
BLOG: Where forward for the Murray-Darling following fish deaths?

Algae and its effects on Australian waterways including the Murray-Darling Basin have been a hot topic in the media recently following the death of up to a million fish in the system over the last two weeks.

Public momentum began with a viral online video showing distressed farmers in knee deep, cloudy green water holding the rotting corpses of sizable Murray cod which had perished in Menindee Lakes in western New South Wales.

In light of this devastating ecological event, now is a good time to better understand the situation and more importantly, how to approach the issue from this point forward.

A good start to understanding what is going on is to realise that algae is like any other plant. They are an essential part of life on earth, consuming carbon dioxide and emitting oxygen, just like your favourite house plant. There are many different species of algae; some are good, and some are not good. The current situation in NSW has been caused by the not so good algae causing what is often called a blue green algal bloom.

Algae exist microscopically in all waterways, both salt and fresh water; they're called '[phytoplankton](#)'.

Like many other ecosystems in the world, human activity can contribute to significant imbalances in natural systems. In this case, runoff pouring into the Murray-Darling Basin has created a spike in nutrients such as nitrogen and phosphorus.

Think of these nutrients as algae food.

If the weather lines up to be hot and dry, just like the summer Australia is currently experiencing, and the water isn't flowing, not so good algae can sit stationary on the couch and stuff their faces with algae food, growing until they quite literally 'bloom' and take over the still water. In these cases, the not so good algae win the day and the good algae get kicked off the couch.

Like your favourite house plant, during the day the algae is in a state of photosynthesis, harnessing energy from the sun and creating oxygen which enriches the water and sustains fish and other life. At night however, algae switches to the opposite process called respiration where they stuff their faces with oxygen and expel carbon dioxide which is not helpful for life in the river.

When the river is hit with such a major bloom, conditions become unsuitable for even the bloom itself to live, and the algae begins to die. As with all things deceased, bacteria are key to the decaying process and as the bacteria multiply, they begin to suck the oxygen from the already oxygen-depleted water. Which means everything else living in the water with the dying bloom and its flesh eating bacteria are choked on the rancid, toxic water.

It is this boiling pot of conditions that cause mass fish death, as seen in the recent photos and videos online.

(Note to self, don't over-fertilise house plant.)



Image credit: freefilmfestivals.org

In summary, the microscopic algae is always there. Through human activity, it was fed too much algae food. As a result the algae got morbidly obese up to an unhealthy level. Then it died, and poisoned everything around its corpse.

So, while many people are debating the cause of the situation, this debate is not going to fix anything unless there is lot of fresh water into the river, or some other smart way to help get the balance back to the river is implemented.

So the question is now, how can a healthy balance be restored to fresh water rivers and streams where bad algae have started to settle in?

With [marine dead zones](#) a reality around the world, and a growing population that needs higher agricultural outputs, new technologies are being explored to prevent algal blooms and treat them without compromising water quality.

Try thinking of a river like we think of gut health nowadays. The state of both determines the health of the surrounding environments.

When we get a tummy bug, we can take an antibiotic to kill the bug, but it will also kill the good bugs we have working for us. This is similar to the use of algaecide; it is effective but doesn't discriminate between good and bad algae species. As a side effect, the good algae is poisoned along with the bad.

In the algae world, wouldn't it be nice to find a way to improve river health in a similar logic to gut health, where pre and probiotics keep the bad bugs at bay? To do this, finding a way to improve the

number of good algae or diatoms in the affected river can help to tip the scales back into balance in the same way pre and probiotics help restore gut health – by outcompeting their toxic counterparts.

This technology is called '[Diatomix](#)'.

Diatoms are the basis of the main food chain in water. They get eaten by zooplankton, and then by every level of predator above that in the food chain including fish, creating healthy waterways.

Diatoms are also the only phytoplankton (microscopic algae) that require silica to grow. Other types of algae don't like silica. Think of silica like a food allergy for all other algae types except diatoms.

Diatomix technology 'spikes' the silica with micronutrients so when a diatom takes in the silica gels, the good algae get a surprise boost of micronutrients which helps them grow faster. It's like crushing up a vitamin and sprinkling it into the food that we know only the diatoms will eat. The diatom algae gets healthier and thrives, outcompeting the other toxic micro algae.

Not only does recent research show the value of helping river water health by enabling the good algae grow and multiply, it also sets up a balanced food system which brings health back into balance without needing an injection of fresh water. This newly developed technology has already been tested in different environments with [positive results](#).

This system is best used when blue green algae isn't already in full bloom as it still needs to die from starvation and decompose somewhere, this process just makes it easier to remove in the early stages.

.

Australia's waterways are delicate living systems which need to be taken care of like a human body and treated with the right medicine when they begin to fall ill.

Perhaps our new year's resolutions for better health should extend further than just our own bodies to the living system we rely on to survive. They say you are what you eat and no doubt, the people who have developed the good algae food would be happy to help the river recover and keep it healthy until the rains come. We understand it is not that costly.

Article by Southern Queensland NRM, January 2019.