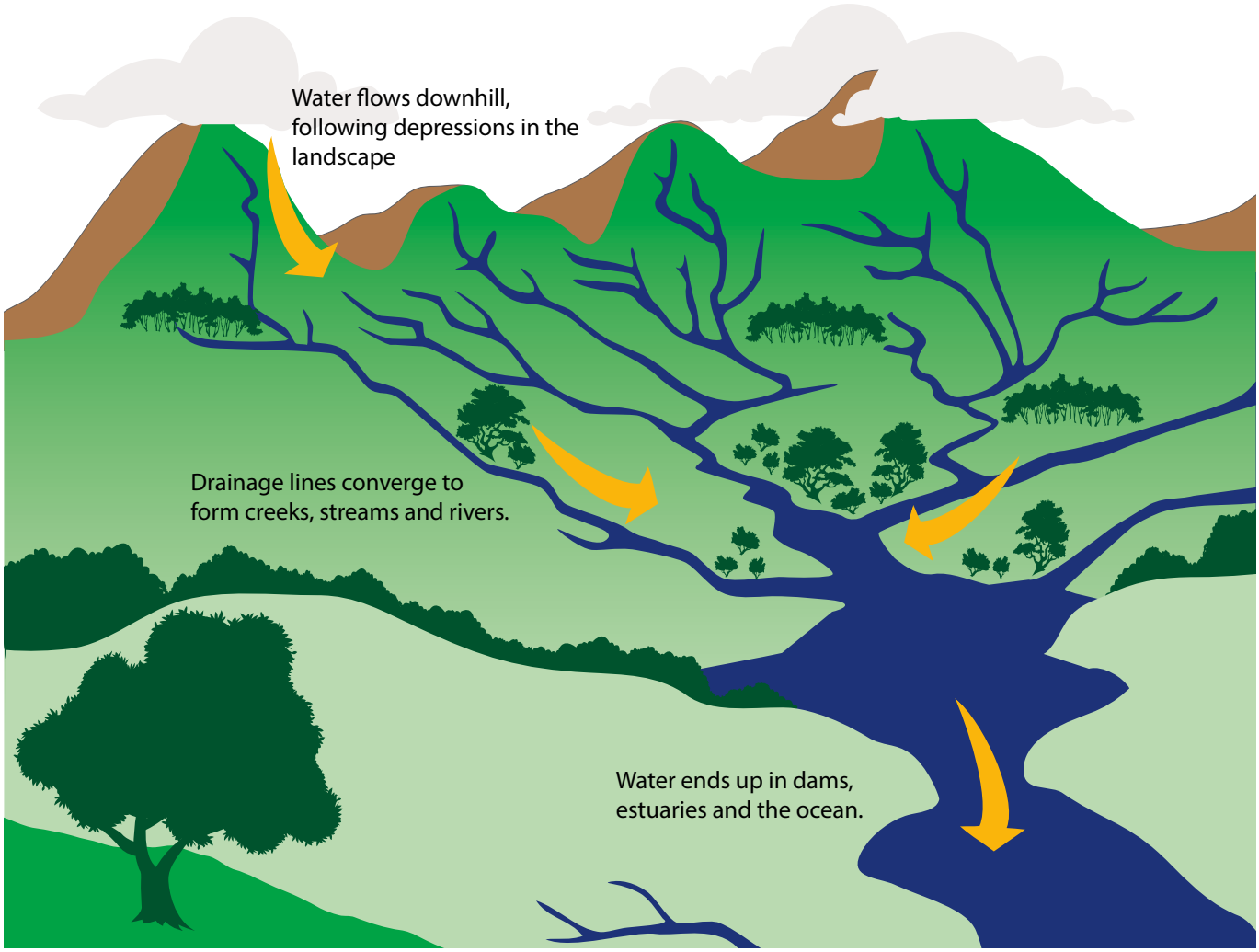
What is a catchment?

A catchment describes any surface where water falls, and drains, to an end point. That means that everywhere on Earth is located within a catchment. A catchment can be small like the roof of a house, or huge like the Murray-Darling Basin.

The NSW marine estate has a huge catchment and includes all the water that flows east of the Great Dividing Range.

Whatever we do in a catchment affects the water that flows through and out of it. For example, if a town pollutes its river water, other water users downstream will use that same polluted water. This is not healthy for our wildlife, our agriculture or our health.

To look after our catchments, we need to care for the land that forms the catchment and be aware of any downstream impacts.



Impacts on water quality from the land

Ecosystems are affected by urban and agricultural run-off, industrial and sewage effluent discharges, and catchment development. This can lead to poor water quality as excess nutrients, sediment, heavy metals, chemical pollutants, faecal bacteria, and organic waste enter the system. Poor water quality can lead to toxic algal blooms, over-sedimentation restricting light (making the water dirty), and contaminated fish and shellfish, which poses a risk to human health.

Over time, development in the marine estate and its catchments has resulted in the loss of seagrass and wetlands, local extinctions of fish populations, loss of natural spawning and nursery grounds, and loss of benthic communities (bottom-dwelling organisms).

There have been improvements in approaches to water quality and habitat management over the years. However, continued losses of seagrass and degraded resources indicate that the marine environment remains highly disturbed.

Pugging from heavy cattle traffic can impact water quality (Kelly Coleman)

Yarrahapinni aerial iron stain, showing water behind the floodgates which is loaded with aluminium and heavy metals including arsenic from the acid sulfate soils (Mitchell Tulau/DPE)

Nutrients from the land

Nutrients are essential for life and they contribute to healthy, productive ecosystems. However, too many nutrients can lead to algae build-up if the weather and water conditions are right. Algal blooms use up available oxygen in the water and can lead to plants and fish dying where blooms break out. Filter feeders, such as shellfish, begin storing toxins from the algae, making them toxic to eat.

This state of excess nutrients is called eutrophication. It has been shown to disrupt the balance of ecosystems, changing the types of organisms found in the ecosystem and reducing overall diversity.

Sediments from the land

Sedimentation is the process of small particles such as silt and mud building up in the ocean. Sedimentation is a natural result of erosion and in a balanced ecosystem, causes no serious threat to marine life.

The problem comes when poor land management decisions within the catchment accelerate sedimentation. Increased erosion on land can severely muddy the freshwater that flows into estuaries, where seagrass meadows and oyster reefs are located. This is particularly problematic after big storm events and flooding.

The sediments that flow into the estuaries often contain lots of toxins and heavy metals from across the catchment. The muddy nature of the water also reduces light reaching seagrasses and they quickly die.

It is important that when we think about looking after the marine estate, we also need to look at the entire catchment landscape and make better land management decisions.

Bushfires, floods and droughts

Bushfires, floods, and droughts are well-known extreme climatic events in Australia, and they can seriously impact our communities. Chances are you have experienced both floods and droughts. Changes in our atmosphere and oceans trigger these events. You may have heard of the terms El Niño (dry) and La Niña (wet). These are two big weather patterns that help us understand if we're going to be in a long drought or have heavy rain events.

Droughts can lead to frequent and intense bushfires like the 2019-20 summer bushfires. Unfortunately, the drought that eastern Australia had experienced for a number of years had dried everything out, making the landscape just right for one of Australia's most tragic bushfire events.

Following the bushfires, many areas of eastern Australia experienced such heavy rainfall that floods occurred in burnt areas. The combination of a burnt landscape followed by heavy rainfall meant a toxic sludge flowed into our rivers, lakes and ocean. The impact from these two close events is still being studied and documented.

For more information

Click or Scan the QR Code

Bushfire impacts on water quality
Factsheet

Left: Floods can wash all sorts of chemicals, silt and debris into rivers (Peter Sharratt/DPE)

Below left: Bushfires have a big impact on our air, land and water (John Lugg/DPE)

Below: Droughts can impact saltmarsh and mangrove ecosystems (John Spencer/DPE)

Bushfire impacts on marine life

The 2019-20 bushfires left behind a huge, charred scar on the landscape. Many areas across NSW and Victoria received large amounts of rain following the fires, washing tonnes of organic matter into coastal lakes and estuaries.

The ash and debris entering waterways during the bushfires and after rain can remove the feeding and breeding areas of aquatic animals, clog the gills of fish, and undermine the breathing of filter-feeding animals such as mussels.

The fires burnt many forests near the coast, destroying vegetation that filters silt and excess nutrients at the coastline. These ecosystems are adapted to the low nutrient flows from the land and are not accustomed to the huge influx following the fires.

Fire retardants used in fire suppression activities can harm aquatic animals when directly or indirectly applied to waterways.

The bushfire impacts on estuaries and other coastal waterways could take months or years to materialise, making it imperative for researchers to undertake comprehensive and ongoing monitoring programs.

Landscapes scarred by fire directly impacts rivers and water quality (Rob Blakers/Flickr CC-BY)

Smoke from the 2019-20 bushfires spread across the globe (Ash Hogan/Flickr CC-BY)

Marine debris

Marine debris is litter that ends up in our oceans and is a globally recognised environmental issue of increasing concern. Marine ecosystems worldwide are affected by human-made refuse, much of which is plastic. Marine debris can include:

- styrofoam
- plastic bottles
- fishing nets
- food packaging
- crates
- cigarette butts
- gloves
- buckets
- rope
- fishing gear
- packing materials
- light globes
- plastic bags
- plastic microbeads
- aluminium cans
- plastic six-pack rings
- disposable face masks
- balloons.

As a lot of marine debris is plastic or rubber-based products, they tend to float within the water column. Some float on the surface, such as plastic bottles or rubber thongs, others float beneath the surface, such as plastic bags. These items start to resemble food for marine animals, and they feed on those items instead of their actual food. In some areas, such as Lord Howe Island, ocean birds have been found to have stomachs full of plastics. This is also true for many sea turtles that mistake plastic bags for jellyfish.

Other animals get entangled in fishing lines, plastic, metal rings or bags. In the open ocean, discarded fishing nets, called ghost nets, float around and catch sharks, sea turtles, dolphins and birds.

The accumulation of small plastics called microplastics is another problem for birds and fish. Some chicks have been found to have stomachs full of plastic, including balloon fragments, that their parents mistook for food, or fed them fish that contained microplastics.

For more information

Click or Scan the QR Codes

Tangaroa Blue
Website

What does marine debris mean for our oceans?
Video

Marine litter campaign
Videos

Above: Plastic bags often end up in the ocean and harm wildlife (Peter Sherratt/DPE)

Keep our coasts clean

Cleaning up our beaches, estuaries and catchments is vital to stop marine debris killing our marine life.

Up to 40,000 pieces of plastic are estimated to float in every square kilometre of ocean. 800 species worldwide including 77 Australian species are impacted by marine debris. Over 75% of what is removed from our beaches is made of plastic.

Below: Styrofoam is a serious threat to marine life as it crumbles into thousands of small fragments (Kelly Coleman)