



Australian Government



MURRAY-DARLING
BASIN AUTHORITY

Explaining mass fish deaths

A mass fish death is a sudden and unexpected mass mortality of wild or cultured fish. They are often the result of water pollution, but there are many causes of mass fish deaths and often they are caused by natural events.

Mass fish deaths can occur in both freshwater systems and estuarine systems and are more likely to occur in summer, during the months of January and February. This is likely to be due to:

- generally higher water temperatures (and consequently lower dissolved oxygen levels)
- more frequent severe and sudden storm/flood events
- generally lower water levels in freshwater river systems during these months.

There are a range of causes of fish deaths. They are generally associated with water quality changes, pollution, infection, associated directly with human activities or a combination of causes. However, in almost half of all reported mass fish death events the cause remains unknown.

Some causes include:

- dissolved oxygen levels (e.g. caused by bushfires, flood events, decaying vegetation matter)
- high or low temperatures
- drought or dry conditions
- algae and algal blooms
- acidic runoff
- pesticide/chemical pollution
- dumping of waste fish or bycatch
- disease/infections.

Key facts

Fish deaths are usually the result of sudden events or changes in the local environment.



Mass fish deaths are **more likely to occur in summer**, during January/February.



Deaths are usually the **result of sudden events** or changes in the local environment.



Fish will naturally avoid adverse environmental conditions, however **escape is not always possible.**



Low levels of dissolved oxygen can cause stress (and even death) to fish and other aquatic animals which rely on oxygen in the water to breathe.



Larger fish species, such as Murray cod, tend to become stressed and/or **die first due to their greater oxygen requirements.**

Often, a large percentage of fish deaths are caused by several factors acting together. For example, drought conditions, blue-green algae and a change in temperature, resulting in reduced dissolved oxygen, collectively are thought to have led to mass fish deaths in the Lower Darling in December 2018 and January 2019.

Mass fish deaths are usually the result of sudden events or changes in the local environment. As far as possible, fish will avoid adverse environmental conditions and swim to another area to avoid harm. However, if the entire or a large proportion of the waterway is affected, there are barriers to movement. If the adverse conditions appear very rapidly, then fish are unable to relocate and a mass fish death results.

Reduced dissolved oxygen and its effects on fish

Low levels of dissolved oxygen can cause stress (and even death) to fish and other aquatic animals which rely on oxygen in the water to breathe.

Dissolved oxygen in water comes from both the atmosphere—by exchange across the air-water interface, mostly from wind and wave action, or agitation during flows in streams and rivers—and is released by aquatic plants, via photosynthesis.

The normal range of dissolved oxygen for water is between 6–8 milligrams per litre (mg/L). However, this does vary between coastal and inland rivers and estuarine and marine waters.

Most aquatic animals, including fish, extract the oxygen they need from the water through their gills. Very low levels of dissolved oxygen will cause suffocation and death of aquatic animals.

It is not necessary for the water to become completely deoxygenated for mass fish deaths to occur. The critical minimum level varies with different species and different physical conditions, but as a general guide, few fish species will tolerate prolonged exposure to levels below 3 mg/L.

Larger fish species, such as Murray cod, tend to become stressed and die first due to their greater oxygen requirements.

Reporting mass fish deaths

If you witness a mass fish death we encourage you to report this to the relevant local authority:

New South Wales

Fishers Watch - 1800 043 536

Victoria

EPA Pollution Hotline - 1300 372 842

South Australia

Fishwatch Hotline - 1800 065 522

Queensland

Department of Environment and Science
- 1300 130 372

Australian Capital Territory

Access Canberra - 13 22 81



Connect with us.

The MDBA has offices in Adelaide, Albury-Wodonga, Canberra, Goondiwindi, Griffith, Mildura, Murray-Bridge, Toowoomba, and regional engagement officers around the Basin.

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